Subject: Land Exchange Project between the Montana Department of Natural Resources and the Lolo National Forest

Threatened Plants Assessment and Sensitive Plants Biological Evaluation

To: Gary Garthwait

Direction and Purpose
This paper is a documentation of prefield reviews, survey results, and potential effects on threatened and sensitive plant species that may result from a proposed Montana Department of Natural Resources (DNRC) and Forest Service Land Exchange within the Lolo National Forest. Forest Service Manual, FSM 2670.5, directs a review of projects to determine how an activity may affect any threatened, endangered, proposed or sensitive plant species.

Proposed Land Exchange
Under the proposed action alternative (Alternative 4), 12,335 acres of state land would be acquired by the Lolo National Forest in exchange for 11,493 acres of federal land. The purpose of the exchange is to acquire isolated in-holdings to improve and consolidate National Forest landownership patterns for more effective and efficient land management. Likewise, the DNRC would assume the same benefits for their land management purposes.

Threatened and Endangered Plant Species
Interagency cooperation between the Forest Service and the USFWS, regarding proposed, threatened, or endangered species is described in Section 7 of the Endangered Species Act. Definitions relating to “consultation” and “conference” are given in FSM Supplement 2600-90-6. Two plant species, *Howellia aquatilis* (water howellia) and *Silene spaldingii* (Spalding’s catchfly), are federally listed as Threatened. Both of these plants are suspected to occur on the Lolo National Forest.

Water howellia is a member of the *Campanulaceae* family. It is an annual plant that occurs in small, vernal, freshwater glacial ponds and oxbow sloughs in the valley zone from 3100 to 4425 feet in elevation. These ponds typically dry by late summer. The plant flowers in late July to early August. Potential habitat for this plant occurs on the Seeley Lake Ranger District of the Lolo National Forest.

Spalding’s catchfly is a member of the *Caryophyllaceae* family. It is a perennial plant that is primarily restricted to mesic grasslands that make up the Palouse region in southeastern Washington, northwestern Montana, and adjacent portions of Idaho and Oregon. It is typically associated with grasslands dominated by native perennial grasses such as Idaho fescue or rough fescue. Other associated species include bluebunch wheatgrass, snowberry, Nootka rose, yarrow, prairie smoke avens, sticky purple geranium, and arrowleaf balsamroot. Scattered
individuals of ponderosa pine may also be found in or adjacent to Spalding’s catchfly habitat. Occupied sites range from 1750 to 5100 feet in elevation. Habitat for this plant occurs on/near the Plains/Thompson Falls District of the Lolo National Forest.

Habitat for water howellia and Spalding’s catchfly does not occur in or near the project areas (land parcels for exchange).

Currently, no federally listed known or suspected Endangered plant species or critical habitat occurs on lands managed by the Lolo National Forest or the state of Montana.

**Forest Sensitive Plants that were Known to Occur in the Land Parcels Prior to Surveys**

*Cypripedium fasciculatum* (Clustered Lady's-slipper) was known to occur in two parcels: Cutoff 16 and Fourmile 34. Under the proposed exchange, Cutoff 16 would transfer from DNRC to Forest Service management. Fourmile 34 would transfer from Forest Service to DNRC management.

**Forest Sensitive Plants that are Suspected to Occur in the Land Parcels**

*Bidens beckii* (Beck Water-marigold) *Asteraceae* family

Habitat: Aquatic perennial plant, found in still or slow-moving water of lakes, rivers, and sloughs in the valleys. This plant is usually growing in 0.1-3 meters depth of water at 3-4,000 feet elevation. On the Seeley District, it is known to occur in Seeley Lake, Salmon Lake, and Lake Alva. Survey: Flowers in late August through September.

*Brasenia schreberi* (Watershield) *Nymphaceae* family

Habitat: Aquatic perennial plant, found in shallow water of ponds, lakes, sloughs, slow-moving rivers, and sluggish streams in the valley zone, 3-4,000 feet elevation. On the Seeley Ranger District, it is known to occur in Seeley Lake and the Clearwater River; in 1-3 feet of water. Survey: Flowers in August.

*Carex chordorrhiza* (Creeping Sedge) *Cyperaceae* family

Habitat: Wet, organic soil of sphagnum fens and bogs in the montane zone, 3410-5280 feet. Survey: Fruit matures in July.

*Clarkia rhomboidea* (Common Clarkia) *Onagraceae* family

Habitat: Dry, open forests with gravelly soils in the montane zone, 2460-6800 feet (one historic occurrence reported at 6800 feet). All known Lolo NF occurrences are on the Plains/Thompson Falls District from 3200-4400 feet. One historic occurrence reported at 6800 feet could not be relocated. Seven locations occur within or adjacent to the Douglas-fir/ninebark habitat type. One occurs in a Douglas-fir/bluebunch wheatgrass habitat type. Most occur on southerly aspects with one occurrence including a west aspect. Survey: Occurrences in Plains/Thompson Falls flower around the first 3 weeks of July.

*Claytonia arenicola* (Sand Springbeauty) *Portulacaceae* family

Habitat: Annual plant that grows in mossy, forested, north-facing slopes in the lower montane zone, 2700 feet. On the Plains/Thompson Falls District it is known to occur in the following
drainages: Falls Creek, Cascade Creek, Siegel Creek, Wallace Creek, Wilson Creek and Robertson Creek.
Survey: Occurrences in Plains/Thompson Falls flower in late April through late May.

_Cypripedium fasciculatum_ (Clustered Lady's-slipper) _Orchidaceae_ family
Most Montana occurrences are in warm, dry mid-seral montane forest in the Douglas-fir/ninebark and grand fir/ninebark habitat types. Elsewhere in its range, it is in western red cedar habitat types. On the Lolo NF, it has been found on the Ninemile, Superior, and Plains/Thompson Falls Districts. It has been found mainly in the Douglas-fir/ninebark habitat type, but also in grand fir/twinflower, grand fir/ninebark, grand fir/queencup beadlily, and Douglas-fir/pinegrass habitat types. Elevation zone is between 2600 and 4680 feet.
Survey: On the Lolo NF it flowers in late-May through July.

_Grimmia brittoniae_ (Britton’s Dry Rock Moss) _Grimmiaceae_ family
This sensitive moss grows on vertical faces of shaded, calcareous cliffs or large boulders (calcium-rich argillite, calcareous siltite) in warm, dry, but climatically moist valley-bottom or piedmont forests dominated by Douglas-fir (_Pseudotsuga menziesii_) with an understory of ninebark (_Physocarpus malvaceus_). It is only found beneath overhangs where leached calcium has precipitated to form a crust over the rock. There may be some association with vernal seepage (Greven and Spribille 1999).

On the LNF, the habitat is as described above. It is found between 2500-2700 feet in elevation on calcic dolmitic rock of the Wallace formation. Britton’s dry rock moss has been found on the Plains/Thompson Falls District in the Thompson River drainage. It has been collected from five separate locations; two of these are over one mile from each other.

_Grindelia howellii_ (Howell's Gumweed) _Asteraceae_ family
Habitat: Various disturbed and natural habitats, including roadsides, pine plantations, grazed pastures, forest openings, river terraces, and native grasslands, 3320-5960 feet. On the Lolo NF, it has been found on the Seeley District along roadsides. Survey: Flowers in July and August.

_Potamegton obtusifolius_ (Blunt-leaved Pondweed) _Potamogetonaceae_ family
Habitat: Shallow water of lakes, ponds, and sloughs in the valley, foothill, and montane zones, 3080-5200 feet. Survey: Flowers in late July and August.

_Scheuchzeria palustris_ (Podgrass) _Scheuchzeriaceae_ family
Habitat: Wet, organic soil of fens, bogs, and lake margins in the valley and montane zones, usually with sphagnum moss and _Carex spp._, 2950-6550 feet. Survey: Flowers in June and fruits in July.

_Scirpus subterminalis_ (Water Bulrush) _Cyperaceae_ family
Habitat: Open water and boggy margins of ponds, lakes, and sloughs at 0.1-3 m depth in the valley, foothill, and montane zones, 2890-6000 feet. On the Lolo NF, this plant has been found on the Seeley District in the Clearwater drainage on a floating peat mat.
Survey: Flowers in late June and July, fruits in August.
Trifolium gymnocalpon (Hollyleaf Clover) Fabaceae family
Habitat: Open woods and slopes, usually in dry soil of sagebrush steppe to ponderosa pine forests in the foothills to lower montane zone, 4800-6300 feet. On the Lolo NF, it has been found on the Missoula District in the Rock Creek drainage. Survey: Flowering has been seen in mid-April (Missoula occurrence) to July.

Prefield Review of Existing Information
The risk of adverse effects from proposed project activities was evaluated for 37 sensitive plants, including two threatened plant species. The sensitive plant list used is dated October 28, 2004.
A prefield review of existing information was conducted for the project areas using all or some of the following sources:
1. aerial photographs
2. topographic maps
4. Lolo National Forest Sensitive Plant location maps
5. Regional Forester’s Sensitive Plant List (2004)
6. Regional floristic manuals, including Hitchcock et al. (1969), Lackschewitz (1991), Dorn (1984), and the Lolo National Forest Sensitive Plant Field Guide
7. Lolo National Forest Land Systems Inventory (LSI), Sasich and Lamotte-Hagen (1988)
8. timber stand database and field survey records
9. sensitive species conservation strategies, status reviews, and research reports
10. previous botanical surveys in the project vicinity

In the fall of 2003, pre-field reviews and on-the-ground surveys for potential sensitive plant habitat were conducted on several land parcels by Forest Botanist, Darlene Lavelle. Contour maps, aerial photographs, Lolo National Forest Land Systems Inventory (LSI) data, locations of previously found sensitive plant species, and timber stand data provided by the Lolo National Forest were used in this prefield work. As the project proceeded, stand information for DNRC lands became available. This information was used in association with LSI data to assess potential habitat on state lands if surveys had not been conducted.

Prefield reviews and on-the-ground surveys indicated that clustered lady’s-slipper (Cypripedium fasciculatum) was the Forest sensitive plant that had the most potential habitat involved in this land exchange. Therefore, clustered lady’s-slipper would most likely be the Forest sensitive plant that would be affected by this land exchange.

On the Lolo National Forest’s Superior District, there are fifteen populations of this plant, including one on DNRC land. In addition, four populations are located on the Plains/Thompson Falls District, and three are on the Ninemile District. The current status of these populations on the Lolo National Forest is summarized in Appendix A.

Clustered lady’s-slipper has not been found on the Seeley Lake or Missoula Districts. However, potential habitat (known habitat types where clustered lady’s-slipper plants have been found) does occur on these two districts. I rated clustered lady’s-slipper as having a low probability of occurring in the Missoula District’s areas of potential habitat. This plant has not been found on this District and has been searched for by several botanists for several years. Therefore, these
acres are referred to as having “low potential” in this analysis (i.e., they have some potential for clustered lady’s-slipper occurrence, but not medium or high potential). Parcels proposed for exchange near Seeley Lake did not have potential habitat for clustered lady’s-slipper.

**Survey Results**

Field surveys were conducted in fall 2003 and field season 2004 by Darlene Lavelle (Forest botanist), Todd Carlson (botany technician), and Laura Courser (botany technician). In parcels that were field surveyed, general areas of suitable sensitive plant habitat were mapped. LSI information and stand inventory data provided habitat information for areas where surveys did not occur. Surveys were conducted as time allowed in parcels that were identified as having a high probability for sensitive plant occurrence. Appendices B and C list potential acres of sensitive plant habitat and document surveys for the land exchange parcels. Detailed survey documentation is stored at the Supervisor’s Office in the Botany Program Office.

*Cypripedium fasciculatum* (Clustered Lady’s-slipper)

Survey results show that Forest Service parcels proposed for exchange include 6,620 total acres of potential clustered lady’s-slipper habitat. DNRC parcels proposed for exchange include 3,901 total acres of potential clustered lady’s-slipper habitat (high to medium potential). An additional 740 acres of DNRC land for exchange have “low potential” clustered lady’s-slipper habitat. These total acreages are broken down according to the Lolo National Forest Districts in the following sections:

- **Superior District and Adjacent DNRC Lands**

  For Forest Service parcels to be transferred to DNRC, Lavelle and Courser used Superior District’s timber stand inventory to determine if potential habitat for clustered lady’s-slipper was present. On the Superior District, 22 of the 30 parcels were rated as having potential habitat for clustered lady’s-slipper. These 22 parcels sum to 6,300 acres of potential habitat for clustered lady’s-slipper. In two of these parcels, Fourmile 34 and Pardee 14, clustered lady’s-slipper plants are already known to occur (see Appendix D and E).

  **Fourmile 34:** Within the Fourmile 34 parcel, there are two known subpopulations of clustered lady’s-slipper. These clustered lady’s-slipper plants were found prior to this analysis in 1997 by Nora Leetch, botany technician. One subpopulation was reported to contain 9 plants (16 stems) and cover an 8x250 foot area. The other was reported to contain 543 plants (787 stems) and cover an estimated 13 acres.

  **Pardee 14:** This parcel is located in the Flat Creek drainage just north of the town of Superior. A subpopulation of clustered lady’s-slipper plants was located within this parcel in Wood Gulch in 2004 by Todd Carlson, botany technician. This subpopulation covers a 50x50 foot area and contains at least 50 stems. Carlson conducted a limited focus survey in the best clustered lady’s-slipper habitat within the parcel. Additional plants may be in this parcel. This subpopulation is one of four known subpopulations within two square miles. These subpopulations are tracked as the Flat Creek Population.

Of the lands currently owned by DNRC and proposed for transfer to the Forest Service, there are 3,341 acres on the Superior District identified as having potential clustered lady’s-slipper habitat.
This figure includes the Cutoff 16 parcel (622 acres), where clustered lady’s-slipper plants are known to occur. A population of 4 clustered lady’s slipper stems was located in this parcel in 2000.

- Plains/Thompson Falls District and Adjacent DNRC Lands
  Plains/Thompson Falls District would transfer 160 acres of potential clustered lady’s-slipper habitat to DNRC with the Calico 10 parcel. The Forest Service would acquire 40 acres of potential habitat from DNRC with the Ashley Creek parcel.

- Ninemile District and Adjacent DNRC Lands
  On the Ninemile District, the Forest Service would trade 160 acres of potential clustered lady’s-slipper habitat (Houle Creek) to DNRC. The Forest Service would acquire 520 acres of potential habitat (Sawmill and Peppard).

- Missoula District and Adjacent DNRC Lands
  On the Missoula District, the Forest Service would receive 740 acres of “low potential” habitat for clustered lady’s-slipper.

- Seeley Lake District and Adjacent DNRC Lands
  On Seeley Lake District and adjacent DNRC lands, parcels proposed for exchange did not have potential habitat for clustered lady’s-slipper.

Clarkia rhomboidea (Common Clarkia)
The Forest Service would acquire 40 acres of potential habitat for common clarkia with the Cube Iron Mountain parcel. This parcel would be added to National Forest lands on the Plains/Thompson Falls District.

Trifolium gymnocarpon (Hollyleaf Clover)
The Forest Service would acquire 50 acres of potential habitat for hollyleaf clover with the Rattlesnake (10 acres) and Black Mountain (40 acres) parcels. Both Rattlesnake and Black Mountain parcels would be added to National Forest lands on the Missoula District.

Claytonia arenicola (Sand Springbeauty)
The Forest Service would acquire known habitat for sand springbeauty. In 2004, over 1,000 plants were found within the Quinn parcel. Plants were on less than one acre. The Quinn parcel would become part of National Forest lands on the Plains/Thompson Falls District.

Grindelia howellii (Howell's Gumweed)
The Forest Service would acquire known habitat for Howell’s gumweed with the Monture parcel. This plant is present along the roadside within section 26. The Monture parcel would be added to National Forest lands on the Seeley Lake District.

Grimmia brittoniae (Britton’s Dry Rock Moss)
DNRC would acquire up to 5 acres of potential Britton’s Dry Rock Moss habitat with the Deerhorn parcel. This parcel would be transferred to DNRC from the Plains/Thompson Falls District.
Riparian sensitive plants - Beck Water-marigold, Watershield, Creeping Sedge, Blunt-leaved Pondweed, Podgrass, and Water Bulrush
DNRC would acquire an estimated 25 acres of potential habitat for the riparian plants listed above with the Whitney 12 parcel. This parcel would be transferred to DNRC from the Plains/Thompson Falls District.

**Land Exchange Alternatives**
**Alternative 1 - No action.**
All plants would stay under management of the respective agency. In this alternative, there would be no new impacts to analyze as management of these lands would not change.

**Alternative 4 – Proposed Action Alternative**
DNRC would acquire the following acres of sensitive plant habitat from the Forest Service:
- 6,620 acres of potential clustered lady’s-slipper habitat,
- with three known subpopulations, with over 853 stems (one subpopulation at Pardee 14 and two at Fourmile 34)
- 25 acres of potential riparian sensitive habitat
- 5 acres of potential Britton’s dry rock moss habitat

The Forest Service would acquire the following acres of potential and known sensitive plant habitat:
- 3,901 acres of potential clustered lady’s-slipper habitat,
- with one known population of 4 stems (Cutoff 16)
- 740 acres of “low potential” clustered lady’s-slipper habitat
- 50 acres of potential hollyleaf clover habitat
- 40 acres of potential common clarkia habitat
- 1-5 acres of habitat for sand springbeauty,
- with one known subpopulation of over 1,000 plants (Quinn)
- roadside habitat for Howell’s gumweed (Monture)

**Alternative 4a**
This alternative is similar to the proposed alternative 4, except it does not include the following parcels: Fourmile 5, Fourmile 9, and Fourmile 10.

With this alternative, 210 acres of potential clustered lady’s-slipper habitat within the Fourmile 9 parcel would not be acquired by DNRC. Because 210 acres of potential habitat would not be traded to DNRC, Alternative 4a may have fewer impacts to clustered lady’s-slipper. For all other sensitive plant species, this alternative would involve the same amounts of potential habitat to be exchanged as alternative 4.
Analysis of Effects

Clustered lady’s-slipper
Under the proposed action alternative, the Forest Service would acquire 3901 acres of potential habitat for clustered lady’s-slipper, and DNRC would acquire about 6620 acres.

Clustered lady’s-slipper occurs in Washington, Oregon, California, Idaho, Montana, Wyoming, Utah, and Colorado. There are over 700 occurrences known from these states (Lichthardt 2003). In Montana, clustered lady’s-slipper is a peripheral species (i.e. it occurs at the outer margins of its contiguous range). All known locations for Montana are in the northwest corner of the state. There are 29 separate known occurrences for the state, and 20 of these occurrences are on the Lolo NF.

On the Superior District, clustered lady’s-slipper plants are known to occur in 36 sections. A section was counted even if only one subpopulation was known to occur in the section. The proposed alternative would transfer acres within two of these 36 sections to DNRC.

A loss of individuals or habitat can be considered significant when the potential effect may: 1) contribute to a trend toward federal listing; 2) result in a significantly increased risk of loss of viability to a species, or 3) result in a significantly increased risk of loss of viability to a significant population.

The proposed alternative is not expected to result in a trend toward federal listing, nor is the proposed alternative expected to risk a loss of viability to this species on the Lolo National Forest. Nevertheless, care must be exercised if population viability is to be maintained after the land exchange is complete.

The proposed alternative would result in a change of ownership for two known populations on the Superior District. Approximately one third of the Fourmile Population would be retained on National Forest lands and two thirds of the population would be transferred along with lands to DNRC (the Fourmile 34 parcel). This population is ranked as an “A” population in the clustered lady’s-slipper conservation strategy (Lichthardt 2003). Approximately one half of the Flat Creek Population would be retained on National Forest lands and the other half would be transferred along with lands to DNRC (the Pardee 14 parcel). The Flat Creek Population is ranked as a “B” population. Ranking designations are based on the known number of genetically individual plants in the population (A>200, B=50-200, C=10-50, D<10).

For A- and B-ranked populations, seed-source subpopulations should be designated. Designation should be given to numerous, closely aggregated clusters within the population. These seed sources should be protected from the direct and indirect affects of management (Lichthardt 2003). Seed-source subpopulations are located within the Fourmile 34 and Pardee 14 Parcels; therefore, the seed-source subpopulations associated with these parcels are likely critical to the viability of their respective populations.

The proposed alternative may impact clustered lady’s slipper individuals and habitat. However, if DNRC complies with the state’s existing sensitive species rule 36.11.436 for forest
management and does not conduct activities within areas of known clustered lady’s-slipper populations until field surveys and/or consultation with qualified professionals is undertaken, then significant reduction in viability to the Fourmile and/or Flat Creek populations is not expected. See Appendix F, Letter to Deborah Austin, Lolo NF, from Anthony Liane, DNRC, 30 May 2005.

On June 16, 2005, Darlene Lavelle (Lolo Forest Botanist) and Jeff Rupkalvis (DNRC Forester) buffered the Fourmile 34 parcel containing known Cypripedium plants. See Appendix G and H for location of buffered plants and GPS locations of buffer.

On July 11, 2005, Darlene Lavelle (Lolo Forest Botanist) and Jeff Rupkalvis (DNRC Forester) buffered the Pardee 14 parcel containing known Cypripedium plants. See Appendix I and J for location of buffered plants and GPS locations of buffer.

To maintain and enhance population vigor for the Fourmile and Flat Creek populations, I recommend that, to the extent possible with existing conditions, habitat continuity be preserved around these populations and across ownership in these location (i.e., subpopulations should be treated as part of a larger population, even though some subpopulations will be managed under different agencies).

In those parcels with potential habitat for clustered lady’s slipper that would be traded to DNRC and surveys have not been conducted, it is not known whether this transaction will result in a significant loss of viability to a significant population. Surveys would need to be conducted to determine if any plants exist, the size of the population(s), and its (their) proximity to other populations.

**Britton’s dry rock moss**
There are no sensitive plant species viability concerns with the Deerhorn Parcel that would be transferred to DNRC. This parcel was identified as having potential habitat for *Grimmia brittoniae* (Britton’s dry rock moss). In 2003, the potential habitat within this parcel was surveyed in association with another Forest project. This moss was not located, although it has been found in four separate locations in the Thompson Falls drainage, the same drainage in which the Deerhorn parcel is located. The locations where Britton’s dry rock moss were located look similar to the Deerhorn Parcel habitat, except the rock ledges where this moss was found had obvious streaked calcium deposits, unlike the habitat within the Deerhorn Parcel. According to Greven and Spribille (1999) this moss is only found beneath overhangs where leached calcium has precipitated to form a crust over the rock. Therefore, the potential to find this moss in the Deerhorn Parcel is considered to be low.

**Beck water-marigold, watershield, creeping sedge, blunt-leaved pondweed, podgrass, and water bulrush**
The Whitney 12 parcel, which is proposed for transfer to DNRC, may have potential habitat for the following aquatic and wetland sensitive plants: Beck water-marigold, watershield, creeping sedge, blunt-leaved pondweed, podgrass, and water bulrush. This parcel was not field surveyed. Riparian areas on Forest Service lands and DNRC lands are managed similarly since they are
required to follow the same state laws. Therefore, these riparian sensitive plant species are not expected to be negatively impacted with this land exchange.

**Determinations**
The proposed alternative for the DNRC Land Exchange may affect individuals and habitat, but is not likely to result in a trend toward Federal listing or loss of viability for *Cypripedium fasciculatum* (clustered lady’s-slipper) and the other Regional Forester’s sensitive plant species. Concerning population viability of clustered lady’s-slipper in potential habitat to be traded to DNRC where no surveys have been done and it is not known if populations exist, potential impacts to these plants are not known.

This determination is based upon the above effects analysis, with expectation of DNRC’s compliance with existing sensitive species rule 36.11.436.

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Literature Cited


