

Final Report -- Floristic Surveys in Meadows
Interagency Special Status/Sensitive Species Program

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Sensitive plant surveyors working on cattle allotment permit projects have documented occurrences of 11 sensitive species (Table 1) (USDA 2011) in meadows on the Colville National Forest. All of the sensitive plants are Priority Sensitive Species for the Forest (USDA FS 2013). None have federal status. Meadows include natural openings and human-made ones for homesteads or pastures. They are grazed by livestock and wildlife, and provide fire breaks and open areas for recreation, including camping and off-road vehicle use. Noxious weeds are a concern.

Table 1. Global and Washington State ranks, and Washington State status (WNHP 2014, USDA FS 2011, 2013).

Vascular Species	Global Rank¹	WNHP State Status²	WNHP State Rank³	R6 Priority Sensitive Species (X = Yes)
Upswept moonwort (<i>Botrychium ascendens</i>)	G3	SS	S2	X
Crenulate moonwort (<i>Botrychium crenulatum</i>)	G3	SS	S3	X
Western moonwort (<i>Botrychium hesperium</i>)	G4	ST	S1	X
Skinny moonwort (<i>Botrychium lineare</i>)	G2G3	ST	S1	X
Two-spiked moonwort (<i>Botrychium paradoxum</i>)	G3G4	ST	S2	X
Stalked moonwort (<i>Botrychium pedunculosum</i>)	G2G3	SS	S2	X
Bulb-bearing water hemlock (<i>Cicuta bulbifera</i>)	G5	SS	S2	X
Crested shield fern (<i>Dryopteris cristata</i>)	G5	SS	S2	X
Water avens (<i>Geum rivale</i>)	G5	SS	S2S3	X
Adder's tongue (<i>Ophioglossum pusillum</i>)	G5	ST	S1S2	X
Kidney-leaved violet (<i>Viola renifolia</i>)	G5	SS	S2	X

¹G2 = Imperiled.

¹G3 = Rare and uncommon; vulnerable.

¹G4 = Not rare and apparently secure.

¹G5 = Demonstrably widespread, abundant and secure.

²SS = State Sensitive; plant species vulnerable or declining and could become Endangered or Threatened in the state.

²ST = State Threatened; plant species likely to become Endangered in Washington.

²S1 = Critically imperiled (5 or fewer occurrences).

²S2 = Imperiled (6 to 20 occurrences), very vulnerable to extirpation.

²S3 = Rare or uncommon in the state (21 to 100 occurrences).

³Sensitive = Vulnerable or declining and could become Endangered or Threatened in the state.

³Threatened = Likely to become Endangered in Washington.

METHODS

Areas proposed for this project were identified using a GIS layer that defined meadows, as having a flat topography. This was coupled with a heritage layer identifying cultural sites (homesteads). From the GIS attribute table, a list of homestead meadows was generated and compared to a list of meadows known to have sensitive plant locations. Aerial photos were used to confirm the locations of meadows proposed for surveys. Transects were walked through 14 meadows (Bell, Bennett, Bestrom, Bisbee, Cameron, Dahlstrom, Gypsy, Hande, Hidden, Krumm, Lost, Squirrel, Tiger and Woodward) and all species were recorded.

All but one of the meadows, Hande, are in grazing allotments. Most of the meadows have some level of invasive weed encroachment. In addition, Gypsy Meadow is in a Terrestrial Restoration and Conservation Strategy Priority Watershed, "Sullivan Creek-Pend Oreille River - TRACS-65." The 14 selected meadows have homestead sites, old cabins or camps (Maps 1-14). Since four species of *Botrychiums* occur in Bestrom Meadow (*B. hesperium*, *B. paradoxum*, *B. pedunculatum*, and *B. simplex*), it was included as a gauge for the best time to survey meadows.

RESULTS

Over 352 acres were surveyed in the 14 meadows. Table 2 shows the locations, survey dates and comments from the 2016 surveys. In Bennett Meadow new locations of *Viola renifolia*, *Cicuta bulbifera* and possibly *Viola septentrionalis* were found. In Cameron Meadow a new location of *Botrychium hesperium* was discovered. Survey and sighting information of all sensitive taxa were documented in the Natural Resources Management database. All of the meadows had noxious weeds. Noxious weed treatment in meadows with sensitive plants is an issue. Since noxious weeds reduce livestock forage, range personnel treat noxious weeds in meadows to encourage grass growth. What herbicides could be used that would not negatively impact sensitive plants?

ACKNOWLEDGEMENTS

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Table 2. Sensitive plant surveys in homestead meadows in 2016.

Site, Township Range Section, Elevation (ft.)	Homestead Name	Survey Date, Acres	2016 Survey Comments
Bell Meadow; T34N R42E S7, S12, S18; 3,600	James Bell (S7), James Bell (S12), John Wilson (S18), Sarah E. Bell (S18)	7/11, 8.1	No sensitive plants found. Grass is very dense in this meadow. Ungrazed, no sign of cows yet. Good <i>Botrychium</i> habitat along edges of meadow. Noxious weeds present: <i>Hieracium</i> sp., <i>Leucanthemum vulgare</i> , <i>Hypericum perforatum</i> , <i>Cirsium</i> sp.
Bennett Meadow, T40N R38E S11, 2,160		7/13 & 8/17, 22.8	7/13: No sensitive plants found. Meadow grazed to the dirt. Cattle present in the meadow. Much of meadow is wetland, with the S end mainly a marsh. To the E grassy clearings and widely spaced conifers, "dry Bennett Meadow." In this area <i>Viola renifolia</i> was found and possibly <i>V. septentrionalis</i> , but needs a revisit spring 2017 to confirm identification. <i>Cicuta bulbifera</i> was possibly present in the N end of the "wet" part of the meadow, recommend revisiting to confirm identification. Noxious weeds present: <i>Hieracium</i> sp., <i>Cirsium</i> sp., <i>Leucanthemum vulgare</i> and <i>Hypericum perforatum</i> . 17 Aug 2016: revisit confirmed <i>Cicuta bulbifera</i> .
Bestrom Meadow; T36N R41E S9, S16, S17; 3,480	Chas. M. Bestrom (S9), H.E. Beck (S16), John W. Beck (S16), James F. Rioth (S17)	6/27, 8.2	No new sensitive plants found. <i>Botrychium</i> monitoring plots are present. The plots were read this season and numbers of plants were very low. The meadow had been lightly grazed; no cattle present. Revisited: 062101EO004BOHE5_1 & 2; 062101FO008BOMI5; 062101EO014BOPA9_1,2& 3; 062101EO019BOPE4_1 & 2; 062101EO012GERI2_1 & 2; 062101FO043VIRE2_1 & 2. (Known from meadow: <i>Botrychium hesperium</i> , <i>B. michiganense</i> , <i>B. paradoxum</i> , <i>B. pendunculatum</i> , <i>Geum rivale</i> , <i>Sisyrinchium septentrionale</i>)
Bisbee Meadow, T34N R41E S24, 3,280		6/21, 10.1	No new sensitive plants found. The main part of Bisbee Meadow is very grassy. The meadow edges harbor small regenerating lodgepole pines with quite a bit of gopher activity and strawberries (indicators of good <i>Botrychium</i> habitat). The meadow edges were searched, but no <i>Botrychiums</i> were located. Cattle had been along the edges of the meadow and had trampled the area fairly thoroughly. Noxious weeds present: <i>Hypericum perforatum</i> , <i>Hieracium</i> sp., <i>Centaurea</i> sp.

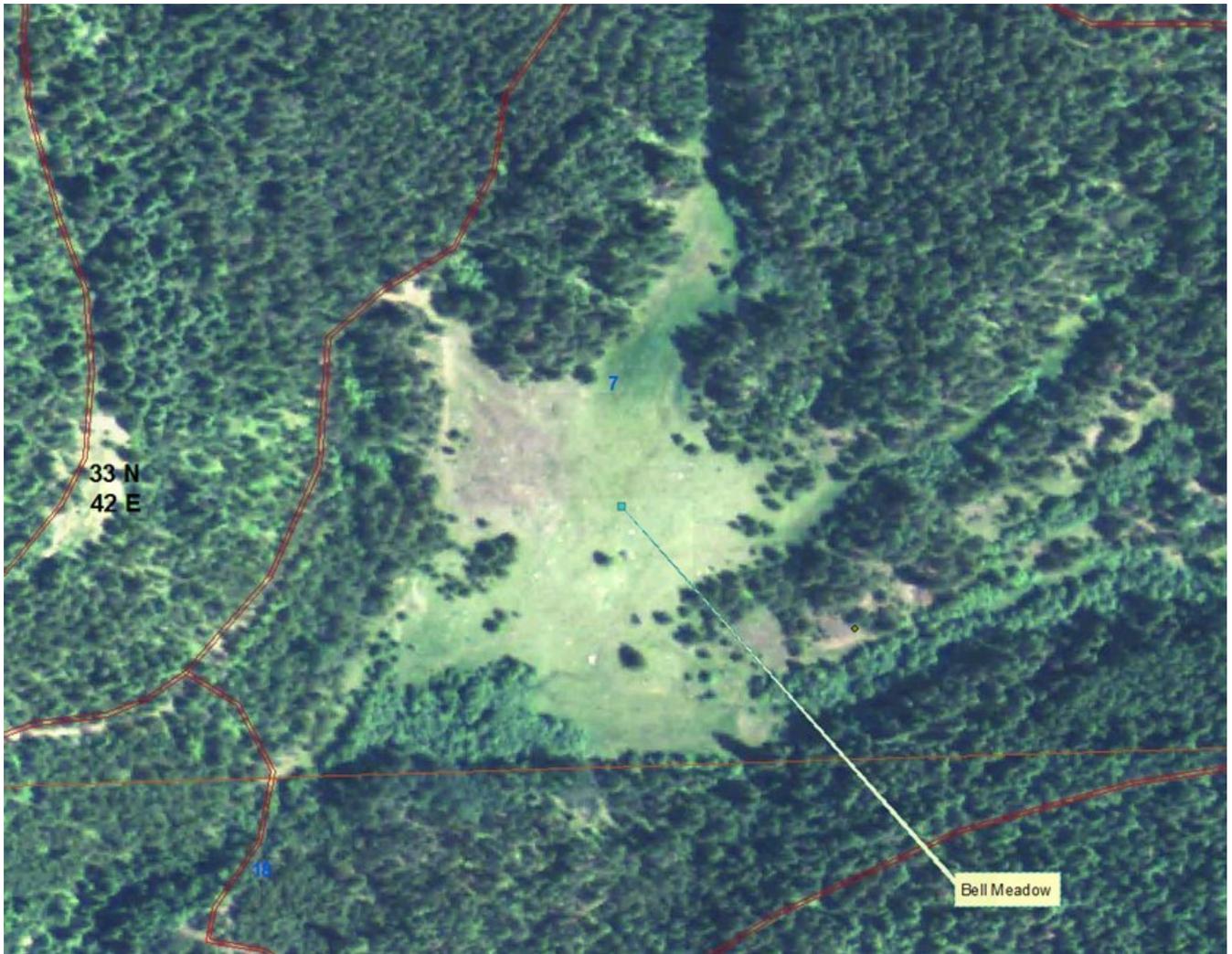
Site Name, Township Range Section, Elevation (ft.)	Homestead Name	2016 Survey Date and Acres	2016 Survey Comments
Cameron Meadow, T43N R42E S14, 2,640	John McBrides	7/12, 14.4	Meadow dominated by grasses and noxious weeds (<i>Centaurea</i> sp., <i>Hieracium aurantiacum</i> , <i>Hypericum perforatum</i> and <i>Leucanthemum vulgare</i> .) New sensitive plant: <i>Botrychium hesperium</i> .
Dahlstrom Meadow, T33N R41E S14, 3,400	A.W. Dahlstrom, Emerson R. Fruin	7/11, 18.8	No sensitive plants found. Fence is damaged on north and east ends of the meadow, allowing cows to get in, although we didn't see signs of grazing. Grass is very tall and dense in this meadow. Good <i>Botrychium</i> habitat along meadow edges beneath lodgepole pines, but none were observed. Weeds present: <i>Hieracium</i> sp., <i>Leucanthemum vulgare</i> , <i>Hypericum</i> sp. , <i>Cirsium</i> sp.
Gypsy Meadow, T39N R45E S3, 4,160	Gypsy Mdws CCC Camp	7/18 , 17.1	No sensitive plants found. Small dry open meadow, mainly composed of grasses and forbs. Edges of meadow and wetter grassy clearings were surveyed. Campsites along edge of meadow. Noxious weeds present: <i>Hieracium auranticum</i> , <i>Leucanthemum vulgare</i> , <i>Hypericum perforatum</i> , and <i>Cirsium</i> sp.
Hande Meadow, T36N R42E S13, 3,440	Ole N. Hande	7/12, 1.5	No sensitive plants found. Meadow is grassy with large patches of <i>Smilacina stellata</i> . Hande Opening (larger clearing to the W of Hande Meadow) was grassy with patches of <i>Hieracium</i> sp. Recent and old gopher activity in Hande Opening. Noxious weeds present: <i>Cirsium</i> sp., <i>Hieracium aurantiacum</i> , <i>Hypericum perforatum</i> , and <i>Leucanthemum vulgare</i> .
Hidden Meadows, T34N R41E S20, S29; 4,080	E. Liekfold Cabin	7/11, 2.5	No sensitive plants found. Very wet meadow, sedges and alder, especially around meadow perimeter. Noxious weeds present: <i>Hieracium</i> sp., <i>Leucanthemum vulgare</i> , and <i>Hypericum perforatum</i> .
Krumm Meadow, T33N R41E S33, 3,720	T. Mulquin	7/11, 7.9	No sensitive plants found. Moisture in the meadow ranges from dry in the lower portion to quite moist/wet in the upper section. Lots of grass throughout the meadow with some conifer regeneration along the edges. Strawberries are present and there is not much new or recent gopher disturbance. Mats of <i>Hieracium</i> sp. dominate the N-side of the meadow. Upper meadow appears to have some sort of perched water table with sedges and alder. Noxious weeds present: <i>Hieracium</i> sp., <i>Leucanthemum vulgare</i> , <i>Hypericum perforatum</i> , <i>Carduus acanthoides</i> , <i>Cirsium</i> sp., and <i>Potentilla</i> sp. <i>Sisyrinchiums</i> scattered on higher ground throughout the meadow. Some fairly good <i>Botrychium</i> habitat in the lower part of the meadow on the N-side.

Site Name, Township Range Section, Elevation (ft.)	Homestead Name	2016 Survey Date and Acres	2016 Survey Comments
Krumm Meadow, T33N R41E S33, 3,720	T. Mulquin	7/11, 7.9	No sensitive plants found. Moisture in the meadow ranges from dry in the lower portion to quite moist/wet in the upper section. Lots of grass throughout the meadow with some conifer regeneration along the edges. Strawberries are present and there is not much new or recent gopher disturbance. Mats of <i>Hieracium</i> sp. dominate the N-side of the meadow. Upper meadow appears to have some sort of perched water table with sedges and alder. Noxious weeds present: <i>Hieracium</i> sp., <i>Leucanthemum vulgare</i> , <i>Hypericum perforatum</i> , <i>Carduus acanthoides</i> , <i>Cirsium</i> sp., and <i>Potentilla</i> sp. <i>Sisyrinchiums</i> scattered on higher ground throughout the meadow. Some fairly good <i>Botrychium</i> habitat in the lower part of the meadow on the N-side.
Lost Meadow, T35N R42E S3, 3,880		7/12, 9.1	No sensitive plants found. Very wet/marshy meadow; best habitat is along meadows edge at the tree line on the E side of the road and the meadow on the W side of the road is very wet with lots of willows and other small shrubby trees, not good <i>Botrychium</i> habitat. Doesn't look like cows have been in the meadow, no grazing.
Squirrel Meadow, T34N R43E S13, 2,320		7/12, 17.4	No sensitive plants found. Cows were in the meadow during our visit. Meadow grazed, especially along the tree line. Grass tall and dense in the center of the meadow. Good <i>Botrychium</i> habitat along edge of meadow, but none observed. Weeds present: <i>Hieracium aurantiacum</i> , <i>Leucanthemum vulgare</i> , <i>Hypericum perforatum</i> , and <i>Centaurea</i> sp.
Tiger Meadow, T37N R42E S35, 3,200		6/28, 7/12, 7/18; 202.9	No sensitive plants found. On the N side of highway the meadow is open and grassy. Lodgepole pine are encroaching around perimeter of meadow with some grand fir, Engelmann spruce, Douglas-fir, shrubs and forbs.
Woodward Meadow, T32N R42E S31, 2,840		6/21, 11.6	No sensitive plants found. The area that had been cleared at one time for homestead activities is now overgrown with shrubs; regenerating conifers are over 20 feet tall. Access roads and openings are infested with <i>Hieracium caespitosum</i> , <i>Hypericum perforatum</i> , <i>Leucanthemum vulgare</i> , and <i>Centaurea</i> sp.

Map 1. Bell Meadow.

T43N R42E S7

FS Survey Site ID: #062101S001020



Map 2. Bennett Meadow.
T40N R38E S11
FS Survey Site ID: #062101S001020



Map 3. Bestrom Meadow.

T36N R41E S9, 16, 17

Revisits to: 062101EO004BOHE5, 062101FO008BOMI5, 062101EO014BOPA9,
062101EO019BOPE4, 062101EO012GERI2, 062101FO043VIRE2.



Map 4. Bisbee Meadow.
T34N R41E S24
FS Survey Site ID: 062101S001022



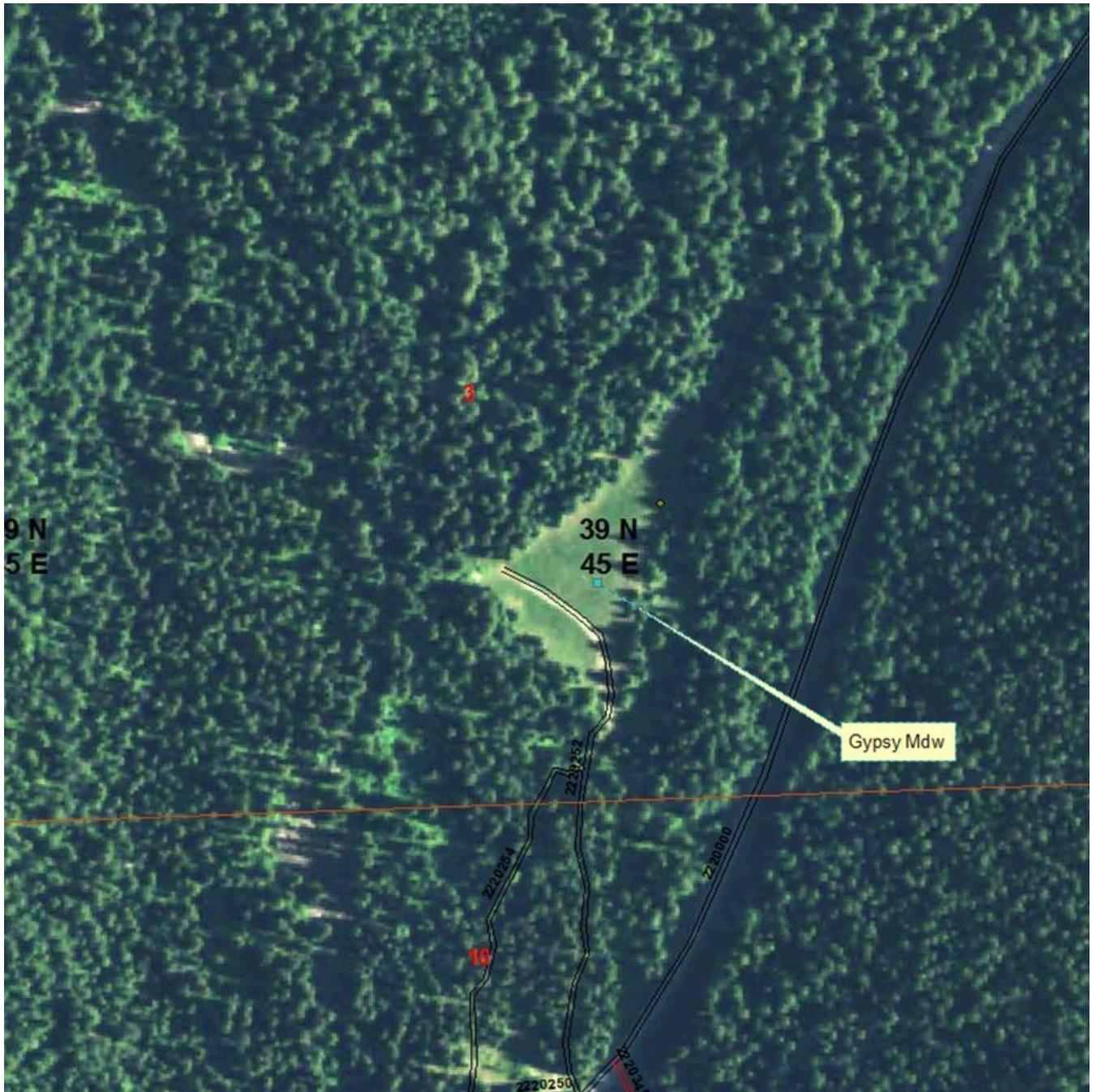
Map 5. Cameron Meadow.
T34N R42E S14
FS Survey Site ID: 062105S001023



Map 6. Dahlstrom Meadow.
T33N R41E S14
FS Survey Site ID: 062101S001024



Map 7. Gypsy Meadow.
T39N R45E S3
FS Survey Site ID: 062105S001025



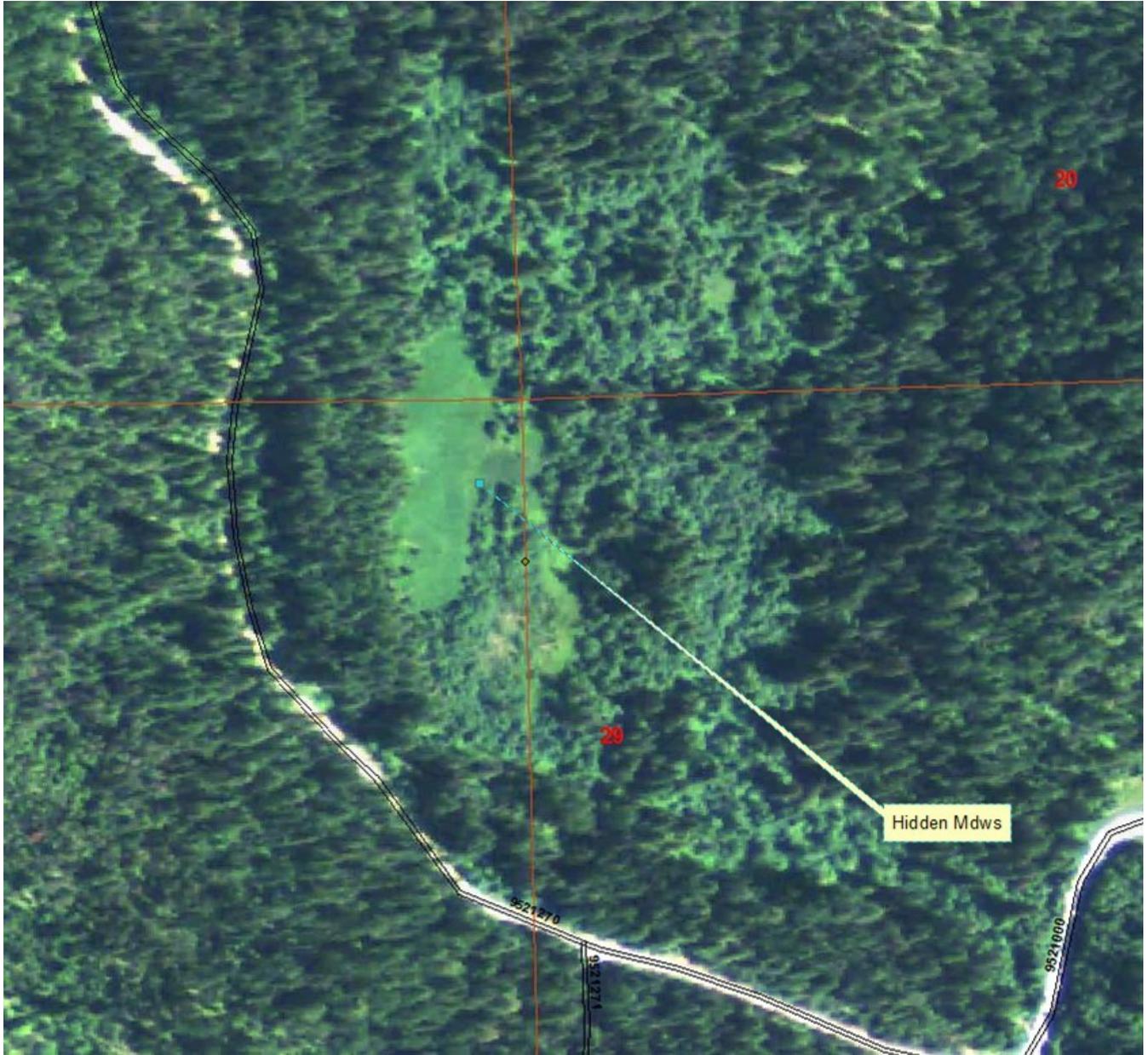
Map 8. Hande Meadow and Hande Opening.

T36N R42E S13

FS Survey Site ID: 062101S001026



Map 9. Hidden Meadows.
T34N R41E S20, 29
FS Survey Site ID: 062101S001028



Map 10. Krumm Meadows.
T33N R41E S33
FS Survey Site ID: 062101S001029



Map 11. Lost Meadow.
T35N R42E S3
FS Survey Site ID: 062103S001030



Map 13. Tiger Meadow.
T37N R42E S35
FS Survey Site ID: 062105S001033



Map 14. Woodward Meadow.
T32N R42E S31
FS Survey Site ID: 062101S001032

