Wetland Mapping and Fen Survey
in the
White River National Forest
2011

Natural Heritage Program
COLORADO

Colorado State University

Wetland Mapping and Fen Survey in the White River National Forest

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Introduction

In January 2011, Colorado State University and the Colorado Natural Heritage Program (CNHP) contracted with the White River National Forest (WRNF) to complete wetland mapping and fen field surveys within the White River National Forest (WRNF). Since, 2008, CNHP has been working with the U.S. Fish and Wildlife Service's National Wetland Inventory (NWI) Program and numerous funding partners to create a comprehensive digital map of wetlands for the state of Colorado by 2015. The digitizing and mapping of the wetlands within the WRNF is integral to CNHP's goal to determine the *extent and location* of wetlands across the state. In addition to the digitizing of the 124 NWI maps, a subset of mapped wetlands consisting of 39 (original number was 25) fens were field surveyed during 2011. The data collected from this project will be added to the CNHP database of critical biological resources, including unique wetlands such as fens. This project will continue to build upon CNHP's past wetland survey and assessment projects.

The WRNF covers 2.3 million acres within the State and ranges from 7,000 ft. to 14,265 ft. in elevation. The Forest includes a portion of the headwaters of two major river basins in Colorado; the White River and the Roaring Fork River. The diverse geography of the WRNF creates a template for an equally diverse set of wetlands. Heavy snowfall in the mountains percolates through shallow mountain soils and creates extensive areas of wet meadows, riparian shrublands, and peat-forming wetlands known as fens. Downstream of the mountains, numerous rivers and creeks create a mosaic of riparian woodlands, shrublands, and backwater channels. These wetland habitats provide important ecological services to both WRNF and lands downstream. Wetlands act as natural filters, helping to protect water quality by retaining sediments and potential toxins, as well as removing excess nutrients such as nitrogen and phosphorus. Wetlands help to regulate local and regional hydrology by stabilizing base flow, attenuating floods, and replenishing belowground aquifers. Wetlands also support habitat for numerous plant and animals species that depend on aquatic habitats for some portion of their life cycle. Though the acreage of wetlands across the WRNF is extensive and the services they provide are vital, prior to this project, comprehensive digital wetland mapping did not exist for the Forest.

Fens, a unique type of peatland, were prioritized during both the mapping and field survey. Fens are an irreplaceable resource; Forest Service, Region 2 has determined that fens are a sensitive plant habitat and they will be managed for conservation and restoration (FSM 2600 Sept. 30, 2011). In the Southern Rockies fen wetlands are defined as a peat accumulating wetland that are fed by mineral rich surface water or groundwater and usually supports sedge and grass-like vegetation (Mitch and Gosselink 2007). The soil beneath fens is peat or histosols, a soil consisting primarily of organic materials. Histosols are defined as having 40 cm (16 in) or more of organic soil material in the upper 80 cm (31 in) of the soil profile (Soil Survey Staff 2006). Accumulation of peat to this depth requires constant soil saturation and cold temperatures which t hen creates anaerobic conditions that slows the decomposition of organic matter resulting in peat accumulation. In the arid west peat accumulation occurs very slowly; estimates are 20 cm (8 in) per 1000 years in Colorado (Chimner 2000, Chimner and Cooper 2002).

Long-term maintenance of fens requires maintenance of both the hydrology and of the plant species that interact to create and maintain the peat that defines and enables fen function. Thus management that conserves these environmental and ecological features will contribute to long-term sustainability of this vital resource.

This project provides WRNF resource specialists with wetland data that can be used by the latest technological tools available. This benefit allows specialists to identify and focus on critical wetland complexes. Additionally, WRNF resource managers now have the necessary tools to make proactive decisions to protect biologically sensitive wetlands by providing critical biological information in identifying and prioritizing conservation and restoration projects. Results can be used to implement conservation and protection of critical wetland resources into ongoing forest wetland protection and land-use.

Methods

Wetland Mapping

National Wetland Inventory Maps

In the late 1970s, the U.S. Fish and Wildlife Service began an inventory of the extent and types of the nation's wetlands. Basic mapping units for the U.S. National Wetlands Inventory (NWI) were provided by the Cowardin et al. (1979) classification system. Photo-interpretation and field reconnaissance were used to refine wetland boundaries according to the wetland classification system. In Colorado, maps east of the 106th parallel were created using 1970s black and white aerial photography. Maps west of the 106th parallel were created in the early 1980s using color aerial photography. The majority of maps produced for Colorado, however, were created as paper maps and not available as digital polygon data appropriate for use in a GIS format. Converting existing NWI maps for WRNF from paper to digital data was completed prior to the summer field season.

Working with the NWI Program, CNHP obtained scanned image files of the original wetland delineation maps developed through photo-interpretation. The scanned images were converted to digital shapes in GIS which allowed for indexed searching, area calculation and interactive displays. The original NWI wetland codes (describing the wetland type) were transferred to the digital shapes are the primary attribute.

The Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) describes ecological taxa, arranges them in a system useful to resource managers, furnishes units for mapping and provides uniformity of concepts and terms. Ecological systems form the highest level of the classification hierarchy; five are defined for the United States—Marine, Estuarine, Riverine, Lacustrine and Palustrine (non-tidal). The next level of the classification indicates the life form of the dominant vegetation. Ten predominant system and life forms combinations are identified for WRNF:

(1) Laucustrine Limnetic (L1)—freshwater lakes, deeper water zone, supports non-rooted plants, plant and animal plankton;

(2) Lacustrine Littoral (L2)—freshwater lakes, shallow water zone, supports rooted plants and bottom dwelling animals;
(3) Palustrine Aquatic Bed (PAB)—dominated by plants that grow on or below water surface.
(4) Palustrine Emergent Wetland (PEM)—vegetated wetlands dominated by emergent herbaceous flowering plants;
(5) Palustrine Forested Wetland (PFO)—vegetated wetlands dominated by woody vegetation that is 6m > tall;
(6) Palustrine Scrub-Shrub Wetland, (PSS)—vegetated wetlands dominated by woody vegetation > 6 m tall;
(7) Palustrine Unconsolidated Bottom (PUB)—shallow water wetlands with vegetative cover less than 30% (open ponds) and Unconsolidated Shore (PUS)—shoreline wetlands with vegetative cover less than 30%; and
(8) Riverine Lower Perennial Unconsolidate Bottom (R2UB) and Unconsolidated Shore (R2US);
(9) Riverine Upper Perennial (R3)—river and stream channels with high gradient;
(10)Riverine Intermittnet (R4)—flowing water only part of the year;

Fen Attributes

Potential fens in the WRNF were identified by analysis of digital aerial photography and topographic maps. True color, 1 meter horizontal resolution county mosaics from 2005 and 2009 were used in conjunction colora infrared imagery from 2008/2009 with 1 foot horizontal resolution provided by WRNF office. Wetland features mapped by the NWI program in the 1970's and early 80's were then examined. Wetlands described as "Palustrine Emergent Saturated" (PEMB) and "Palustrine Scrub-Shrub Saturated" (PSSB) were targeted.

Members of the CNHP ecology team reviewed a subset of potential fens and collaborated on identifying characteristic fen signatures. Potential fens were assigned a confidence level of 1 through 5 with 5 having high confidence of being a fen and 1 with low confidenence. Those wetland features that had no fen characteristics were not assigned a confidence value. Notes were added to each wetland observed to briefly describe the characteristics present or absent that led to the confidence level assigned.

Fen Field Survey

Field surveys of potential fen sites were conducted with the following protocol:

1. Potential fen sites were mapped and located with GPS.
2. A tile soil probe was used to evaluate depth to mineral/soil/rock interface at several points in the wetland.
3. Soil pit was dug at a representative probe depth using a sharpshooter shovel; pit was dug to the depth of peat or the depth of the shovel whichever was reached first.
    a. UTM coordinates were taken at the pit.
    b. Depth of peat in the pit was measured.
    c. If peat depth was >40cm the site was initially determined to be a fen and the following actions were undertaken:
    d. 500 cc soil sample collected

e. After a minimum "resting period" of one hour, water quality measurements of pour water were collected which included pH, electrical conductivity and temperature.
f. Soil was classified using the Von Post scale of humification
g. Photograph and UTM of the pit were taken

4. Fen perimeter was delineated using GPS.
5. Plant communities and plant species within the fen perimeter and in surrounding landscape were identified and assessed.
6. Specimens of any sphagnum species were collected.
7. Photo point was established and used to photo document the site; UTM and azimuth were recorded.
8. Panorama photographs were taken of the site; UTM and azimuth were recorded.
9. General environmental information was collected including:
10. Slope
11. Aspect
12. Topographic position
13. Hydrology source and flow characteristics
14. Disturbance type, intensity and extent
15. Fen type was categorized according to hydrology as specified in the Solid Disturbance Fen Form.

Results

Fen Field Survey

The scope of work developed between the USFS and CNHP included field surveys of 25 wetlands within the White River National Forest. After photo-interpretation by CNHP and further analysis, it became apparent that many of these sites were actually clusters of potential fens. Thus, the number of potential fens surveyed between July 20th and September 2nd 2011 was 44, many occurring as clusters of from 2 to 5 fens in 24 wetland areas. Of these 44 potential fens, 39 were determined to qualify as fens based on peat depth and degree of humification (Table 1). After results from soil sample analyses are completed these results may be altered. During these surveys numerous sensitive plant species and communities were documented including species such as russet cottongrass (*Eriophorum chamissonis*) (G5S1) and communities including mud sedge (*Carex limosa*) (G5S2) and buckbean (*Menyanthes trifoliata*) herbaceous vegetation.

Table 1. Summary of Fen Characteristics

Fen ID	Fen ?	Fen Type	Dominant Plant Community	Dist-tur-bance Y/N	Peat Depth cm	Von Post Scale	Elevation (feet)	Aspect M°	Slope %	pH	EC	C°
4285	No	NA	C. aquatilis; C. utriculata	N	20							
4295	Yes	B	Carex aquatilis	N	50	H7/8	10,652	160	3	6.15	41	16.8
4452	Yes	F	Carex aquatilis	N	40	H7/8	10,343	0	0	4.86	31	20.6
42811	No	NA	C. utriculata	N	20		10,453					
42855	Yes	B	Mesic forb	Y	105	H2	10,416	210; 120	1.5	10.30	191	24.6
11471	Yes	B	Mesic forb; E. quinqueflora	Y	106	H2	10,537	30-40	4; 11	7.50	18	23.3
11505	Yes	A	Mesic forb; C. aquatilis	Y	60	H3	10,244	330-315	2	4.93	30	23.9
12021	Yes	B	Mesic forb; E.quinqueflora	Y	60	H4/5	10,852	10-40	0; 9	5.56	17	28.2
12030	Yes	B	E.quinqueflora; C. aquatilis	Y	60	H3/4	10,962	30	1; 9	5.46	12	13.5
12046	Yes	B	E.quinqueflora; Mesic forb-graminoid herb vegetation	Y	60	H3/4	10,972	30	1; 10	6.48	26	9.7
12075	Yes	A	E.quinqueflora; Mesic forb-graminoid herb vegetation	Y	90	H2	11,008	65-100	1; 20	5.85	16	17.2
12177	Yes	A(B)	E.quinqueflora; N. lutea	Y	117	H2	11,169	330-340	1	5.78	18	30.4
12313	Yes	A	E. quinqueflora	Y	105	H3	10,965	220	3-4	5.83	29	26.5
30589	Yes	B	C. aquatilis	Y	50	H2	10,864	90-140	9	5.9	120	10.4
32800	Yes	A	T. palustre	Y	72	H3	11,044	320-350	3	9.34	133	15.4
32843	Yes	A	C. scopulorum	Y	70	H3/4	11,216	200	1.5	5.3	80	16.0
32844	Yes	B	C. scopulorum	Y	98	H7	11,060	40	0;5	8.75	78	9.6
6982	Yes	B	E. quinqueflora	N	92	H6	10,622	190; 280	1	5.39	16	14.5
6969	Yes	A	B. nana-Mesic graminoid-Mesic forb	N	88	H3	10,659	290	0.1	5.68	29	14.6
7534	No	NA										
7566	Yes	A	Mesic forb	Y	70	H3	10,668	60	1.5	6.71	25	29.6
7578	No		C. utriculata	Y								
36695-1	Yes	F (B)	E. quinqueflora	Y	40	H8/9	10,890	0	0-1.5	8.68	13	26.2

Fen ID	Fen ?	Fen Type	Dominant Plant Community	Dist-tur-bance Y/N	Peat Depth cm	Von Post Scale	Elevation (feet)	Aspect M°	Slope %	pH	EC	C°
36695-2	Yes	B	E. quinqueflora	Y	80	H2/3	10,881	0-180-270	1-3	7.44	16	22.5
30850	Yes	B	E.quinqueflora; Mesic forb; S. . planifolia	Y	90	H3/4	11,289	250	0-5	8.74	16	27.0
30946	Yes	B	E. quinqueflora	Y	87	H5	11,769	260	1.5	9..16	8	18.6
31802	Yes	B	E.quinqueflora; Mesic forb; S.planifolia	Y	97	H4	12,038	120; 190	1; 6	9.71	7	17.9
31430	Yes	B	E quinqueflora	Y	72	H3/4	11,658	340	4-5	8.0	15	14.8
32344	Yes	B	D.floribunda-B.nana/Mesic graminoid	Y	95	H3	10,385	0	2.5-6	5.78	63	19
32439	Yes	B	E. quinqueflora	Y	100	H2	11,176	250-300	1; 4	10.84	174	19.6
3245	Yes	A	C. utriculata; B.nana/Mesic Forb-Mesic graminoid	Y	58	H4	10,538	220-280	1	9.06	40	16.6
37193	No	NA	E.quinqueflora	Y	10							
37373	Yes	A	E.quinqueflora; C.leptosepala	N	90	H3	12,309	170	9	10.3	14	15.9
31457	Yes	A	E.quinqueflora; Mesic forb; S.planifolia-S.brachycarpa/ Mesic forb; Mesic graminoid	Y	70	H4	12,035	220	0; 9	9.89	3	26.6
31464	Yes	A	E.quinqueflora; Mesic forb; S.planifolia-S.brachycarpa/ Mesic forb; Mesic graminoid	Y	85	H5	12,078	240	1; 8	8.78	10	22.4
31467	Yes	A	E.quinqueflora; Mesic forb; S.planifolia-S.brachycarpa/ Mesic forb	Y	78	H6	12,037	200	0; 6	8.46	19	19.4

Fen ID	Fen ?	Fen Type	Dominant Plant Community	Dist-tur-bance Y/N	Peat Depth cm	Von Post Scale	Elevation (feet)	Aspect M°	Slope %	pH	EC	C°
31473	Yes	B	E.quinqueflora; Mesic forb; S.planifolia/ Mesic forb; Mesic graminoid	Y	62	H3	12,023	325	4-6	8.85	10	12.2
31479	Yes		E.quinqueflora; Mesic forb; S.planifolia-S.brachycarpa/ Mesic forb	Y	105	H3/4	12,089	250	7	9.50	51	11.1
31488	Yes	A	E.quinqueflora; Mesic forb; S.planifolia/ Mesic forb; Mesic gram.	Y	60	H4	12,071	330	5	9.30	54	14.9
14392	Yes	A	E.quinqueflora; Mesic forb; D.floribunda/ Mesic forb	Y	98	H3	10,631	40-60	11	6.44	105	20
14867	No	NA	S. wolfii/ Mesic forb	Y	20							
3467	Yes	B	E.quinqueflora;	Y	70	H3	10,987	0	1; 8	6.89	229	15.3
3469	Yes	B	S. wolfii/ Mesic forb; E.quinqueflora	N	68	H2	11,035	110	5	6.8	153	15.9
3473	Yes	B	E.quinqueflora; S.planifolia-S.brachycarpa/ Mesic forb	Y	70	H2/3	11,029	190	7	6.89	165	14.8

Wetland Mapping and Fen Attributes

124 NWI maps were scanned and digitized. Of the 2,300,000 acres within the WRNF, 50,500 acres are wetlands or 2.2% are classified as wetlands according to the NWI maps. The wetland acres are further classified within Table 2.

Table 2. WRNF wetland acres according to NWI Classification.

Cowardin Type	Acres (rounded)	Percent of Total Wetland Acres
Lacustrine Limnetc Unconsolidated Bottom (L1UBH)	3,995	7.89
Lacustrine Littoral Aquatic Bed Intermittent (L2AB; L2UB; L2US)	1,001	1.98
Palustrine Aquatic Bed Semipermanently flooded (PABF)	525	1.04
Palustrine Aquatic Bed Intermittently Exposed (PABG)	2,987	5.92
Palustrine Emergent Temporarily Flooded (PEM)*	**16,086**	**31.85**
Palustrine Forested (PFO)	175	0.35
Palustrine Scrub Shrub (PSS)*	**15,703**	**31.10**
Palustrine Unconsolidated Bottom (PUB) and Unconsolidated Shore (PUS)	1,664	3.30
Riverine Lower Perennial Unconsolidated Bottom (R2UB) and Unconsolidated Shore (R2US)	26	0.05
Riverine Upper Perennial Unconsolidated Bottom (R3UB) and Unconsolidated Shore (R3US)	6,863	13.6
Riverine Intermittent Streambed (R4SB)	1,475	2.92
Totals	50,500	100%

**Bold are NWI types prioritized for fen attributes.*

The PEM and PSS types are the most common in the WRNF. Table 3 breaks down the PEM into Water Regimes and Special Modifiers (e.g., diked or excavated) and Table 4 further describes the PSS.

Table 3. PEM in WRNF according to water regimes and special modifiers.

Cowardin Type	Acres
Palustrine Emergent Temp. Flooded (PEMA)	138
Palustrine Emergent Temp. Flooded Diked or Impounded (PEMAh)	14
Palustrine Emergent Saturated (PEMB)	**8,457**
Palustrine Emergent Saturated with Beaver (PEMBb)	343
Palustrine Emergent Seasonally Flooded (PEMC)	2,902
Palustrine Emergent Seasonally Flooded Diked or Impounded (PEMCh)	217
Palustrine Emergent Seasonally Flooded Excavated (PEMCx)	182
Palustrine Emergent Semipermanently Flooded (PEMF)	54
Palustrine Emergent Semipermanently Flooded Diked or Impounded (PEMFh) or excavated (PEMFx)	6
Palustrine Emergent Semipermanently Flooded Artifically Flooded (PEMKC)	3,771

Table 4. PSS in WRNR according to water regimes and special modifiers

Cowardin Type	Acres
Palustrine Scrub Shrub/Emergent Temporarily Flooded (PSS/EMA)	8.5
Palustrine Scrub Shrub/Emergent Saturated (PSS/EMB)	597
Palustrine Scrub Shrub/Emergent Seasonally Flooded (PSS/EMC)	2237
Palustrine Scrub Shrub Temporarily Flooded (PSSA)	469
Palustrine Scrub Shrub Temporarily Flooded (PSSB)	**8198**
Palustrine Scrub Shrub Temporarily Flooded with Beaver (PSSBb)	1049
Palustrine Scrub Shrub Seasonally Flooded (PSSC)	3095
Palustrine Scrub Shrub Seasonally Flooded with Beaver (PSSCb)	3
Palustrine Scrub Shrub Seasonally Flooded Diked or Impounded (PSSCh) or Excavated (PSSCx)	48

Within the PEMB type CNHP wetland ecologists attributed approximately 395 excellent fen signatures (5 confidence), 395 with very good fen signature (4 confidence), and 1,110 with good fen signatures (3 confidence). In the PSSB, 20 wetlands were attributed with an excellent signature, 55 with very good (4 confidence), and 159 with fair signature (3 confidence).

Discussion

The results of the wetland mapping and prioritized fen survey confirms that WRNF supports numerous wetlands in an otherwise arid landscape. The digitized wetland GIS layer now enables WRNF to manage the wetland resource with up to date data and to avoid sensitive habitats such as fens. The results from the fen survey documented several tracked plant species and communities. Tracked plant communities included: Timber oatgrass (*Danthonia intermedia*) herbaceous vegetation(G2G3S2S3), Mud sedge (*Carex limosa*) herbaceous vegetation (G2S1S2), Buckbean (Menyanthes trifoliata) herbaceous vegetation, Yellow pond lily (*Nuphar lutea ssp. polysepala*) herbaceous vegetation (G5S3), Rock sedge (*Carex saxatilis*) herbaceous vegetation (G3S2), Wolf willow/Mesic forb (*Salix wolfii/*Mesic forb) shrubland (G3S3). Tracked plant species included: Russet cottongrass (*Eriophorum chamissonis*) (G5S1), Altai cottongrass (*Eriophorum altaicum var.neogaeum*) (G4?TeT4S3), Slendercottongrass (*Eriophorum gracile*) (G5S2), Buxbaum sedge (*Carex buxbaumii*), Bristle-stalk sedge (*Carex leptalea*) (G5S1), James' snowlover **(***Chionophila jamesii*) (G4?S3S4) and quillwort (Isoetes spp.)

These surveys identified numerous fens that were at risk from a variety of anthropogenic activities and occasionally from elk (*Cervus elaphus*) activity. Hydrologic and vegetation alteration were the primary ultimate causes of fen impairment. Development activities that resulted in hydrologic alteration included water diversions, ditching, and roads. Vegetation disturbance is also a factor in fen degradation. Vegetation disturbance, resulting from both legal

and illegal motorized recreational use, and also occasionally from Elk use, was documented in several fens in this survey.

Because fens provide numerous essential ecosystem functions, including water storage and conservation, carbon sequestration, habitat for sensitive plant species and communities and important wildlife refugia, management of the landscape surrounding fens to maintain fen function is essential to maintenance of the larger ecological system.

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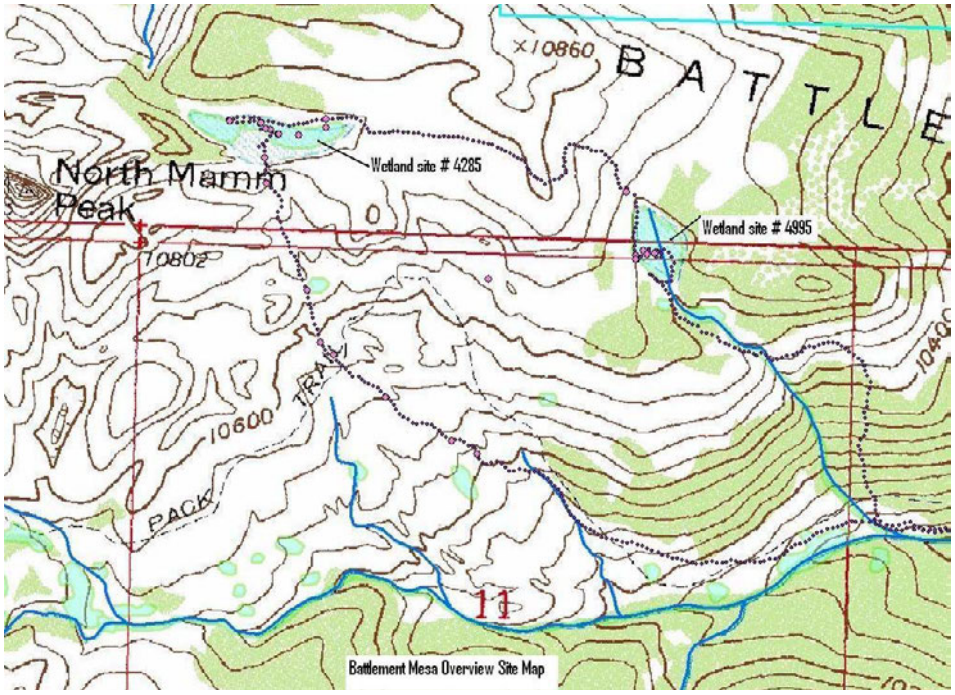
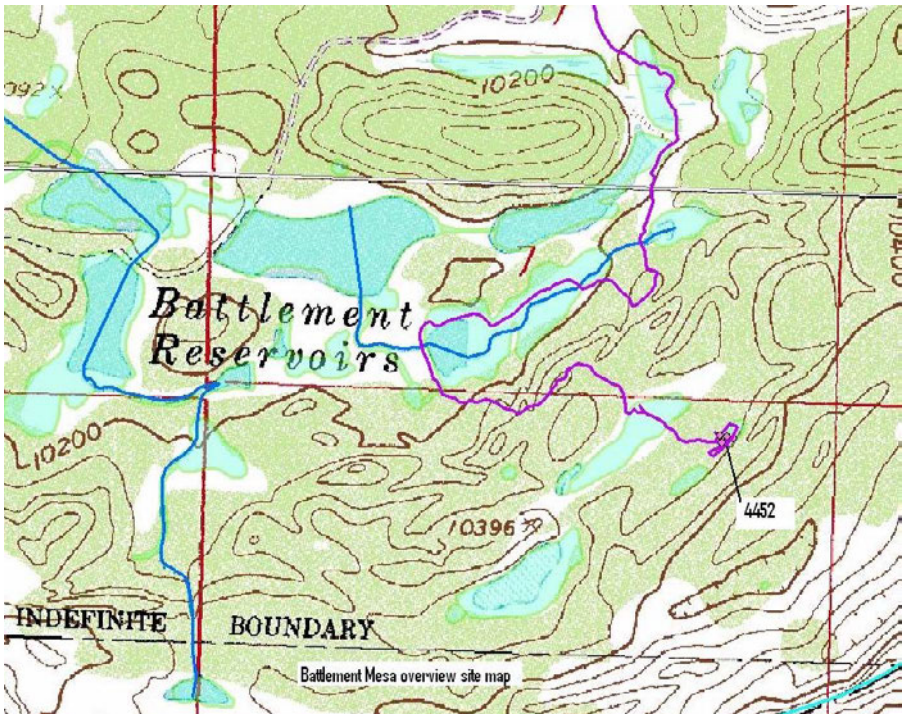
Appendix I:
White River National Forest Sites Surveyed in 2011

Rifle Ranger District: Battlement Mesa Overview Maps



Battlement Mesa overview map of survey sites 4295 and 4285



Battlement Mesa overview map of survey sites 4452

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date:7/20/2011

Wetland Site ID: 4295

Wetland Classification: Palustrine; emergent; persistent; and non-tidal saturated and permanently flooded. This fen is both surface and groundwater dominated with evidence of both surface and groundwater inflow and outflow.

Fen? yes

General Description: This wetland fen is located in the subalpine zone on Battlement Mesa and occupies a south-facing terrace that is surrounded to the west, east and north by moderately steep to gentle slopes with spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and boulder fields This slope wetland fen is dominated by herbaceous vegetation that is characterized by a mosaic of mesic graminoid communities. Soils are moist to saturated peat and the site has a low-gradient slope that drains to the southeast. These wetlands are headwaters for Beaver Creek which provides a water source to the City of Rifle. Surrounding uplands are a mosaic of graminoid and forb meadows interspersed with stands of spruce-fir. Aspen (*Populus tremuloides*) woodlands dominate lower elevation upland habitat and dense willow (Salix spp.) shrublands characterize riparian habitat. Surrounding uplands were historically impacted by clearcut logging. Logged habitat is recovering as open herbaceous meadows.

Wetland characterization

Elevation: 10,652

Aspect: 160 ^{o}

Slope: 3%

Tile probe depth: 30cm

Peat depth: 50cm

Von Post peat classification: H7/H8

Soil Characteristics: Soils are saturated peat.

Organic/Mineral percent:

Soil gley in upper 40cm? no

Water source and flow direction characteristics: Inflow is primarily from shallow groundwater flow, primarily from southeast-facing slopes but also from east- and west-facing slopes, discharges into the wetland as shallow ground and surface water. However a small surface channel contributes to inflow. Outflow occurs as both ground and surface channel flow to the southeast.

Water Quality:

pH: 6.15

Conductivity(mS): 41

Temperature (C^{o}): 16.8

Disturbance: yes in wetland.

Type: 1) Elk grazing and 2) elk trampling.

Intensity: 1)Grazing impact is low (1); clipping is noticeable on some graminoids and forbs but plants have normal vigor. 2) Trampling impact is low (1); soil compaction is noticeable in a few areas but no bare soil is present.

Extent: covers all (5)

Amphibian species present: none observed here, however Chorus frog (*Pseudacris triseriata*) and tiger salamander (*Ambystoma tigrinum*) occupy nearby ponds and tarns that are scattered across the landscape at the following GPS UTM locations:
Chorus frog E 254,195/ N 4,363,387; E 253964/N 4363123.667821.
Tiger salamander E 253848/N 4363218.
Avian species present: Olive-sided Flycatcher, Dark-eyed Junco, Warbling Vireo, Lincoln's Sparrow, Tree swallow, American Robin, Pine Siskin, Broad-tailed Hummingbird, Ruby-crowned Kinglet, Golden-crowned Kinglet, Chipping Sparrow, MacGillivray's Warbler, Swainson's Thrush, Western tanager, Hermit Thrush, Mountain Chickadee, White-crowned Sparrow, Northern Harrier, Common Snipe.
Mammal species present: Elk (*Cervus elaphus*)

Plant Communities:
1) Dominant: Water sedge (*Carex aquatilis*) herbaceous vegetation
Total herbaceous cover = 70% with 14% forbs and 56% graminoids; C. aquatilis cover= 39%.
2. Beaked sedge (*Carex utriculata*) herbaceous vegetation.
Plant List:
CNHP Tracked, TEP or Forest Service RFSS plant species and communities (*appendix I):
**Danthonia intermedia* herbaceous vegetation (adjacent uplands)
Other plant species present:
Carex aquatilis
Carex utriculata
Carex ebenea
Carex canescens
Carex eleocharis
Deschampsia cespitosa
Phleum alpinum
Agrostis scabra
Calamagrostis canadensis
Senecio crocatus
Caltha leptosepala
Pedicularis groenlandica,
Ranunculus alismifolius
Veratrum californicum
Juncus parryi
Cystopteris fragilis
Viola adunca
Ribes montingenum
Lewisia pygmaea
Vaccinium cespitosum
Pneumonanthe affinis
Setaria viridis (non-native)
Taraxacum officinale (non-native)
Noxious weed species present (Noxious weed form attached): none.

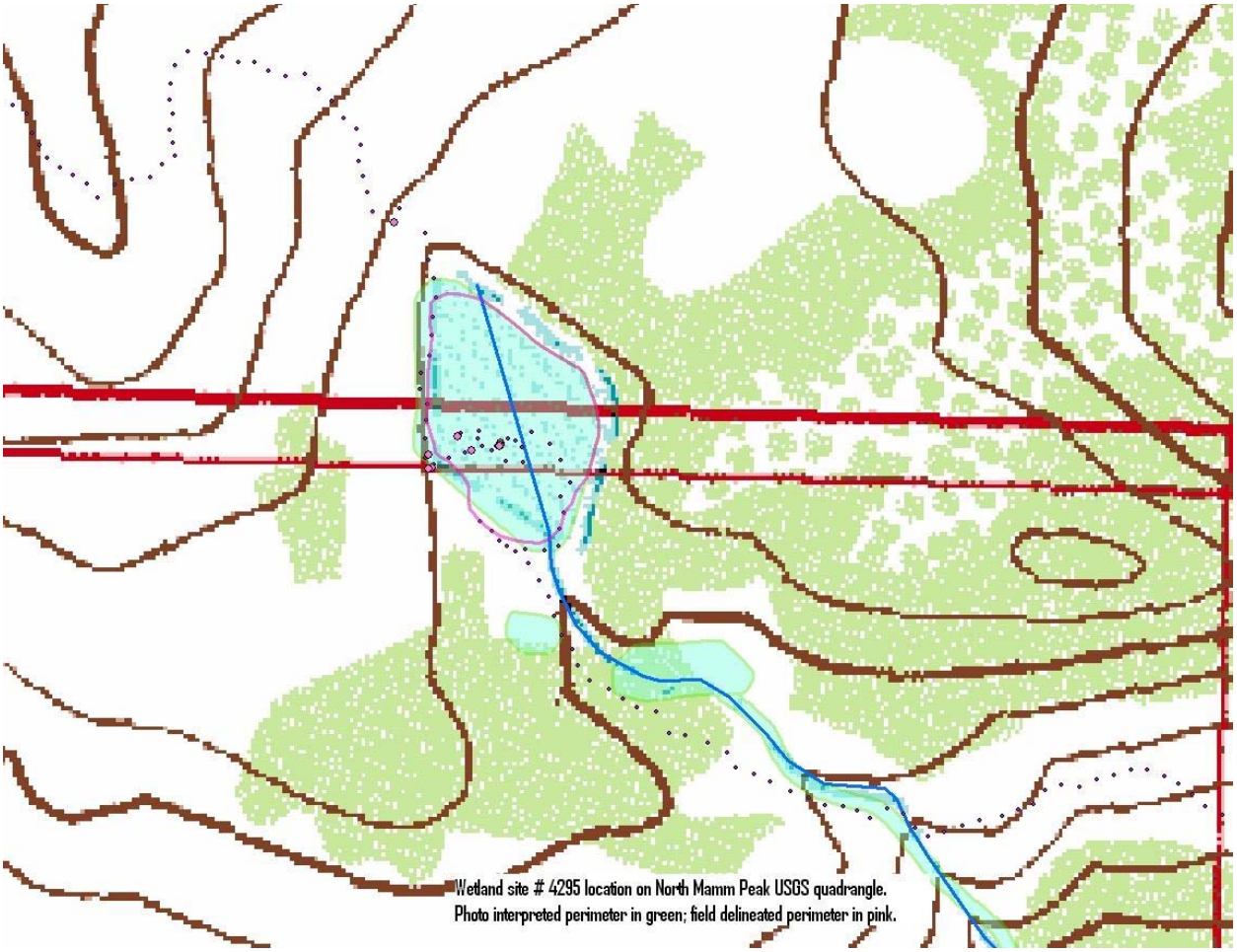
Photo Documentation Wetland Site # 4295

Site Panorama (Clockwise from left): Starting Azimuth 340°, UTM point E 254552/N 4363442

Photo Point: Azimuth center photo 60°, GPS UTM point E 254525/N 4363431

Soil Pit: GPS UTM point E 254569/ N 4363445

Looking southeast into fen # 4295



Wetland site # 4295 location on North Mamm Peak USGS quadrangle. Photo interpreted perimeter is in green; field delineated perimeter is pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/20/2011
Wetland Site ID: 4285
Wetland Classification: Palustrine; emergent; persistent; non-tidal saturated and permanently flooded. Topographically the wetland is a closed basin with shallow groundwater flow dominating the inflow but there is no outflow.
Fen? No.
General Description: This wetland is located in the subalpine zone on Battlement Mesa. The site occupies a depression on a wide ridgetop and is topographically a closed basin. Soils vary from xeric mineral soils and rock to saturated peat. Plant communities vary with soil characteristics. The site is characterized by an herbaceous meadow with a mosaic of mesic and xeric graminoid communities and open water. Surrounding upland hillslopes to the north and west are dominated by spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest to the north and west and to the south and east by mixed graminoid-forb meadows. Uplands are a mosaic of graminoid and forb meadows interspersed with stands of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest with aspen (*Populus tremuloides*) woodlands dominating lower elevation upland habitat. Surrounding uplands were historically impacted by clearcut logging. Logged habitat is recovering as herbaceous meadows.

Wetland characterization

Elevation: 10,740
Aspect: 0^{o}
Slope: 0%
Tile probe depth: 10cm
Peat depth: 20 cm
Von Post peat classification: H8
Soil Characteristics: Saturated, shallow peat
Organic/Mineral content percent: na
Soil gley in upper 40cm? na
Water source and flow direction characteristics: shallow groundwater discharge from surrounding slopes moves into this closed basin; this is topographically a closed basin and there is no outflow.
Water Quality:
pH: 5.8a
Conductivity(mS): 19
Temperature (C^{o}): 21.8
Disturbance:
Type: 1) Elk grazing and 2) elk trampling.
Intensity: 1) Grazing impact is low (1); clipping is noticeable on some graminoids and forbs but plants have normal vigor. 2) Trampling impact is low (1); soil compaction is noticeable in a few areas but no bare soil is present.
Extent: covers all (5)
Amphibian species present: Chorus frog (*Pseudacris triseriata*) occupy shallow ponds in this wet meadow at GPS UTM location E 253832/N 4363725.
Avian species present:
Mammal species present: Elk (*Cervus elaphus*)

Plant Communities: habitat is characterized by a mosaic of mesic and xeric graminoids and open water.

1) Dominant: Water sedge (*Carex aquatilis*) herbaceous vegetation
   Total herbaceous cover = 70% with 7% forbs and 63% graminoids; C. aquatilis cover = 50%; other graminoids 13%.
2) Co-dominant: Beaked sedge (*Carex utriculata*) herbaceous vegetation
   Total herbaceous cover = 70% with 7% forbs and 63% graminoids; *C. utriculata* cover = 57%; other graminoids 6%.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.

Other plant species present:

Carex aquatilis
Carex utriculata
Carex ebenea
Deschampsia cespitosa
Juncus drummondii
Phleum alpinum
Caltha leptosepala
Carex capillaris
Lemna spp.

Noxious weed species present (Noxious weed form attached): none.

Photo Documentation Wetland Site #4285

Looking east across shallow ponds that occur throughout this closed basin wetland

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/20/2011
Wetland Site ID: 4452
Wetland Classification: Palustrine; emergent; persistent; non-tidal permanently flooded. Surface and groundwater dominated; topographically a closed basin with surface inflow but no outflow.
Fen? Yes.
General Description: This wetland fen is a located on Battlement Mesa. The site is a depressional wetland characterized by graminoid cover that is dominated by water sedge (*Carex aquatilis*). Soils are saturated peat and often inundated. The site is bordered by spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest to the west and northwest and by steep-gradient boulder fields to the east and southeast.

Fen characterization
Elevation: 10,343 feet
Aspect: 0^{o}
Slope: 0%
Tile probe depth: 20cm
Peat depth: 40cm to mineral soil
Von Post peat classification: H7/H8
Soil Characteristics: Saturated peat with hummock formation.
Organic/Mineral content percent:
Soil gley in upper 40 cm? No
Water source and flow direction characteristics: shallow groundwater flow from adjacent east- and southeast-facing slopes discharges as shallow surface and groundwater into this depressional wetland. There is no apparent outflow.
Water Quality:
pH: 4.86
Conductivity(mS): 31
Temperature (C^{o}): 20.6
Disturbance: none observed.
Type: na
Intensity: na
Extent: na

Amphibian species present: none observed at this site. Tiger salamander (*Ambystoma tigrinum*) occur at nearby reservoir # 4 GPS UTM location E 247,833/N 4,362,169.
Avian species present: Warbling Vireo, Stellar's Jay, Ruby-crowned Kinglet, Western Tanager, White-crowned Sparrow, Dark-eyed Junco, House Wren, MacGillivray's Warbler, Hermit Thrush, Swainson's Thrush, Red-breasted Nuthatch.
Mammal species or sign present: Moose (*Alces alces*)
Plant Communities:
1) Dominant community: Water sedge (*Carex aquatilis*) herbaceous vegetation
Total herbaceous cover = 50% with 10% forbs and 40% graminoids; C. aquatilis = 32% cover.
2) Planeleaf willow (*Salix planifolia*)/ mesic graminoid herbaceous vegetation.

Plant Species List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.

Other plant species present:

Carex aquatilis
Carex utriculatus
Carex scopulorum
Juncus parryi
Pedicularis groenlandica
Caltha leptosepala
Viola adunca
Vaccinium cespitosum
Salix planifolia
Picea engelmannii

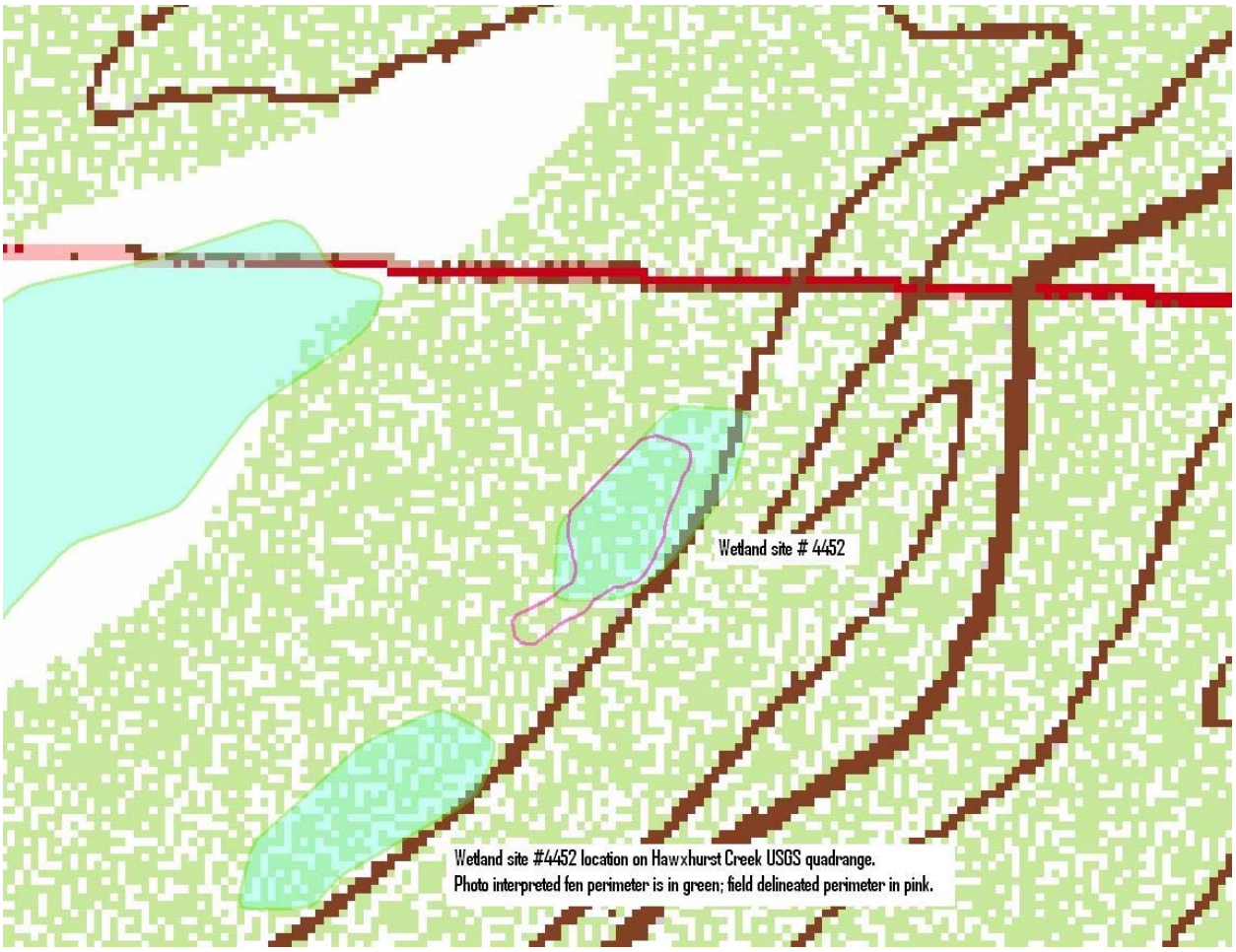
Non-native, weedy species present (Noxious weed form attached): none.

Photo Documentation Wetland Site # 4452

Site Panorama (Clockwise from left): Starting Azimuth 25°, GPS UTM E 248,315/N4361950.

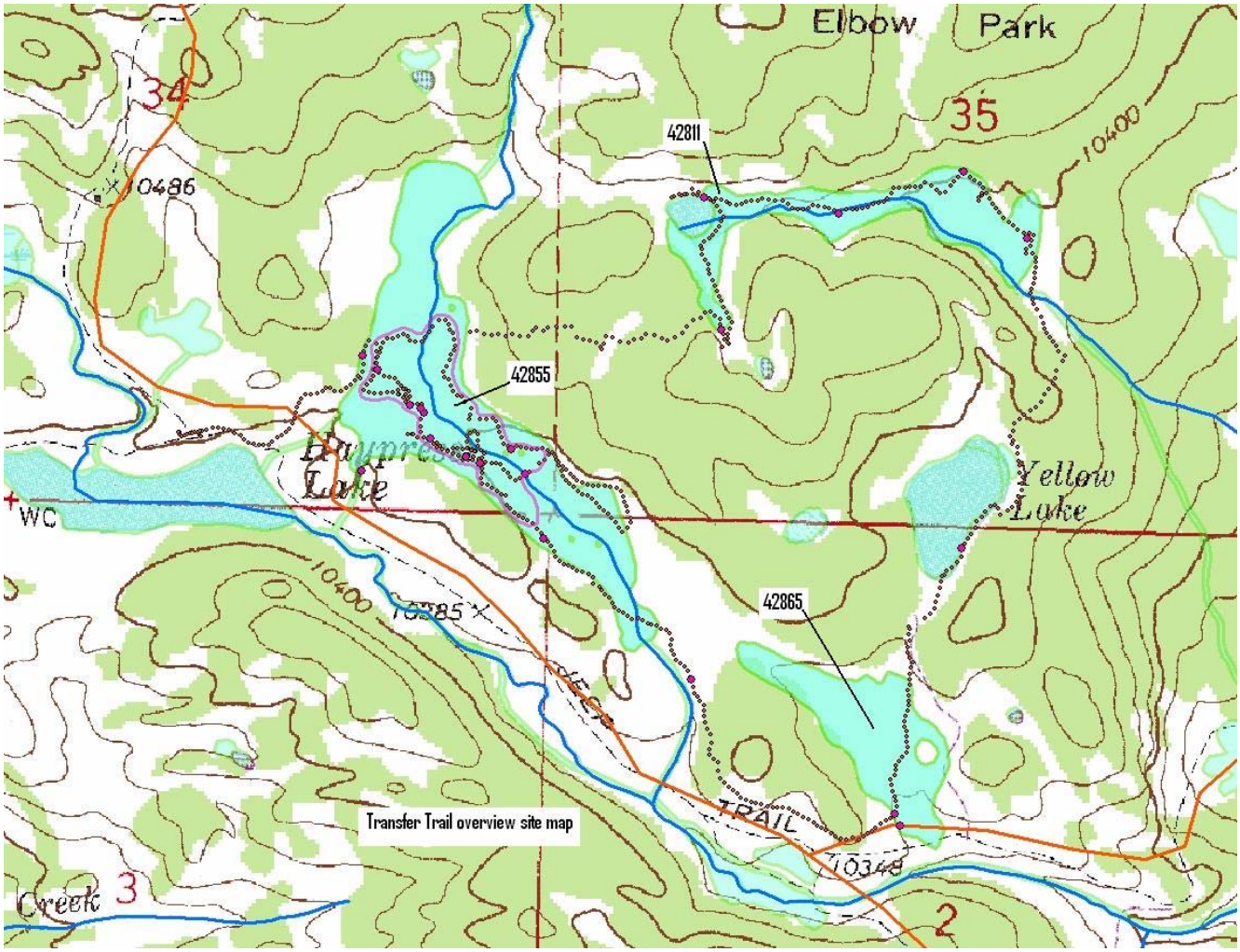
Photo Point: Azimuth of center photo 150°, GPS UTM point E 248301/N 4361952

Soil Pit: GPS UTM point E 248305/ N 4361936.845379



Wetland site # 4452 on Hawxhurst Creek USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter in pink.

Rifle Ranger District: Transfer Trail Overview Map



Transfer trail overview map of survey sites 42855 and 42811

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/5/2011
Wetland Site ID: 42855
Wetland Classification: Palustrine; emergent persistent/scrub-shrub broad-leaved deciduous; non-tidal seasonally flooded/saturated.
Fen? Yes.
General Description: This wetland fen is located in the upper montane zone on the south rim of the White River Plateau on the West Slope of the Continental Divide. These wetlands occupy a wide, low-gradient swale on top of a gently sloping, plateau which tilts southward, ultimately draining down steep cliffs to the Colorado River near Glenwood Springs.

Landscape on top of this plateau is characterized by gently rolling forested hills and moist swales where dozens of lakes and wetlands have formed. Wetland habitat at this site is a rich mosaic of plant communities occurring along a soil moisture gradient that varies from depressions with open water to saturated peat soils. Communities include mesic graminoid and forb meadows, willow (*Salix* spp) shrublands and aquatic communities. Fen hydrology is likely a result of several interacting sources including deep springs, shallow groundwater flow and surface channel flow. Geology is Paleozoic age carbonate limestone. Geology and hydrology have interacted here to create a karst landscape on the southern end of this fen. Here, deep (>3m) sinkholes have formed where aquatic plant communities thrive. Uplands are characterized by mixed spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and aspen (*Populus tremuloides*) woodlands.

Wetland characterization
Elevation (feet): 10,416.
Aspect: north side of fen 210^{o} to 230^{o}; south end of fen 120^{o}.
Slope: north end 1.5% to 2.0%; south end 1.5%.
Tile probe depth: 67cm
Peat depth: 105cm; peat depth varies $\pm$ 30 cm with microtopography.
Von Post peat classification: H2.
Soil Characteristics: saturated to inundated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow to the fen is dominated by groundwater but surface flow also contributes to hydrology. Groundwater likely includes both shallow and spring flow from deeper groundwater sources. Outflow occurs by both ground and surface channel and shallow overland flow

Water Quality:
pH: 10.30
Conductivity(microsiemens): 191
Temperature (C^{o}): 24.6

Disturbance:

Type: 1)Tracks from snowmobile use; and 2) erosion.

Intensity: Very high; a designated snowmobile route is located through this fen; snowmobile passes occur annually and frequently; and 2) very high; several gullies at bottom of fen some with headcuts and >1m wide.

Extent: 1) covers 50% of fen; and 2) covers <10% of area but is resulting in excessive draining.

Amphibian species present: western chorus frog (*Pseudacris triseriata*)
Avian species present: Three-toed Woodpecker, Stellar's Jay, Yellow-rumped Warbler, Yellow Warbler, Pine Grosbeak, Lincoln's Sparrow, White-crowned Sparrow, Mountain Chickadee, Ruddy Duck.
Mammal species present: Elk (*Cervus elaphus*) sign.

Plant Communities:
1. Co-dominant: Mesic forb herbaceous vegetation.
   Total cover 60% with 39% forbs and 21% graminoids.
2. Co-dominant: Planeleaf willow/Mesic forb (*Salix planifolia/Mesic forb*) shrubland
   Total shrub cover 70%; herbaceous cover 40% with 24% forbs and 16% graminoids.
3. Beaked sedge (*Carex utriculata*) herbaceous vegetation with 50% cover.
4. Water sedge (*Carex aquatilis*) herbaceous vegetation with 70% cover.
5. Few-flower spikerush (Eleocharis quinqueflora) herbaceous vegetation
   Total cover = 60% with 6% forbs and 54% graminoids; E. quinqueflora = 43% of graminoid cover, other graminoids = 11%.
6. (*Carex limosa*) herbaceous vegetation; occupies depressions with water from 0.5 to 1m deep; cover = 65%.
7. Buckbean (*Menyanthes trifoliata*) aquatic herbaceous vegetation; occupies sink holes with water to 2m deep.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):
*Mud sedge (*Carex limosa*) herbaceous vegetation
*Buckbean (*Menyanthes trifoliata*) herbaceous vegetation
Beaked sedge (*Carex utriculata*) herbaceous vegetation
Water sedge (*Carex aquatilis*) herbaceous vegetation
Planeleaf willow/Mesic forb (*Salix planifolia/Mesic forb*) shrubland
Other plant species present:
Eleocharis quinqueflora
Eriophorum angustifolium
Carex limosa
Carex aquatilis
Carex utriculata
Carex microglochin
Carex nova
Carex scopulorum
Carex canescens
Carex illota

Juncus drummondii
Deschampsia caespitosa
Phleum alpinum
Bistorta vivipara
Senecio crocatus
Spiranthes romanzoffiana
Limnorchis dilatata
Menyanthes trifoliata
Sedum rhodanthum
Pedicularis bracteosa
Castilleja sulphurea
Pedicularis groenlandica
Caltha leptosepala
Gentianopsis thermalis
Ranunculus alismifolius
Veronica wormskjoldii
Geum macrophyllum
Salix planifolia

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 42855

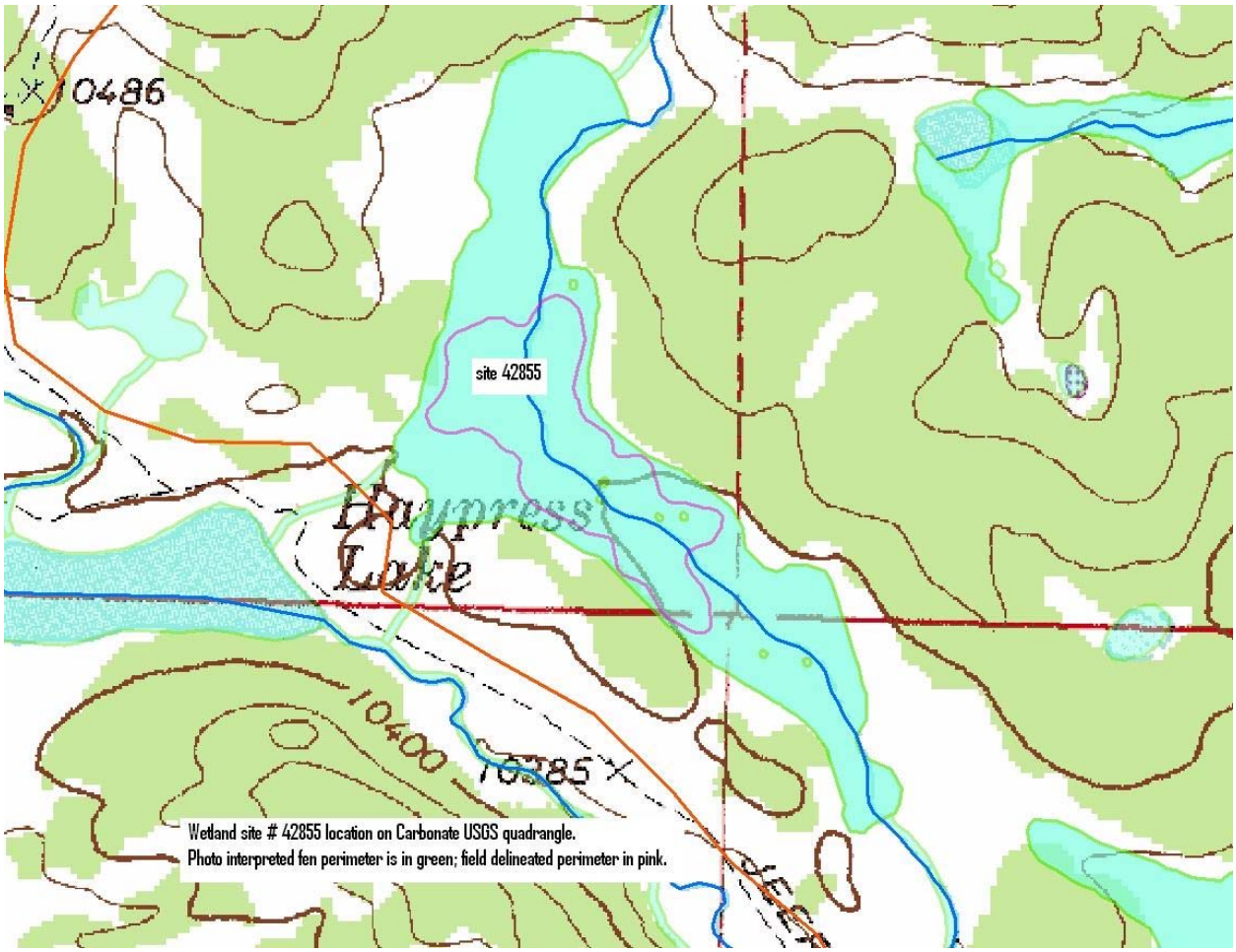
Site Panorama (Clockwise from left): Starting Azimuth 120°, UTM E297737/N4391926

Photo Point: Azimuth of center photo 110°, UTM E297730/N4391934

Soil Pit:UTM E297709/N4391941

Peat is eroding from the south end of the fen

Deep sink holes occur throughout the fen.



Wetland site #42855 location on Carbonate USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/9/2010
Wetland Site ID: 42811
Wetland Classification: Palustrine; emergent persistent/scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? No.
General Description: This wetland site is located in the upper montane zone on the south rim of the White River Plateau on the West Slope of the Continental Divide. This wetland occupies a low-gradient swale on a gently sloping plateau which tilts southward, ultimately draining down steep cliffs to the Colorado River near Glenwood Springs.

Plateau landscape is characterized by gently rolling forested hills and moist swales where dozens of lakes and wetlands have formed. Wetland habitat at this site is characterized by a mosaic of mesic graminoid and forb meadows, willow (*Salix* spp.) shrublands and open water ponds. Uplands are characterized by mixed spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and aspen (*Populus tremuloides*) woodlands.

Wetland characterization
Elevation (feet): 10,453
Aspect: northwest, east and southeast
Slope: 0% to 6%
Tile probe depth: 20cm
Peat depth: 20cm
Von Post peat classification: na
Soil Characteristics: shallow peat underlain by rock.
Organic/Mineral content percent:
Soil gley in upper 40cm?
Water source and flow direction characteristics: Groundwater dominates both inflow and outflow. Additionally however, surface channel flow does exist and contributes to outflow.
Water Quality: na
pH: na
Conductivity(microsiemens): na
Temperature (C^o): na
Disturbance: none.
Type: na
Intensity: na
Extent: na

Amphibian species present: western chorus frog (*Pseudacris triseriata*)
Avian species present: Stellar's Jay, Yellow-rumped Warbler, Yellow Warbler, Pine Grosbeak, Lincoln's Sparrow, White-crowned Sparrow, Mountain Chickadee, Ruddy Duck.
Mammal species present: Elk (*Cervus elaphus*) sign.

Plant Communities:
1. Co-dominant: Beaked sedge (*Carex utriculata*) herbaceous vegetation
2. Co-dominant: Mountain sedge (*Carex scopulorum*) herbaceous vegetation.
3. Co-dominant: Mesic forb herbaceous vegetation.
4. Co-dominant: Planeleaf willow/Mesic forb (*Salix planifolia/Mesic forb*) shrubland.
5. Bluejoint reedgrass (*Calamagrostis canadensis*) herbaceous vegetation.

Plant List:

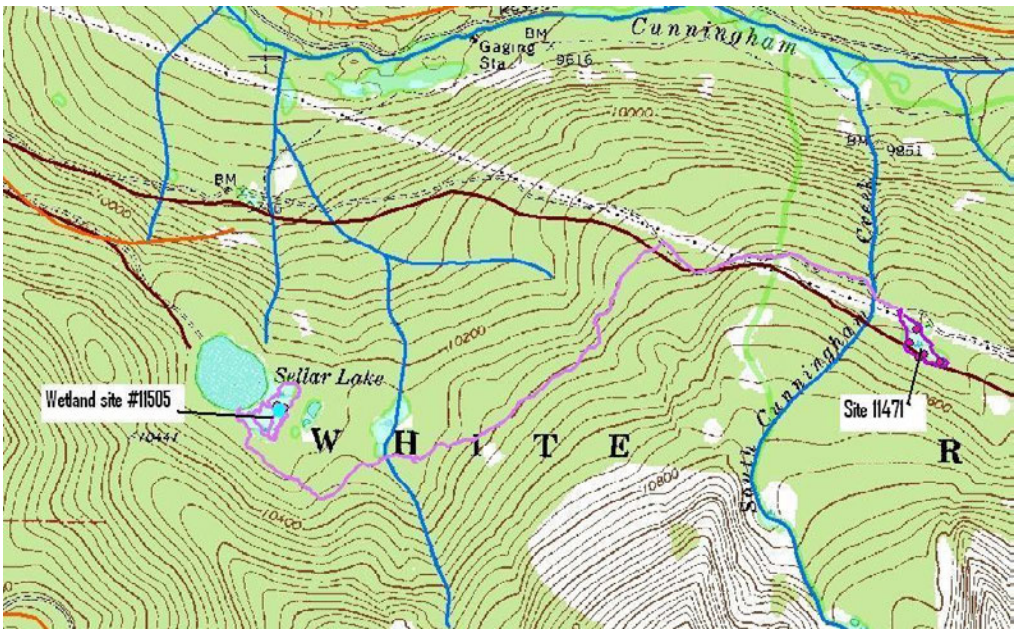
CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):
*Isoetes spp.
Beaked sedge (*Carex utriculata*) herbaceous vegetation
Bluejoint reedgrass (*Calamagrostis canadensis*) herbaceous vegetation.
Planeleaf willow/Mesic forb (*Salix planifolia/Mesic forb*) shrubland.
Other plant species present:
Carex utriculata
Carex scopulorum
Carex illota
Carex canescens
Carex nova
Carex aquatilis
Eleocharis palustris
Caltha leptosepala
Isoetes spp.
Phleum alpinum
Pedicularis groenlandica
Erigeron peregrinus
Senecio crocatus
Bistorta vivipara
Cymopterus lemmonii
Ranunculus alismifolius
Epilobium hornemannii
Sedum rhodanthum
Menyanthes trifoliata
Geum macrophyllum
Viola adunca
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 42811

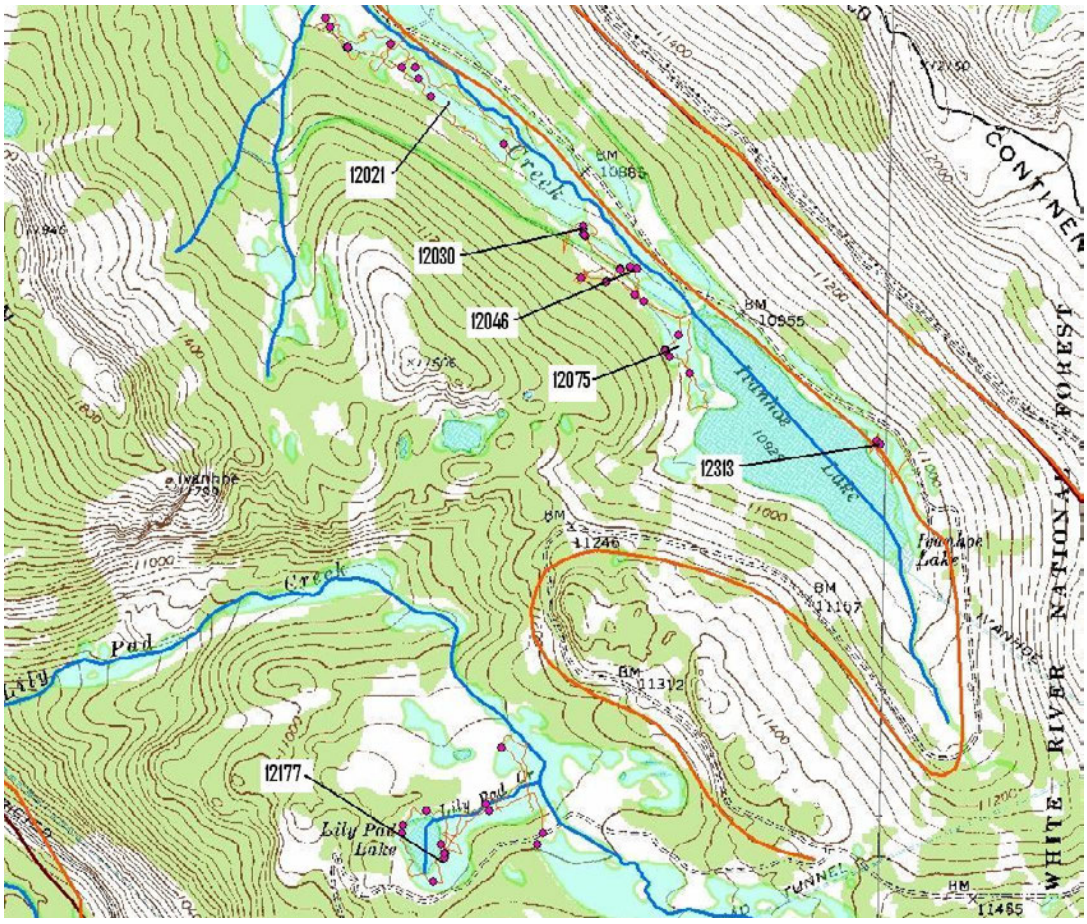
Left Photo: chorus frogs were abundant in this wet meadow.
Right Photo: Quillwort (*Isoetes* spp) and tadpoles were abundant in this sinkhole.

Small ponds and sinkholes occur throughout this wet meadow habitat.

Sopris Ranger District: Fryingpan Watershed Overview Maps



Overview map for survey sites 11505 and 11471



Overview map for survey sites 12021, 12030, 12046, 12075, 12313, 12177

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/25/2011
Wetland Site ID: 11471
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. The fen occupies a lowslope at the base of steep, northeast-facing slopes and is drained by a west-trending stream which is located at the base of the wetland. Soils are deep, saturated peat with a consistently high cover of bryophytes with especially high cover of sphagnum spp.. Saturated soils have resulted in slumping that has created a series of terraces and slopes each with specific plant communities responding to soil and soil moisture conditions. Thus habitat at this site is characterized by a mosaic of mesic herbaceous graminoid and forb communities and, on the fen perimeter by willow (*Salix* spp.) shrublands. Uplands are a mosaic of spruce-fir (*Picea engelmannii-Abies* lasiocarpa) forest and herbaceous meadows and shrublands. Riparian habitat is typically characterized by a narrow but dense cover of willow shrublands.

Wetland characterization
Elevation: 10,537
Aspect: 30 ^{o} to 40 ^{o}
Slope: 4% to 11%
Tile probe depth: TP1=60cm, TP2=106 cm
Peat depth: 106 cm
Von Post peat classification: H2
Soil Characteristics: Saturated, deep peat with abundant shallow surface flow.
Organic/Mineral content percent:
Soil gley in upper 40cm?
Water source and flow direction characteristics: Dominant inflow to maintain this wetland is provided by shallow groundwater from adjacent northeast facing slopes. Shallow groundwater discharge at the wetland-upland interface zone results in shallow surface flow through the wetland. Outflow occurs by both groundwater and surface flow and by a small channel that runs along the base of the wetland.

Water Quality:
pH: 7.50
Conductivity(microsiemens): 18
Temperature (C^{o}): 23.3
Disturbance:
Type: 1) Powerline; and 2) Road in wetland buffer at base of wetland.
Intensity: 1) Moderate to high intensity; power line is over the wetland; moderate amount of human activity from maintenance activities with clearing in wetland.
2) Moderate intensity; one, natural-surface road is open during the season and used many times per week.
Extent: 1) Impacted area covers from >10% <25%; 2) Impacted area covers <10% but extends across entire base of fen.

Amphibian species present: none.
Avian species present: Stellar's Jay, Wilson's Warbler, Red-naped Sapsucker, Mountain Chickadee.
Mammal species present: Elk (*Cervus elaphus*).

Plant Communities:
1) Dominant: Mesic forb herbaceous vegetation.
Total cover 80% with 48% mesic forbs and 32% mesic graminoids.
2) Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation
Total cover 60% with 12% forbs and 48% graminoids; E. quinqueflora = 29% of graminoid cover, water sedge (*Carex aquatilis*) 10% and other graminoids 9%. Elephantella (*Pedicularis groenlandica*) = 11% of forb cover, other forbs = 1% cover.
3. Water sedge (*C. aquatilis*) herbaceous cover
Total cover 70% with 21% forbs and 49% graminoids; C. aquatilis = 29% of graminoid cover, other graminoids = 20% of cover; forb cover is mixed.
4. Planeleaf willow/mesic forb (*Salix planifolia*/Mesic forb) shrubland (occupies periphery of fen).

Plant List:
CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Sphagnum platyphyllum
Eleocharis quinqueflora
Carex aquatilis
Carex canescens
Luzula parviflora
Deschampsia caespitosa
Eriophorum angustifolium
Lewisia pygmaea
Pedicularis groenlandica
Senecio triangularis
Saxifraga oregana
Veratrum californicum
Caltha leptosepala
Draba crassifolia
Equisetum arvense
Trollius laxus
Limnorchis dilatata
Taraxacum officinale (non-native)
Vaccinium cespitosa
Salix planifolia
Noxious weed species present (noxious weed form attached): none.

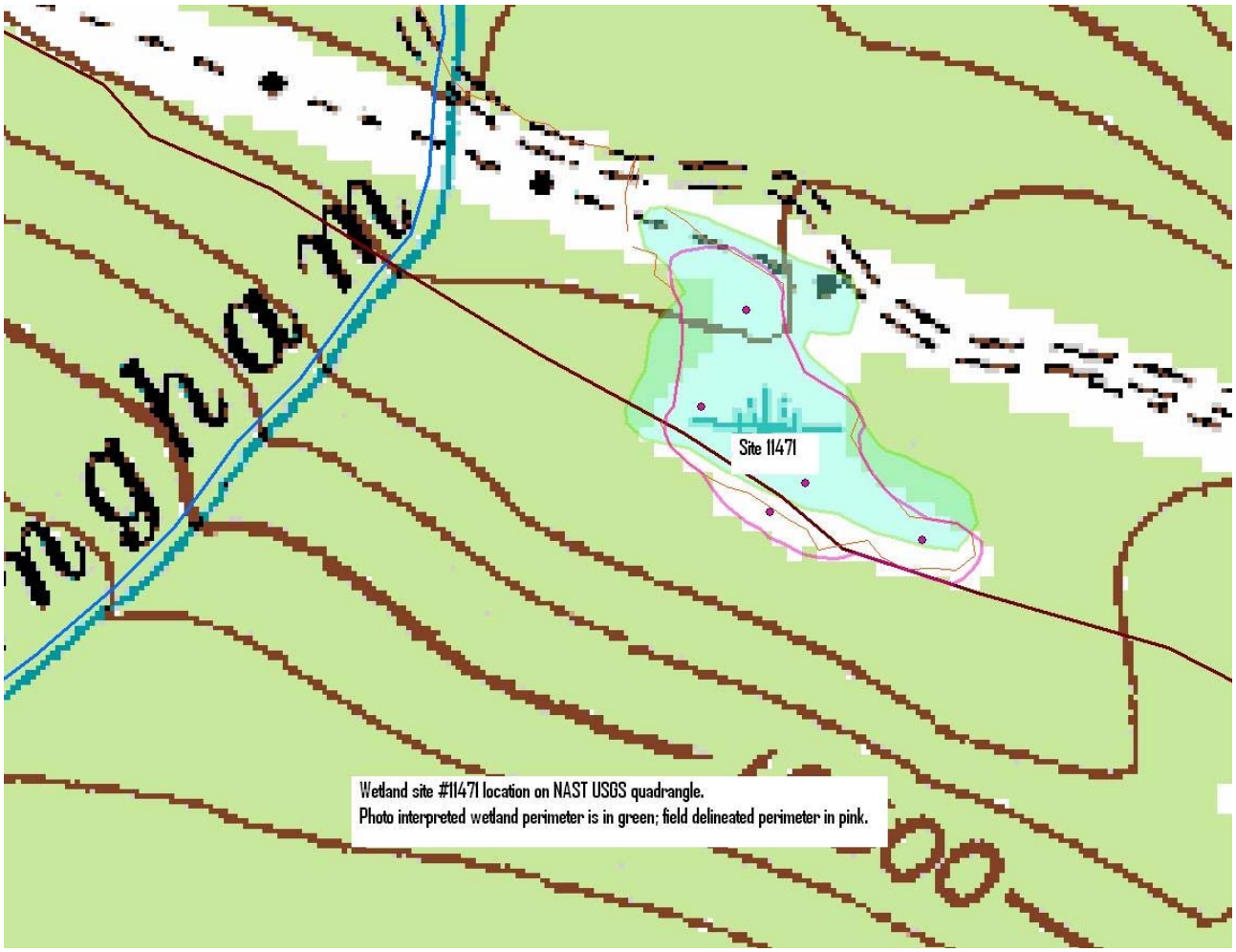
Photo Documentation Wetland Site # 11471

Site Panorama (Clockwise from left): Starting Azimuth 310 ^{o}, UTM point E 365767/ N4353951

Photo Point: Azimuth of center photo 0 ^{o}, UTM point E 365801/N 4353899

Soil Pit:UTM point E 365818/N 4353913

Elk wallow at this shallow pond in this fen.



Wetland site #11471 location on NAST USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/22/2011
Wetland Site ID: 11505
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated. This wetland has evidence of both surface and groundwater inflow and outflow.
Fen? Yes.
General Description: This slope wetland fen occupies the toeslope at the base of steep northwest facing mountain slopes in the subalpine zone of the Sawatch Range and drains northwest into Sellar Lake. Wetlands are characterized by a mosaic of mesic herbaceous graminoid and forb meadows and shrublands with small open water ponds occurring throughout the site. Surrounding uplands are dominated by spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest.

Wetland characterization
Elevation (feet): 10,244
Aspect (degrees): 330° to 315°
Slope(percent): 2%
Tile probe depth: 41cm
Peat depth: 60cm
Von Post peat classification: H3 at 40cm; H4 below 40cm
Soil Characteristics: Soils are saturated peat. Soil slumping has resulted in terracing and lobes. Depressions have formed behind lobes where shallow ponds have developed.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow ground- and overland surface water flow from adjacent west- and northwest-facing slopes discharges into the wetland at the topographic change in gradient.
Water Quality:
pH: 4.93
Conductivity(microsiemens): 30
Temperature (C°): 23.96
Disturbance: Occurs in wetland (type 1 and 2) and in buffer (type 3).
Type: 1) elk grazing and browsing; 2) trails from human recreational hiking; and 3) historic 4-wd road has been closed.
Intensity: 1) Low intensity in wetland; clipping is noticeable on some graminoids and forbs and some shrubs but herbaceous plants and shrubs have normal vigor and height. 2) Low intensity in wetland; a few trails by humans in two or three places but bare soil is only slightly above normal limits. 3) Low intensity impact in wetland buffer; a natural-surface road was closed and now is restoring naturally.
Extent: 1) Covers all; 2) covers <10%; and 3) covers <10%.

Amphibian species present: none.
Avian species present: Lincoln's Sparrow. Hermit Thrush, Red-naped Sapsucker, Williamson's Sapsucker.
Mammal species present: Elk (*Cervus elaphus*) sign.

Plant Communities:

1) Dominant: Mesic forb herbaceous vegetation.
   Total cover 80% with 64% forbs and 16% mixed graminoids. Bryophyte cover is 40%.
2) Co-dominant: Water sedge-mesic forb (Carex aquatilis-mesic forb) herbaceous vegetation
   Total cover 70% with 25% mixed forbs and 45% graminoids; C. aquatilis = 35% and 10% other graminoids.
3) Planeleaf willow/water sedge (*Salix planifolia/Carex aquatilis*) shrubland occupies perimeter of fen.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.

Other plant species present:

Sphagnum squarrosum
Carex aquatilis
Carex utriculata
Luzula parviflora
Equisetum arvense
Deschampsia cespitosa
Carex canescens
Carex paupercula
Carex foetida
Poa alpina
Eriophorum angustifolium
Eleocharis quinqueflora
Limnorchis dilatata
Caltha leptosepala
Pedicularis groenlandica
Juncus drummondii
Senecio triangularis
Trollius laxus
Veratrum californicum
Saxifraga oregana
Mitella stauropetala
Mertensia ciliata
Sedum rhodanthum
Saxifraga odontoloma
Senecio crocatus
Ranunculus alismifolius
Vaccinium scoparium
Erigeron perigrinus
Salix planifolia
Betula nana
Lonicera involucrata

Noxious weed species present (Noxious weed form attached): none.

Photo Documentation Wetland Site # 11505

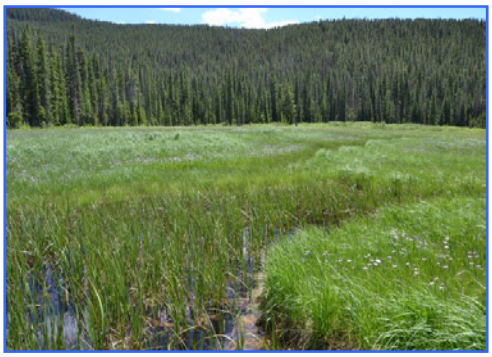
Site Panorama (Clockwise from left): Starting Azimuth 200°, GPS UTM point E363533/N 4353713

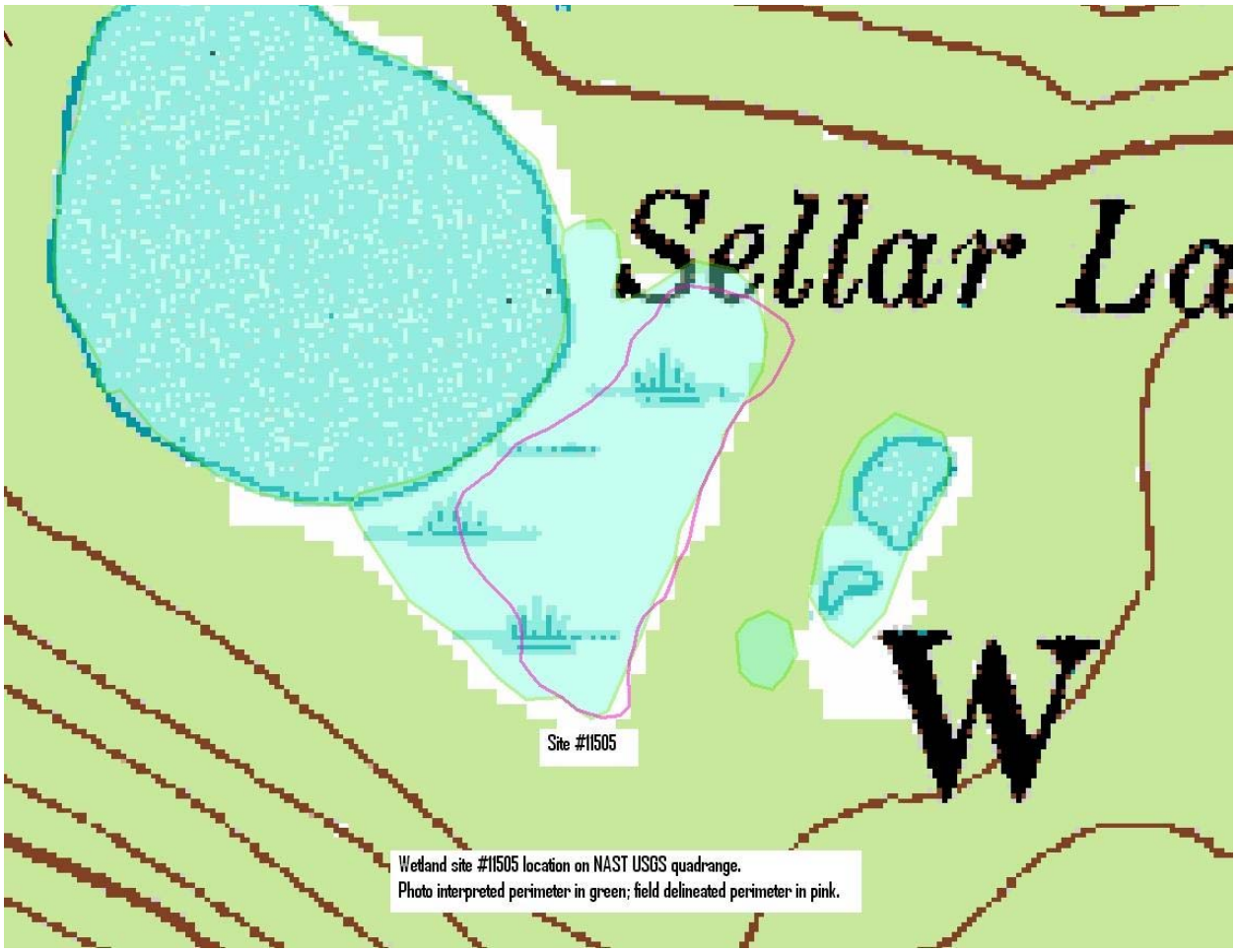
Photo Point: Azimuth of center photo 315 °, GPS UTM point E 363528/N 4353729

Soil Pit:UTM point E363538 /N 4353712

Shallow surface and groundwater discharge from adjacent slopes into fen.

Lush habitat in this fen is characterized by a mosaic of moisture-loving forbs and graminoids.





Wetland site #11505 location on NAST USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/23/2011
Wetland Site ID: 12021
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated/seasonally flooded. Shallow groundwater dominated inflow; both shallow ground and surface water outflow. Groundwater discharges at topographic change in gradient and surface overland outflow exists.
Fen? Yes.
General Description: This slope wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. This fen occupies low-gradient, northeast-facing, mid-slope benches above Ivanhoe Creek. A mosaic of plant communities characterize fen habitat and have developed as a result of saturated, slumping soils which have created terraces and slopes. Terraces have saturated soils with deep accumulations of peat while intervening slopes are better drained but also have peat soils. Graminoids dominate terraces habitat, mesic forbs dominate slopes and shrublands occupy the perimeter of the fen. Surrounding uplands are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and open forb and graminoid meadows. Riparian habitat is characterized by dense willow (*Salix* spp.) cover with a mesic forb and graminoid understory.

Wetland characterization

Elevation: 10,852
Aspect: 10 ^{o} to 40^{o}
Slope: 0% on terraces to 9% on intervening slopes
Tile probe depth: 40cm
Peat depth: 60cm
Von Post peat classification: H4/H5
Soil Characteristics: saturated peat with shallow surface water on terraces.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater from adjacent, steep, upland slopes, flows north to northeast towards Ivanhoe Creek. Shallow groundwater discharge at the topographic change in gradient results in both shallow surface and groundwater flowing through the fen.
Water Quality:
pH: 5.56
Conductivity(mS): 17
Temperature (C^{o}): 28.2
Disturbance:
Type: 1) Ditch in buffer above site; 2) road in buffer; and 3) historic grazing.
Intensity: 1) Low to moderate intensity; one maintained ditch is located approximately 80 – 120 feet upslope of this site. This ditch interrupts and diverts groundwater flow away from the fen but because of the distance between the ditch and the fen there is sufficient recovery of flows as evidenced by soil saturation and good condition and vigor of wetland vegetation.

2) Low intensity; one all weather roads is located in the wetland buffer below the fen but has little impact on wetland function. 3) None; impacts from historic grazing have recovered.

Extent: 1) Covers less than 10%; 2) covers less than 10%; 2) historically covered all.

Amphibian species present: none.
Avian species present: White-crowned Sparrows, Lincoln's Sparrow, Wilson's Warbler, Red-naped Sapsucker.
Mammal species present: Elk (*Cervus elaphus*) sign, Mule deer (*Hemionus odocoileus*) sign, coyote (*Canis latrans*), Raccoon (*Procyon lotor*).
Plant Communities:
1. Dominant: Few-flowered spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies saturated terraces).

Total cover 50% with 5% mesic forbs and 45% graminoids; *E. quinqueflora* = 36% of graminoid cover, other graminoids = 9%. Bryophyte cover = 30% to 80%.

2. Co-dominant: Mesic forb herbaceous vegetation (occupies slopes between terraces).

Total cover 80% with 56% mesic forbs and 24% graminoids. Bryophyte cover = 70-80%.

3. Water sedge (Carex aquatilis) herbaceous vegetation (occupies lower, less moist, terraces).

Total cover 55% with 5% mesic forbs and 50% graminoids; C. aquatilis = 45% of graminoid cover, other graminoids = 5%.

4. Planeleaf willow/mesic forb (Salix planifolia/mesic forb) shrubland (occupies perimeter of fen).

Total shrub cover 70%; herbaceous cover 50%.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I):
*Russet cottongrass (*Eriophorum chamissonis*)
Other plant species present:
Sphagnum platyphullum
Eriophorum angustifolium
Eleocharis quinqueflora
Carex aquatilis
Carex utriculata
Carex canescens
Carex microptera
Carex illota
Carex scopulorum
Carex subnigricans
Luzula parviflora
Deschampsia cespitosa
Phleum alpinum
Juncus drummondii
Pedicularis groenlandica
Sedum rhodanthum
Senecio crocatus
Bistorta bistortoides
Saxifraga oregana

Senecio triangularis
Viola adunca
Trollius laxus
Erigeron peregrinus
Draba crassifolia
Ranunculus altissimum
Cystopteris montana
Salix planifolia
Salix brachycarpa
Betula nana
Vaccinium cespitosum

Noxious weed species present (Noxious weed form attached): none.

Photo Documentation Wetland Site # 12021

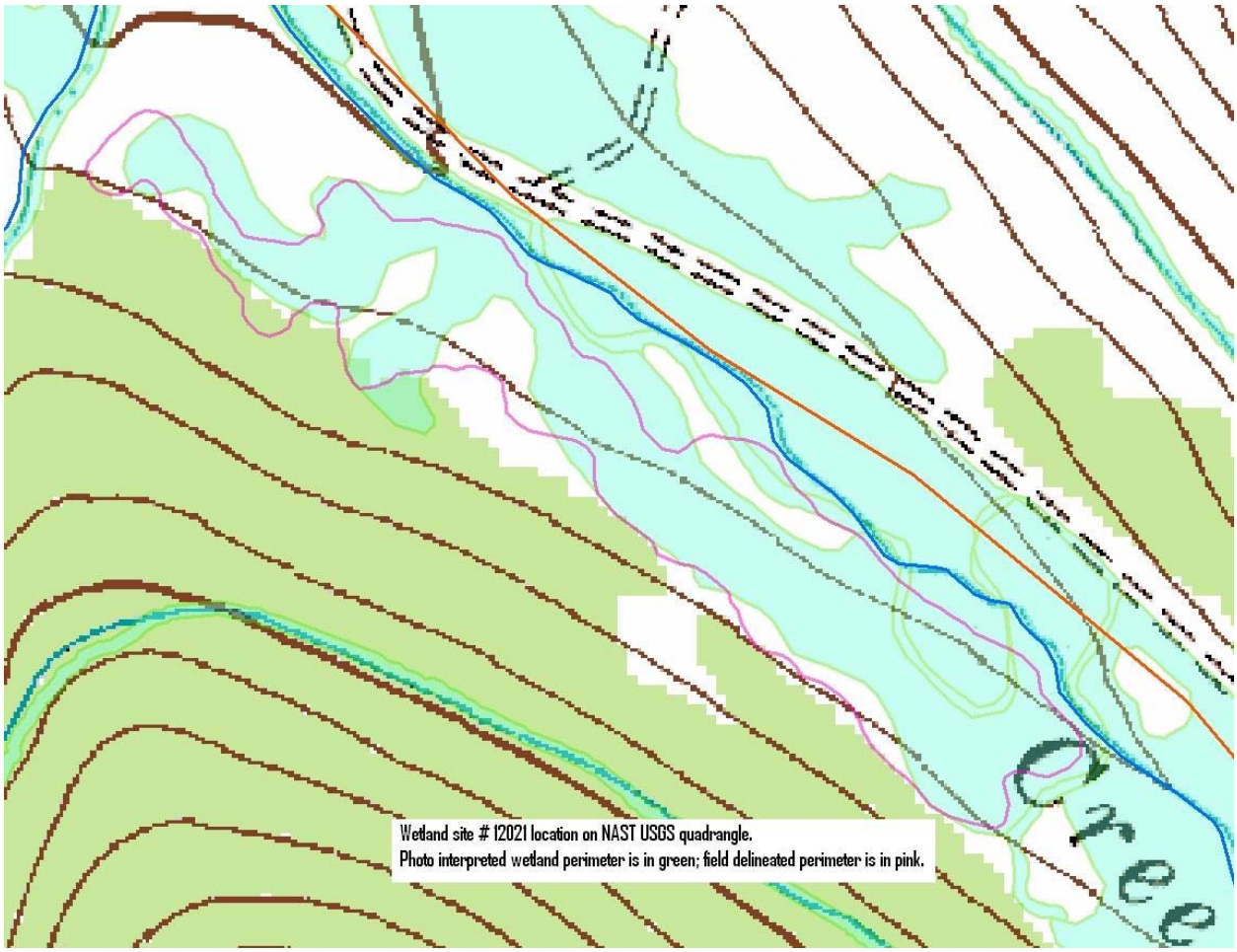
Site Panorama (Clockwise from left): Starting Azimuth 330°,GPS UTM point E 363533/N 4353713

Photo Point: Azimuth of center photo 350°, GPS UTM point E 363528/N 4353729

Soil Pit:UTM point E 363538/N 4353712

Terracing microtopography

Eriophorum chamissonis



Wetland site # 12021 location on NAST USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date:7/24/2011
Wetland Site ID: 12030
Wetland Classification: Palustrine; emergent persistent; non-tidal. Shallow groundwater inflow is dominant; no surface channel inflow to wetland but surface channel outflow exists due to the formation of several small gullies. *Note: hydrology at this site has been anthropogenically altered by ditching.
Fen? Yes.
General Description: This slope wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. This fen occupies low-gradient, northeast-facing, mid-slope benches above Ivanhoe Creek. A mosaic of plant communities characterize fen habitat and developed as a result of saturated, slumping soils which created terraces and slopes. Historically, terrace soils were saturated which enabled the development of deep accumulations of peat while intervening slopes, although better drained, also have peat soils. Currently, because of ditch-induced fen dewatering, peat soils are drying and plant community characteristics are changing. Currently although graminoids continue to dominate terraces habitat, with mesic forbs dominating slopes and shrublands occupying the perimeter of the fen, community characteristics such as species composition and percent cover are altered compared to nearby fen sites where hydrology is intact. Surrounding uplands are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and open forb and graminoid meadows and shrublands. Riparian habitat is characterized by dense willow (*Salix* spp.) cover with mesic forb and graminoid understory.

Wetland characterization
Elevation (feet**)**: 10,962
Aspect: 30 ^{o}
Slope: terraces 0% to 1%; intervening slopes 8% to 9%.
Tile probe depth: 77cm
Peat depth: 60cm
Von Post peat classification: H3/H4. Peat color change from brown to red occurred at 10cm – potentially resulting from oxidation due to drying.
Soil Characteristics: Peat soils; peat is drying and appears to be oxidizing.
Organic/Mineral content percent:
Soil gley in upper 40cm? No, but gleying does occur below 60cm.
Water source and flow direction characteristics: Shallow groundwater inflow from adjacent uphill slopes moves northeast through the fen predominantly as groundwater. Several small gullies have developed at this site that exacerbate drainage. *Note; Soils at this site are not saturated and only moist; the water table is at 50cm and there is no surface water or flow.
Water Quality: *note; soil pit was dug at 10:00 am; at 4:30 pm that day water was 50cm from the surface.
pH: 5.46
Conductivity (microsiemens): 12
Temperature (C^{o}): 13.5

Disturbance:

Type: 1) Ditch in buffer approximately 26m upslope of fen; 2) road in buffer below fen; and 3) historic grazing.

Intensity: 1) High intensity; one maintained ditch is located in the wetland buffer approximately 26m upslope from the fen and traverses the slope across entire site. This ditch interrupts and diverts groundwater flow away from the fen to Ivanhoe Reservoir; water table is well below normal levels, peat soils are drying, vegetation is drying and plant communities are changing. 2) High intensity; one regularly used in season campsite is located in the fen where peat soils have dried; soils are bare and eroding. 3) None; one all weather road is located in the wetland buffer below the fen and on the opposite side of the stream that drains the wetland with minimal to no impact on wetland function.
4) None; habitat has recovered from historic grazing related impacts.

Extent: 1) Covers less than 10% but traverses and impacts entire site; 2) covers less than 10%; 2) historically covered entire site.

Amphibian species present: none.
Avian species present: Lincoln's Sparrow, White-crowned Sparrow.
Mammal species present: Elk (*Cervus elaphus*) sign, Mule deer (*Hemionus odocoileus*) sign, coyote (*Canis latrans*), Raccoon (*Procyon lotor*).

Plant Communities:

1) Dominant: Water sedge (*Carex aquatilis*) herbaceous vegetation (occupies terraces and slopes)
Total cover 75% with 22% mesic forbs and 53% mesic graminoids; *C. aquatilis* = 37% of graminoid cover, other graminoids =16%.

2) Co-dominant: Few-flowered spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies terraces).
Total cover 35% with 4% mesic forbs and 31% mesic graminoids; *E. quinqueflora* = 22% of graminoid cover, other graminoid species = 9% of graminoid cover.
Bare soil = 50% to 60%.

3) Tufted hairgrass (*Deschampsia cespitosa*) herbaceous vegetation (occupies slopes and terraces).
4) Planeleaf willow/mesic graminoid (*Salix planifolia*/Mesic graminoid) herbaceous vegetation (perimeter of wetland)
5) Mesic forb herbaceous vegetation (occupies slopes)

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Sphagnum spp.
Polytrichum spp.
Eleocharis quinqueflora
Carex aquatilis
Carex utriculata
Carex scopulorum
Carex microptera
Carex athrostachya
Juncus drummondii

Deschampsia caespitosa
Phleum alpinum
Senecio triangularis
Bistorta bistortoides
Bistorta viviparum
Caltha leptosepala
Pedicularis groenlandica
Erigeron peregrinus
Saxifraga oregana
Ranunculus alismifolius
Anemone multifida
Viola adunca
Aconitum columbianum
Trollius laxus
Sedum rhodanthum
Mertensia ciliata
Cymopteris lemmonii
Noxious weed species present (noxious weed form attached): none.

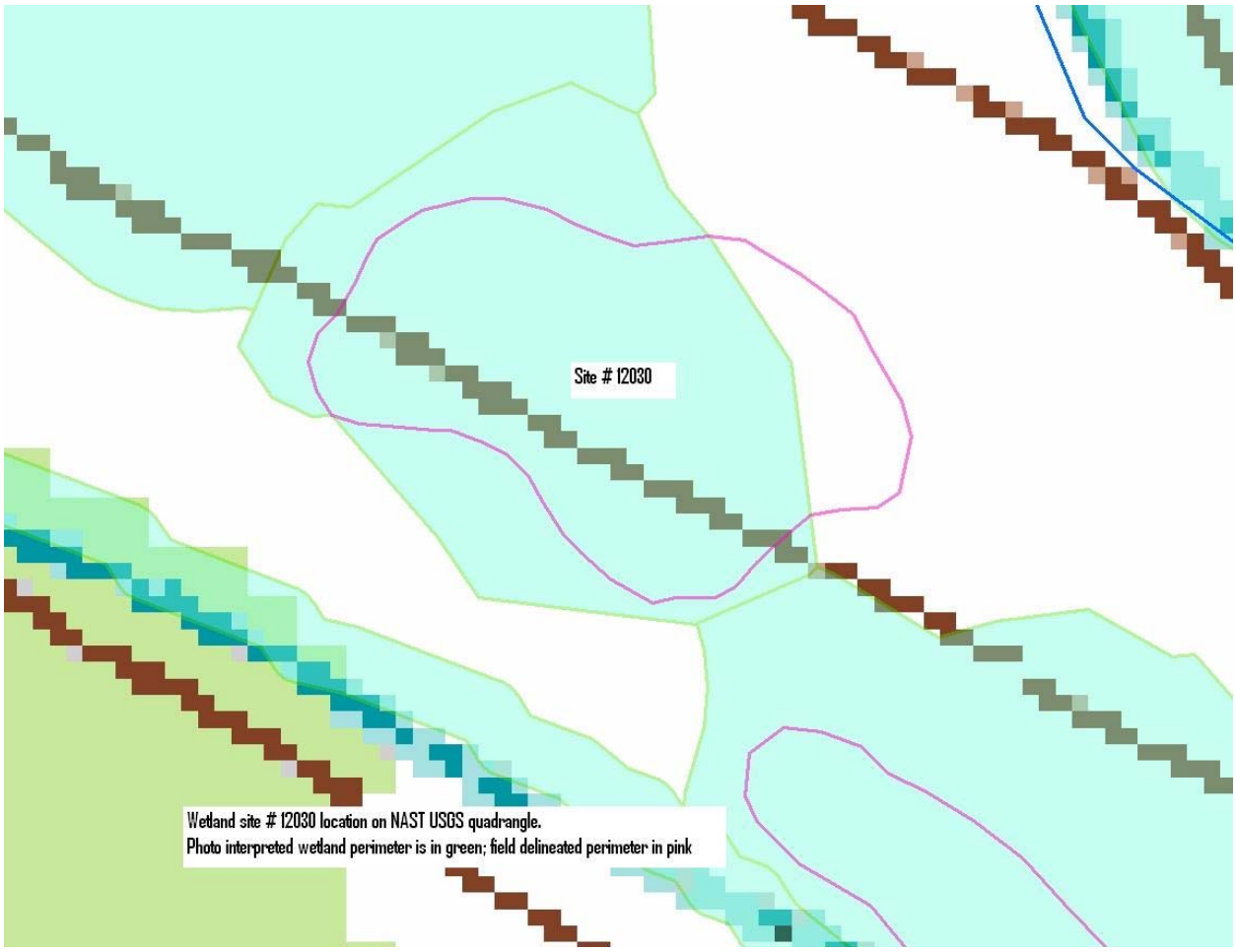
Photo Documentation Wetland Site # 12030

Site Panorama (Clockwise from left): Starting Azimuth 310°, UTM point E 369489/N 4348395

Photo Point: Azimuth of center photo 310 °, UTM point E 369485/N 4348398

Soil Pit:UTM point E 369483/N 4348403

Drying peat has resulted in vegetation drying.



Wetland site #12030 location on NAST USTS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/23/2011
Wetland Site ID: 12046
Wetland Classification: Palustrine; emergent persistent; non-tidal. Shallow groundwater inflow is dominant; no surface channel inflow to wetland but surface channel outflow exists due to the formation of several small gullies. *Note: hydrology at this site has been anthropogenically altered by ditching.
Fen? Yes.
General Description: This slope wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. This fen occupies low-gradient, northeast-facing, mid-slope benches above Ivanhoe Creek. A mosaic of plant communities characterize fen habitat and developed as a result of saturated, slumping soils which created terraces and slopes. Historically, terrace soils were saturated, which enabled the development of deep accumulations of peat on terraces. Intervening slopes, although better drained, also have deep peat soils. Currently, because of ditch-induced fen dewatering, peat soils are drying and plant community characteristics are changing. Currently although graminoids continue to dominate terraces habitat, with mesic forbs dominating slopes and willow (*Salix* spp.) shrublands occupying the perimeter of the fen, community characteristics such as species composition and percent cover are altered compared to nearby fen sites where hydrology is intact. Surrounding uplands are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and open forb and graminoid meadows and shrublands. Riparian habitat is characterized by dense willow (*Salix* spp.) cover with mesic forb and graminoid understory.

Wetland characterization
Elevation (feet): 10,972
Aspect: 30^{o}
Slope: 0% -1% on terraces; 8% - 10% on intervening slopes.
Tile probe depth: 67cm.
Peat depth: 60cm. *Note- peat soils were not saturated until a depth of 60cm.
Von Post peat classification: H3/H4. *Note – peat color change from brown to red occurred at 10cm – potentially resulting from oxidation due to drying.
Soil Characteristics: Peat soils; peat is drying and appears to be oxidizing.
Organic/Mineral content percent:
Soil gley in upper 40cm? No, but gleying does occur below 60cm.
Water source and flow direction characteristics: Shallow groundwater inflow from adjacent uphill slopes moves northeast through the fen predominantly as groundwater. Several small gullies have developed at this site that exacerbate drainage. Soils at this site are only moist and the water table is at 50cm

Water Quality: *note; soil pit was dug at 5:30 pm but was not filled with sufficient water to take water quality measurements until 9:30 am the next morning.
pH: 6.48
Conductivity(microsiemens): 26
Temperature (C^{o}): 9.7

Disturbance:

Type: 1) Ditch at upper perimeter of fen; 2) campsites in wetland where peat is drying; 3) road in buffer; and 4) historic grazing.

Intensity: 1) High intensity; one maintained ditch is located at the upper perimeter of the fen and traverses the entire site. This ditch interrupts and diverts groundwater flow away from the fen to Ivanhoe reservoir; water table is well below normal levels, peat soils and vegetation are drying and plant communities are changing.

2) High intensity; one regularly used in season campsite is located in the fen where peat soils have dried; soils are bare and eroding.

3) None; one all weather road is located in the wetland buffer below the fen and on the opposite side of the stream that drains the wetland with minimal to no impact on wetland function.

4) None; habitat has recovered from historic grazing related impacts.

Extent: 1) Covers less than 10% but traverses the entire slope and impacts entire site; 2) covers less than 10%; 2) historically covered all.

Amphibian species present: none.
Avian species present: Lincoln's sparrow, White-crowned Sparrow
Mammal species present: Elk (*Cervus elaphus*) sign, Mule deer (*Hemionus odocoileus*) sign, coyote (*Canis latrans*), Raccoon (*Procyon lotor*).

Plant Communities:

1. Dominant: Few-flowered spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies saturated terraces).

   Total cover 30% with 5% mesic forbs and 25% graminoids; *E. quinqueflora* = 22% of graminoid cover, other graminoids = 3%. Bryophyte cover = 10%. Bare dirt = 60% to 70%.

2. Co-dominant: Mesic forb-Mesic graminoid herbaceous vegetation (occupies slopes between terraces).

   Total cover 80% with 40% mesic forbs and 40% graminoids. Bryophyte cover = 70-80%.

3. Water sedge (Carex aquatilis) herbaceous vegetation (occupies lower, less moist, terraces).

   Total cover 40% with 4% mesic forbs and 36% graminoids; C. aquatilis = 29% of graminoid cover, other graminoids = 7%.

4. Planeleaf willow/mesic forb (Salix planifolia/mesic forb) shrubland (occupies perimeter of fen).

   Total shrub cover 70%; herbaceous cover 50%.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I):

Russet cottongrass (*Eriophorum chamissonis*) (5 individuals occupy the only area at this site with surface flow)

Other plant species present:

Poa pratensis (non-native that occupies campsite area)
Eriophorum angustifolium
Eleocharis quinqueflora
Carex aquatilis

Carex utriculata
Carex canescens
Carex microptera
Carex illota
Carex scopulorum
Carex subnigricans
Luzula parviflora
Deschampsia cespitosa
Phleum alpinum
Juncus drummondii
Pedicularis groenlandica
Sedum rhodanthum
Senecio crocatus
Bistorta bistortoides
Saxifraga oregana
Senecio triangularis
Viola adunca
Trollius laxus
Lewisia pygmaea
Erigeron peregrinus
Draba crassifolia
Ranunculus altissimum
Cystopteris montana
Salix planifolia
Salix brachycarpa
Betula nana
Vaccinium cespitosum

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 12046

Site Panorama (Clockwise from left): Starting Azimuth 320°,GPS UTM point E 369649/N 4348288

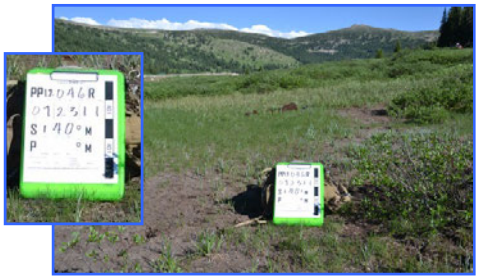
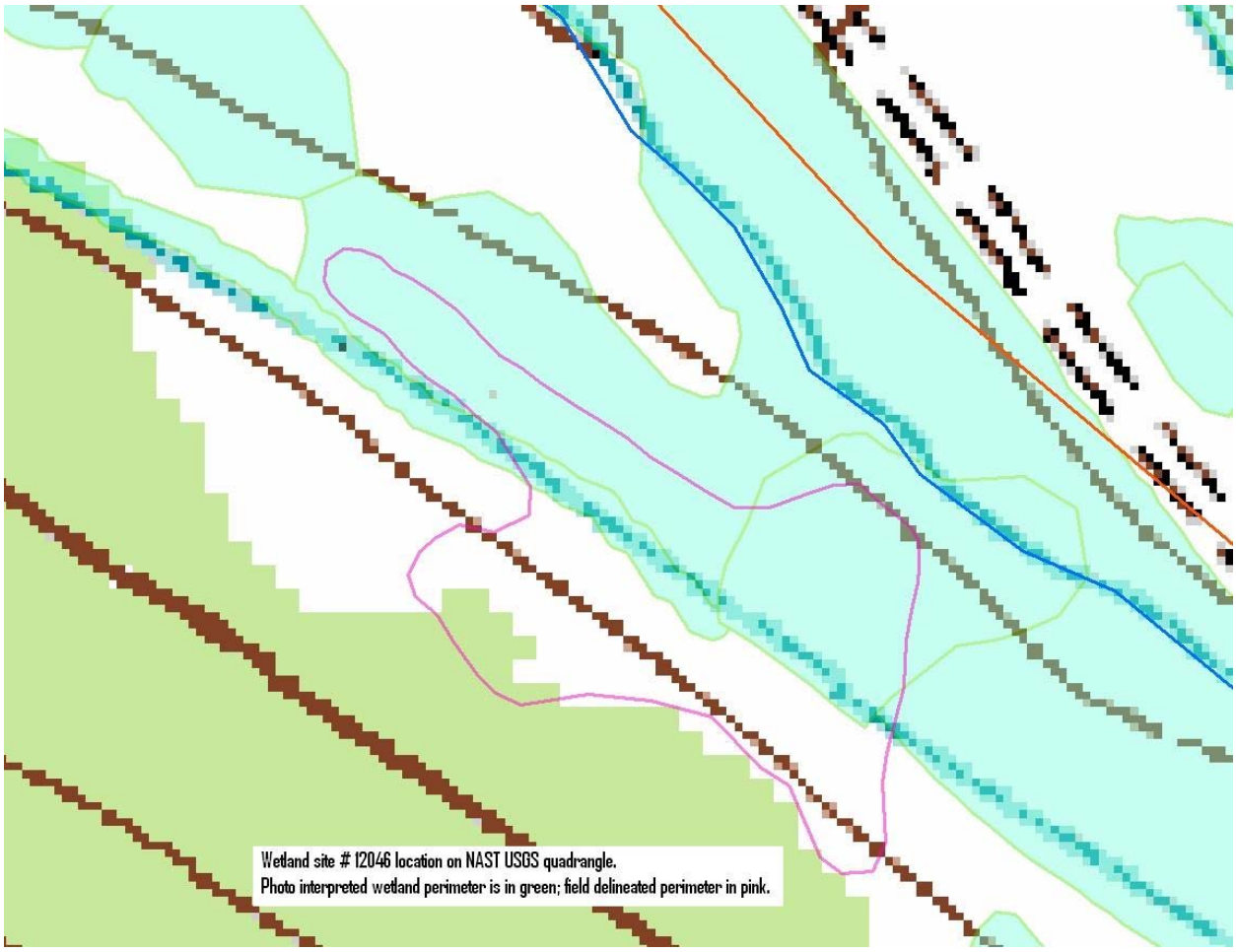


Photo Point: Azimuth of center photo 140 °, GPS UTM point E 369649/ N4348288

Soil Pit:
UTM E 369651/N 4348282.

Ditch diverts groundwater flow from fen to reservoir

Drying peat is resulting in vegetation change and soil erosion.



Wetland site #12046 location on NAST USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date:7/24/2011
Wetland Site ID: 12075
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated . Groundwater dominates inflow to wetland; groundwater discharge occurs at topographic gradient change at upland-wetland interface results in shallow surface flow and both shallow ground and surface water outflow.
Fen? Yes.

General Description: This slope wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. This fen occupies moderate-gradient, northeast-facing mid- and toeslopes just above and on the shoreline of Ivanhoe Reservoir. Soils are perennially saturated which has resulted in slumping soils that have created microtopography of terraces and slopes. Saturated terrace soils have enabled the development of deep accumulations of peat. Intervening slopes, although better drained, also have deep peat soils. Habitat is characterized by a mosaic of plant communities that correspond to soil conditions. Mesic graminoid herbaceous meadows occupy terraces; intervening slopes are dominated by mesic forb meadows and fen perimeters are dominated by willow (*Salix* spp.) shrublands. Dense and extensive mats of sphagnum spp. carpet the ground on terraces and slopes. Surrounding uplands are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and open forb and graminoid meadows and shrublands. Riparian habitat is characterized by dense willow (*Salix* spp.) cover with mesic forb and graminoid understory.

Wetland characterization
Elevation (feet): 11,008
Aspect: 65^{o} to 100^{o}
Slope: varies from 1% on terraces to 20% on intervening slopes.
Tile probe depth: 106cm
Peat depth: 90 cm
Von Post peat classification: H2
Soil Characteristics: Saturated peat with shallow surface water; formation of large hummock on upper region of site.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater inflow from adjacent uphill slopes moves northeast through the fen towards Ivanhoe Reservoir. The fen is maintained by both shallow surface flow from groundwater discharge at the upland-wetland interface and also by continuance of shallow groundwater flow.
Water Quality:
pH: 5.85
Conductivity(microsiemens): 16
Temperature (C^{o}): 17.2

Disturbance:

Type: 1) Tracks from ATV use in wetland; 2) Trails in fen with associated human trampling; and 3) Camping in fen buffer.

Intensity: 1) Moderate to high; vehicle passes occur annually in two to five places; bare soil somewhat above normal limits across area. 2) Low to moderate; a few trails by humans in two places are getting deeper and wider each year; bare soil somewhat above normal limits. 3) High; several camp sites used weekly in season; most sites and roads are >10m from wetland edge but some sites are <10m.

Extent: 1) covers <10%; 2) covers <10%; and 3) covers <10%.

Amphibian species present: none.

Avian species present: Hermit Thrush, Swainson's Thrush, Red-naped sapsucker, White-crowned Sparrow, Lincoln's Sparrow, Wilson's Warbler.

Mammal species present: Elk (*Cervus elaphus*) sign.

Plant Communities:

1) Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (Occupies saturated terraces)

Total cover 60% with 6% mesic forbs and 54% mesic graminoids; *E. quinqueflora* = 38% of graminoid cover, other graminoids = 16%. Bryophyte cover 80%.

2) Co-dominant: Mesic forb-graminoid herbaceous vegetation (occupies intervening slopes and hummocks)

Total cover 80% with 40% mesic forbs and 40% mesic graminoids. Bryophyte cover 80%.

3) Salix planifolia/Mesic forb shrublands (occupies perimeter of site)

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I):

Russet cottongrass (*Eriophorum chamissonis*)

Other plant species present:

Sphagnum platyphyllum
Eriophorum angustifolium
Eleocharis quinqueflora
Carex aquatilis
Carex utriculata
Carex scopulorum
Carex subnigricans
Luzula parviflora
Deschampsia cespitosa
Phleum alpinum
Juncus drummondii
Pedicularis groenlandica
Sedum rhodanthum
Senecio crocatus
Bistorta bistortoides

Saxifraga oregana
Senecio triangularis
Viola adunca
Trollius laxus
Erigeron peregrinus
Draba crassifolia
Ranunculus altissimum
Cystopteris montana
Mertensia ciliata
Salix planifolia
Betula nana
Vaccinium cespitosum
Kalmia microphylla
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 12075

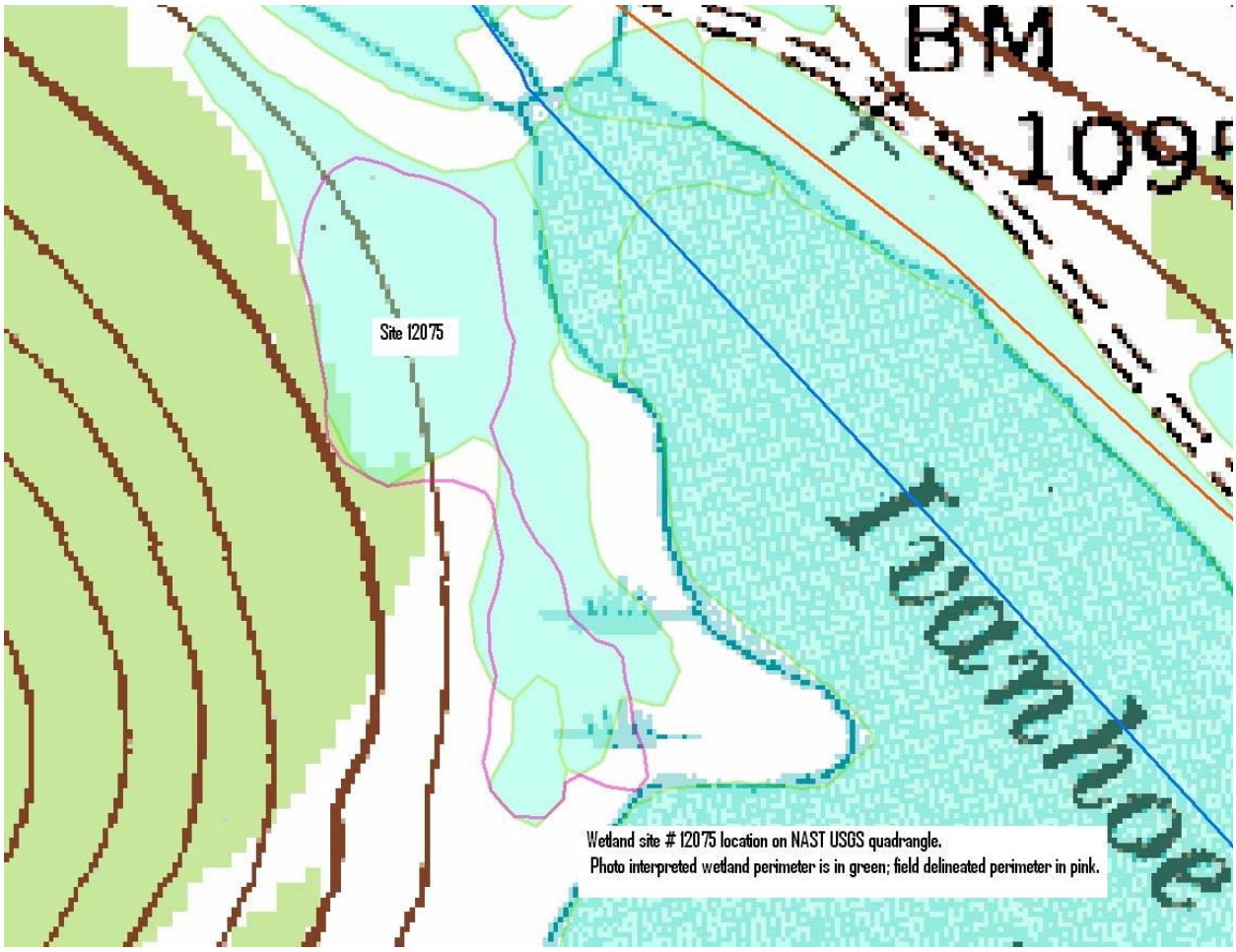
Site Panorama (Clockwise from left): Starting Azimuth 340 °, UTM point E 369772/N 4347993

Photo Point: Azimuth of center photo 85 °, UTM point E 369774/N 4347992

Soil Pit:UTM point E 369776/N 4347988

Lush herbs and mosses cover hummocks

Russet cottongrass (*Eriophorum chamissonis*) occurs abundantly at this site.



Wetland site # 12075 location on NAST USGS quadrangle. Photo interpreted wetland perimeter is in green; field delineated perimeter is in pink

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/24/2011
Wetland Site ID: 12177
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated and non-tidal permanently flooded. Surface inflow is predominantly from shallow groundwater but also shallow surface flow during spring runoff and precipitation, due to depression topography, make important contributions to hydrology at this site.
Fen? Yes.
General Description: This depressional wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. The site is topographically a relic depression left in glacial moraine with a successional lake in the center of the depression. Lake habitat is characterized by yellow pond lily (*Nuphar lutea* ssp. *polysepala*) herbaceous vegetation with floating sedge mats on the lake perimeter. Habitat immediately surrounding the lake is characterized by a complex mosaic of several types of mesic graminoid and mesic forb meadow communities. Soils here are saturated peat. Further away from the center of the depression, soils are less moist and habitat is characterized by willow (*Salix* spp.) shrublands. Uplands are characterized by a mosaic of spruce-fir forests and herbaceous parklands with mixed graminoids and forbs. Glacial erratics are scattered throughout wetland and upland habitat giving an indication of the recent climate and geologic history of the site.

Wetland characterization
Elevation: 11,169
Aspect: from 330^{o} to 340^{o}
Slope: 0% to 1%
Tile probe depth: TP1= 105cm; TP2=101cm; TP3=67cm
Peat depth: 117cm
Von Post peat classification: H2
Soil Characteristics: Saturated peat with surface water from 1 to 2 inches deep; Soil hummocks common on periphery of fen.

Organic/Mineral content percent:
Soil gley in upper 40cm? No.

Water source and flow direction characteristics: Water that maintains the wetland is provided by several sources including shallow groundwater flow from surrounding slopes, shallow surface flow during spring runoff and precipitation. Groundwater and spring runoff emanates primarily from adjacent slopes and flows northeast and northwest into this depressional wetland. A small (anthropogenic) outlet channel flows to the north and is the only surface outlet.
Water Quality:

pH: 5.78
Conductivity(microsiemens): 18
Temperature (C^{o}): 30.4

Disturbance:

Type: 1)Road in buffer upslope of wetland; 2) ditch draining wetland; and 3) human trails in wetland.

Intensity: 1) Moderate to high; one open, natural-surface road open that is used frequently, at least several to many times per week, during the season; road interrupts groundwater flow to the fen. 2) Low to moderate; one small (anthropogenic?) ditch drains water from the wetland; water table is slightly below normal levels. 3) Low; a few trails by humans around the lake used nearly every year resulting bare soil and vegetation damage.

Extent: 1) Covers <10% but traverses across the entire slope above the fen. 2) Covers <10% but impact may be greater than areal coverage. 3) covers <10%.

Amphibian species present: none.
Avian species present: Wilson's Warbler, Lincoln's Sparrow, Yellow Warbler, Stellar's Jay.
Mammal species present: Elk (*Cervus elaphus*) sign.

Plant Communities:

1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 50% with 10% forbs and 40% graminoids; E. quinqueflora = 28% of graminoid cover, other graminoids = 12%.
   Forb cover is dominated by elephantella (*Pedicularis groenlandica*). Bryophyte cover = 60-80%.
2. Water sedge (*Carex aquatilis*) herbaceous vegetation.
3. Mesic forb herbaceous vegetation.
4. Tufted hairgrass (*Deschampsia cespitosa*) herbaceous vegetation
5. Poor sedge-Elephantella (*Carex paupercula-Pedicularis groenlandica*) herbaceous vegetation
6. Poor sedge-Gray sedge (*C. paupercula-C.canescens*) floating mats (perimeter of lake)
7. Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland (perimeter of wetland)

Plant List:

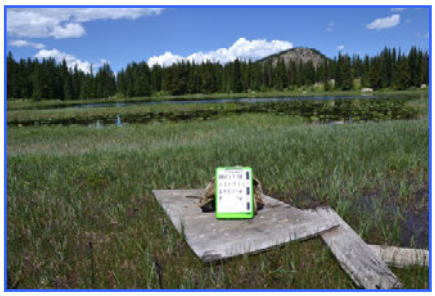
CNHP tracked, TEP or RFSS plant species or communities (*appendix I):
*Yellow pond lily (*Nuphar lutea ssp. polysepala*) herbaceous vegetation.
Other plant species present:
Sphagnum russowii
Eleocharis quinqueflora
Eriophorum angustifolium
Carex aquatilis
Carex canescens
Carex paupercula
Carex utriculata
Carex scopulorum
Carex microptera
Deschampsia cespitosa
Phleum alpinum
Saxifraga oregana
Pedicularis groenlandica
Caltha leptosepala

Viola adunca
Sedum rhodanthum
Senecio crocatus
Anaphalis margaritacea
Lewisia pygmaea
Bistorta bistortoides
Trollius laxus
Anemone multifida
Draba crassifolia
Erigeron peregrinus
Taraxacum officinale (non-native)
Salix planifolia
Salix brachycarpa
Betula nana

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 12177

Site Panorama (Clockwise from left): Starting Azimuth 190°, UTM point E 368992/N 4346215



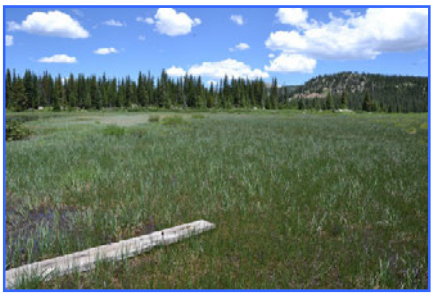
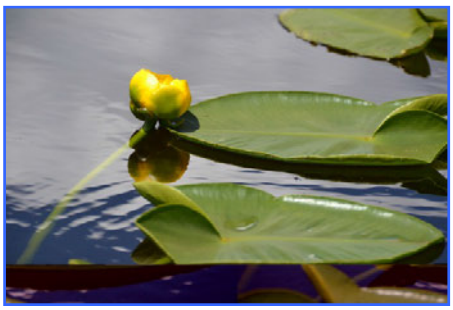


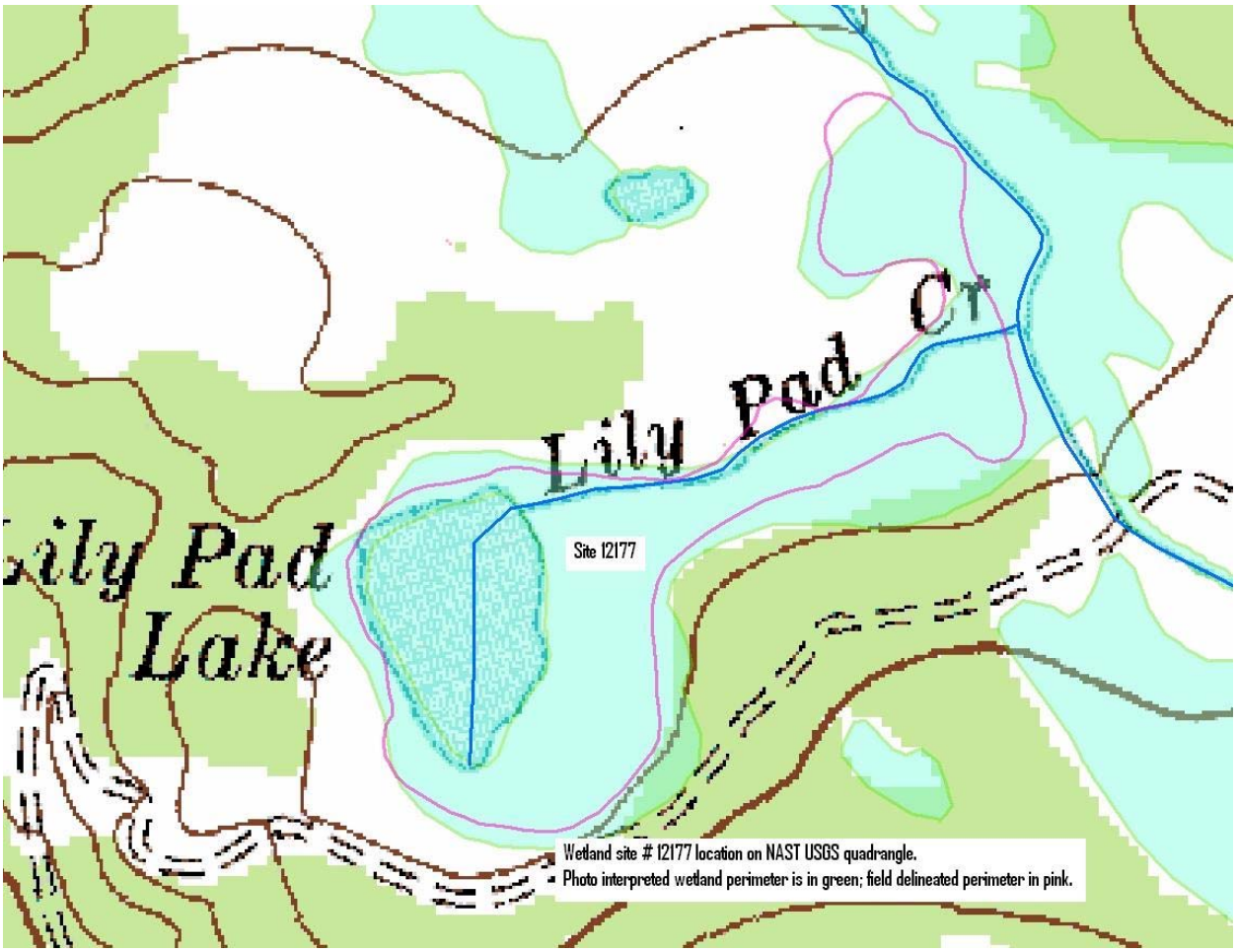
Photo Point: Azimuth of center photo 330 °, UTM point E 368988/N 4346216

Soil Pit: UTM E368988/N 4346200



Yellow pond lily *(Nuphar lutea* ssp. *polysepala)*

Lily Pad Lake: a relic depression in glacial moraine.



Wetland site # 12177 location on NAST USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/24/2011
Wetland Site ID: 12313
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated. Groundwater dominates inflow to wetland; groundwater discharge occurs at topographic gradient change at upland-wetland interface resulting in both shallow ground and surface water outflow.
Fen? Yes.
General Description: This slope wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. This fen occupies moderate-gradient, southwest-facing mid- and toeslopes just above and on the shoreline of Ivanhoe Reservoir. A mosaic of plant communities characterize fen habitat and has developed as a result of saturated, slumping soils which created microtopography of terraces and slopes. Terrace soils are saturated, which has enabled the development of deep accumulations of peat. Intervening slopes, although better drained, also have deep peat soils. Currently, even where habitat is intact, peat soils appear to be drying; where peat has been mined habitat is dramatically altered and remnant piles of peat are desiccated. Intact habitat is characterized by mesic graminoid meadows occupying terraces with intervening slopes dominated by mesic forbs and the fen perimeter dominated by willow (*Salix* spp.) shrublands. Surrounding uplands are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and open forb and graminoid meadows and shrublands. Riparian habitat is characterized by dense willow (*Salix* spp.) cover with mesic forb and graminoid understory.

Wetland characterization
Elevation: 10,965
Aspect: 220^{o}
Slope: 3% to 4%
Tile probe depth: 105cm
Peat depth: 105 + cm
Von Post peat classification: H3
Soil Characteristics:
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater inflow from adjacent uphill slopes moves southwest through the fen towards Ivanhoe Reservoir. The fen is maintained by both shallow surface flow from groundwater discharge at the upland-wetland interface and also by continuance of shallow groundwater flow.
Water Quality:
pH: 5.83
Conductivity(microsiemens): 29
Temperature (C^{o}): 26.5
Disturbance:
Type: 1) Peat mining in fen; 2) Flooding; and 3) Constructed road in wetland buffer.
Intensity: 1) High intensity: peat mining of 30% of fen on lower toe of fen; remainder of peat is intact but hydrology is altered due to excessive draining that results from removal

of peat on fen toe. 2) High to very high intensity: a dam has raised the water table from >20cm to >50cm above normal levels; vascular plants drowned and dying; large pieces of peat dislodged. 3) Moderate intensity: Constructed, all-weather road located in wetland buffer, >10m from and upslope of fen alters upslope hydrology.
Extent: 1) Covers 30 % of fen; 2) unknown; and 3) Covers < 10% of buffer but traverses the entire slope above the fen.

Amphibian species present: none.
Avian species present: Lincoln's sparrow, White-crowned Sparrow
Mammal species present: none.

Plant Communities:
1) Dominant: Few-flowered spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies peat terraces)
Total cover 50% with 5% mesic forbs and 45% mesic graminoids; *E. quinqueflora* = 40% of graminoid cover, other graminoids = 5%. Bare dirt = 30%.
2) Water sedge (*Carex aquatilis*) herbaceous vegetation.
3) Planeleaf willow/mesic graminoid (*Salix planifolia*/mesic graminoid) shrublands
4) Tufted hairgrass (*Deschampsia cespitosa*) herbaceous vegetation.
5) Beaked sedge (*Carex utriculata*) herbaceous vegetation (occupies sites where peat has been removed but soils remain saturated)

Plant List:
CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Carex aquatilis
Carex utriculata
Carex nebrascensis
Eleocharis quinqueflora
Deschampsia cespitosa
Caltha leptosepala
Sedum rhodanthum
Pedicularis groenlandica
Saxifraga oregana
Noxious weed species present (noxious weed form attached): none.

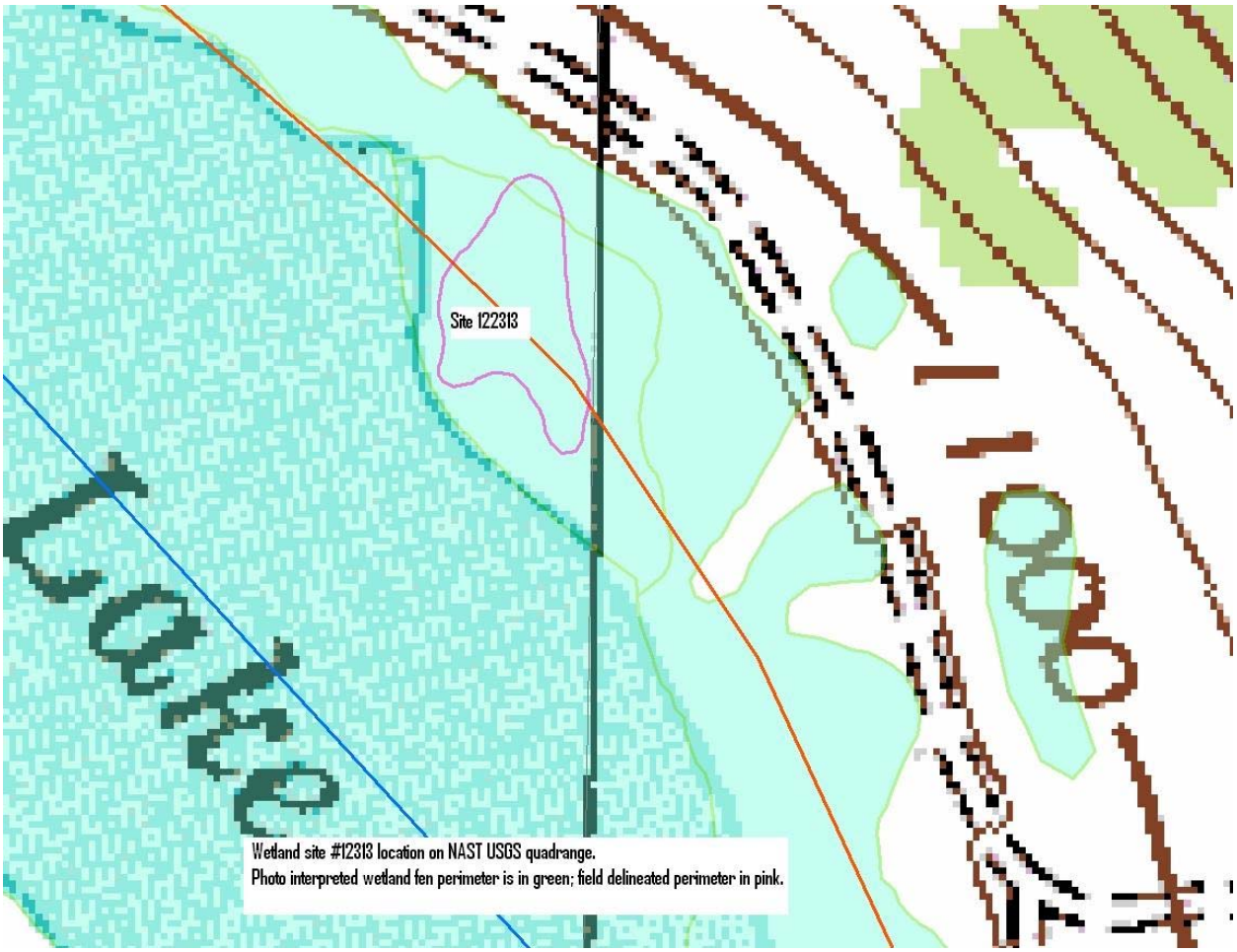
Photo Documentation Wetland Site # 12313

Site Panorama (Clockwise from left): Starting Azimuth 160 °, UTM point E 370534/N4347661

Photo Point: Azimuth of center photo 140 °, UTM point E 370523/N4347671

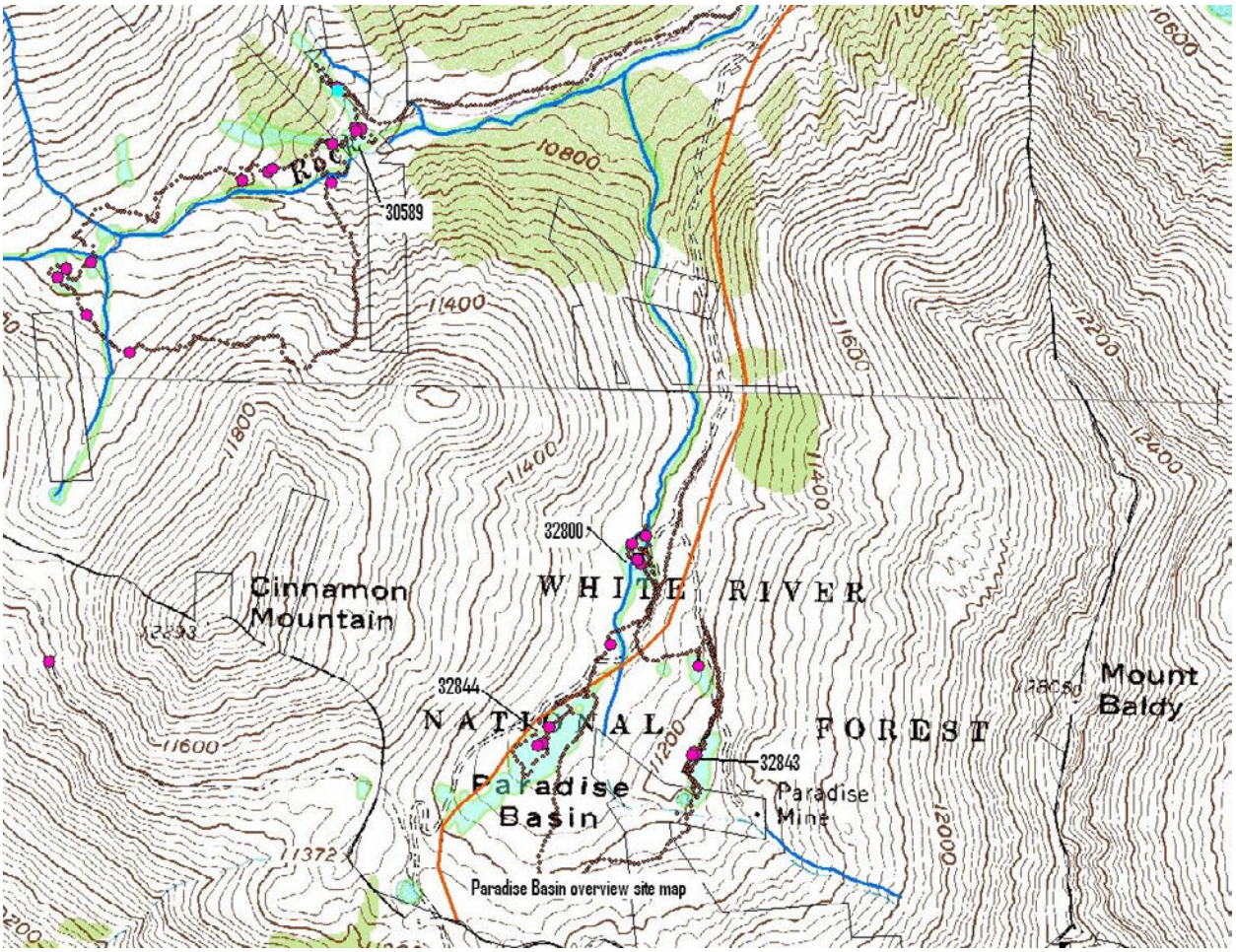
Soil Pit:UTM point E 370522/N4347669

Peat mining and water level fluctuations have eliminated fen habitat.



Wetland site #12313 location on NAST USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

Sopris Ranger District: Paradise Basin overview map



Paradise Basin overview map for survey sites 30589, 32844, 32800, and 32843.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/12/2011
Wetland Site ID: 30589
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.

General Description: This slope wetland fen is located on the west side of the Continental Divide in the Elk Range in a glacially sculpted valley between Treasury and Cinnamon Mountains. Pleistocene-age glaciers carved deeply into these shale mountains leaving steep, unstable slopes, wide basins and large morainal deposits. Area geology is Cretaceous Age shale and sandstone with Middle Tertiary Age intrusive rock. Metallic ores associated with Tertiary Age volcanism were discovered in these mountains in the 1870's, bringing hardrock and placer mining exploration to these mountains. A legacy of mine drainage, tailing piles and mine sites remains in this and surrounding valleys.

This fen occurs in a glacially sculpted narrow gully below a northeast trending cirque, occupying narrow midslopes and toeslopes on the left bank of Rock Creek. The basin is drained by Rock Creek which has its beginnings in the cirque and its confluence with the South Fork of the Crystal River. Shallow ground and surface water flow from southeast-facing slopes is the primary source of water to the fen, flowing through the fen to discharge into Rock creek. Fen soils are saturated peat that has slumped to form microtopography of alternating slopes and terraces and shallow depressions where ponding occurs. Fen habitat is characterized by mosaic of lush mesic forb and graminoid meadows. Upland habitat is an expansive mosaic of herbaceous meadows, shrublands, krummholz stands of spruce-fir (*Picea engelmannii-Abies lasiocarpa*), avalanche chutes with scrub willow, aspen, spruce and fir, and steep scree and talus slopes. Riparian habitat is characterized by a dense cover of willow (*Salix* spp.). Avalanches are common in this steep, narrow valley bringing avalanche debris into the lower wetland fen and also inhibiting the accumulation of peat soils on steeper slopes.

Wetland characterization
Elevation (feet): 10,864
Aspect: 90^{o} to 140^{o}
Slope: 9%
Tile probe depth: 50cm
Peat depth: 50cm
Von Post peat classification: H2
Soil Characteristics: moist peat
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow to the fen comes from both shallow surface and groundwater from southeast- and east-facing slopes. Outflow also occurs by both shallow surface and groundwater flow that moves and drains to Rock Creek.

Water Quality:

pH: 5.9

Conductivity(microsiemens): 120

Temperature (C^o): 10.4

Disturbance:

Type: Constructed road in buffer

Intensity: Moderate; one natural-surface road is used several times per year and is within 10m of the edge of the fen; road alters surface flow to the fen.

Extent: covers 25% of buffer.

Amphibian species present: none.

Avian species present: Swainson's Thrush, Yellow Warbler, Mountain Chickadee, White-Crowned Sparrow, Lincoln's Sparrow, Red-naped Sapsucker.

Mammal species present: Elk (*Cervus elaphus*) sign.

Plant Communities:

1. Dominant: Water sedge (*Carex aquatilis*) herbaceous vegetation.
   Total cover 70% with 7% forbs and 63% graminoids.
2. Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 50% with 0% forbs and 50% graminoids.
3. Mountain sedge (*Carex scopulorum*) herbaceous vegetation.
   Total cover 60% with 3% forbs and 57% graminoids.
4. Planeleaf willow/Mesic graminoid (*Salix planifolia*/Mesic graminoid) shrubland.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):

*Altai cottongrass (*Eriophorum altaicum*)

Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation

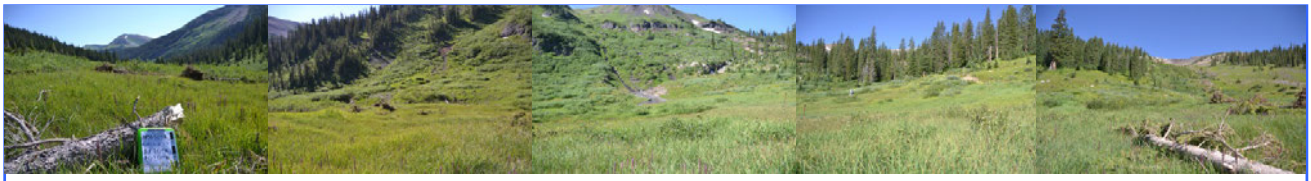
Other plant species present:

Sphagnum squarrosum
Eleocharis quinqueflora
Carex aquatilis
Carex scopulorum
Carex illota
Carex echinata
Carex nigricans
Carex saxatilis
Juncus tracyi
Juncus triglumis
Juncus hallii
Juncus mertensianus
Juncus saximontanus
Deschampsia cespitosa
Calamagrostis canadensis
Senecio triangularis
Sedum rhodanthum

Arnica mollis
Oxypolis fendleri
Viola adunca
Limnorchis hyperborea
Caltha leptosepala
Erigeron peregrinus
Aconitum columbianum
Ligusticum porteri
Erigeron speciosus
Veratrum tenuipetalum
Parnassia fimbriata
Pedicularis groenlandica
Mimulus guttatus
Chondrophylla prostrata
Gentianopsis thermalis
Saxifraga oregana
Trollius laxus
Salix planifolia
Salix wolfii

Noxious weed species present (noxious weed form attached):

Photo Documentation Wetland Site # 30589



Site Panorama (Clockwise from left): Starting Azimuth 70°, UTM E 321039/N 4319435

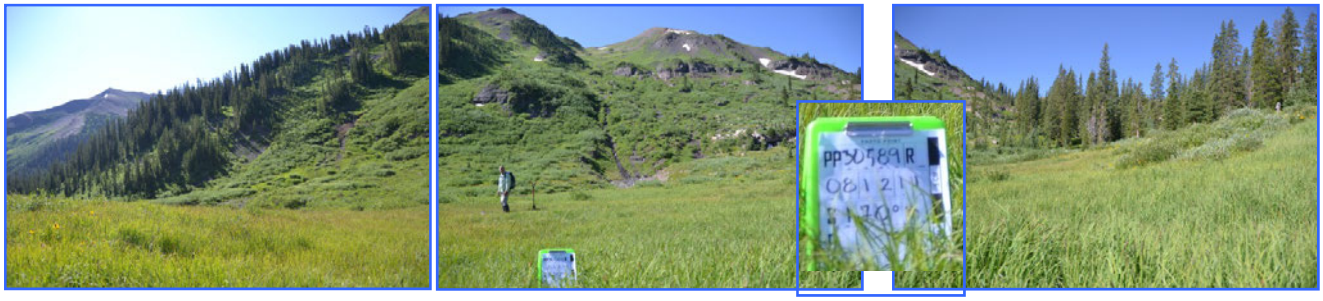
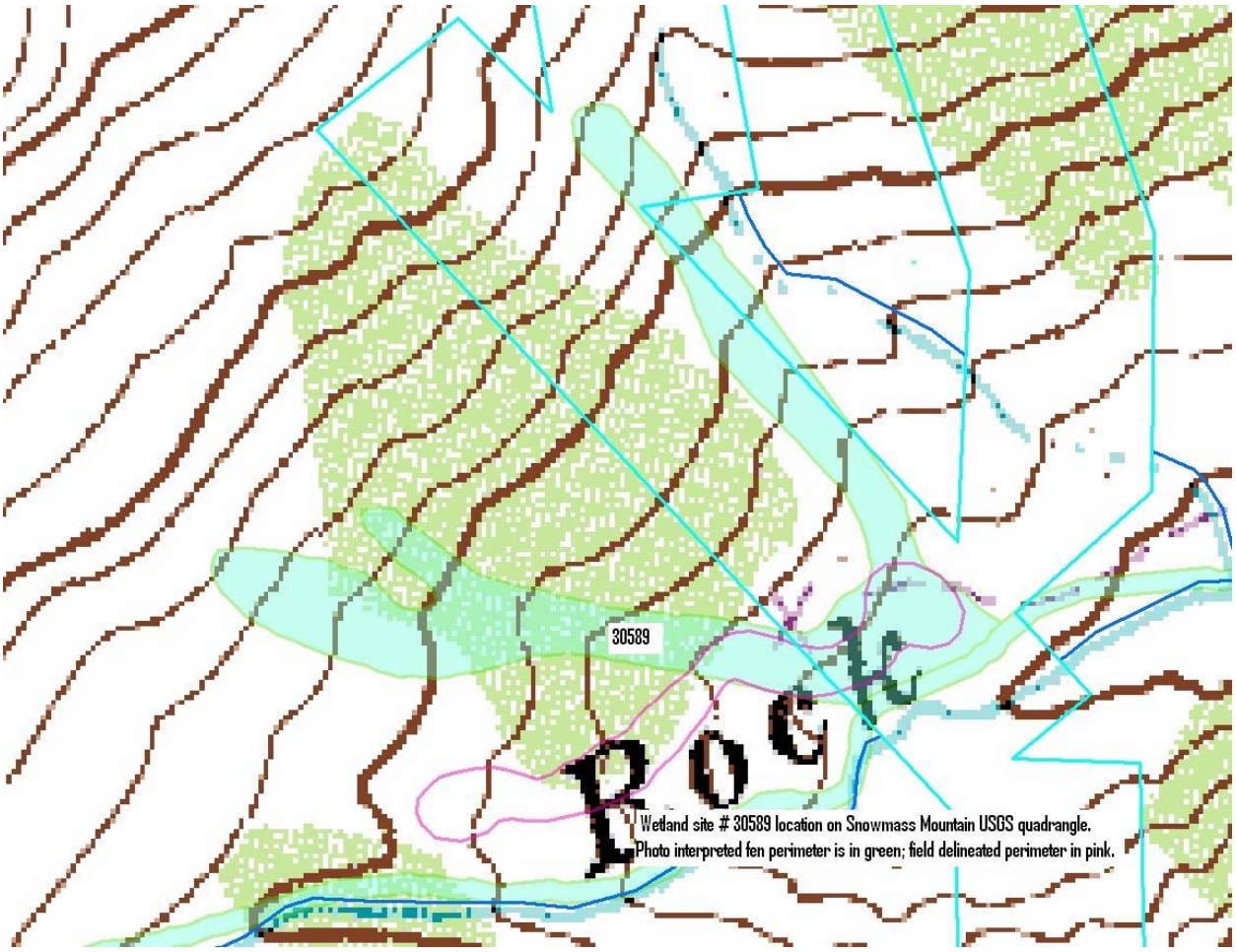


Photo Point: Azimuth of center photo 170 °, UTM E 321022/N 4319436

Soil Pit:UTM E 321026/N 4319429

Looking southeast, down into the Rock Creek valley bottom to the fen.



Wetland site #30589 location on Snowmass Mountain USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/11/2011
Wetland Site ID: 32800
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes
General Description: This slope wetland fen is located on the west side of the Continental Divide in the Elk Range in Paradise Basin, between the east flank of Cinnamon Mountain and the west flank of Mount Baldy. Pleistocene-age glaciers carved deeply into these mountains leaving steep, unstable slopes and wide basins, such as Paradise Basin, where this fen is located. Paradise Basin is a wide, low gradient, north trending valley that is drained by a first order stream that soon flows into the South Fork of the Crystal River. Basin geology is Middle Tertiary Age intrusive rock. Metallic ores associated with Tertiary Age volcanism were discovered in these mountains in the 1870's, which resulted in hardrock and placer mining activity throughout the area. A legacy of mine drainage, tailing piles and mine sites remains in this valley.

This fen occupies a terrace on the valley floor of Paradise basin. Groundwater from west-facing slopes is the primary source of water to the fen. Although groundwater flow from east-facing slopes is abundant, a stream that is located on the west side of the fen receives and drains this groundwater flow before it reaches the fen. Fen soils are saturated peat that has slumped to form microtopography of alternating slopes and terraces and also shallow depressions where ponding occurs. Fen habitat is dominated by mesic graminoid meadows that occupy broad terraces. Intervening slopes and hummocks are occupied by mesic forbs while the periphery of the fen is characterized by willow (*Salix* spp.) shrublands. Upland habitat is an expansive mosaic of herbaceous meadows, shrublands, krummholz stands of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and steep scree and talus slopes. Riparian habitat is characterized by a dense cover of willow (*Salix* spp.).

Wetland characterization
Elevation (feet): 11,044
Aspect: 320^{o} to 350^{o}
Slope: 3%
Tile probe depth: 90cm
Peat depth: 72cm
Von Post peat classification: H3
Soil Characteristics:
Organic/Mineral content percent: poorly drained, saturated peat.
Soil gley in upper 40cm?
Water source and flow direction characteristics: Groundwater from adjacent west- and northwest-facing slopes dominates inflow. Copious shallow surface flow also occurs at topographic changes in gradient where soil slumping has created terrace/slope microtopography. Outflow occurs by surface channel and by shallow ground and surface water flow.
Water Quality:
pH: 9.34
Conductivity(microsiemens): 133
Temperature (C^{o}): 15.4

Disturbance:

Type: Constructed road in buffer

Intensity: Very high; a high use natural surface road alters and diverts the dominant source of groundwater flow to the fen.

Extent: covers 10% to 25% of buffer

Amphibian species present: none.
Avian species present: American Robin, Spotted Sandpiper, Lincoln's Sparrow, Wilson's Warbler.
Mammal species present: none.

Plant Communities:

1. Dominant: Marsh arrowgrass (*Triglochin palustre*) herbaceous vegetation (occupies terraces).
   Total cover 65% with 3% forbs and 62% graminoids; T. palustre = 47% of graminoid cover, other graminoids including especially few-flower spikerush (*Eleocharis quinqueflora*) and mountain sedge (*Carex scopulorum*) = 12%; forb cover includes elephantella (*Pedicularis groenlandica*) and marsh marigold (*Caltha leptosepala*). Bryophyte cover = 80%.
3. Mountain sedge (*C. scopulorum*) herbaceous vegetation (occupies terraces).
   Total cover 50% with 5% forbs and 45% graminoids.
2. Minor habitat component: Mesic forb herbaceous vegetation (occupies slopes and hummocks).
   Total cover 90% with 72% forb and 18% graminoid cover.
4. Minor habitat component: Few-flower spikerush (Eleocharis quinqueflora) herbaceous vegetation (occupies terraces).
   Total cover 50% with 10% forbs and 40% graminoids.
5. Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland (occupies fen perimeter).
   Total shrub cover 60%; herbaceous cover 80% with 56% forb and 24% graminoids.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):

1)(Seaside arrowgrass)-Marsh arrowgrass (*Triglochin maritimum-Triglochin palustre*) herbaceous vegetation.

2)Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland

Other plant species present:

Carex scopulorum
Carex nigricans
Carex illota
Carex microptera
Carex aquatilis
Carex canescens
Carex ebenea
Triglochin palustre
Juncus mertensianus
Juncus drummondii
Deschampsia caespitosa
Sedum rhodanthum
Caltha leptosepala

Pedicularis groenlandica
Saxifraga oregana
Arnica mollis
Bistorta bistortoides
Erigeron peregrinus
Castilleja rhexifolia
Viola adunca
Senecio triangularis
Cardamine cordifolia
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 32800

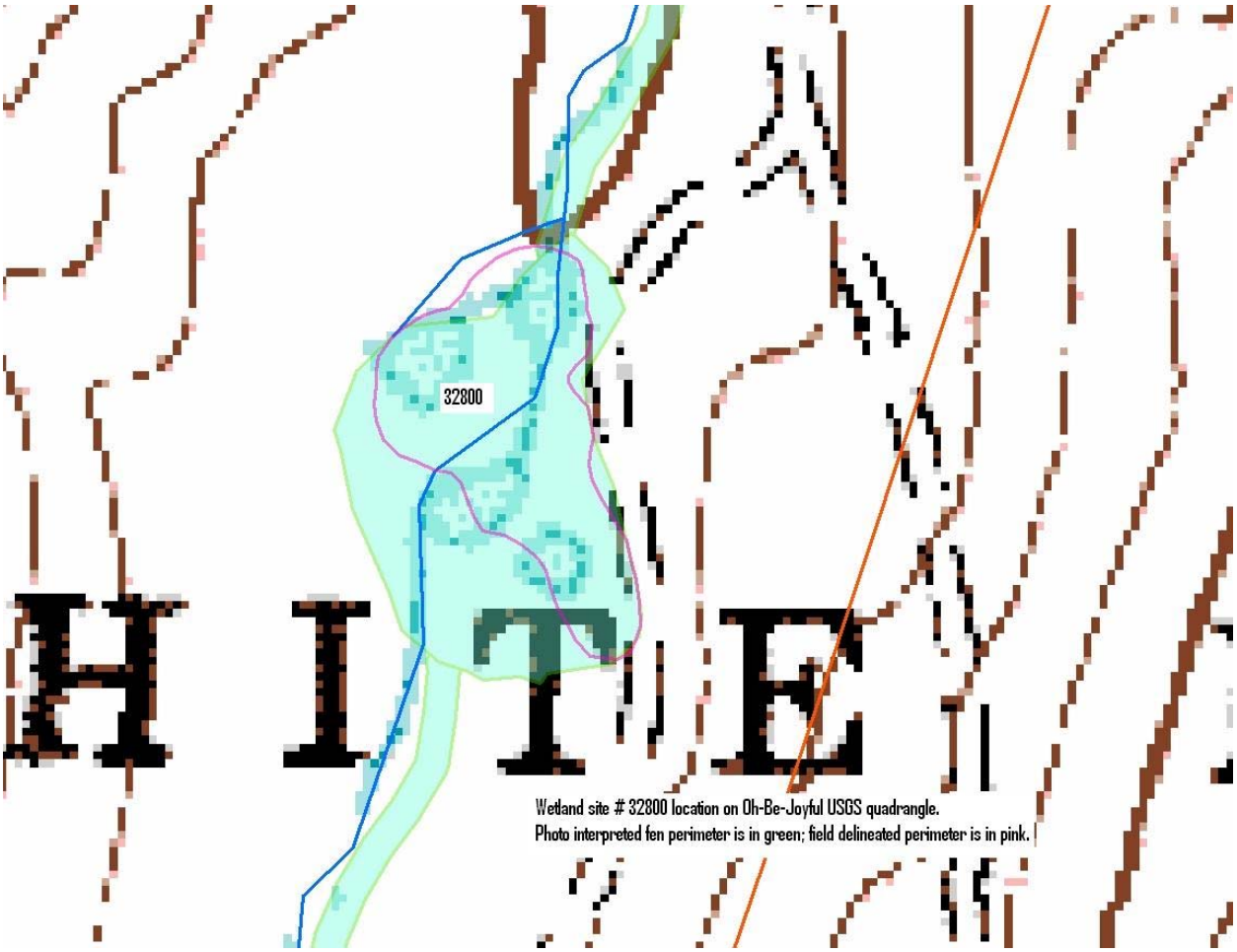
Site Panorama (Clockwise from left): Starting Azimuth 200°, UTM E 321726/N4318363

Photo Point: Azimuth of center photo 0°, UTM E 321720/N 4318375

Soil Pit:UTM E 321722/N 4318374

Marsh arrowgrass dominates the habitat in these poorly drained peat soils.

Looking north and downslope across the fen.



Wetland site #32800 location on Oh-Be-Joyful USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/11/2011
Wetland Site ID: 32843
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This slope wetland fen is located on the west side of the Continental Divide in the Elk Range in Paradise Basin which is the valley that lies Cinnamon Mountain and Mount Baldy. Pleistocene-age glaciers carved deeply into these mountains leaving steep, unstable slopes and wide basins, such as Paradise Basin, where this fen is located. Paradise Basin is a wide, low gradient, north trending valley that is drained by a first order stream that soon flows into the South Fork of the Crystal River. Basin geology is Middle Tertiary Age intrusive rock. Metallic ores associated with Tertiary Age volcanism were discovered in these mountains in the 1870's, which resulted in hardrock and placer mining activity throughout the area. A legacy of mine drainage, tailing piles and mine sites remains in this valley. The Paradise mine is located upslope of this fen. Drainage from this mine leaves a white residue on cobbles in the stream that drains the area.

This fen occupies a swale on a bench that is located on the east side of Paradise basin. Groundwater from west-facing slopes is the primary source of water to the fen. Fen soils are saturated peat that has slumped to form microtopography of alternating slopes and terraces and shallow depressions where ponding occurs. Fen habitat is characterized by mosaic of lush mesic forb and graminoid meadows. Upland habitat is an expansive mosaic of herbaceous meadows, shrublands, krummholz stands of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and steep scree and talus slopes. Riparian habitat is characterized by a dense cover of willow (*Salix* spp.).

Wetland characterization
Elevation (feet): 11,216
Aspect: 200^{o}
Slope: 1.5%
Tile probe depth: 70cm
Peat depth: 70cm
Von Post peat classification: H3/H4
Soil Characteristics: saturated peat
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Groundwater from adjacent west-facing slopes dominates inflow. Copious shallow surface flow also occurs at topographic changes in gradient where soil slumping has created terrace/slope microtopography. Outflow occurs by a surface channel and by shallow ground and surface water flow.
Water Quality:
pH: 5.3
Conductivity (microsiemens): 80
Temperature (C^{o}): 16.0

Disturbance:

Type: Constructed mine road in buffer.
Intensity: Very high; a low use natural surface road alters and diverts the source of groundwater flow to the fen to surface flow which moves down the road and into a gully.
Extent: covers 10% to 25% of buffer

Amphibian species present: none.
Avian species present: American pipit
Mammal species present: Elk (Cervus elaphus) sign.

Plant Communities:

1. Dominant: Mountain sedge (Carex scopulorum) herbaceous vegetation.
   Total cover 40% with 8% forbs and 32% graminoids (occupies terraces). Bryophyte cover 90%.
2. Marsh marigold (Caltha leptosepala) herbaceous vegetation (occupies slopes and hummocks).
   Total cover 80% with 64% forbs and 16% graminoids.
3. Few-flower spikerush (Eleocharis quinqueflora) herbaceous vegetation (occupies small patches on terraces)
4. Planeleaf willow/Mesic forb (Salix planifolia/Mesic forb) shrubland (occupies perimeter).

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):
1) Marsh marigold (Caltha leptosepala) herbaceous vegetation
2) Few-flower spikerush (Eleocharis quinqueflora) herbaceous vegetation
3) Planeleaf willow/Mesic forb (Salix planifolia/Mesic forb) shrubland

Other plant species present:

Carex scopulorum
Carex nova
Carex microptera
Carex aquatilis
Carex illota
Carex ebenea
Carex canescens
Carex nigricans
Carex utriculata
Carex eleocharis
Eleocharis quinqueflora
Poa alpina
Juncus mertensianus
Senecio crocatus
Saxifraga oregana
Erigeron peregrinus
Pedicularis groenlandica
Potentilla diversifolia
Epilobium hornemannii
Senecio triangularis

Noxious weed species present (noxious weed form attached):none.

Photo Documentation Wetland Site # 32843 (photo card was mis-labeled)

Site Panorama (Clockwise from left): Starting Azimuth 40°. UTM E321474/N4317916

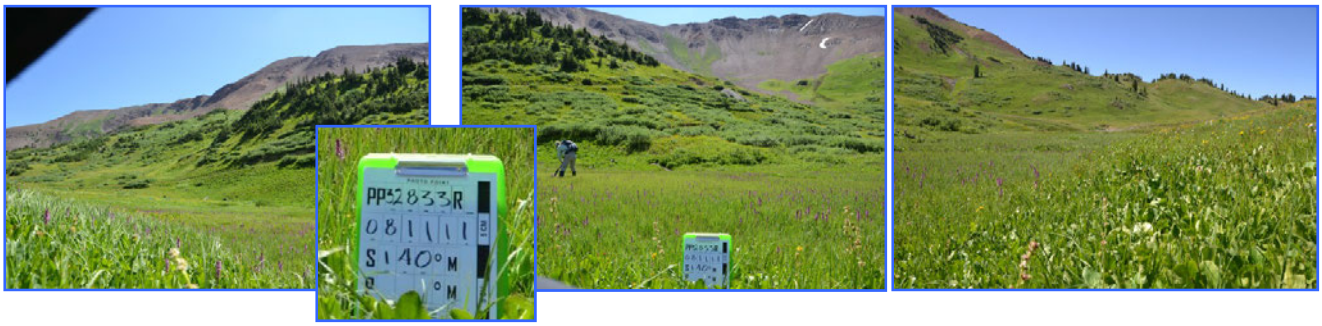
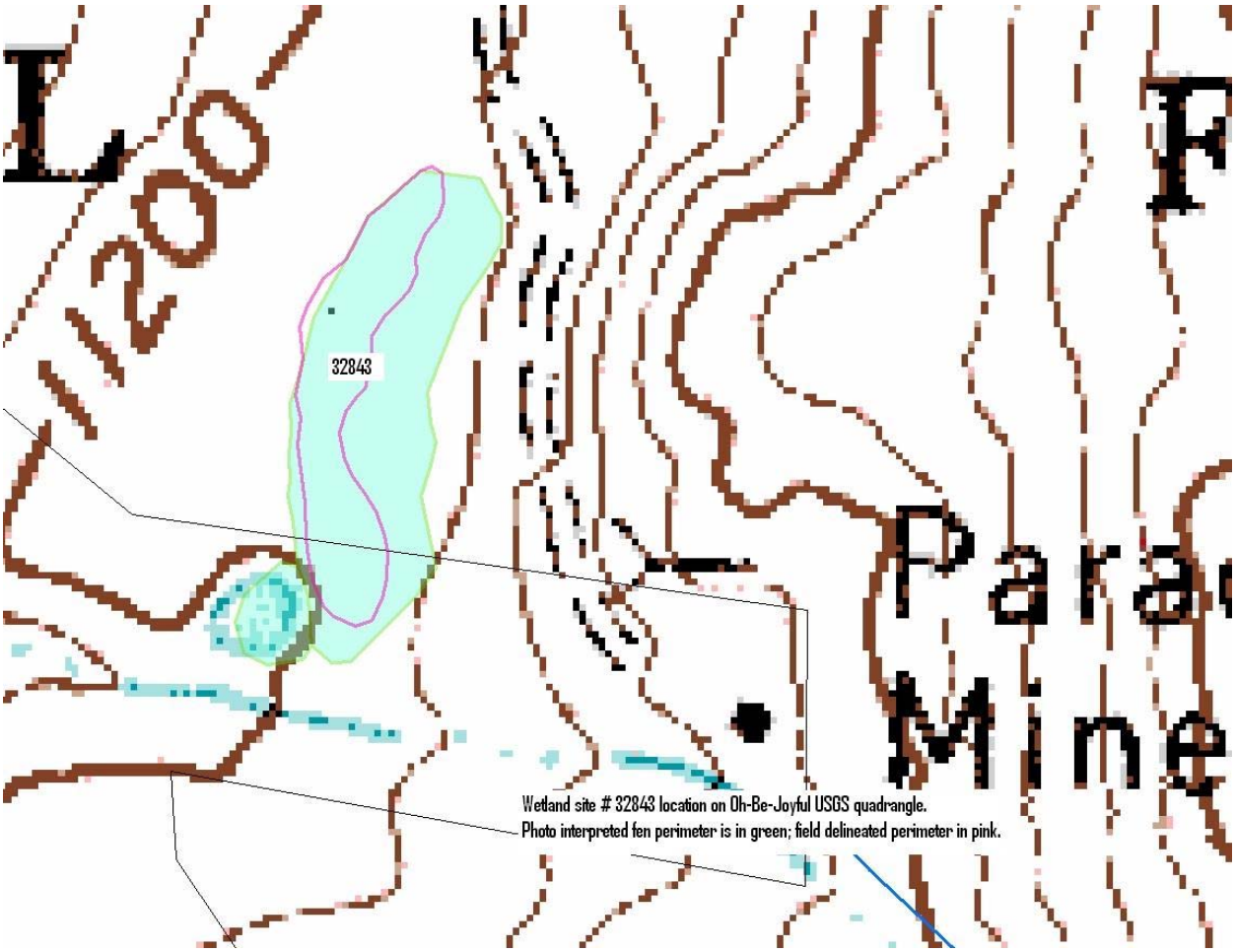


Photo Point: Azimuth of center photo 140 °, UTM E321472/N 4317915

Soil Pit:UTM E321484/N4317922

A mining road interrupts and diverts groundwater flow away from the fen and down the road to a gully.



Wetland site # 32843 on Oh-Be-Joyful USS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/10/2011
Wetland Site ID: 32844
Wetland Classification: Palustrine; emergent persistent/scrub-shrub, broad-leaved deciduous; nontidal saturated.
Fen? Yes
General Description: This slope wetland fen is located on the west side of the Continental Divide in the Elk Range in Paradise Basin, lying between the east flank of Cinnamon Mountain and the west flank of Mount Baldy. Pleistocene-age glaciers carved deeply into these mountains leaving steep, unstable slopes and wide basins, such as Paradise Basin, where this fen is located. Paradise Basin is a wide, low gradient, north trending valley that is drained by a first order stream that soon flows into the South Fork of the Crystal River. Basin geology is Middle Tertiary Age intrusive rock. Metallic ores associated with Tertiary Age volcanism were discovered in these mountains in the 1870's, which resulted in hardrock and placer mining activity throughout the area. A legacy of mine drainage, tailing piles and mine sites remains in this valley.

This fen occupies a lowslope on the west side of Paradise basin. Groundwater from northeast- and southeast-facing slopes is the primary source of water to the fen. Although groundwater flow from northwest-facing slopes is abundant, a stream that is located on the east side of the fen receives and drains this groundwater flow before it reaches the fen. Fen soils are saturated peat that have slumped to form microtopography of alternating slopes and terraces and also depressions where shallow ponds have formed. Terrestrial fen habitat is a mosaic of mesic herbaceous graminoid and forb meadows and shrublands while shallow ponds harbour aquatic communities. Upland habitat is an expansive mosaic of herbaceous meadows, shrublands, krummholz spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and steep, unstable scree and talus slopes. Riparian habitat is characterized by a dense cover of willow (*Salix* spp.)

Wetland characterization
Elevation (feet): 11,060
Aspect: 40^{o}
Slope: terraces and ponds 0%; slopes 5%
Tile probe depth: 69cm, 73cm, 96cm and 105 cm.
Peat depth: 98cm
Von Post peat classification: H7
Soil Characteristics: soils are saturated peat, heavily reduced and clayey.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Groundwater from adjacent northeast- and southeast-facing slopes dominates inflow. Shallow surface flow also occurs at topographic changes in gradient where soil slumping has created terrace/slope microtopography**.** Outflow occurs by both a surface channel and by shallow groundwater flow.
Water Quality:
pH: 8.75
Conductivity(microsiemens): 78
Temperature (C^{o}): 9.6

Disturbance:

Type: Constructed road in buffer.
Intensity: Very high; a high use natural surface road alters and diverts the dominant source of groundwater flow to the fen.
Extent: covers 25% of groundwater source area in buffer.

Amphibian species present: none.
Avian species present: American Robin, Spotted Sandpiper, Wilson's Warbler, White-crowned Sparrow.
Mammal species present: none.
Other: in shallow ponds - caddisfly (*Trichoptera* spp.), leeches (*Hirudinea* spp.), fairy shrimp (*Anostraca* spp.), diving beetle (*Coleoptera* spp.), dragonfly nymph (*Odonata* spp.).

Plant Communities:
1. Dominant: Mountain sedge (*Carex scopulorum*) herbaceous vegetation.
   Total cover 50%; forb cover = 3%, graminoid cover = 47%
2. Mesic forb herbaceous vegetation; Total cover 70%; forb cover = 56%, graminoids = 14%.
3. Few-flower spikerush (*Eleocharis quinqueflora*); total cover 50%; forb cover = 5%, graminoid 45%.
4. Planeleaf willow/Water sedge (*Salix planifolia/Carex aquatilis*) shrubland
5. Planeleaf willow/ Mountain sedge (*S. planifolia/C. scopulorum*) shrubland

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):
*Quillwort (*Isoetes* spp.)
Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation
Planeleaf willow/Water sedge (*Salix planifolia/Carex aquatilis*) shrubland
Other plant species present:
Carex aquatilis
Carex scopulorum
Carex illota
Carex ebenea
Carex aurea
Carex nova
Eleocharis quinqueflora
Equisetum variegatum
Phleum alpinum
Isoetes spp.
Pedicularis groenlandica
Caltha leptosepala
Arnica mollis
Bistorta vivipara
Senecio crocatus
Sedum rhodanthum
Saxifraga oregana
Trollius laxus

Oxypolis fendleri
Viola adunca
Potamogeton spp.
Salix planifolia
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 32844

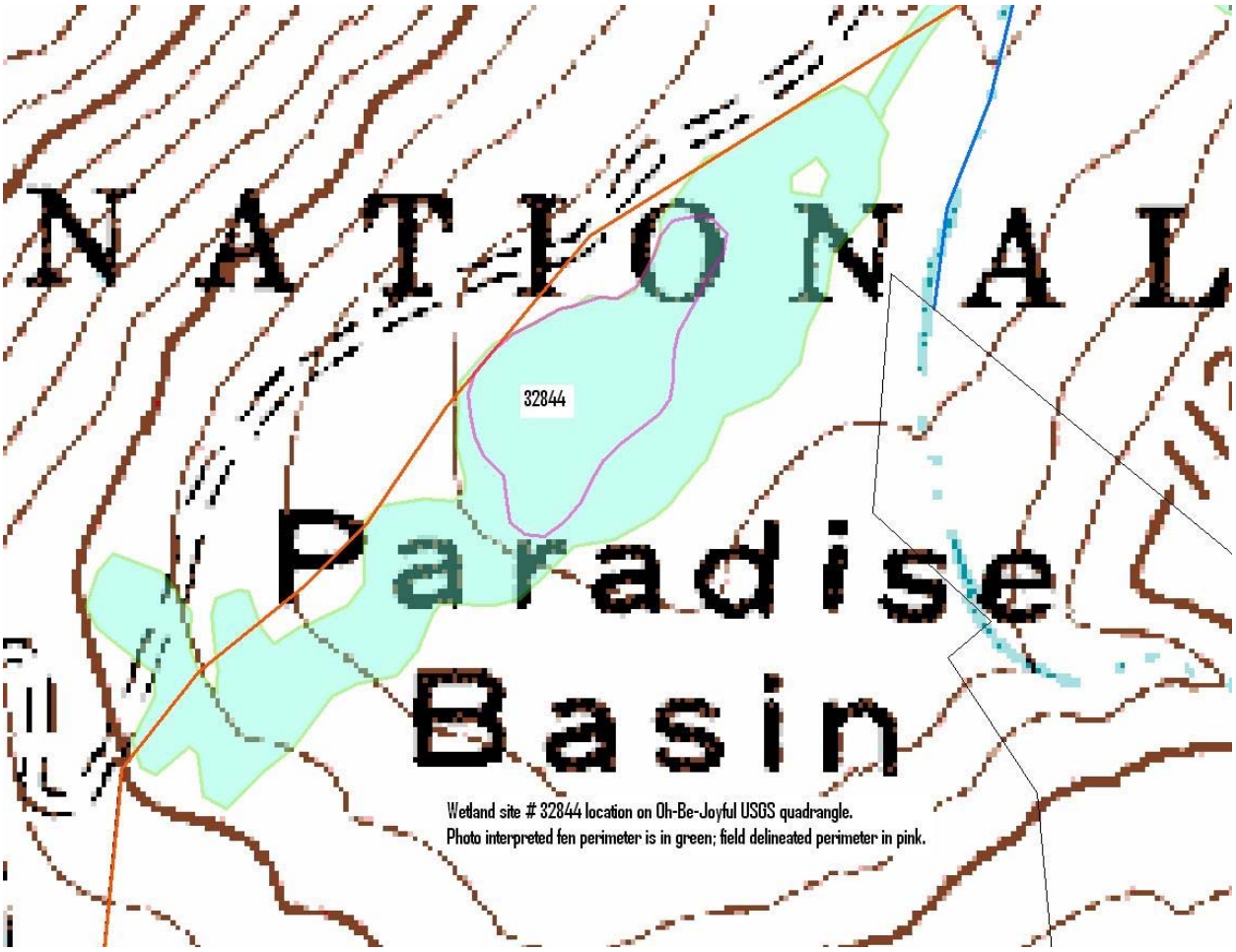
Site Panorama (Clockwise from left): Starting Azimuth 10°, UTM E321474/N4317916

Photo Point: Azimuth of center photo 10 °, UTM E321472/N4317915

Soil Pit:UTM E321484/N4317922

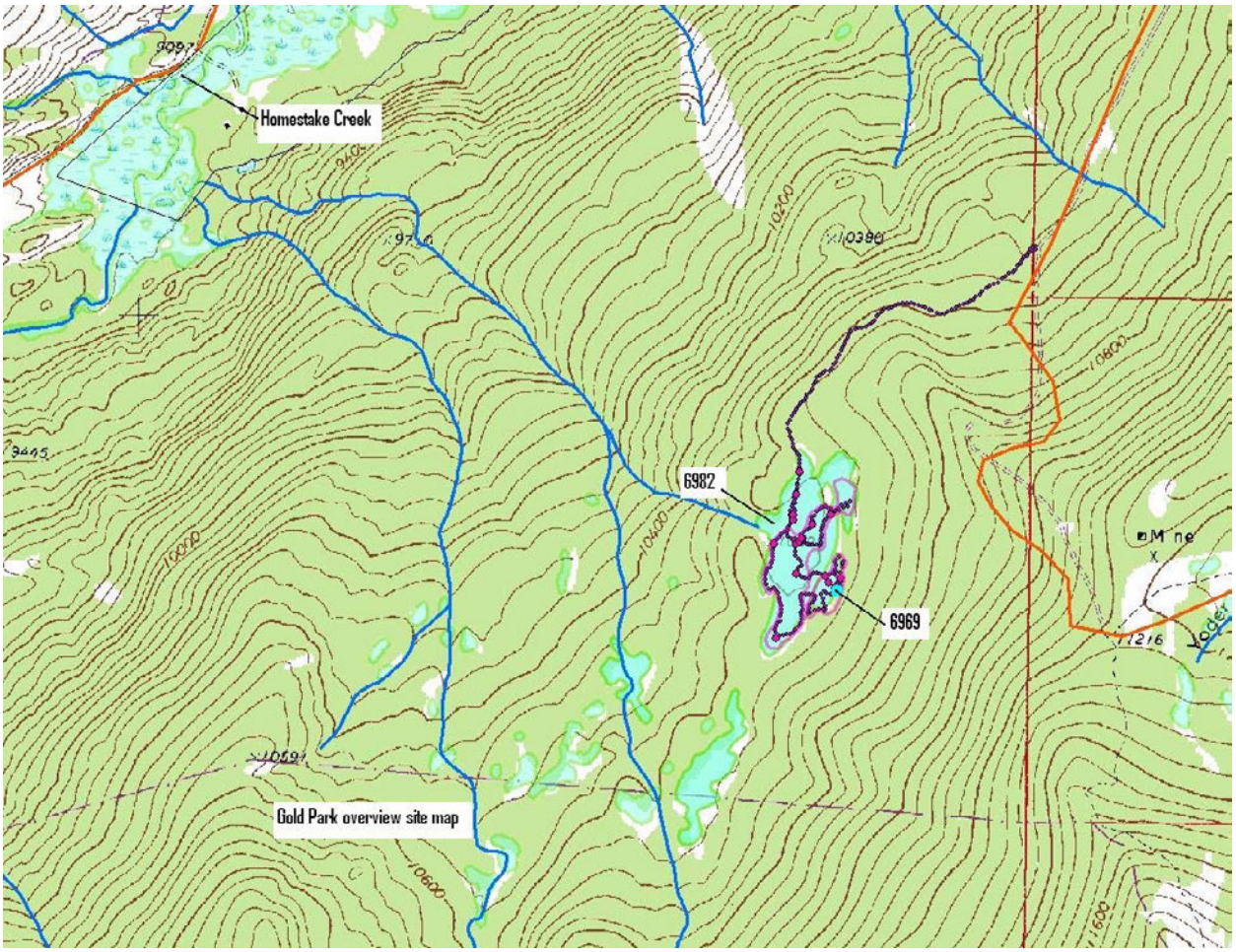
Caddisfly larvae occupy shallow ponds.

A road that traverses the hillside in Paradise Basin alters groundwater flow to the fen below.



Wetland site # 32844 location on Oh-Be-Joyful USGS quadrangle. Photo interpreted perimeter is in green; field delineated perimeter is in pink.

Holy Cross Ranger District: Gold Park Overview Map



Holy Cross Ranger District: Overview map for Gold Park survey sites 6982 and 6969.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 9/12/2011
Wetland Site ID: 6982
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This basin wetland fen is located in the subalpine zone in the Sawatch Range on the west slope of the Continental Divide. Area geology is Precambrian age metamorphic rock with deposits of glacial drift from the Pinedale and Bull Lake glaciations of the Pleistocene. Glaciers carved steep mountain slopes and deep valleys leaving broad ridges, benches and depressions.

This fen occupies a wide shallow basin on a north-south trending ridge that separates two drainages, Homestake Creek to the west and the Eagle River to the east, and drains west into Homestake Creek. Basin habitat is a mosaic of wetland communities characterized by mesic graminoid and forb habitats that vary along a soil moisture gradient. Soils on the outer perimeter of the basin are mineral, vary from moist to saturated and support mesic herbaceous graminoid communities; soils become progressively moister toward the center of the basin where they are saturated to inundated and a fen has developed and where hydric plant communities thrive. Upland habitat is characterized by a dense tree canopy of mixed conifers with lodgepole pine (*Pinus contorta*), Engelmann spruce (*Picea engelmannii*), and Subalpine fir (*Abies lasiocarpa*).

Wetland characterization
Elevation (feet): 10,622
Aspect: generally 190^{o} and, in a small opening that drains the fen site 280^{o}.
Slope: 0.5% to 1%; and on the west-facing perimeter 2%.
Tile probe depth: 105cm,80cm, 75cm
Peat depth: 92cm
Von Post peat classification: H6
Soil Characteristics: fen with inundated to saturated peat; hummocky soils on fen perimeter.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow is dominated by groundwater from adjacent west- and northwest-facing slopes.. Additionally, at topographic changes in gradient, groundwater discharge results in abundant surface flow. Outflow occurs by groundwater and by one surface channel.
Water Quality:
pH: 5.39
Conductivity (microsiemens): 16
Temperature (C^{o}): 14.5
Disturbance: none.
Type: na
Intensity: na
Extent: na

Amphibian species present: none.
Avian species present: Common Snipe
Mammal species present: Elk (*Cervus elaphus*) sign.

Plant Communities:
1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 55% with 3% forbs and 52% graminoids; *E.quinqueflora* = 47% of graminoid cover, other graminoids = 5%. Forb cover dominated by elephantella (*Pedicularis groenlandica*) and marsh marigold (*Caltha leptosepala*).
2. Beaked Sedge (*Carex utriculata*) herbaceous vegetation.
3. Tufted hairgrass (*Deschampsia cespitosa*) herbaceous vegetation (occupies outer perimeter of meadow)
4. Mesic forb herbaceous vegetation (occupies sites on outer perimeter).

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):
*Slender cottongrass (*Eriophorum gracile*)
*Buxbaum sedge (*Carex buxbaumii*)
Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation
Beaked sedge (*Carex utriculata*) herbaceous vegetation.
Tufted hairgrass (*Deschampsia cespitosa*) herbaceous vegetation
Other plant species present:
Sphagnum warnstorfii
Carex aquatilis
Carex capillaris
Carex utriculata
Carex paupercula
Eleocharis quinqueflora
Eriophorum angustifolium
Juncus longistylis
Equisetum arvense
Danthonia intermedia
Deschampsia caespitosa
Phleum alpinum
Caltha leptosepala
Veratrum tenuipetalum
Sedum rhodanthum
Pedicularis groenlandica
Aster foliaceus
Castilleja occidentalis
Antennaria pulcherrima
Senecio triangularis
Ligusticum tenuifolium
Bistorta vivipara

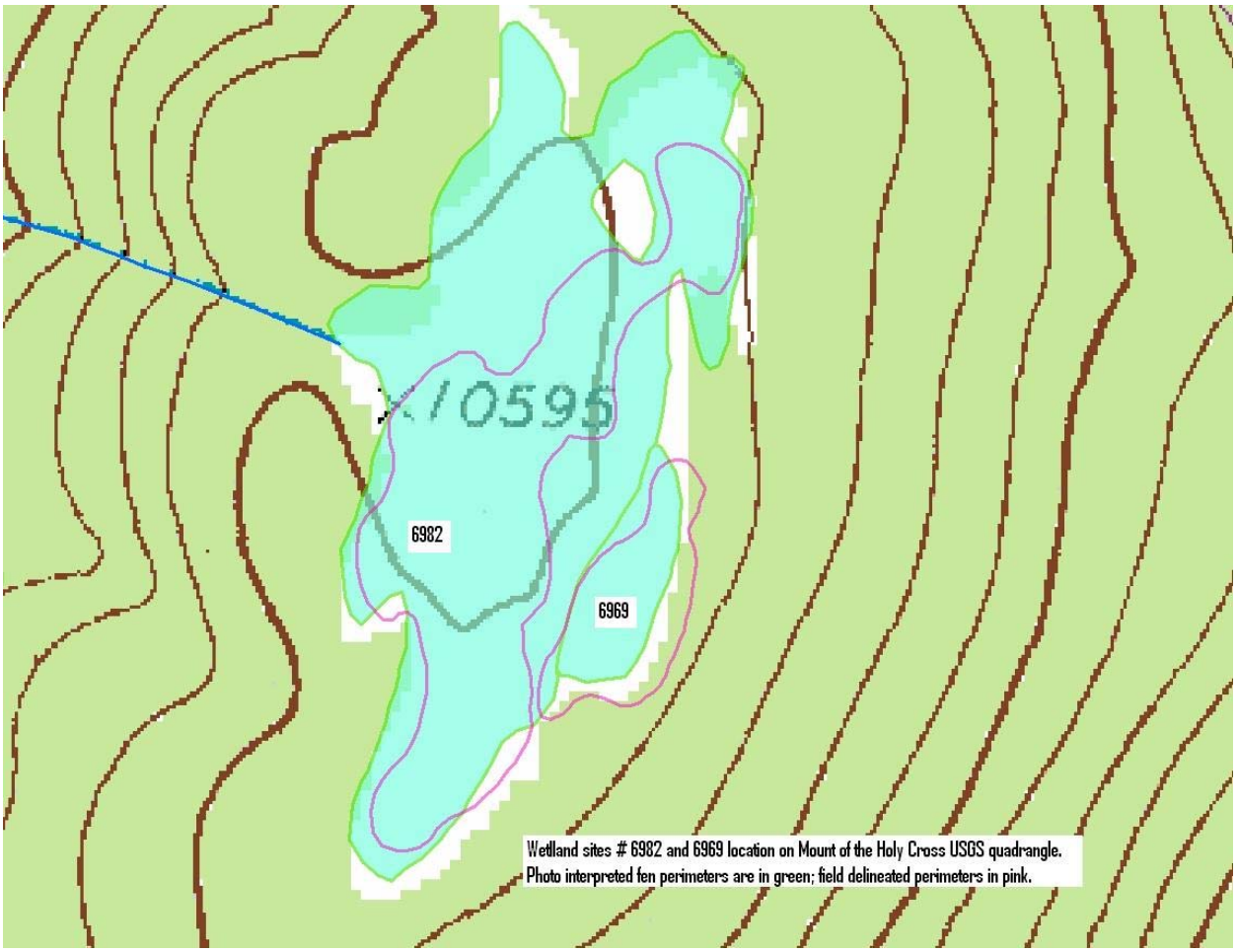
Conioselinum scopulorum
Spiranthes romanzoffiana
Senecio crocatus
Gentianopsis thermalis
Limnorchis hyperborea
Gentiana fremontii
Swertia perennis
Betula nana
Salix planifolia
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 6982

Site Panorama (Clockwise from left): Starting Azimuth 180°, UTM E 380047/N 4363286

Photo Point: Azimuth of center photo 190°, UTM E 380043/N 4363285

Soil Pit:UTM E 380036/N 4363275



Wetland sites # 6982 and 6969 location on Mount of the Holy Cross USGS quadrangle. Photo interpreted fen perimeters are in green; field delineated perimeters are in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 9/12/2011
Wetland Site ID: 6969
Wetland Classification: Palustrine; scrub-shrub, broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This slope wetland fen is located in the subalpine zone in the Sawatch Range on the west slope of the Continental Divide. Area geology is Precambrian age metamorphic rock with deposits of glacial drift from the Pinedale and Bull Lake glaciations of the Pleistocene. Glaciers carved steep mountain slopes and deep valleys leaving broad ridges, with benches and depressions where wetlands have developed.

This site occurs on a north-south trending ridge that separates two drainages, Homestake Creek to the west and the Eagle River to the east. Here this fen occupies a small bench at the base of a steep, forested slope and above a large wetland basin fen. Soils are a mosaic of inundated and saturated peat and hummocks with a dense cover of moss. Fen habitat is characterized by a rich mosaic of mesic shrub and graminoid communities that vary with soil moisture conditions. Upland habitat is characterized by a dense tree canopy of mixed conifers with lodgepole pine (*Pinus contorta*), Engelmann spruce (*Picea engelmannii*), and Subalpine fir (*Abies lasiocarpa*).

Wetland characterization
Elevation (feet): 10,659
Aspect: 290^{o}
Slope: 0.1% to 0.5%
Tile probe depth: 60cm
Peat depth: 88cm
Von Post peat classification: H3
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow is dominated by groundwater from adjacent west- and northwest-facing slopes. Additionally, groundwater discharge at the forest/wetland boundary, results in copious surface flow. Outflow occurs by groundwater.
Water Quality:
pH: 5.68
Conductivity (microsiemens): 29
Temperature (C^{o}): 14.6
Disturbance: none.
Type: na
Intensity: na
Extent: na

Amphibian species present: none.
Avian species present: Stellar's Jay, Red-tailed Hawk, Red-breasted Nuthatch, Hermit Thrush
Mammal species present: none.

Plant Communities:

1. Dominant: Bog birch/Mesic graminoid-Mesic forb (*Betula nana*/Mesic graminoid-Mesic forb) shrubland.

    Tree cover 10% dominated by subalpine fir (Abies lasiocarpa); shrub cover 30% dominated by bog birch (Betula nana); herbaceous cover 70% with 21% forbs and 49% graminoids.

2. Beaked sedge (*Carex utriculata*) herbaceous vegetation.
3. Mesic graminoid herbaceous vegetation.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):

Bog birch/Mesic graminoid-Mesic forb (*Betula nana*/Mesic graminoid-Mesic forb) shrubland.

Beaked sedge (*Carex utriculata*) herbaceous vegetation.

Other plant species present:

Sphagnum spp.
Equisetum arvense
Carex canescens
Carex utriculata
Carex aquatilis
Luzula parviflora
Poa palustris
Sedum rhodanthum
Senecio triangularis
Pedicularis groenlandica
Swertia perennis
Conioselinum scopulorum
Bistorta vivipara
Spiranthes romanzoffiana
Limnorchis hyperborea
Gentianopsis thermalis
Vaccinium myrtillus
Vaccinium cespitosum
Gaultheria humifusa
Caltha leptosepala
Saxifraga oregana
Pyrola asarifolia
Salix planifolia
Betula nana
Kalmia microphylla
Abies lasiocarpa

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 6969

Site Panorama (Clockwise from left): Starting Azimuth 200°, UTM E 380163/N 4363161

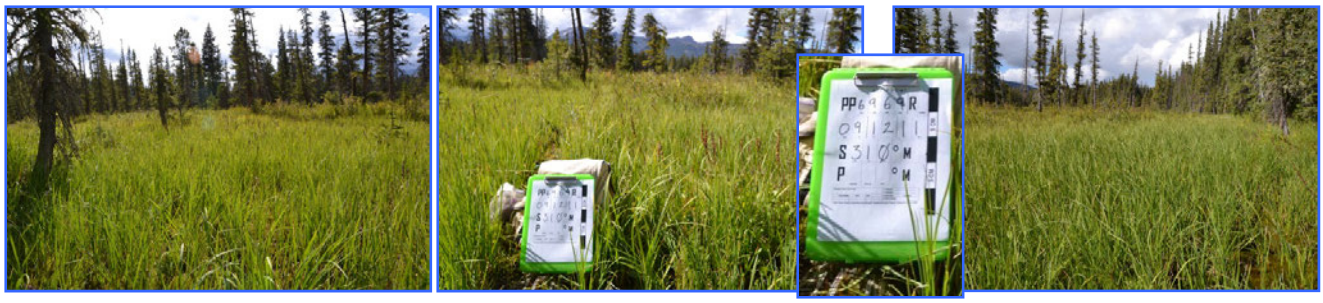
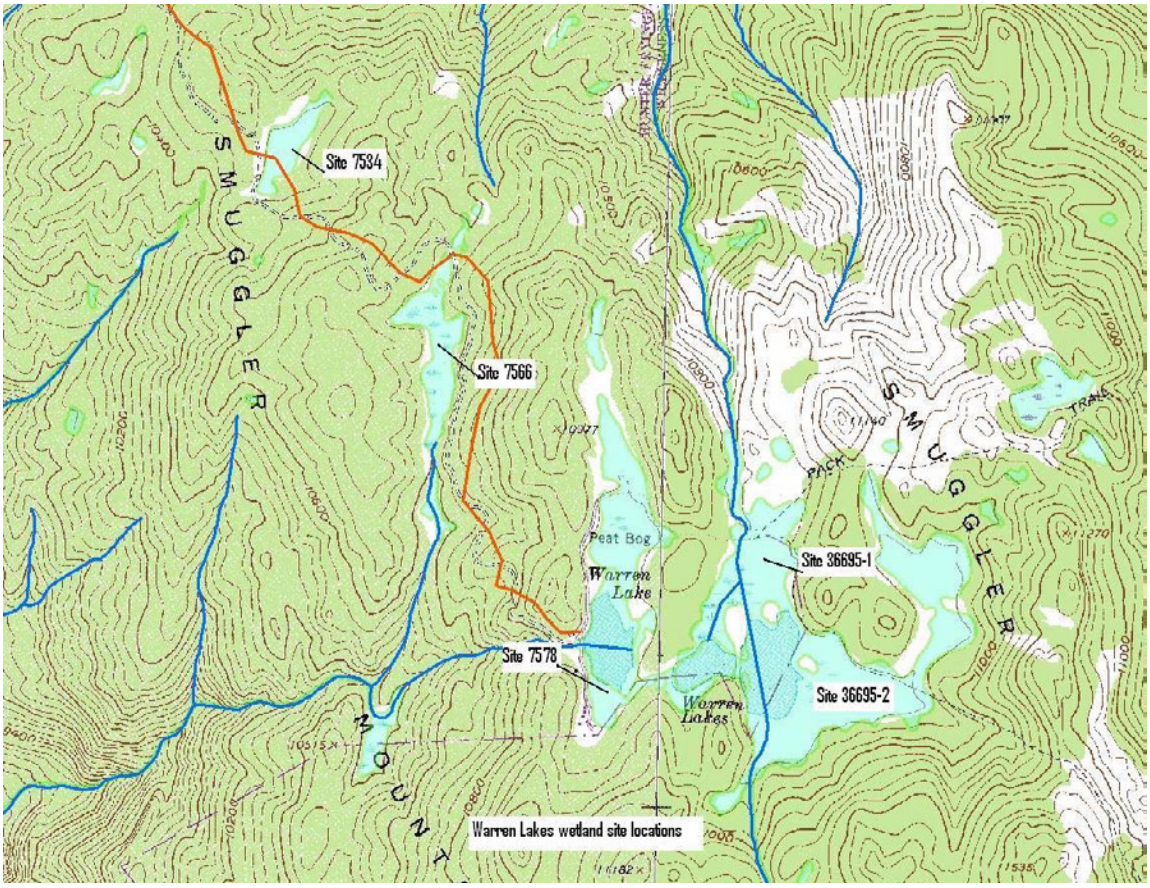


Photo Point: Azimuth of center photo 310°, UTM E 380156/N 4363127

Soil Pit:UTM E 380151/N 4363121

Large, moss covered hummocks occur throughout this fen.

Aspen Ranger District: Warren Lakes Overview Map



Overview map of Warren Lakes survey sites 7534, 7566, 7578, 36695-1 and 36695-2.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/29/2011
Wetland Site ID: 7534
Wetland Classification: Palustrine; emergent persistent/scrub-shrub broad-leaved deciduous; nontidal.
Fen? No.
General Description: Herbaceous slope wetland characterized by a mosaic of graminoid and forb communities.

Wetland characterization
Elevation (feet): 10,558
Aspect: 180°
Slope: 1% to 2%
Tile probe depth: 18cm
Peat depth: 18cm.
Von Post peat classification: H9
Soil Characteristics: soils are moist to saturated with the water table at 22 cm.
Organic/Mineral content percent:
Soil gley in upper 40cm? Yes.
Water source and flow direction characteristics: Groundwater inflow is dominant; there is no surface inflow to the wetland but a surface outflow channel exists.
Water Quality: na
pH: na
Conductivity(microsiemens): na
Temperature (C°): na
Disturbance: na
Type: na
Intensity: na
Extent: na

Amphibian species present: none.
Avian species present:
Mammal species present: Elk (*Cervus elaphus*) sign.
Plant Communities:
1) Dominant: Mesic forb herbaceous vegetation.

Plant List:
CNHP Tracked, TEP or RFSS plant species (forms attached): none.
Other plant species present:
Juncus drummondii
Carex aquatilis
Carex microptera
Carex scopulorum
Carex utriculata
Calamagrostis canadensis

Deschampsia caespitosa
Pedicularis groenlandica
Limnorchis dilatata
Senecio crocatus
Saxifraga oregana
Sedum rhodanthum
Castilleja rhexifolia
Anaphalis margaritacea
Trollius laxus
Veronica wormskjoldii
Bistorta bistortoides
Erigeron peregrinus
Caltha leptosepala
Senecio triangularis
Salix planifolia

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 7534

Soil Pit: UTM E347317/N 4339333

Looking south across the herbaceous wet meadows at wetland site 7534

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date:7/29/2011
Wetland Site ID: 7566
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes

General Description: These herbaceous slope wetland fens are located in the upper montane zone of the Sawatch Mountain Range in the Roaring Fork watershed. The site is comprised of three fens surrounded by wetlands that occupy low slopes on terrace benches above a north-south trending stream. Soils are saturated peat which has slumped, creating a complex microtopography of terraces, lobes, slopes and hummocks. Fen habitat is a complex mosaic of herbaceous plant communities that vary with microtopography and soil characteristics. Surrounding uplands are a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and lodgepole pine (*Pinus contorta*) forest and aspen (*Populus tremuloides*) woodlands.

Wetland characterization
Elevation: 10,668
Aspect: Fen 1 = 60^{o}, Fen 2 = 300^{o} , Fen 3 = 300^{o}
Slope: Fen =1.5%, Fen 2 = 0% to 8%, Fen 3 = 0%-8%
Tile probe depth: TP1 = 75cm, TP2 = 70cm, TP3 = 70cm
Peat depth: Fen1 = 70cm, Fen 2 =70cm, Fen 3 = 70 cm
Von Post peat classification: Fen 1 H3, Fen 2 H1/H2, Fen 3 H1/H2
Soil Characteristics: saturated peat with slumping soils and hummocks.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Groundwater from adjacent east-facing slopes dominates both inflow and outflow. However some surface outflow exists, flowing downslope to the east to a small pond and first-order stream.
Water Quality:
pH: fen 1 = 6.71, Fen 2 = 8.36
Conductivity(microsiemens):Fen 1= 25, Fen 2 = 19
Temperature (C^{o}): Fen 1 = 29.6, Fen 2 = 22.7
Disturbance:
Type: 1) ATV tracks; 2) road in buffer; and 3) ditch in fen
Intensity: 1) Low; a few passes evident in the past but impact is healing. 2) Moderate to high; one natural surface road is open and used many times per week during the season. 3) Low to moderate; one shallow ditch is still functional and draining water from the wetland.
Extent: 1) impact covers <10%; 2) impact directly covers <10% but impact extends beyond area of direct impacted; and 3) direct impact covers <10% but impacts entire fen site.

Amphibian species present: none.
Avian species present: MacGillivray's Warbler, Yellow Warbler, Red-naped Sapsucker, Lincoln's Sparrow, Stellar's Jay.
Mammal species present: none observed.

Plant Communities:
1. Dominant: Mesic forb herbaceous vegetation (occupies hummocks and slopes)
   Total cover 90% with 54% forb and 36% graminoid cover.
2. Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation with 50% total cover (occupies depressions and terraces with shallow surface water).
3. Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb)shrublands (occupies north perimeter)

Russet cottongrass (*Eriophorum chamissonis*) contributes abundant cover in this mesic forb-dominated fen.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I):

*Russett cottongrass (*Eriophorum chamissonis*)

Other plant species present:

Eriophorum angustifolium (fen 2)
Eleocharis quinqueflora
Juncus drummondii
Carex aquatilis
Carex canescens
Carex microptera
Carex scopulorum
Carex paupercula
Carex utriculata
Calamagrostis canadensis
Deschampsia caespitosa
Pedicularis groenlandica
Limnorchis dilatata
Senecio crocatus
Saxifraga oregana
Sedum rhodanthum
Castilleja rhexifolia
Anaphalis margaritacea
Trollius laxus
Veronica wormskjoldii
Bistorta bistortoides
Erigeron peregrinus
Caltha leptosepala
Senecio triangularis
Salix planifolia

Noxious weed species present (noxious weed form attached): none.

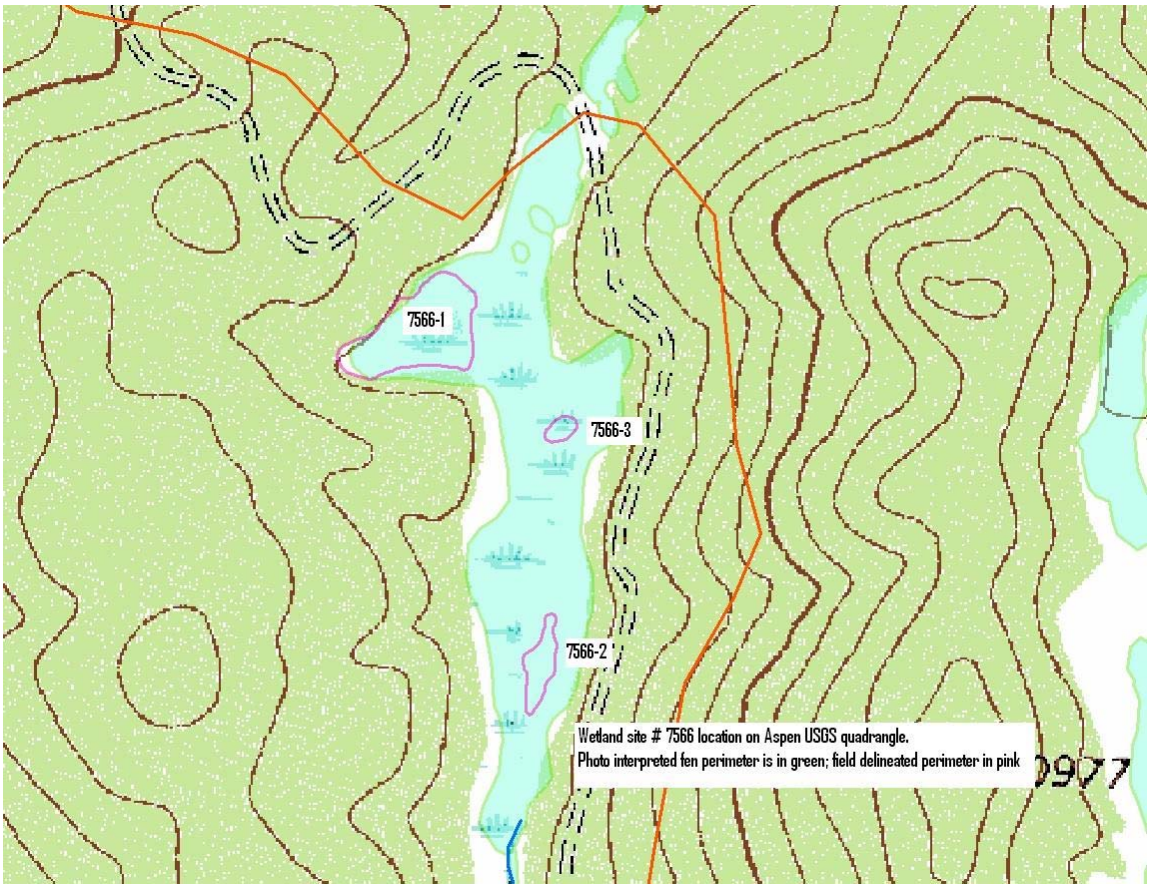
Photo Documentation Wetland Site # 7566-1

Site Panorama (Clockwise from left): Starting Azimuth 260°, UTM point E 347734/N4338655

Photo Point: Azimuth of center photo 340 °, UTM point E 347731/N433866

Soil Pit:UTM E347736/N 433866

Mesic forb community with russet cottongrass



Wetland site #7566 location on Aspen USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/28/2011
Wetland Site ID: 7578
Wetland Classification: Palustrine; emergent persistent; non-tidal seasonally flood/saturated
Fen? No.
General Description: This depressional wetland is part of a large fen complex that is located in the upper montane zone on Smuggler Mountain in the Sawatch Range. The fens occupy relict depressions on top of lateral moraine that was deposited by the last local glaciation. Historically this site was a glacial lake that, over thousands of years, by accumulating peat, developed into fens. However, natural habitat conditions in the fen complex have been dramatically altered by a variety of anthropogenic activities including ditching, draining, damming and peat mining. Peat at this site was mined and the area was then flooded. The site is no longer a fen but is a wetland. Habitat is characterized by a mosaic of graminoid herbaceous vegetation and open water. Glacial erratics are evident on the periphery of the site where low-gradient hillslopes surround the fen. These upland habitats are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and lodgepole pine (*Pinus contorta*) forest, aspen (*Populus tremuloides*) woodlands and herbaceous parks with mixed graminoids and forbs.

Wetland characterization
Elevation: 10,824
Aspect: 0^{o}
Slope: 0%
Tile probe depth: 10cm.
Peat depth: 10cm
Von Post peat classification: H9
Soil Characteristics: saturated, anaerobic, mineral.
Organic/Mineral content percent:
Soil gley in upper 40cm?
Water source and flow direction characteristics: na
Water Quality: na
pH: na
Conductivity (microsiemens):
Temperature (C^{o}): na
Disturbance:
Type: 1) peat mining; and 2) flooding
Intensity: 1) very high intensity; peat mining of >3/4 of the wetland. 2) very high intensity.
Extent: 1) impact occurs over entire site. 2) impact covers entire site.
Amphibian species present: none
Avian species present: Common snipe, Mallard, Red-winged Blackbird.
Mammal species present: none.
Plant Communities:
1) Dominant: Beaked sedge (*Carex utriculata*) herbaceous vegetation.

Photo Documentation Wetland Site # 7578

Warren Lake at wetland site 7578 has been mined and flooded.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/28/2011
Wetland Site ID: 36695-1
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This depressional wetland is a large fen complex that is located in the upper montane zone on Smuggler Mountain in the Sawatch Range. The fens occupy a relict depression on top of lateral moraine that was deposited by the last local glaciation. Historically this site was a glacial lake that, over thousands of years, accumulated peat, developing into fens. However, natural habitat conditions in the fen complex have been dramatically altered by a variety of anthropogenic activities including ditching, draining, damming and peat mining. This site was once part of one larger fen but now an earthen dam divides the site into two separate fens. Activities are underway to restore wetland/fen function. Current habitat at this fen site is characterized by a mosaic of herbaceous mesic graminoid and forb communities. Wetland soils are saturated peat .Glacial erratics are scattered throughout the fen providing insight to the recent climate and geological history of the site. Low-gradient hillslopes surround the fen. These upland habitats are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and lodgepole pine (*Pinus contorta*) forest, aspen (*Populus tremuloides*) woodlands and herbaceous parks with mixed graminoids and forbs.

Wetland characterization
Elevation: 10,890
Aspect: 0^{o}
Slope: From 0% at center to 1.5% on periphery
Tile probe depth: 105cm
Peat depth: 40cm
Von Post peat classification: H8/H9
Soil Characteristics: saturated peat with shallow surface flow
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Topographically this site is a closed basin with inflow dominated by groundwater but also with several small surface channels that flow into the fen. There is no evidence of outflow.
Water Quality:
pH: 8.68
Conductivity (microsiemens): 13
Temperature (C^{o}): 26.2
Disturbance:
Type: Earthen dam alters groundwater flow to fen
Intensity: High; peat soils are drying and upland plants are appearing in wetland.
Extent: Impact from hydrologic alteration covers 75% of site

Amphibian species present: none
Avian species present: Yellow Warbler, Lincoln's Sparrow, Chipping Sparrow, Dark-eyed Junco, Mountain Bluebird, Red-tailed Hawk.
Mammal species present: Elk (*Cervus elaphus*), Mule deer (*Odocoileus hemionus*),

Plant Communities:
1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation. Total cover 60% with 6% forbs and 54% graminoids; E. quinqueflora = 38% of graminoid cover, other graminoids = 16%. Forb cover dominated by elephantella (*Pedicularis groenlandica*).
2. Mesic forb herbaceous vegetation; Total cover 80% with 48% forbs and 32% graminoids.
3. Tufted hairgrass (*Deschampsia cespitosa*) herbaceous vegetation; Total cover 80% with 16% forbs and 64% graminoids.
4. Beaked sedge (*Carex utriculata*) herbaceous vegetation (small patch occupies open water at base of dam)
5. Planeleaf willow/Mesic forb (*Salix planifolia/Mesic forb*) shrubland (occupies perimeter)

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.

Other plant species present:

Eleocharis quinqueflora
Carex canescens
Carex scopulorum
Carex utriculata
Carex aquatilis
Carex microptera
Carex ebenea
Juncus drummondii
Phleum pratense
Deschampsia caespitosa
Calamagrostis canadensis
Sedum rhodanthum
Bistorta bistortoides
Saxifraga oregana
Erigeron peregrinus
Caltha leptosepala
Senecio crocatus
Agoseris aurantiaca
Anaphalis margaritacea
Senecio triangularis
Draba crassifolia
Antennaria pulcherrima
Geum macrophyllum
Taraxacum officinale (non-native)

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 36695-1

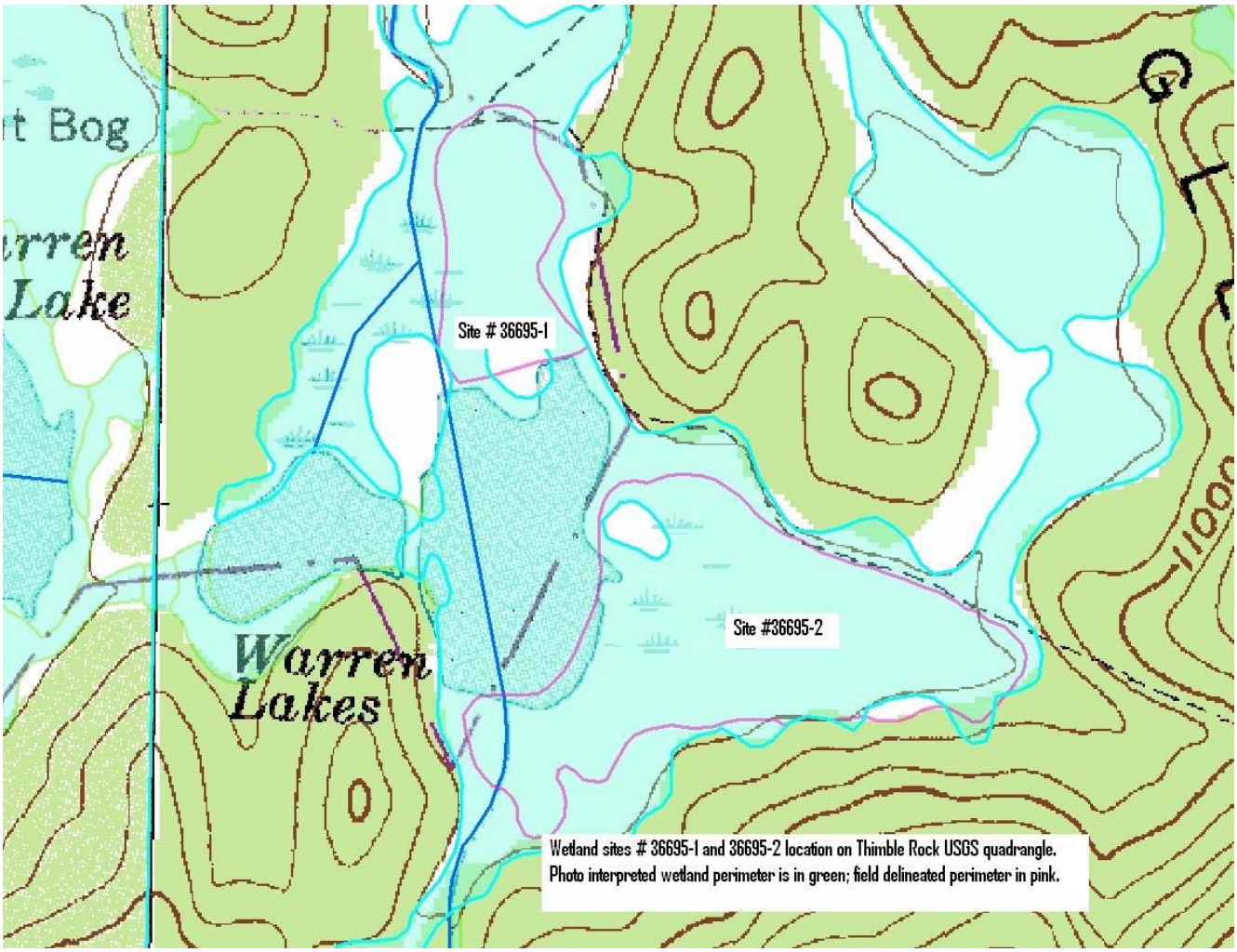
Site Panorama (Clockwise from left): Starting Azimuth 120°, UTM point E 349148/N 4337680

Photo Point: Azimuth of center photo 210 °, UTM point E 349156/N 4337695

Soil Pit:UTM point E 349157/N 4337693

Dam alters groundwater flow to fen

Site occupies a relict depression in glacial moraine; Glacial erratics occur throughout fen .



Wetland sites # 36695-1 and 36695-2 location on Thimble Rock USGS quadrangle. Photo interpreted fen perimeters are in green; field delineated perimeters are in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/28/2011
Wetland Site ID: 36695-2
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This depressional wetland is part of a large fen complex that is located in the upper montane zone on Smuggler Mountain in the Sawatch Range. The fens occupy relict depressions on top of lateral moraine that was deposited by the last local glaciation. Historically this site was a glacial lake that, over thousands of years, by accumulating peat, developed into fens. However, natural habitat conditions in the fen complex have been dramatically altered by a variety of anthropogenic activities including ditching, draining, damming and peat mining. This site was once part of one larger fen but now an earthen dam divides the site into two separate fens. Activities are underway to restore wetland/fen function. Wetland soils here are saturated deep peat with abundant shallow surface water. Saturated soils have resulted in slumping which has created a series of low terraces and lobes. Current habitat at this fen site is characterized by a mosaic of herbaceous mesic graminoid and forb communities with willow (*Salix* spp.) shrublands bordering the fen. Glacial erratics are evident on the periphery of the site where low-gradient hillslopes surround the fen. These upland habitats are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and lodgepole pine (*Pinus contorta*) forest, aspen (*Populus tremuloides*) woodlands and herbaceous parks with mixed graminoids and forbs.

Wetland characterization
Elevation: 10,881
Aspect: From 0^o, 180^o to 270^o
Slope: 0% on terraces; 1% to 3% on intervening slopes
Tile probe depth: TP1 105cm; TP2 85cm
Peat depth: 80cm
Von Post peat classification: H2/H3
Soil Characteristics: saturated peat with soil slumping and 5cm to 10 cm of shallow surface flow.

Organic/Mineral content percent:
Soil gley in upper 40cm? No.

Water source and flow direction characteristics: Topographically this site is a basin with inflow predominantly from groundwater. However, there is also evidence of both surface water inflow and outflow.
Water Quality:

pH: 7.44
Conductivity (microsiemens): 16
Temperature (C^o): 22.5

Disturbance:

Type: Ditching in wetland
Intensity: Low to moderate; one shallow ditch has been dug and is maintained; the ditch continues to drain water from the wetland.
Extent: Ditch covers less than 10% of site but impacts a much larger area.

Amphibian species present: none.
Avian species present: Yellow Warbler, Lincoln's Sparrow, Chipping Sparrow, Dark-eyed Junco, Mountain Bluebird, Red-tailed Hawk.
Mammal species present: none.

Plant Communities:
1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 50% with 5% forbs and 45% graminoids; E. quinqueflora = 27% of graminoid cover, other graminoids = 18% cover. Forb cover dominated by elephantella (Pedicularis groenlandica).
2. Mesic forb herbaceous vegetation (occupies lobes and slopes between terraces)
3. Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland.
4. Planeleaf willow/Beaked sedge (*S. planifolia/Carex utriculata)* shrubland.

Plant List:
CNHP Tracked, TEP or RFSS plant species (*appendix I):
*Russet cottongrass (*Eriophorum chamissonis*) is abundant in *Eleocharis quinqueflora c*ommunities.
Planeleaf willow/Beaked sedge (*S. planifolia/C.utriculata*) shrubland
Other plant species present:
Sphagnum warnstorfii
Eleocharis quinqueflora
Carex utriculata
Carex aquatilis
Carex microptera
Carex scopulorum
Deschampsia cespitosa
Calamagrostis canadensis
Saxifraga oregana
Bistorta bistortoides
Erigeron perigrinus
Pedicularis groenlandica
Caltha leptosepala
Sedum rhodanthum
Anaphalis margaritacea
Senecio crocatus
Salix planifolia
Betula nana
Salix brachycarpa
Noxious weed species present (noxious weed form attached): none.

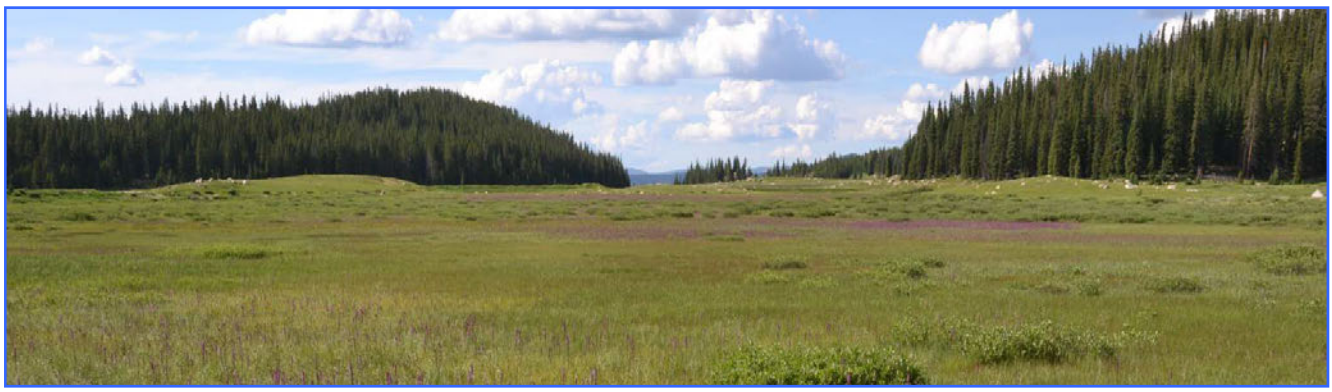
Photo Documentation Wetland Site # 36695-2

Site Panorama (Clockwise from left): Starting Azimuth 230 °, UTM point E 349557/N4337125

Photo Point: Azimuth of center photo 300 °, UTM point E 349540/N4337134

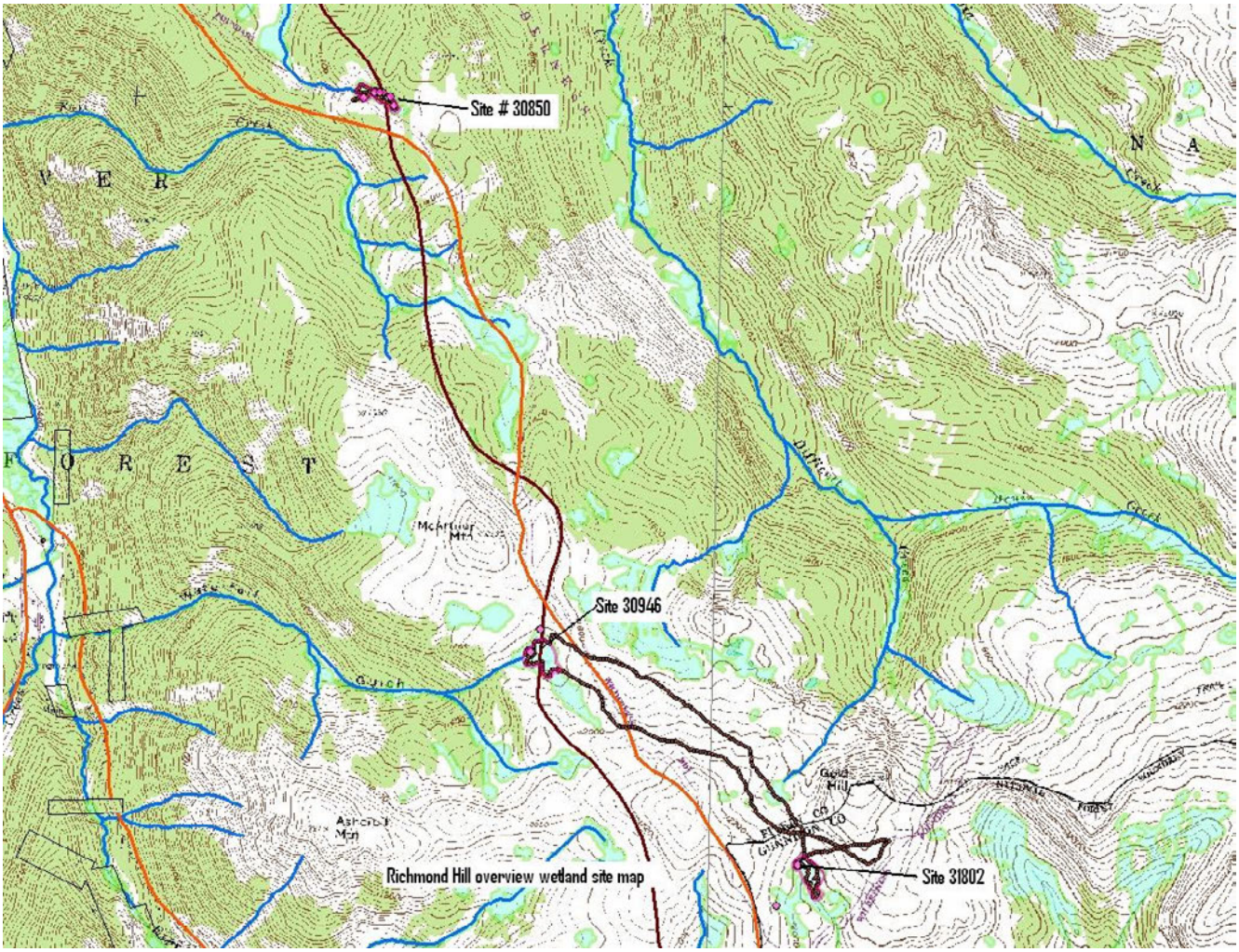
Soil Pit:UTM E 349511/N4337139.348766

Ditch draining wetland



Russet cottongrass (*Eriophorum chamissonis*)

Aspen Ranger District: Taylor Pass/Richmond Hill Overview Map



Taylor Pass/Richmond Hill overview map of survey sites 30850, 30946, and 31802.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/8/2011
Wetland Site ID: 30850
Wetland Classification: Palustrine; emergent persistent/scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the subalpine zone on the west slope of the Continental Divide on the flanks of the Sawatch Mountain Range, on the shoulder of a wide, long, north-south trending ridge, Richmond Hill, which separates two deep valleys, Castle Creek valley to the west and Difficult Creek to the east. During the Pleistocene ice age, the ridgetop, was likely unglaciated, but local glaciers certainly filled the valley's below and carved the steep slopes, cirques and basins that characterize these mountain slopes lying below the ridge. This fen occupies a small, low-gradient, west-trending swale basin just below the ridge of Richmond Hill. Groundwater flow through this fen gathers into surface flow forming a 1st order stream that eventually flows northwest and then northeast into Difficult Creek.

Complex faulting has occurred throughout this region and has brought mineral-rich rocks to the surface. As a consequence, from the 1880's through the early 1900's, hardrock mining and mineral exploration were extensive. Habitat alterations from mining and mining-related activities continue to impact the landscape as does ongoing motorized recreational use of these mining roads.

Fen habitat is characterized by a mosaic of mesic herbaceous meadows and shrublands and small open water ponds. Saturated peat soils have slumped resulting in slope/terrace microtopography with differing soil characteristics and accordingly different plant communities. Uplands are an expansive mosaic of grasslands, spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and patches of aspen woodlands. Ridgetops and rock outcrops are occupied by alpine fellfield communities and patches of flagged spruce-fir krummholz and in low, protected swales lush herbaceous wetland meadows develop where late-lying snowfields provide a constant source of water.

Wetland characterization
Elevation (feet): 11,289
Aspect: 250°
Slope: 0% to 1% on terraces; 5% on slopes.
Tile probe depth: 90cm
Peat depth: 90cm
Von Post peat classification: H3/H4
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow is dominated by groundwater that emanates from adjacent east- and south-facing slopes. Additionally, abundant shallow surface flow occurs where groundwater discharges at topographic changes in gradient that result from terrace/slope microtopography. Outflow occurs by both groundwater and by a west trending surface channel that has developed toward the bottom of the fen.

Water Quality:

pH: 8.74

Conductivity (microsiemens): 16

Temperature (C^o): 27.0

Disturbance:

Type: Road in wetland buffer.

Intensity: Low; a natural-surface road is located along the south ridge above the fen, but >10m from wetland edge; the road is heavily used many times per week by ATVs but does not impede water flow into the fen.

Extent: covers <25% of buffer.

Amphibian species present: none.
Avian species present: Red-breasted Nuthatch, Stellar's Jay, Wilson's Warbler, Mountain Chickadee
Mammal species present: Elk (*Cervus elaphus*) sign, pine squirrel (*Tamiasciurus hudsonicus*),

Plant Communities:

1. Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 50% with 5% forbs and 45% graminoids.
2. Co-dominant: Mesic forb herbaceous vegetation.
   Total cover 85% with 60% forbs and 25% graminoids.
3. Co-dominant: Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) herbaceous vegetation.
   Total shrub cover 60%; total herbaceous cover 50% with 30% forbs and 20% graminoids.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*forms attached):
Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation
Other plant species present:

Sphagnum warnstorfii
Eleocharis quinqueflora
Carex scopulorum
Carex aquatilis
Carex canescens
Carex illota
Carex paupercula
Carex microptera
Juncus saximontana
Luzula parviflora
Calamagrostis canadensis
Deschampsia cespitosa
Oxypolis fendleri
Saxifraga oregana
Pedicularis groenlandica
Senecio triangularis
Gentianopsis thermalis
Swertia perennis
Sedum rhodanthum

Aconitum columbianum
Erigeron peregrinus
Arnica mollis
Bistorta vivipara
Limnorchis hyperborea
Viola adunca
Veronica wormskjoldii
Caltha leptosepala
Salix planifolia
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 30850

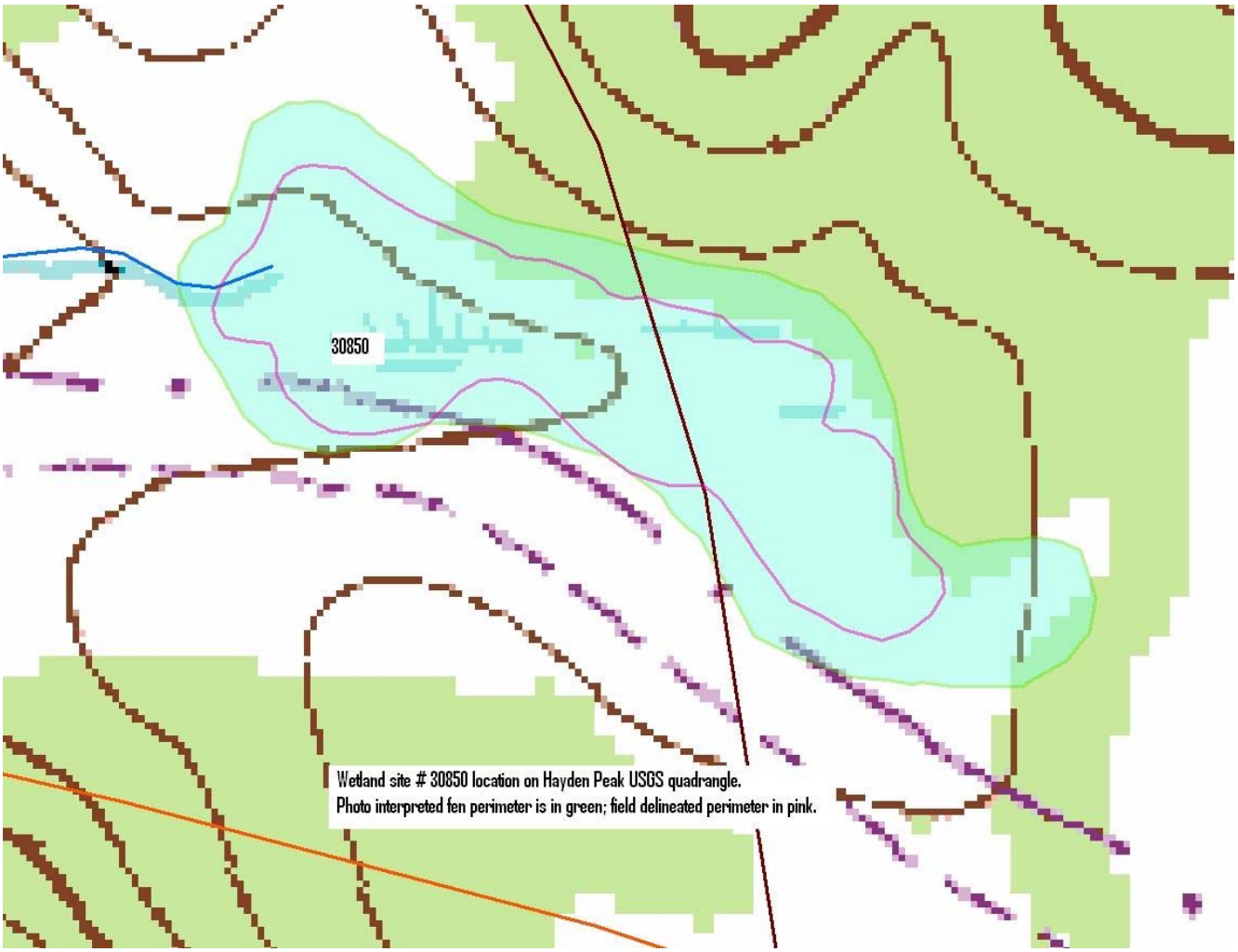
Site Panorama (Clockwise from left): Starting Azimuth 110°, UTM E346458/N4327582

Photo Point: Azimuth of center photo 270 °, UTM E346448/N4327576

Soil Pit:UTM E346445/N4327582

Hummocks have dense sphagnum cover.

Looking west and downslope across the fen toward the Elk Mountains



Wetland site #30850 location on Hayden Peak USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pin

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/3/2011
Wetland Site ID: 30946
Wetland Classification: Palustrine; emergent persistent/scrub-shrub broad-leaved deciduous; non-tidal seasonally flooded/saturated.
Fen? Yes.
General Description: This wetland fen is located in the lower alpine zone on the west slope of the Continental Divide on the flanks of the Sawatch Mountain Range on the shoulders of a wide, north-south trending ridge, Richmond Hill, which separates two deep valleys, Castle Creek valley to the west and Difficult Creek to the east. During the Pleistocene ice age, the ridgetop, was likely unglaciated, but local glaciers certainly filled the valley's below and carved the steep slopes, cirques and basins that characterize these mountain slopes below the ridge. This fen occupies a large, low-gradient, west-facing basin just below the ridge of Richmond Hill. Groundwater flow through this fen gathers into surface flow forming a 1st order stream that eventually flows into Castle Creek.

Complex faulting has occurred throughout this region and has brought mineral-rich rocks to the surface. As a consequence, from the 1880's through the early 1900's, hardrock mining and mineral exploration were extensive. Habitat alterations from mining and mining-related activities continue to impact the landscape as does ongoing motorized recreational use of these mining roads.

Fen habitat is characterized by a mosaic of mesic herbaceous meadows and shrublands and small open-water ponds. Uplands are an expansive mosaic of grasslands, spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and patches of aspen woodlands. Ridgetops and rock outcrops are occupied by alpine fellfield communities and patches of flagged spruce-fir krummholz and in low, protected swales lush herbaceous wetland meadows develop where late-lying snowfields provide a constant source of water.

Wetland characterization
Elevation (feet): 11,769
Aspect: 260°
Slope: 1.5%
Tile probe depth: 87cm
Peat depth: 87cm
Von Post peat classification: H5
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow is dominated by groundwater from surrounding south-, west- and north-facing slopes. Surface channel inflow is also evident from north-facing slopes. Additionally, abundant shallow surface flow occurs where groundwater discharges at topographic changes in gradient, such as occurs at the slope-basin intersect. Outflow occurs by both surface channel and groundwater flow.

Water Quality:

pH: 9.16

Conductivity (microsiemens): 8

Temperature (C^o): 18.6

Disturbance:

Type: Road in buffer.

Intensity: High to very high; hydrology is altered by a natural-surface road that is located at the crest of the ridgetop above the fen and >10m from wetland edge; the road is heavily used many times per week by ATVs.

Extent: covers <10% of buffer but impacts >30% of the local drainage basin.

Amphibian species present: none.
Avian species present: American pipit, White-crowned Sparrow, Lincoln's Sparrow.
Mammal species present: Elk (*Cervus elaphus*) (a large herd was present at this site).

Plant Communities:

1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation. Total cover 50% with 10% forbs and 40% graminoids; *E. quinqueflora* = 26% of graminoid cover, *Carex scopulorum* = 12%, other graminoids = 2%. Forb cover is dominated by elephantella (*Pedicularis groenlandica*).
2. Mesic forb herbaceous vegetation; 80% cover with forb 48% cover and 32% graminoid cover.
3. Russet sedge (*Carex saxatilis*) herbaceous vegetation (occupies depressions with shallow open water); 30% cover.
4. Mountain sedge (*Carex scopulorum*) herbaceous vegetation; 50% cover with 3% forbs and 47% graminoids.
5. Planeleaf willow/Mesic graminoid (*Salix planifolia/Mesic graminoid*) shrubland (occupies large hummocks)

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):

1) *Russet sedge (*Carex saxatilis*) herbaceous vegetation (occupies small depressions with shallow open water); 30% cover with 24% *C. saxatilis* and 6% *C. aquatilis*.
2) Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
3) Mountain sedge (*Carex scopulorum*) herbaceous vegetation; 50% cover with 3% forbs and 47% graminoids.
4) Planeleaf willow/Mesic graminoid (*Salix planifolia/Mesic graminoid*) shrubland (occupies large hummocks)

Other plant species present:

Eleocharis quinqueflora
Carex saxatilis
Carex canescens
Carex microptera
Carex scopulorum
Carex utriculata

Carex aquatilis
Deschampsia cespitosa
Saxifraga oregana
Caltha leptosepala
Pedicularis groenlandica
Senecio crocatus
Sedum rhodanthum
Salix planifolia
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 30946

Site Panorama (Clockwise from left): Starting Azimuth 0°, UTM E 347403/N 4324140

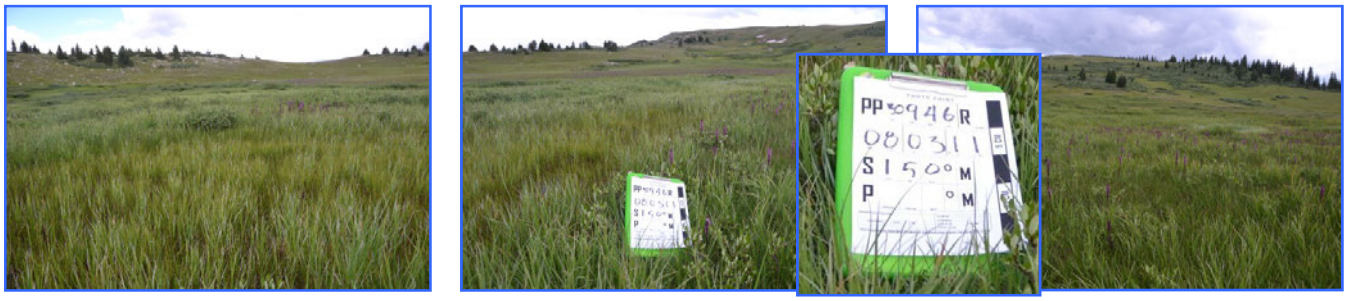
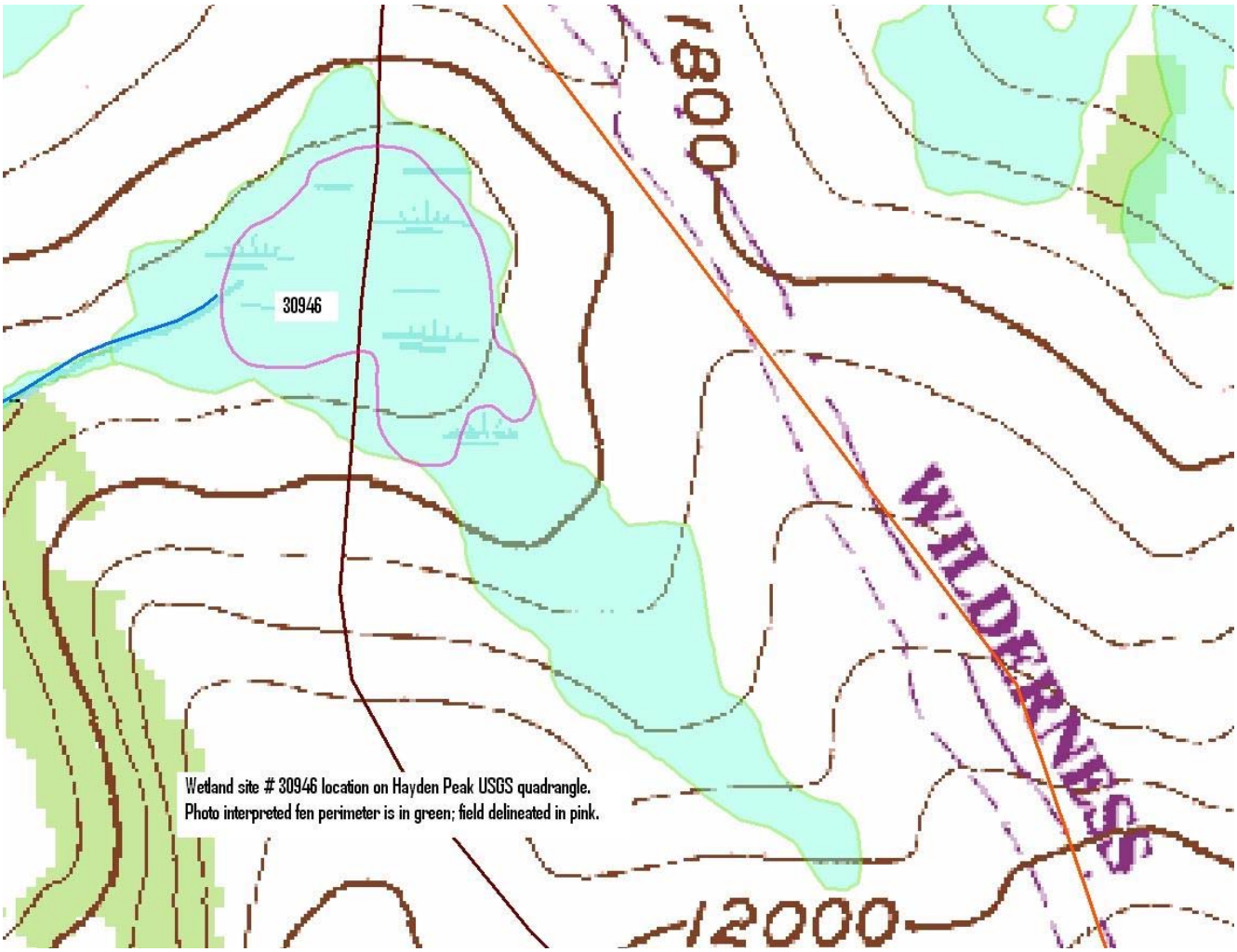


Photo Point: Azimuth of center photo 150 °, UTM E 347406/N 4324135

Soil Pit:UTM E 347404/N 4324139

A 4wd drive road alters fen hydrology.

Lush, mesic, herbaceous communities characterize this wetland fen.



Wetland site # 30946 location on Hayden Peak USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/3/2011
Wetland Site ID: 31802
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the lower alpine zone in the Sawatch Mountain Range on the west slope of the Continental Divide near the top of a wide, north-south trending ridge, Richmond Hill, which separates two, glacially carved valleys, Castle Creek valley to the west and the Difficult Creek valley to the east. This fen occurs on a high slope on the south end of the ridge on low-gradient, undulating, south-facing slopes that drain into the Taylor River watershed. Historic hardrock mining and associated development occurred extensively throughout this area from the 1880's through the early 1900's. Habitat alteration from historic mining and mining-related activities continue to impact the landscape as do current recreational use of mine roads.

Fen habitat is characterized by a mosaic of herbaceous, mesic meadows. Soils are saturated peat that have slumped to form microtopography of terraces and slopes, each with different communities; terraces are typically occupied by graminoid communities while a rich, lush cover of forbs typically occupies slopes. Small patches of willow (*Salix* spp.) occur along the fen perimeter and also along the riparian corridor of a stream that begins along the lower levels of the fen, and flows south. Uplands are an expansive mosaic of grasslands with outcrops of rock that are occupied by alpine fellfield communities, ridgetops with patches of flagged spruce-fir (*Picea engelmannii-Abies lasiocarpa*) krummholz and swales where herbaceous wetland meadows occur.

Wetland characterization
Elevation (feet): 12,038
Aspect: 90^{o} to 120^{o}; 190^{o}
Slope: southeast-facing 0% to 1% on terraces; 4% to 6% on slopes; southwest-facing 5% to 6%.
Tile probe depth: 90cm
Peat depth: 97cm
Von Post peat classification: H4
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow is dominated by groundwater with no evidence of surface channels into the wetland. Additionally, shallow surface flow occurs from shallow groundwater discharge at topographic gradient changes where soil slumping has created terrace/slope microtopography. Outflow occurs by way of a surface channel as well as by groundwater.
Water Quality:
pH: 9.71
Conductivity (microsiemens): 7
Temperature (C^{o}): 17.9

Disturbance:

Type: Historic livestock grazing

Intensity: Low; excessive bank slumping and soil erosion is healing and soils are stabilizing.

Extent: Covers all.

Amphibian species present: none.

Avian species present: White-crowned sparrow, American Pipit, Golden Eagle

Mammal species present: none.

Plant Communities:

1. Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.

   Total cover 60% with 6% forbs and 54% graminoids; E. quinqueflora = 38% of graminoid cover, other graminoids, especially C. scopulorum, C. microglochin, and C. canescens = 16% of graminoid cover; forb cover is dominated by elephantella (*Pedicularis groenlandica*) (occupies terraces). Bryophyte cover =80%.

2. Co-dominant: Mesic forb herbaceous vegetation (occupies slopes and hummocks).

   Total cover = 90% with 63% forbs and 27% graminoids. Bryophyte cover = 85%.

3. Co-dominant: Planeleaf willow/Marsh-marigold (*Salix planifolia/Caltha leptosepala*) shrubland.

   Total shrub cover = 80%; total herbaceous cover = 70% with 49% forbs and 21% graminoids. Bryophyte cover = 25%.

4. Mountain sedge (*Carex scopulorum*) herbaceous vegetation.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):

Planelef willow/Marsh-marigold (*Salix planifolia/Caltha leptosepala*) shrubland.

Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.

Other plant species present:

Carex canescens
Carex scopulorum
Carex microglochin
Carex microptera
Carex nova
Carex illota
Eleocharis quinqueflora
Juncus mertensianus
Pedicularis groenlandica
Caltha leptosepala
Sedum rhodanthum
Saxifraga oregana
Saxifraga odontoloma
Bistorta vivipara
Veronica wormskjoldii
Castilleja rhexifolia
Senecio crocatus
Viola adunca
Salix planifolia

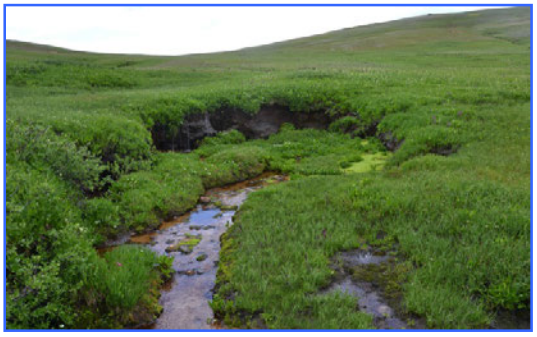
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 31802

Site Panorama (Clockwise from left): Starting Azimuth 30°, UTM E 349054/N 4322834

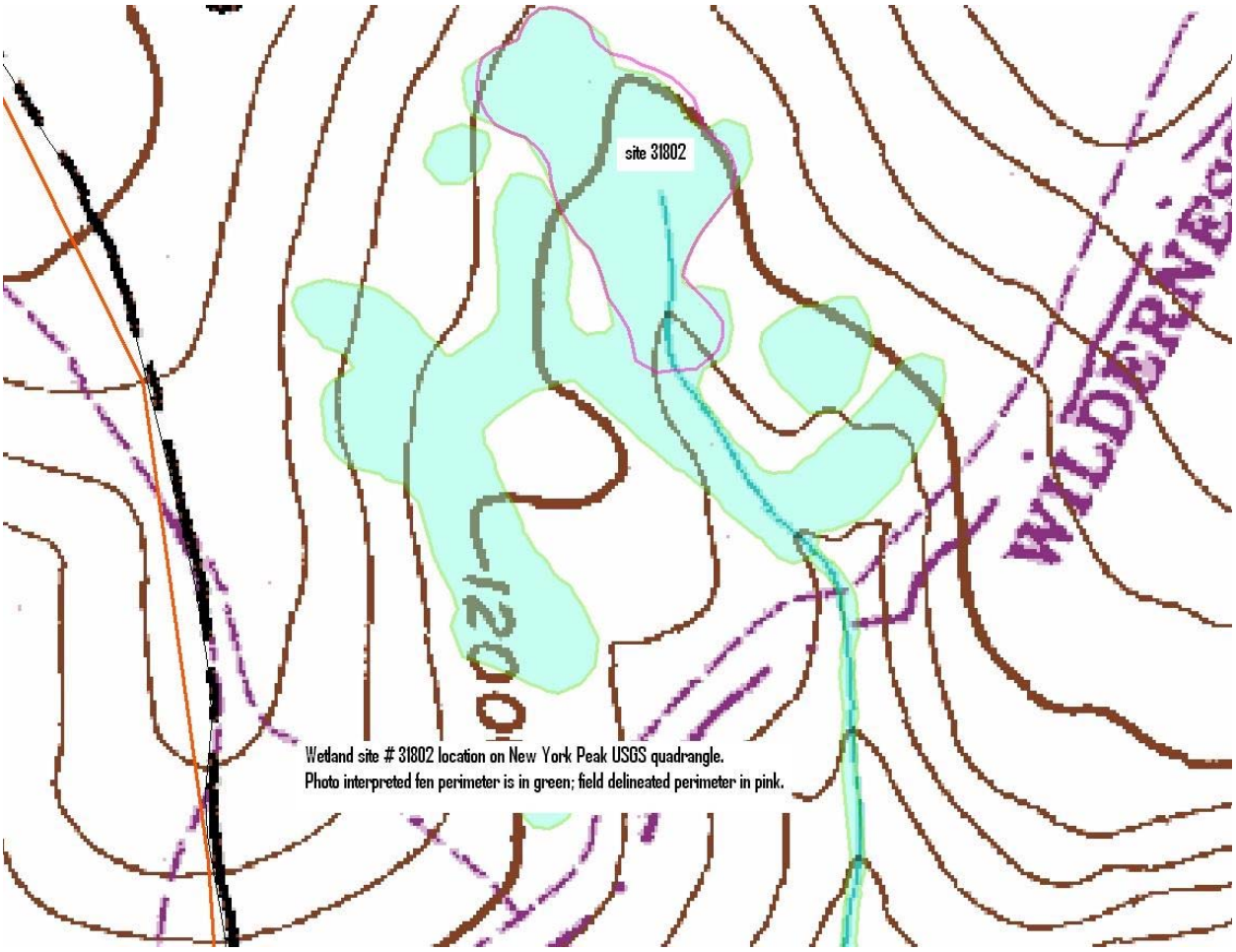
Photo Point: Azimuth of center photo 160 °, UTM E 349048 /N4322822

Soil Pit:UTM E 349058/N 4322820



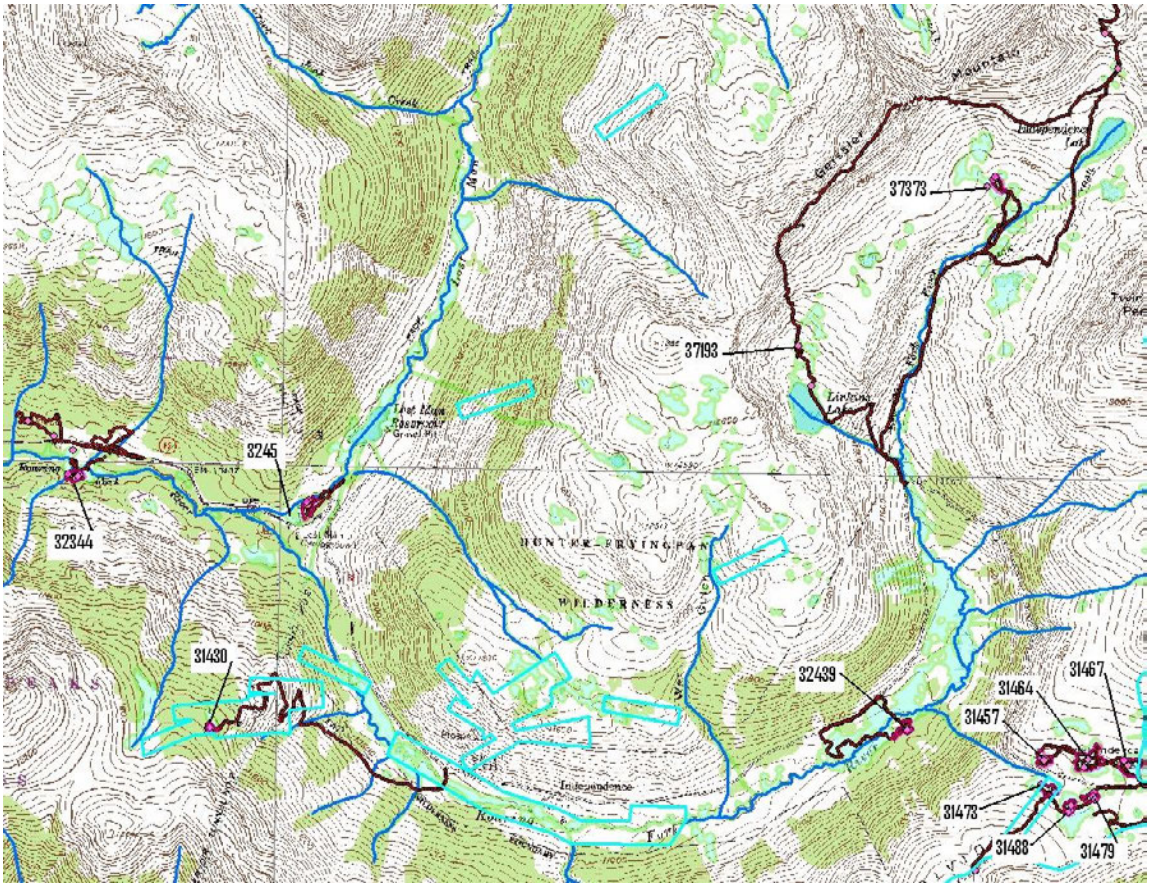
An un-named 1st order stream begins in this fen

Here, a deep accumulation of peat stores and releases the water that are the headwaters for this 1st order stream.



Wetland site # 31802 location on New York Peak USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

Aspen Ranger District: Upper Roaring Fork Watershed Overview Map



Upper Roaring Fork watershed fen survey sites in 2011: 32344, 31430, 32439, 3245, 37193, 37373, and at the top of Independence Pass 31467, 31464, 31457, 31473, 31488, 31479.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/4/2011
Wetland Site ID: 31430
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the upper subalpine zone on the west slope of the Sawatch Mountain Range in the upper Roaring Fork Watershed. This fen occurs mid-slope and occupies a glacially sculpted bench at the base of a steep, northeast facing, forested slope that drains to the Roaring Fork River which flows approximately 800 feet below this site. The historic mining town of Independence is located in the valley below this site. Hardrock mining and mining related activities impacted all of the surrounding habitat including this site.

Copious shallow groundwater flow from adjacent northeast facing slopes has resulted in saturated, slumping soils with a microtopography of alternating slopes and terraces that trend to the northwest. Fen plant communities vary with microtopography and soil characteristics, forming a mosaic of herbaceous graminoid and forb meadows and willow (*Salix* spp.) shrublands. Surrounding uplands are a mosaic of old growth spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest, herbaceous forb and graminoid meadows, avalanche chutes with pioneering willow and aspen (*Populus tremuloides*) shrublands, and boulder fields and cliff faces. Stream riparian habitat is characterized by dense willow cover and streams are structurally diverse with numerous beaver dams and ponds. Mine shafts, tailings and related development occupy slopes immediately below this fen site.

Wetland characterization
Elevation (feet): 11,658
Aspect: fen slopes 340^{o}; upland slopes at upland/terrace discharge zone slope 50^{o}.
Slope: 4% to 5%
Tile probe depth: 71cm
Peat depth: 72 cm
Von Post peat classification: H3/H4
Soil Characteristics: saturated peat with hummock formation on the perimeter of the fen.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Both shallow groundwater and surface flow (from groundwater discharge), that emanates from adjacent northwest-facing slopes, characterize inflow and outflow from this fen. Additionally, where sufficient water gathers at the north lower perimeter of the fen, a small channel has formed that contributes to outflow.

Water Quality:
pH: 8.0
Conductivity (microsiemens): 15
Temperature (C^{o}): 14.8
Disturbance:
Type: 1) Tracks from ATVs; 2) Human trails; and 3) Elk trampling.

Intensity: 1) Low; ATV tracks from 5-10 years ago continues to be visible in fen but is healing; 2) moderate; human trails used every year are getting deeper and wider; and 3) low; a few post-holes occurring occasionally but no bare soil or compaction.
Extent: 1) 50%; 2) <10%; and 3) covers all

Amphibian species present: none.
Avian species present: Pine grosbeak, Three-toed Woodpecker, Cassin's Finch, Dark-eyed Junco, Gray Jay.
Mammal species present: Elk (*Cervus elaphus*) sign, pine squirrel (Tamiasciurus hudsonicus).

Plant Communities:
1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies terraces).
Total cover 50% with 3% forbs and 47% graminoids;
2. Mesic forb herbaceous vegetation (occupies hummocks and fen perimeter).
Total cover =80% with 48% forbs and 32% graminoids.

Plant List:
CNHP Tracked, TEP or RFSS plant species (*appendix I):
*Russet cottongrass (*Eriophorum chamissonis*)
Other plant species present:
Carex scopulorum
Carex aquatilis
Carex nigricans
Carex nova
Carex illota
Carex saxatilis
Luzula parviflora
Juncus drummondii
Poa alpina
Deschampsia cespitosa
Trollius laxus
Pedicularis groenlandica
Senecio triangularis
Arnica mollis
Caltha leptosepala
Erigeron peregrinus
Gaultheria humifusa
Saxifraga odontoloma
Oxypolis fendleri
Swertia perennis
Veronica wormskjoldii
Anemone narcissiflora
Sedum rhodanthum
Salix planifolia
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 31430 (site was mis-labeled on photo card)

Site Panorama (Clockwise from left): Starting Azimuth 330 ^{o}, UTM point E359042/N4330305

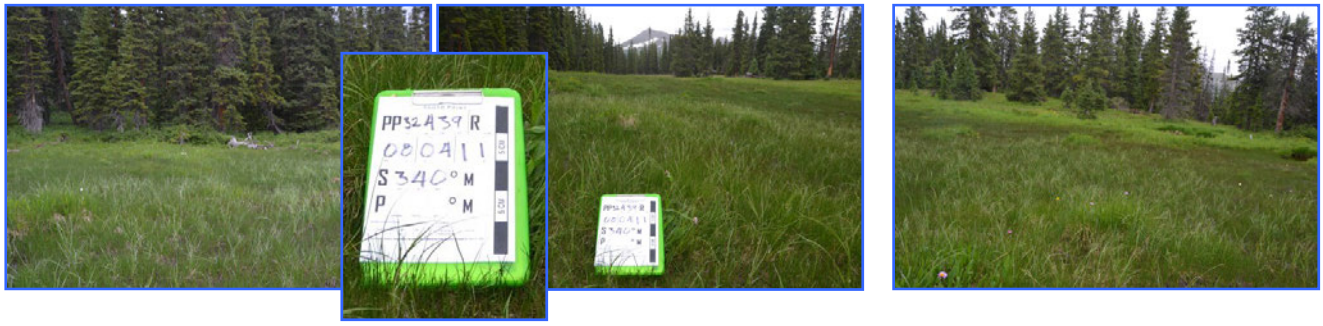
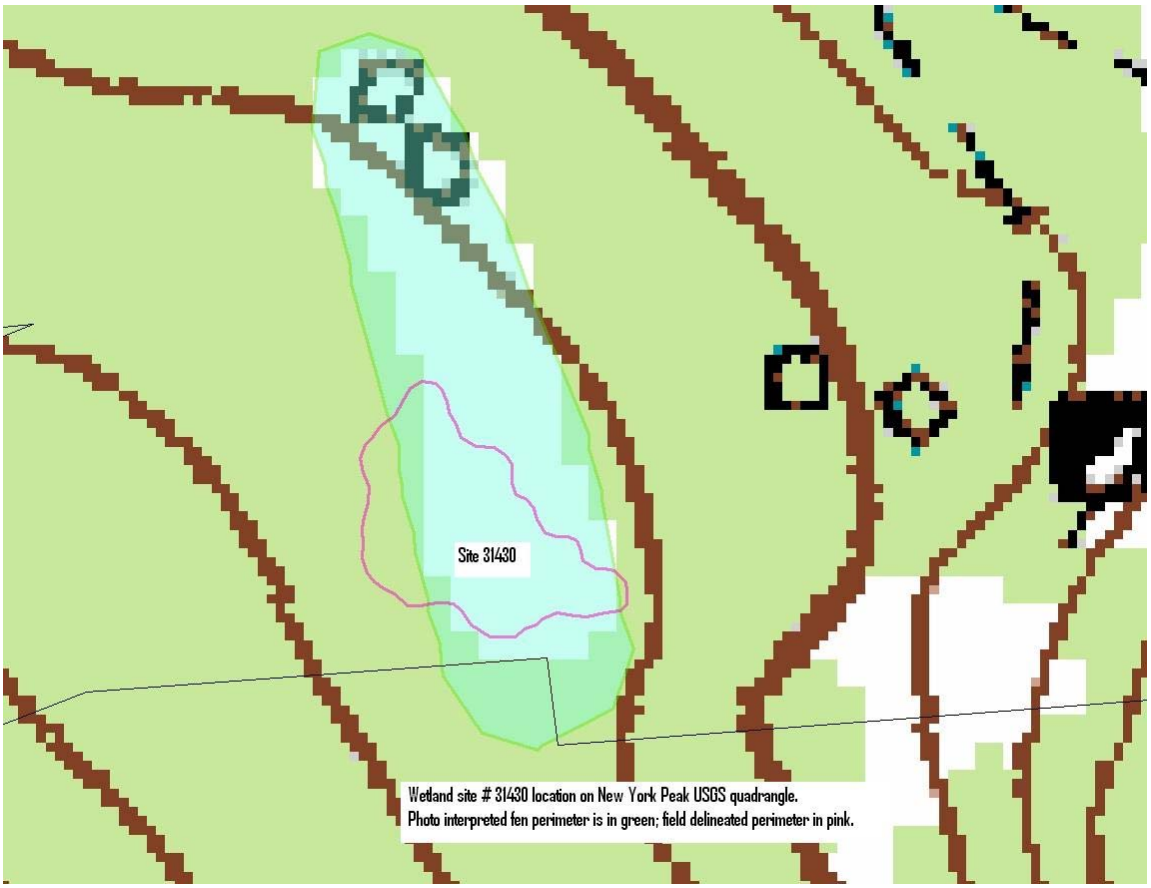


Photo Point: Azimuth of center photo 340 ^{o}, UTM point E359053/N4330297

Soil Pit:UTM E359048/N4330310

ATV tracks remain visible after many years.

Looking west , across the fen, toward Green Mountain .



Wetland site # 31430 location on New York Peak USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/15/2011
Wetland Site ID: 32344
Wetland Classification: Palustrine; emergent persistent/scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the subalpine zone in the Sawatch Range on the west slope of the Continental Divide in the upper reaches of the Roaring Fork watershed. Topographically the fen occupies a toeslope at the base of steep, glacially carved, mountain slopes on the valley floor. Here, along the banks of the Roaring Fork River, where the valley widens and gradient decreases, the fen functions as an ecotone between upland forest and stream habitat. Soils are deep peat that is saturated with shallow ground and surface water that emanates from adjacent north-facing slopes. Historically, prior to diversions out of the Roaring Fork, out-of-bank flows likely also contributed to fen hydrology.
Fen habitat is characterized by a complex mosaic of plant communities that vary with soil and moisture characteristics. Mesic shrublands with a dense moss layer dominate the fen but the site also includes mesic graminoid cover in saturated depressions and mesic forb and shrub cover on moss-covered hummocks. Upland habitat is a dominated by spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest with patches of aspen (*Populus tremuloides*) in forest openings and avalanche chutes. Riparian habitat is characterized by dense shrub cover of willow (Salix spp.) and alder (*Alnus incana*) with an overstory canopy that includes spruce, fir and aspen.

Wetland characterization
Elevation (feet): 10,385
Aspect: 0^{o}
Slope: 2.5% to 6%
Tile probe depth: 90cm
Peat depth: 95cm
Von Post peat classification: H3
Soil Characteristics:
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Inflow is dominated by groundwater from adjacent north-facing slopes. Additionally, at topographic changes in gradient copious shallow surface water occurs. Outflow occurs by both groundwater and surface channels.
Water Quality:
pH: 5.78
Conductivity (microsiemens): 63
Temperature (C^{o}): 19.0
Disturbance:
Type: 1) Hydrologic alteration due to stream dewatering; and 2) elk browse.
Intensity: 1) High; historic overbanking flows that contributed shallow ground and surface water to fen are diminished to absent; and 2) low; a few post-holes and animal trails are present but there is no bare soil or compaction.
Extent: 1) Covers all; and 2) covers all.

Amphibian species present: none
Avian species present: Red-naped Sapsucker, MacGillivray's Warbler, Wilson's Warbler, Fox Sparrow, Lincoln's Sparrow, Pine Grosbeak, Dark-eyed Junco, Stellar's Jay, Broad-tailed Hummingbird, Swainson's Thrush, Hermit Thrush, Tree Swallow,
Mammal species present: Elk (*Cervus elaphus*) sign, Mule deer (*Odocoileus hemionus*) sign, pine marten (*Martes americana*), pine squirrel (*Tamiasciurus hudsonicus*), mink (*Mustela vison*).

Plant Communities:
1) Dominant: Shrubby cinquefoil-Bog birch/Mesic graminoid (*Dasiphora floribunda- Betula nana* /Mesic graminoid) shrubland.
Total shrub cover 20%; *B.nana* = 6%, *D. floribunda* = 14%.
Total herbaceous cover = 70%; forb cover = 14%, graminoid cover = 56%.
Sphagnum spp. cover 70%.
2. Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation with 50% cover (occupies depressions).
3. Mesic graminoid-Mesic forb herbaceous vegetation (occupies hummocks with dense sphagnum cover).
4. Planeleaf willow/Mesic graminoid (*Salix planifolia*/Mesic graminoid) herbaceous vegetation (occupies perimeter of site and riparian habitat).
5. Bog birch/Mesic forb-Mesic graminoid (Betula nana/Mesic forb-Mesic graminoid) herbaceous vegetation.
6. Mountain sedge (*Carex scopulorum*) herbaceous vegetation with 50% cover.

Plant List:
CNHP Tracked, TEP or RFSS species or communities(*appendix I):
1)*Bristle-stalk sedge (*Carex leptalea*)
2) Bog birch/Mesic forb-Mesic graminoid (Betula nana/Mesic forb-Mesic gramnoid) herbaceous vegetation.
3) Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation with 0% cover.
Other plant species present:
Sphagnum warnstorfii
Carex capillaris
Carex paupercula
Carex scopulorum
Carex utriculata
Carex aquatilis
Carex nova
Carex microptera
Carex eleocharis
Carex saxatilis
Luzula parviflora
Deschampsia cespitosa
Danthonia intermedia
Calamagrostis canadensis

Swertia perennis
Caltha leptosepala
Sedum rhodanthum
Oxypolis fendleri
Viola adunca
Gentianopsis thermalis
Pedicularis bracteosa
Pedicularis groenlandica
Pedicularis sudetica scopulorum
Senecio triangularis
Trollius laxus
Cymopterus lemmonii
Bistorta vivipara
Thalictrum alpinum
Erigeron peregrinus
Geum macrophyllum
Potentilla diversifolia
Valeriana edulis
Salix planifolia
Betula nana
Dasiphora floribunda

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 32344

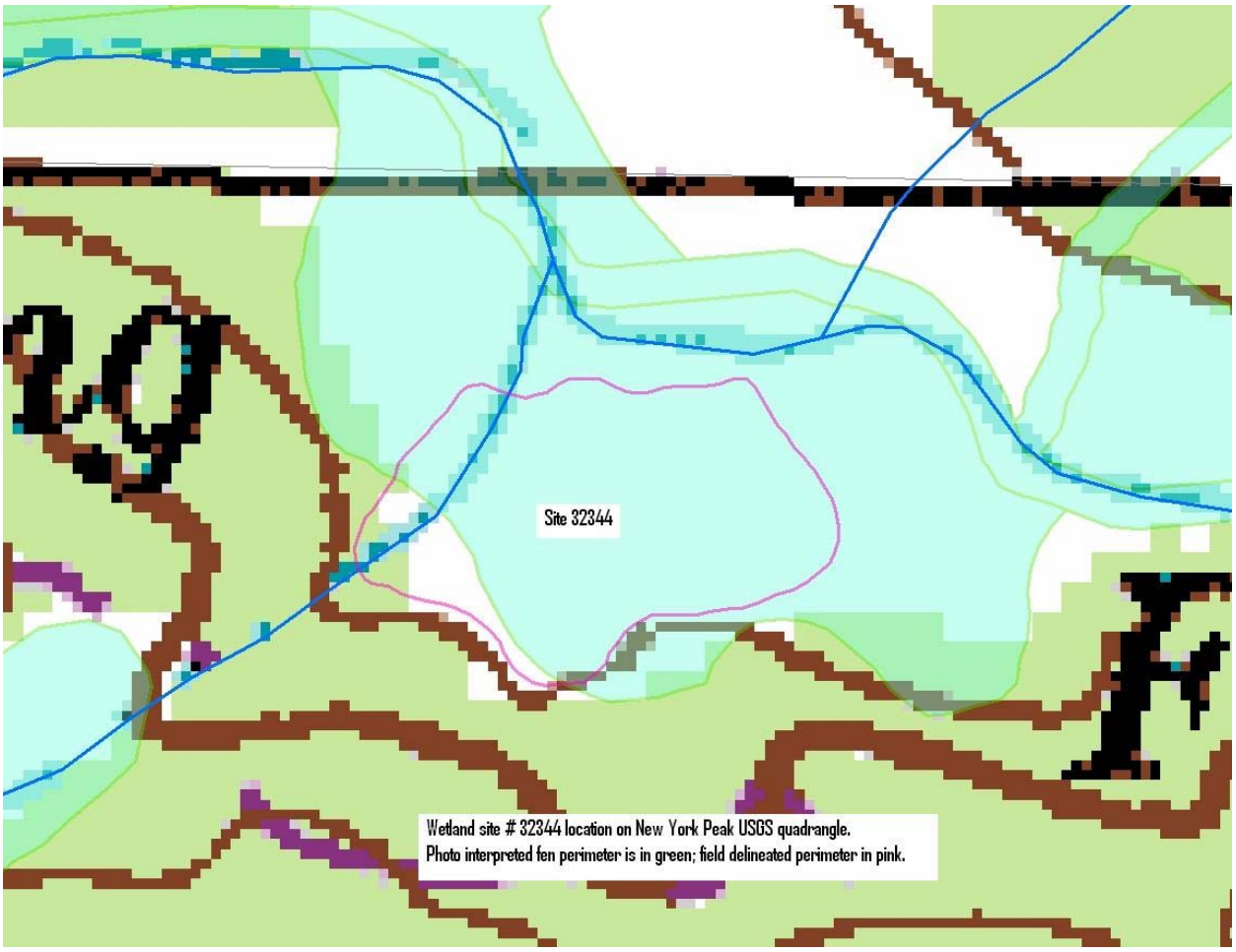
Site Panorama (Clockwise from left): Starting Azimuth 270°, UTM point E358246/N4331828

Photo Point: Azimuth of center photo 300 °, UTM point E358238/N 4331828

Soil Pit:UTM E358241/N4331835

Sphagnum spp. densely cover hummocks

Looking south, across the Roaring Fork River, to the fen.



Wetland site # 32344 location on New York Peak USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/2/2011
Wetland Site ID: 32439
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the upper subalpine zone on the west slope of the Sawatch Mountain Range in the upper Roaring Fork Watershed. Here, at the head of this glacially sculpted, U-shaped, steep-walled valley, the river flows, through a low-gradient valley floor. The fen occurs on a low slope just above the left bank of the Roaring Fork river and occupies an ecotone between steep forested slopes and dense riparian willow carrs.

Copious shallow groundwater flow from adjacent north-facing slopes has saturated soils, results slumping soils which has created microtopography of broad terraces and slopes. Plant communities vary with microtopography and soil characteristics, forming a mosaic of herbaceous graminoid and forb meadows and willow (*Salix* spp.) shrublands. Surrounding uplands are a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest, herbaceous forb and graminoid meadows, avalanche chutes with pioneering willow and aspen (*Populus tremuloides*) shrublands, and boulder fields and cliff faces. Stream riparian habitat is characterized by dense willow (*Salix* spp.) cover and stream habitat is structurally diverse with numerous beaver dams and ponds.

Wetland characterization
Elevation (feet): 11,176
Aspect: 250^{o} to 300^{o}
Slope: terraces = 1% to 2%; slopes = 4% to 12%.
Tile probe depth: 92 cm.
Peat depth: 100 cm.
Von Post peat classification: H2
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Both shallow groundwater and surface flow, from adjacent northwest-facing slopes, characterize inflow and outflow from this fen. Additionally, where sufficient water gathers at the lower perimeter of the fen, a small channel has formed that contributes to outflow.
Water Quality:
pH: 10.84
Conductivity (microsiemens): 174
Temperature (C^{o}): 19.6
Disturbance:
Type: 1) Historic road disturbance related to mining development at the Historic Townsite of Independence; and 2) Elk (*Cervus elaphus*) trampling.
Intensity: 1) low; site has largely recovered and 2) low; a few post holes and a few animal trails are apparent.
Extent: 1) covered entire site; and 2) covers entire site

Amphibian species present: none.
Avian species present: White-crowned sparrow, Wilson's Warbler, Lincoln's Sparrow, Pine Grosbeak, Hermit Thrush, Swainson's Thrush, Ruby-crowned Kinglet, Golden-crowned Kinglet, Mountain Chickadee, Three-toed Woodpecker, Dark-eyed Junco, American Robin.
Mammal species present: Elk (*Cervus elaphus*).

Plant Communities:
1. Dominant: Few-flowered spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies terraces).
    Total cover 50% with 5% forbs and 45% graminoids; *E. quinqueflora* = 36% of graminoid cover, other graminoids = 9%. Bryophyte cover = 40%.
2. Mesic graminoid herbaceous vegetation. Bryophyte cover = 80%.
3. Planeleaf willow/Mesic graminoid herbaceous vegetation (occupies perimeter of fen).

Plant List:
CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Sphagnum warnstorfii
Eleocharis quinqueflora
Eriophorum angustifolium
Carex scopulorum
Carex paupercula
Carex nigricans
Carex capillaris
Carex aurea
Carex microglochin
Deschampsia cespitosa
Parnassia fimbriata
Pedicularis sudetica scopulorum
Caltha leptosepala
Saxifraga odontoloma
Swertia perennis
Senecio crocatus
Bistorta vivipara
Oreoxis alpina
Limnorchis hyperborea
Zigadenus elegans
Sedum rhodanthum
Betula nana
Salix planifolia
Noxious weed species present (noxious weed form attached): None.

Photo Documentation Wetland Site # 32439

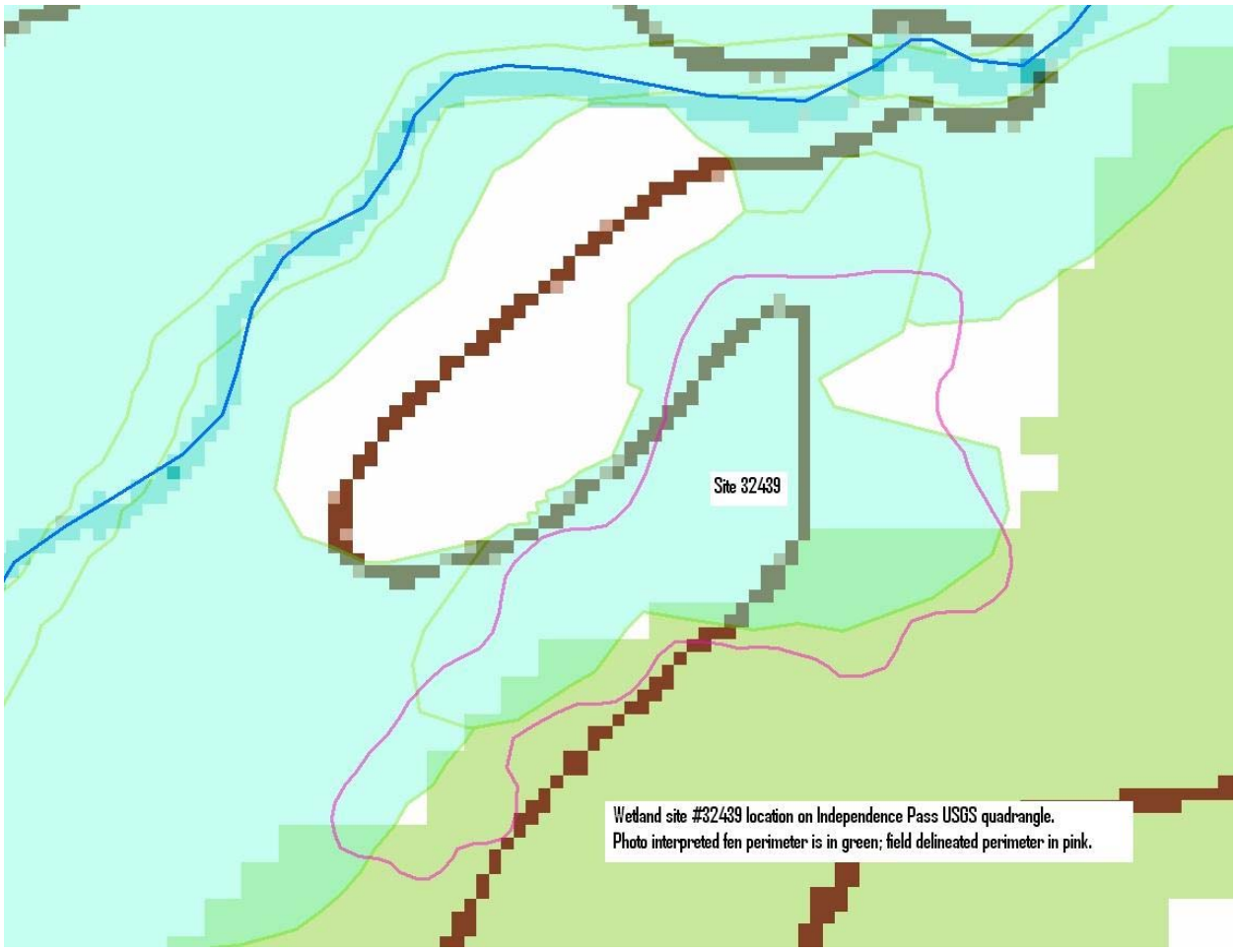
Site Panorama (Clockwise from left): Starting Azimuth 260°, UTM point E 363312/N4330294

Photo Point: Azimuth of center photo 260°, UTM point E 363302/4330292

Soil Pit:UTM E 363299/N4330292

Star gentian (*Swertia perennis*)

Copious shallow surface and groundwater flow from adjacent slopes maintains this fen.



Wetland site # 32439 location on Independence Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/1/2011
Wetland Site ID: 3245
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.

General Description: This wetland fen is located in the subalpine zone on the west slope of the Sawatch Mountain Range in the upper Roaring Fork Watershed. Topographically this fen occupies a toeslope on the left bank of Lost Man Creek just above the confluence with the Roaring Fork River. The Lost Man sub-watershed, where this fen is located, is a narrow, U-shaped, glacially carved, north-south trending valley with abundant water provided by snowmelt. Directly above this wetland and near the confluence with the Roaring Fork River, a dam, reservoir and ditch impound and divert the vast majority of flow from Lost Man Creek to the East slope of the Front Range via the Twin Lakes tunnel. This diversion dramatically alters the natural hydrologic regime including out-of-bank flows, thereby altering wetland function.

Soils at this fen site are a mosaic of hummocks and saturated peat which has slumped to create microtopography of alternating slopes and terraces. Habitat varies with microtopography in an intricate mosaic of herbaceous graminoid and forb meadows, willow (*Salix* spp.) and non-willow shrublands and open water. Lost Man Creek forms the north and downslope perimeter of the fen and receives shallow groundwater discharge from this wetland. Surrounding uplands are a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest, herbaceous forb and graminoid meadows, and avalanche chutes with willow and aspen (*Populus tremuloides*) shrublands. Stream riparian habitat is characterized by dense willow cover.

Wetland characterization
Elevation (feet): 10,538
Aspect: 220^{o} to 280^{o}
Slope: Terraces 0% to 1%; intervening slopes
Tile probe depth: 65cm
Peat depth: 58cm
Von Post peat classification: H4
Soil Characteristics: Saturated peat with hummocks.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from adjacent west-facing slopes dominates both inflow and outflow from this fen. At the downslope perimeter of the fen shallow ground and surface water discharge into Lost Man Creek.
Water Quality:
pH: 9.06
Conductivity (microsiemens): 40
Temperature (C^{o}): 16.6
Disturbance:
Type: 1)Dam and diversion ditch in wetland buffer upstream of fen; 2) Human trail in buffer; and 3) road in buffer downslope of fen.

Intensity: 1) Very high; dam and diversion severely alter hydrology below the dam site 2) low; high use human trail at wetland edge is getting deeper and wider each year and somewhat disrupts water flow and 3) low; paved road (Highway 82) crosses bottom of wetland buffer, somewhat disrupting water flow.
Extent: 1) Disturbs entire wetland; 2) covers<10%; and 3) covers <10%

Amphibian species present: none.
Avian species present: Wilson's Warbler, MacGillivray's Warbler, Lincoln's Sparrow, White-crowned Sparrow, Fox Sparrow, Gray Jay, Stellar's Jay, Dark-eyed Junco, Mountain Chickadee, Cassin's Finch.
Mammal species present: Pine marten (*Martes americana*), black bear (*Ursus americanus*), Mule deer (*Odocoileus hemionus*), Pine squirrel (*Tamiasciurus hudsonicus*), least chipmunk (*Tamias minimus*), golden-mantled ground squirrel (*Spermophilus lateralis*), western jumping mouse (*Zapus princeps*).

Plant Communities:
1) Co-dominant: Beaked sedge (*Carex utriculata*) herbaceous vegetation.
Total cover 50% with 10% forbs and 90% graminoids; C. utriculata = 72% of graminoid cover, Silvery sedge (*Carex canescens*) = 9%, and other graminoids = 9%.
2) Co-dominant: Bog birch/Mesic forb-Mesic graminoid (*Betula nana*/Mesic forb-Mesic graminoid) shrubland (occupies large hummocks).
Total shrub cover 60%; total herbaceous cover 50% with 30% forbs and 20% graminoids. Bryophyte cover 90%.
3. Few-flower (*Eleocharis quinqueflora*) spikerush herbaceous vegetation.
4. Planeleaf willow/Mesic graminoid (*Salix planifolia*/Mesic graminoid) herbaceous vegetation. Bryophyte cover = 30%

Plant List:
CNHP Tracked, TEP or RFSS communities or plant species (* appendix I):
1)Bog birch/Mesic forb-Mesic graminoid (*Betula nana*/Mesic forb-Mesic gramnoid) shrubland.
2)Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
Other plant species present:

Sphagnum warnstorfii
Carex utriculata
Carex canescens
Carex paupercula
Carex scopulorum
Carex aquatilis
Carex foetida var. vernacular
Carex athrostachya
Carex interior
Juncus drummondii
Juncus mertensianus
Juncus ensifolius
Luzula parviflora

Anaphalis margaritacea
Aconitum columbianum
Mertensia ciliata
Epilobium hornemannii
Sedum rhodanthum
Caltha leptosepala
Swertia perennis
Pedicularis groenlandica
Saxifraga oregana
Limnorchis dilatata
Conioselinum scopulorum
Erigeron peregrinus
Trollius laxus
Senecio triangularis
Viola adunca
Bistorta vivipara
Castilleja occidentalis
Pedicularis sudetica scopulorum
Veronica wormskjoldii
Senecio bigelovii
Pneumonanthe affinis
Salix planifolia
Betula nana
Dasiphora floribunda

Noxious weed species present (noxious weed form attached):

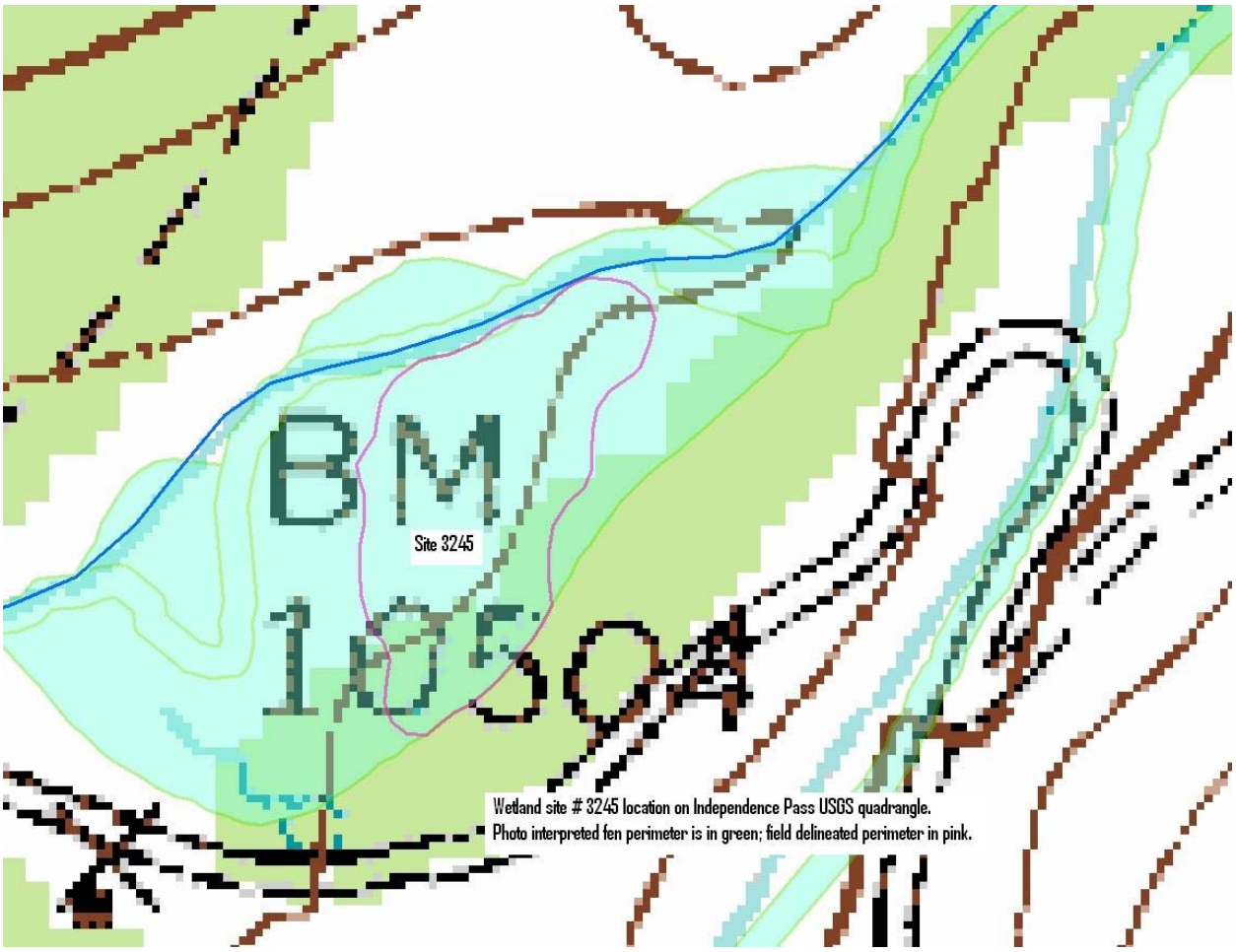
Photo Documentation Wetland Site # 3245

Site Panorama (Clockwise from left): Starting Azimuth 260°, UTM point E 359649/ 4331680

Photo Point: Azimuth of center photo 260 °, UTM point E 359642/N 4331685

Soil Pit:UTM E 359650/N 4331662

Looking southwest toward Green Mountain; a rich diversity of plant communities characterizes this fen.



Wetland site # 3245 location on Independence Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/2/2011
Wetland Site ID: 37193
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? No; although hydrologic and plant community characteristics are appropriate for fen formation and peat soils are present, because glaciation scraped away soils, there likely has been insufficient time in the particular environmental conditions to accumulate a depth of peat that qualifies the site for fen status.

General Description: This wetland is located in the alpine zone in a glacial cirque, above a hanging lake on the west slope of the Continental Divide in the Sawatch Mountain Range. Topographically, this fen occupies a low slope at the base of a steep arête. During the last ice age of the Pleistocene, local glaciers carved this steep-walled cirque, and hanging lake above the valley where the headwaters of the Roaring Fork River arise.

This ecologically transitional landscape is characterized by a rich mosaic of upland and wetland and subalpine and alpine ecosystems. Wetlands are a mosaic of herbaceous wet meadows and fens, riparian shrublands and open water tarns. Uplands are a patchwork of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and krummholz, herbaceous meadow communities including mixed forb, tufted hairgrass (*Deschampsia cespitosa*) and super turf (*Kobresia myosuroides*) meadows, willow (*Salix* spp.) shrublands, and fellfields, boulder fields and cliff faces.

Snowmelt provides the most important source of moisture for wetland and fen development in this north-south trending valley. Wetland habitat here is characterized by a rich mosaic of herbaceous graminoid and forb communities and shrublands. Saturated soils have formed solifluction terraces, behind where melt water accumulates and peat soils have formed. Shallow ground and surface water flows through these fens, discharging at changes in topographic gradient, filling the glacial tarn that is Linkin's Lake and the streams that are headwaters for the Roaring Fork River.

Wetland characterization
Elevation (feet): 12,184
Aspect: 180^{o}
Slope: 2% to 5%
Tile probe depth: 10cm
Peat depth: 10cm
Von Post peat classification: na
Soil Characteristics: shallow peat to a depth of 10cm then muck.
Organic/Mineral content percent:
Soil gley in upper 40cm? na
Water source and flow direction characteristics: na.

Water Quality: na

pH: na

Conductivity (microsiemens): na

Temperature (C^o): na

Disturbance:

Type: Human trails

Intensity: Low to moderate; a few trails are visible and used every year; these social trails are getting deeper and bare soil is above normal limits.

Extent: covers <10 % of the site.

Amphibian species present: None.

Avian species present: White-crowned sparrow, Lincoln's Sparrow, Wilson's Warbler,

Mammal species present: Yellow-bellied Marmot (*Marmota flaviventris*) and Pika (*Ochotona princeps*) in adjacent boulder fields.

Plant Communities:

1) Dominant: Few-flowered spikerush (*Eleocharis quinqueflora*) herbaceous vegetation

2. Mesic forb herbaceous vegetation.

3. Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): None.

Other plant species present:

Eleocharis quinqueflora
Carex scopulorum
Juncus drummondii
Carex illota
Carex nova
Carex saxatalis
Kobresia myosuroides
Caltha leptosepala
Pedicularis sudetica scopulorum
Pedicularis groenlandica
Sedum rhodanthum
Saxifraga oregana
Saxifraga rhomboidea
Trollius laxus
Anemone narcissiflora
Castilleja occidentalis
Oreoxis alpina
Bistorta bistortoides
Bistorta vivipara
Castilleja occidentalis
Salix planifolia
Kalmia microphylla

Noxious weed species present (noxious weed form attached): None.

Photo Documentation Wetland Site # 37193

Soil Pit:UTM E 362635/N 4332632

Left photo: looking south, down into the cirque and Linkin's Lake.
Right photo: slope wetlands with shallow peat have developed on the perimeter of Linkin's Lake.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/2/2011
Wetland Site ID: 37373
Wetland Classification: Palustrine; emergent persistent; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the lower alpine zone in a glacially sculpted, north-south trending valley on the west slope of the Continental Divide in the Sawatch Mountain Range. Topographically, this fen occupies a low-gradient bench at the base of a steep arête. During the last ice age of the Pleistocene, local glaciers carved this steep-walled valley, with broad benches and cirques that is the landscape where the headwaters of the Roaring Fork River arise. Here an abundance of wetlands and tarns have developed in response to climate and topography interacting with natural communities.

This ecologically transitional landscape is characterized by a rich mosaic of upland and wetland and subalpine and alpine ecosystems. Wetlands are a mosaic of herbaceous wet meadows and fens, riparian shrublands and open water tarns. Uplands are a patchwork of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and krummholz, herbaceous meadow communities including mixed forb, tufted hairgrass (*Deschampsia cespitosa*) and super turf (*Kobresia myosuroides*) meadows, willow (*Salix* spp.) shrublands, and fellfields, boulder fields and cliff faces.

Snowmelt provides the most important source of moisture for wetland and fen development in this north-south trending valley. Fen habitat here is characterized by a rich mosaic of herbaceous graminoid and forb communities and shrublands. Saturated soils have formed solifluction terraces, behind where melt water accumulates and fens have formed. Shallow ground and surface water flows through these fens, discharging at changes in topographic gradient, forming the streams that are the headwaters for the Roaring Fork River.

Wetland characterization
Elevation (feet): 12,309
Slope: 9% to 10%
Tile probe depth: 90cm
Peat depth: 90cm
Von Post peat classification: H3
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from snowmelt on surrounding northwest-facing slopes, dominates both inflow and outflow. However, shallow surface flow also exists where decreases in topographic gradient occurs such as on terraces. Sites where shallow surface flow occur are marked by changes in plant community characteristics. Additionally, although there is no evidence of surface channel inflow to the fen, surface channel outflow occurs via several small channels that have developed into streams towards the lower perimeter of the fen.

Water Quality:

pH: 10.3

Conductivity (microsiemens): 14

Temperature (C^o): 15.9

Disturbance: none.

Type: na

Intensity: na

Extent: na

Amphibian species present: none.

Avian species present: White-crowned Sparrow, White-tailed Ptarmigan, and Brown-capped Rosy Finch on high ridges to the northwest.

Mammal species present: Elk (*Cervus elaphus*), Bighorn sheep (*Ovis canadensis*) on high ridges to the northwest, Yellow-bellied Marmot (*Marmota flaviventris*) and Pika (*Ochotona princeps*) in adjacent boulder fields.

Plant Communities:

1. Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.

   Total cover 50% with 5% forb and 45% graminoids; E. quinqueflora = 31% of graminoid cover, Carex scopulorum = 11%, other mixed graminoids = 2%. Forb cover dominated by elephantella (Pedicularis groenlandica) and marsh marigold (Caltha leptosepala)

2. Co-dominant: Marsh marigold (*C. leptosepala*) herbaceous vegetation.

   Total cover 90% with 81% forbs and 9% graminoids.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I):

*James' snowlover (*Chionophila jamesii*) on adjacent upland slopes.

Other plant species present:

Eleocharis quinqueflora
Carex scopulorum
Juncus drummondii
Carex illota
Carex nova
Carex saxatalis
Kobresia myosuroides
Caltha leptosepala
Pedicularis sudetica scopulorum
Pedicularis groenlandica
Sedum rhodanthum
Saxifraga oregana
Saxifraga rhomboidea
Trollius laxus
Anemone narcissiflora
Castilleja occidentalis
Oreoxis alpina
Bistorta bistortoides
Bistorta vivipara
Castilleja occidentalis

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 37373

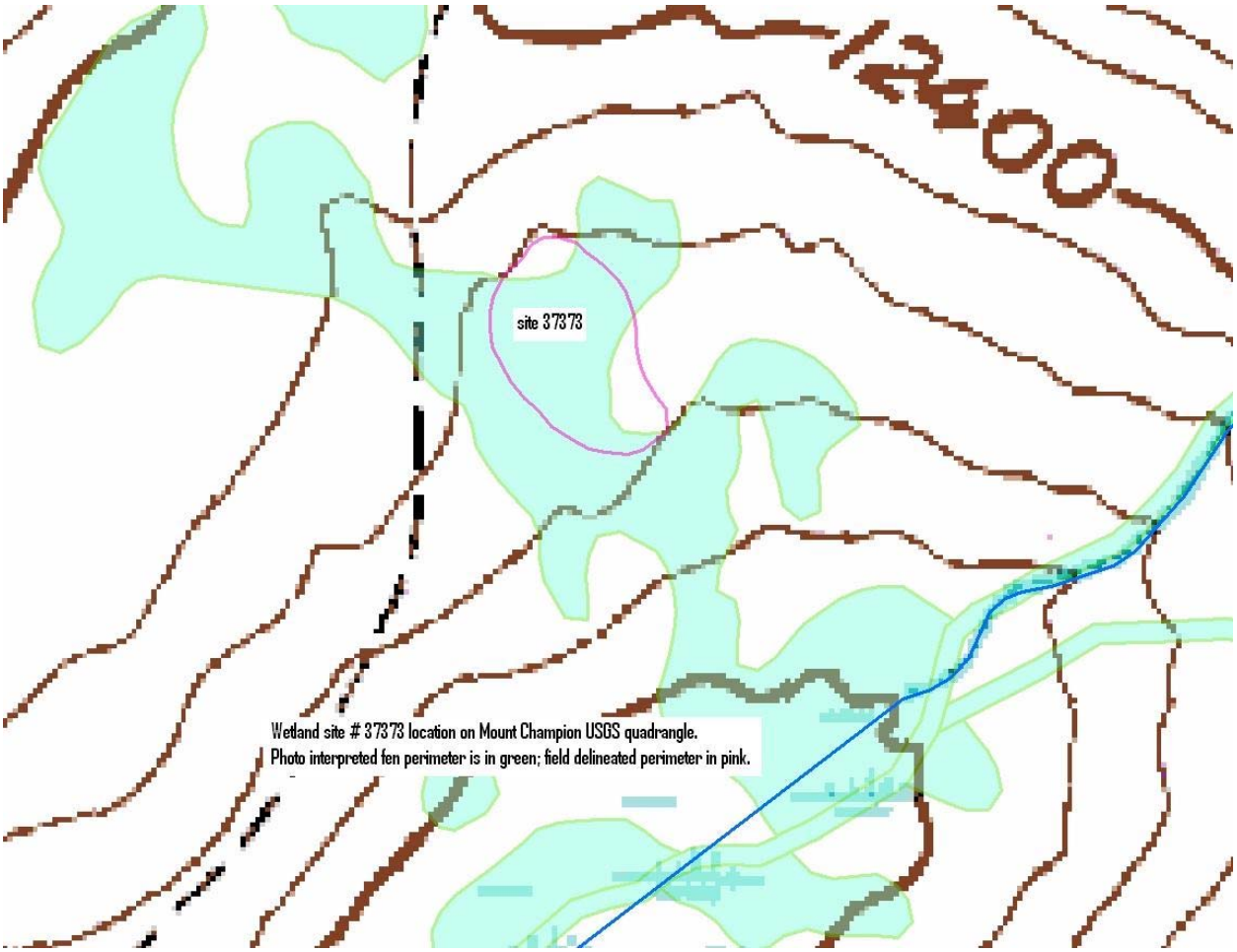
Site Panorama (Clockwise from left): Starting Azimuth 90°, UTM point E 363824/N4333642

Photo Point: Azimuth of center photo 170 °, UTM point E 363833/N4333660

Soil Pit:UTM E 363843/N4333655

Headwaters of the Roaring Fork River

Looking south into the fen and beyond to Roaring Fork Watershed



Wetland site #37373 location on Mount Champion USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/30/2011
Wetland Site ID: 31457
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the alpine zone on Independence Pass in the Sawatch Range on the west slope of the Continental Divide at the headwaters of the Roaring Fork Watershed. Topographically this fen occupies a gently inclined high slope on a saddle that is Independence Pass. This site was likely not glaciated during the Pleistocene ice age, lying above the ice fields that sculpted the steep walls of the Roaring Fork valley below. Gently rolling mountaintops, with steep, glacially sculpted mountain sides and dramatic cirques characterize the landscape in the immediate vicinity of Independence pass.

Gently undulating slopes, an alpine climate and animal activity have acted together to created a complex microtopography that has resulted in a rich habitat mosaic of wetlands and tarns, forb and turf meadows, fellfields, boulder fields and scree and talus slopes. Snowmelt and permafrost provide the most important sources of moisture for wetland and fen development in this alpine environment. These environmental conditions provide a constant and consistent source of moisture that enables the development of peat which insulates and preserves the underlying permafrost. Here, at the top of Independence Pass, due to the interaction of natural communities, climate, and topography a complex of fens have developed. Fen habitat here is characterized by a mosaic of herbaceous graminoid and forb communities and shrublands that have developed in response to soil and moisture conditions. Saturated soils have formed solifluction terraces and lobes, behind which melting water accumulates and fens have formed.

Wetland characterization
Elevation (feet): 12,035
Aspect: 220^{o}
Slope: terraces =0%, intervening slopes 8-9%.
Tile probe depth: 85cm
Peat depth: 70cm
Von Post peat classification: H4
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from snowmelt on adjacent southwest facing slopes dominates both inflow and outflow. There is no evidence of surface flow into or out of the fen but surface channels do traverse adjacent upland habitat.
Water Quality:
pH: 9.89
Conductivity (microsiemens): 3
Temperature (C^{o}): 26.6

Disturbance:

Type: Constructed road (Hwy 82) in buffer downslope of fen site.
Intensity: Moderate intensity: alters hydrology through this entire slope increasing drainage.
Extent: covers <10% of buffer but impacts entire slope.

Amphibian species present: none.
Avian species present: White-crowned Sparrow with nestlings, Horned Lark, American Pipit, White-tailed Ptarmigan.
Mammal species present: Mule deer (*Odocoileus hemionus*)

Plant Communities:

1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 50% with 10% forbs and 90% graminioids; *E. quinqueflora* = 54%, Mountain sedge (*Carex scopulorum*) = 27% and other graminoids = 9%.
2. Co-dominant: Mesic forb herbaceous vegetation
   Total cover 70% with 49% forbs and 21% graminoids.
3. Co-dominant: Planeleaf willow-Barrenground willow/Mesic forb (*Salix planifolia-S. brachycarpa*/Mesic forb) shrubland.
   Total shrub cover 80%; total herbaceous cover 50% with 35% forbs and 15% graminoids.
4. Co-dominant: Mesic graminoid herbaceous vegetation.
   Total cover 70% with 7% forbs and 63% graminoids.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Eleocharis quinqueflora
Carex scopulorum
Carex aquatilis
Carex nova
Carex microptera
Juncus mertensianus
Juncus longistylis
Juncus drummondii
Deschampsia cespitosa
Pedicularis groenlandica
Pedicularis sudetica scopulorum
Erigeron peregrinus
Penstemon whippleanus
Trollius laxus
Anemone narcissiflora
Anemone multifida
Sedum rhodanthum
Potentilla diversifolia
Caltha leptosepala

Oreoxis alpina
Artemesia scopulorum
Senecio crocatus
Castilleja rhexifolia
Castilleja occidentalis
Senecio triangularis
Bistorta bistortoides
Bistorta vivipara
Viola adunca
Veronica wormskjoldii
Salix planifolia
Salix brachycarpa

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 31457

Site Panorama (Clockwise from left): Starting Azimuth 120°, UTM point E 364142/N4330117

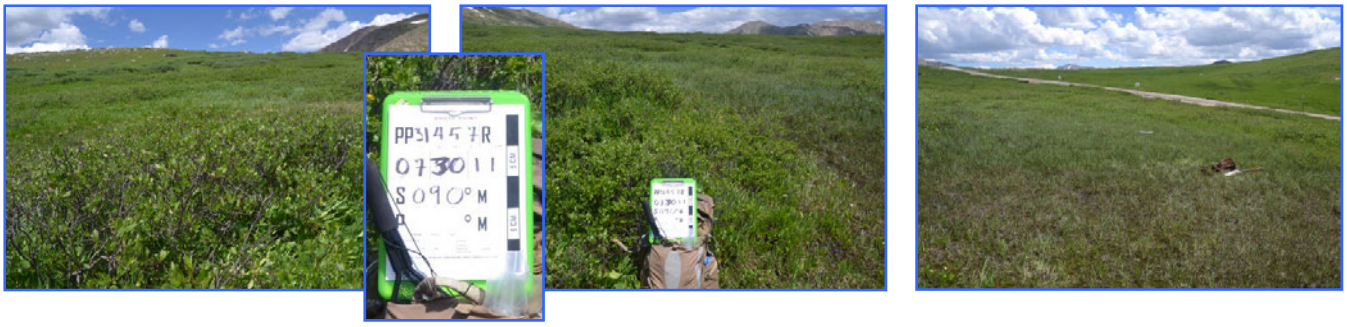
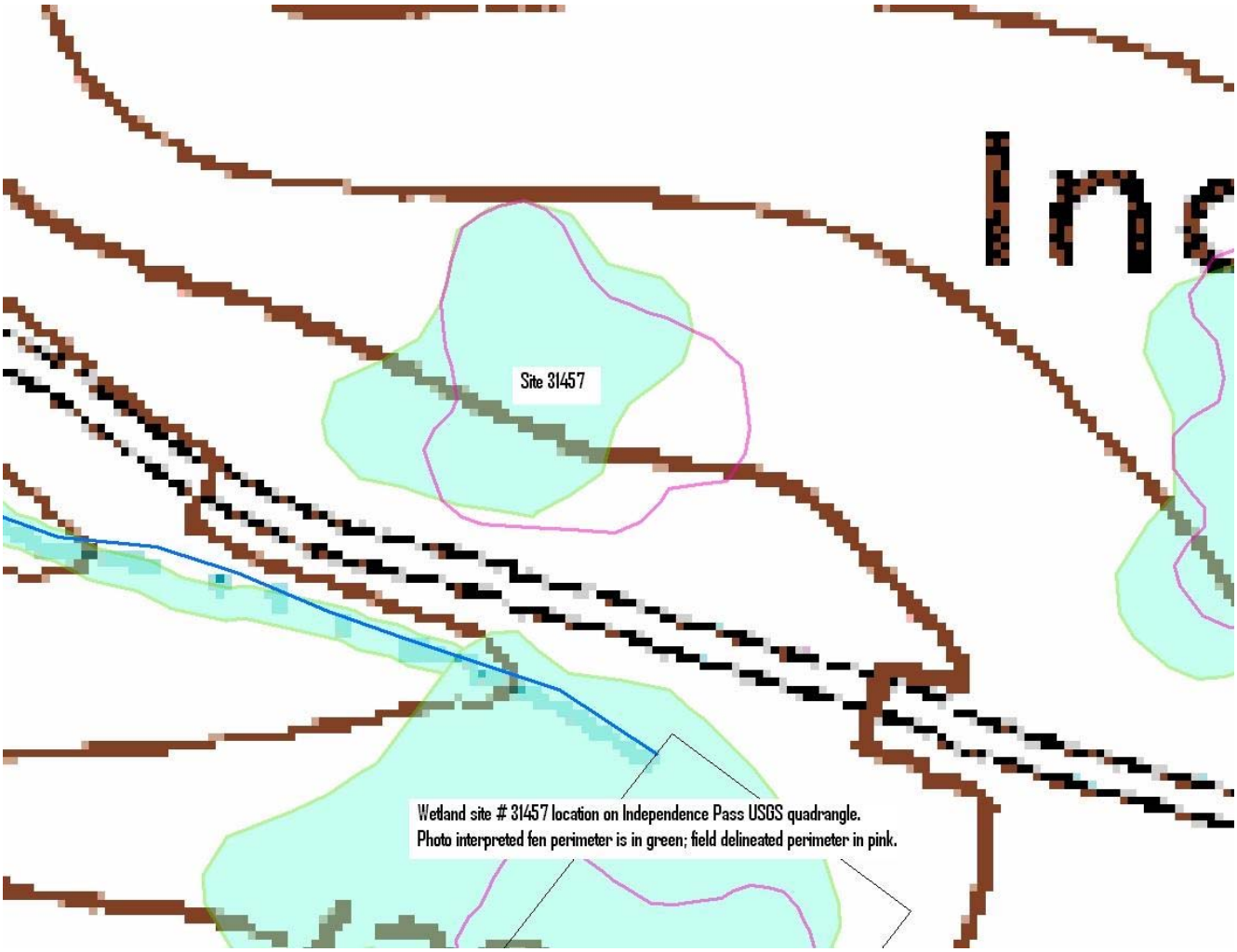


Photo Point: Azimuth of center photo 90 °, UTM point E 364132/N4330113

Soil Pit:UTM E 364134/N4330108

Wildflowers are abundantly rich in these fens



Wetland site #31457 location on Independence Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/30/2011
Wetland Site ID: 31464
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the alpine zone on Independence Pass in the Sawatch Range on the west slope of the Continental Divide at the headwaters of the Roaring Fork Watershed. Topographically this fen occupies a gently inclined high slope on a saddle that is Independence Pass. This site was likely not glaciated during the Pleistocene ice age, lying above the ice fields that sculpted the steep walls of the Roaring Fork valley below. Gently rolling mountaintops, with steep, glacially sculpted mountain sides and dramatic cirques characterize the landscape in the immediate vicinity of Independence pass.

Gently undulating slopes, an alpine climate and animal activity have acted together to created a complex microtopography that has resulted in a rich habitat mosaic of wetlands and tarns, forb and turf meadows, fellfields, boulder fields and scree and talus slopes. Snowmelt and permafrost provide the most important sources of moisture for wetland and fen development in this alpine environment. These environmental conditions provide a constant and consistent source of moisture that enables the development of peat which insulates and preserves the underlying permafrost. Here, at the top of Independence Pass, due to the interaction of natural communities, climate, and topography a complex of fens have developed. Fen habitat here is characterized by a mosaic of herbaceous graminoid and forb communities and shrublands that have developed in response to soil and moisture conditions. Saturated soils have formed solifluction terraces and lobes, behind which melting water accumulates and fens have formed.

Wetland characterization
Elevation (feet): 12,078
Aspect: 240 ^{o}
Slope: terraces <1%; slopes 8%.
Tile probe depth: 105cm
Peat depth: 82cm
Von Post peat classification: H5
Soil Characteristics: saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from snowmelt on adjacent southwest facing slopes dominates both inflow and outflow. There is no evidence of surface flow into or out of the fen but surface channels do traverse adjacent upland habitat.
Water Quality:
pH: 8.78
Conductivity (microsiemens): 10
Temperature (C^{o}): 22.4

Disturbance:

Type: Constructed road (Hwy 82) in buffer downslope of fen.
Intensity: Moderate intensity: alters hydrology through this entire slope increasing drainage.
Extent: covers <10% of buffer but impacts entire slope.

Amphibian species present: none.
Avian species present: White-crowned Sparrow with nestlings, Horned Lark, American Pipit, White-tailed Ptarmigan.
Mammal species present: Mule deer (*Odocoileus hemionus*)

Plant Communities:

1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 50% with 10% forbs and 90% graminioids; *E. quinqueflora* = 54%, *C. scopulorum* = 27% and other graminoids = 9%.
2. Co-dominant: Mesic forb herbaceous vegetation
   Total cover 70% with 49% forbs and 21% graminoids.
3. Co-dominant: Planeleaf willow-Shortfruit willow/Mesic forb (*Salix planifolia-S. brachycarpa*/Mesic forb) shrubland.
   Total shrub cover 80%; total herbaceous cover 50% with 35% forbs and 15% graminoids.
4. Co-dominant: Mesic graminoid herbaceous vegetation.
   Total cover 70% with 7% forbs and 63% graminoids.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I):none.
Other plant species present:
CNHP Tracked, TEP or RFSS plant species (forms attached): none.
Other plant species present:
Eleocharis quinqueflora
Carex scopulorum
Carex aquatilis
Carex nova
Carex microptera
Juncus mertensianus
Juncus longistylis
Juncus drummondii
Deschampsia cespitosa
Pedicularis groenlandica
Pedicularis sudetica scopulorum
Erigeron peregrinus
Penstemon whippleanus
Trollius laxus
Anemone narcissiflora
Sedum rhodanthum
Potentilla diversifolia

Caltha leptosepala
Oreoxis alpina
Artemesia scopulorum
Senecio crocatus
Castilleja rhexifolia
Castilleja occidentalis
Senecio triangularis
Bistorta bistortoides
Bistorta vivipara
Viola adunca
Veronica wormskjoldii
Salix planifolia
Salix brachycarpa

Noxious weed species present (noxious weed form attached): none.

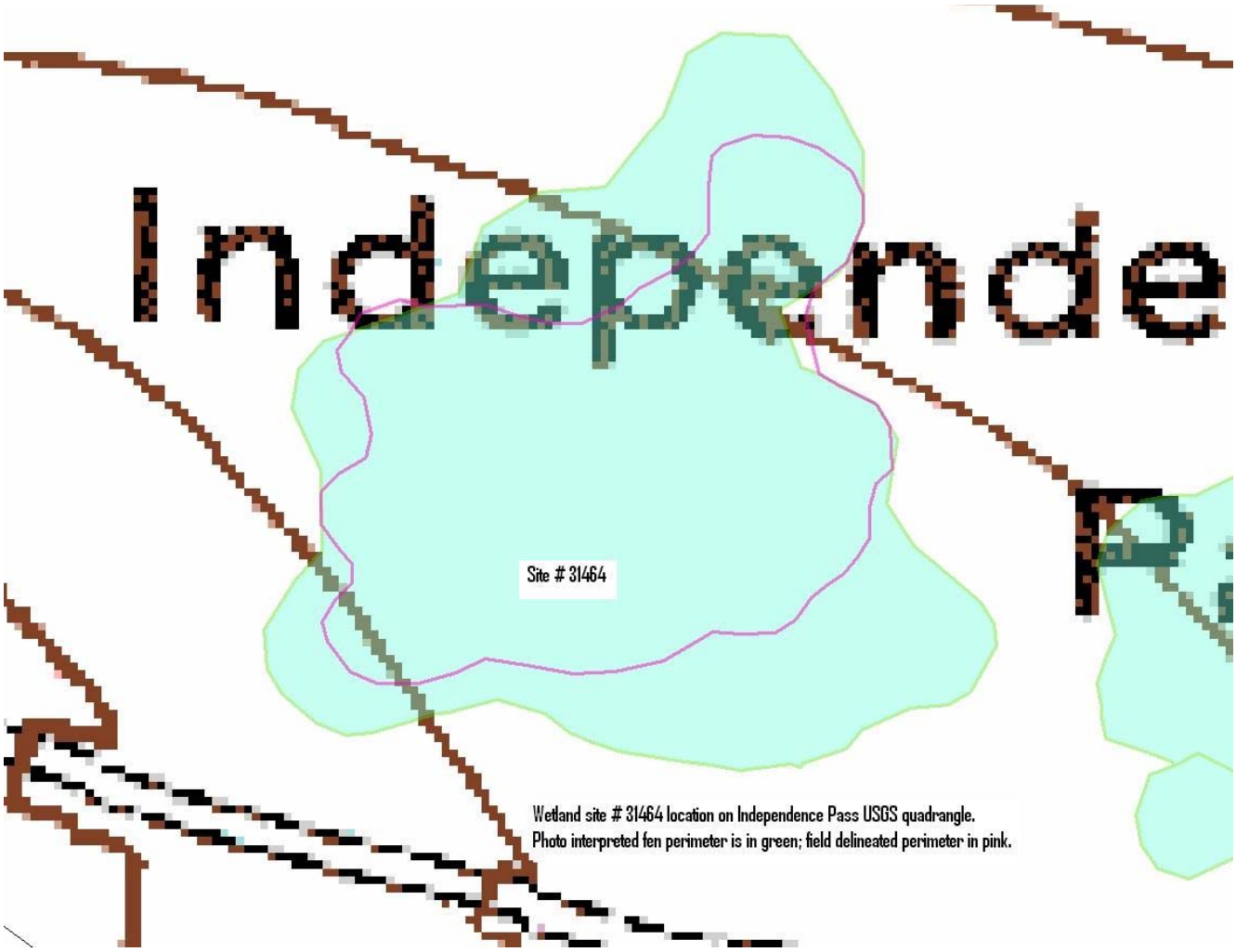
Photo Documentation Wetland Site # 31464

Site Panorama (Clockwise from left): Starting Azimuth 210°, UTM point E 364382/N 4330070

Photo Point: Azimuth of center photo 120 °, UTM point E 364379/N 4330072

Soil Pit:UTM point E 364376/N4330071

Small tarns are scattered throughout the fen.



Wetland site # 31464 location on Independence Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 7/30/2011
Wetland Site ID: 31467
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the alpine zone on Independence Pass in the Sawatch Range on the west slope of the Continental Divide at the headwaters of the Roaring Fork Watershed. Topographically this fen occupies the high slope on a saddle that is Independence Pass. This site was likely not glaciated during the Pleistocene ice age, lying above the ice fields that sculpted the steep walls of the Roaring Fork valley below. Gently rolling mountaintops, with steep, glacially sculpted mountain sides and dramatic cirques characterize the landscape in the immediate vicinity of Independence pass.

Gently undulating slopes, an alpine climate and animal activity have acted together to created a complex microtopography that has resulted in a rich habitat mosaic of wetlands and tarns, forb and turf meadows, fellfields, boulder fields and scree and talus slopes. Snowmelt and permafrost provide the most important sources of moisture for wetland and fen development in this alpine environment. These environmental conditions provide a constant and consistent source of moisture that enables the development of peat which insulates and preserves the underlying permafrost. Here, at the top of Independence Pass, due to the interaction of natural communities, climate, and topography a complex of fens have developed. Fen habitat here is characterized by a mosaic of herbaceous graminoid and forb communities and shrublands that have developed in response to soil and moisture conditions. Saturated soils have formed solifluction terraces and lobes, behind which melting water accumulates and fens have formed.

Wetland characterization
Elevation (feet): 12,037
Aspect: 200^{o}
Slope: 0% on terraces; 6% on slopes
Tile probe depth: 78cm
Peat depth: 78cm
Von Post peat classification: H6
Soil Characteristics:
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from snowmelt on adjacent southwest facing slopes and also likely permafrost dominate both inflow and outflow. There is no evidence of surface flow into or out of the fen but surface channels do traverse adjacent upland habitat.

Water Quality:

pH: 8.46

Conductivity (microsiemens): 19

Temperature (C^o): 19.4

Disturbance:

Type: 1) Constructed, paved road in buffer zone; and 2) trails.

Intensity: 1) High: a paved highway is <10 m from wetland edge; road disrupts hydrology by altering water flow to the fen. 2) High: several human social trails that are used many times per year, traverse the fen; the trails are getting wider each year.

Extent: 1) The highway covers >25%<50% of the wetland buffer. 2) Trails cover <10% of the site but impacts extend beyond the trails.

Amphibian species present: none

Avian species present:

Mammal species present:

Other wildlife species: Tarns with reliable water sources typically have abundant and rich populations of macroinvertebrates. Macroinvertebrates occupying tarns at this site included fairy shrimp (*Anostraca* spp.), predaceous diving beetle (*Coleoptera* spp), and caddisfly (*Trichoptera* spp.) larvae.

Plant Communities:

1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.

   Total cover 50% with 10% forbs and 90% graminoids; *E. quinqueflora* = 54%, *C. scopulorum* = 27% and other graminoids = 9%.

2. Co-dominant: Mesic forb herbaceous vegetation

   Total cover 70% with 49% forbs and 21% graminoids.

3. Co-dominant: Planeleaf willow-Barrenground willow/Mesic forb (*Salix planifolia-S. brachycarpa/*Mesic forb) shrubland.

   Total shrub cover 80%; total herbaceous cover 50% with 35% forbs and 15% graminoids.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I): none.

Other plant species present:

Eleocharis quinqueflora
Carex scopulorum
Carex aquatilis
Carex nova
Carex microptera
Juncus mertensianus
Juncus longistylis
Juncus drummondii
Deschampsia cespitosa
Pedicularis groenlandica
Pedicularis sudetica scopulorum

Erigeron peregrinus
Penstemon whippleanus
Trollius laxus
Anemone narcissiflora
Sedum rhodanthum
Potentilla diversifolia
Caltha leptosepala
Oreoxis alpina
Artemesia scopulorum
Senecio crocatus
Castilleja rhexifolia
Castilleja occidentalis
Senecio triangularis
Bistorta bistortoides
Bistorta vivipara
Viola adunca
Veronica wormskjoldii
Salix planifolia
Salix brachycarpa

Noxious weed species present (noxious weed form attached): none.

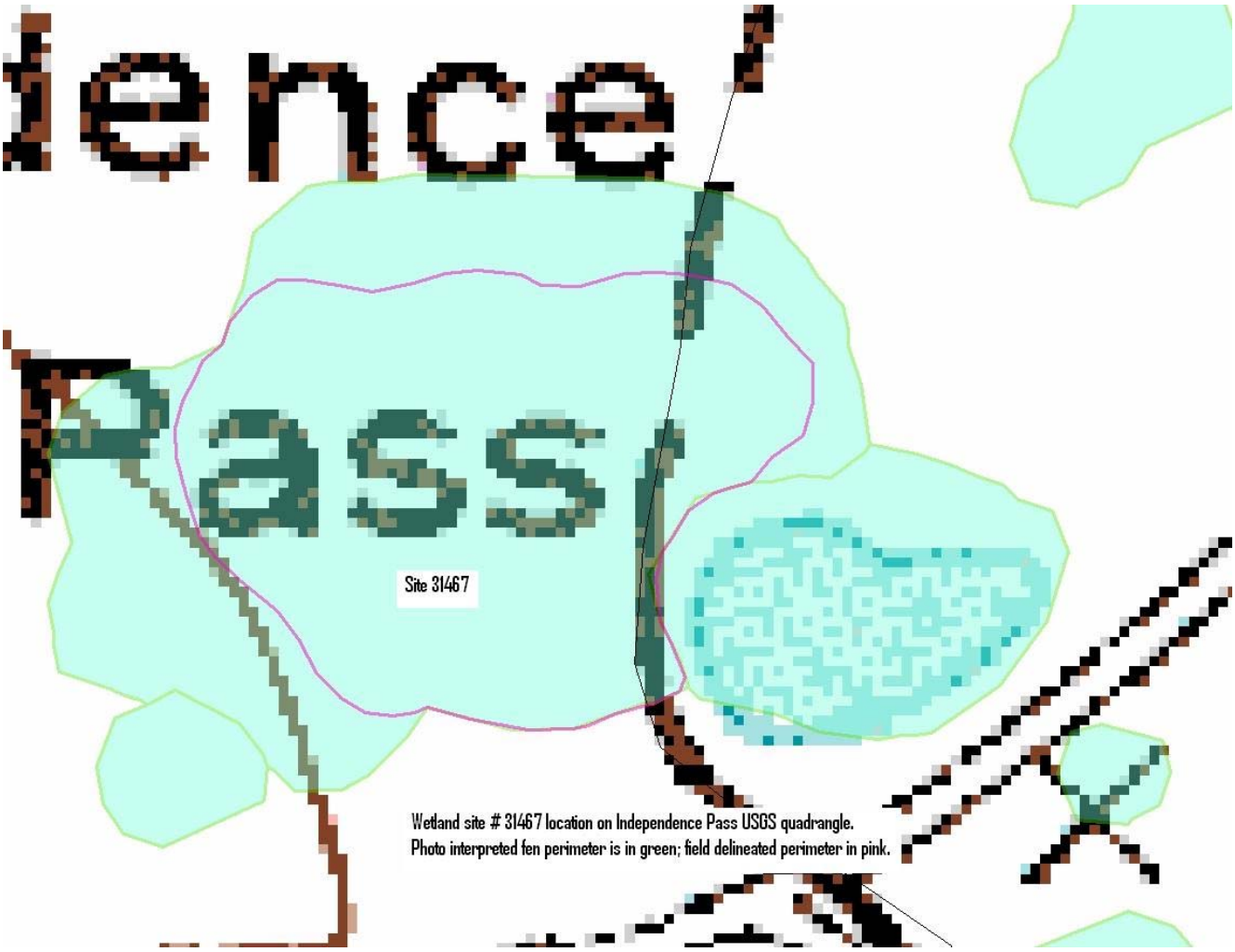
Photo Documentation Wetland Site # 31467

Site Panorama (Clockwise from left): Starting Azimuth 100 °, UTM point E 364625/N 4330115

Photo Point: Azimuth of center photo 210 °, UTM point E 364621/N 4330115

Soil Pit:UTM E 364618/N 4330105

A large, shallow tarn occurs at this wetland fen.



Wetland site #31467 location on Independence Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/1/2011
Wetland Site ID: 31473
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This wetland fen is located in the alpine zone on Independence Pass in the Sawatch Range on the west slope of the Continental Divide at the headwaters of the Roaring Fork Watershed. Topographically this fen occupies a gently inclined high slope on a saddle that is Independence Pass. This site was likely not glaciated during the Pleistocene ice age, lying above the ice fields that sculpted the steep walls of the Roaring Fork valley below. Gently rolling mountaintops, with steep, glacially sculpted mountain sides and dramatic cirques characterize the landscape in the immediate vicinity of Independence pass.

Gently undulating slopes, an alpine climate and animal activity have acted together to created a complex microtopography that has resulted in a rich habitat mosaic of wetlands and tarns, forb and turf meadows, fellfields, boulder fields and scree and talus slopes. Snowmelt and permafrost provide the most important sources of moisture for wetland and fen development in this alpine environment. These environmental conditions provide a constant and consistent source of moisture that enables the development of peat which insulates and preserves the underlying permafrost. Here, at the top of Independence Pass, due to the interaction of natural communities, climate, and topography a complex of fens have developed. Fen habitat here is characterized by a mosaic of herbaceous graminoid and forb communities and shrublands that have developed in response to soil and moisture conditions. Saturated soils have formed solifluction terraces and lobes, behind which melting water accumulates and fens have formed.

Wetland characterization
Elevation (feet): 12,023
Aspect: 325^{o}
Slope: 4% to 6%
Tile probe depth: 52cm
Peat depth: 62cm
Von Post peat classification: H3
Soil Characteristics: saturated peat
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from snowmelt on surrounding northwest-facing slopes, and also from permafrost that likely underlies peat soils, dominates both inflow and outflow. Additionally, shallow surface flow occurs on terraces. Although there is no evidence of surface channel flow into the fen, surface outflow occurs by way of a gully has developed at the bottom of the fen.
Water Quality:
pH: 8.85
Conductivity (microsiemens): 10
Temperature (C^{o}): 12.2

Disturbance:

Type: Constructed road in buffer.
Intensity: Low intensity; Highway 82 is located >10m downslope of the fen; hydrologic alteration likely occurs but only minimally impacts wetland function.
Extent: Impact covers <10% of buffer.

Amphibian species present: none.
Avian species present: White-crowned sparrow, American Pipit, White-tailed Ptarmigan.
Mammal species present: Mule deer (*Odocoileus hemionus*), Northern pocket gopher (*Thomomys talpoides*) sign, yellow-bellied marmot (*Marmota flaviventris*), Long-tailed weasel (*Mustela frenata*), Montane vole (*Microtus montanus*)

Plant Communities:

1. Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 50% with 5% forbs and 45% graminioids; *E. quinqueflora* = 32%, mountain sedge (*Carex scopulorum)* = 11% and other graminoids = 2% of graminoid cover. Bryophyte cover = 90%.
2. Co-dominant: Mesic forb herbaceous vegetation
   Total cover 80% with 48% forbs and 32% graminoids. Bryophyte cover = 90%
3. Co-dominant: Planeleaf willow/Mesic forb (*Salix planifolia/*Mesic forb) shrubland.
   Total shrub cover 20%; total herbaceous cover 60% with 36% forbs and 24% graminoids. Bryophyte cover = 50%.
4. Co-dominant: Mesic graminoid herbaceous vegetation.
   Total cover = 50% with 5% forbs and 45% graminoids; Carex scopulorum = 27% of graminoid cover with 18% *E. quinqueflora*. Bryophyte cover = 90%.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Eleocharis quinqueflora
Carex scopulorum
Carex aquatilis
Carex nova
Carex microptera
Carex ebenea
Carex nigricans
Carex illota
Juncus mertensianus
Juncus saximontanus
Juncus drummondii
Deschampsia cespitosa
Saxifraga rhomboidea
Saxifraga oregana
Pedicularis groenlandica
Pedicularis sudetica scopulorum
Erigeron peregrinus

Penstemon whippleanus
Trollius laxus
Anemone multifida
Anemone narcissiflora
Sedum rhodanthum
Potentilla diversifolia
Caltha leptosepala
Oreoxis alpina
Artemesia scopulorum
Senecio crocatus
Castilleja rhexifolia
Castilleja occidentalis
Senecio triangularis
Senecio crocatus
Bistorta bistortoides
Bistorta vivipara
Viola adunca
Veronica wormskjoldii
Primula parryi
Silene acaulis
Trifolium nanum
Trifolium parryi
Salix planifolia
Salix brachycarpa

Noxious weed species present (noxious weed form attached): none.

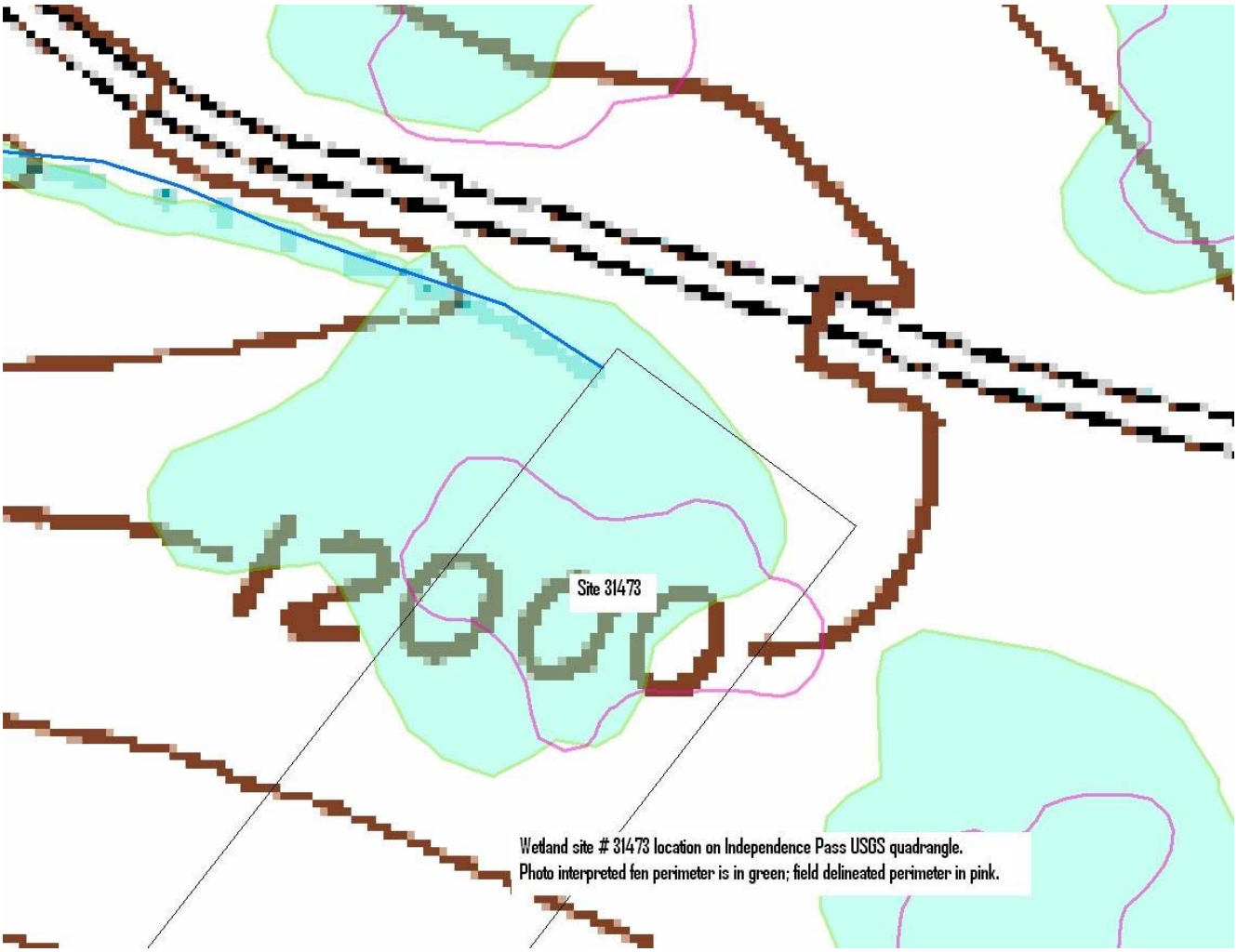
Photo Documentation Wetland Site # 31473

Site Panorama (Clockwise from left): Starting Azimuth °, UTM point E 364115/N4329965

Photo Point: Azimuth of center photo 330°, UTM point E 364201/N4329920

Soil Pit:UTM E364193/N 4329926

Abundant meltwater has enabled fen development in this alpine tundra ecosystem.



Wetland site # 31473 location on Independence Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/1/2011
Wetland Site ID: 31479
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes
General Description: This wetland fen is located in the alpine zone on Independence Pass in the Sawatch Range on the west slope of the Continental Divide at the headwaters of the Roaring Fork Watershed. Topographically this fen occupies a gently inclined high slope on a saddle that is Independence Pass. This site was likely not glaciated during the Pleistocene ice age, lying above the ice fields that sculpted the steep walls of the Roaring Fork valley below. Gently rolling mountaintops, with steep, glacially sculpted mountain sides and dramatic cirques characterize the landscape in the immediate vicinity of Independence pass.

Gently undulating slopes, an alpine climate and animal activity have acted together to created a complex microtopography that has resulted in a rich habitat mosaic of wetlands and tarns, forb and turf meadows, fellfields, boulder fields and scree and talus slopes. Snowmelt and permafrost provide the most important sources of moisture for wetland and fen development in this alpine environment. These environmental conditions provide a constant and consistent source of moisture that enables the development of peat which insulates and preserves the underlying permafrost. Here, at the top of Independence Pass, due to the interaction of natural communities, climate, and topography a complex of fens have developed. Fen habitat here is characterized by a mosaic of herbaceous graminoid and forb communities and shrublands that have developed in response to soil and moisture conditions. Saturated soils have formed solifluction terraces and lobes, behind which melting water accumulates and fens have formed.

Wetland characterization
Elevation (feet): 12,089
Aspect: 250^{o}
Slope: 7%
Tile probe depth: 105cm
Peat depth: 105cm
Von Post peat classification: H3/H4
Soil Characteristics: saturated peat
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from snowmelt on surrounding west-facing slopes, and also from permafrost that likely underlies peat soils, dominates both inflow and outflow. There is evidence of surface flow via gullies into the fen due to anthropogenic disturbance but there is no evidence of surface outflow.
Water Quality:
pH: 9.50
Conductivity (microsiemens): 51
Temperature (C^{o}): 11.1

Disturbance:

Type: Constructed, paved road in fen buffer.
Intensity: High intensity; Highway 82 is <10m from the wetland; road related impacts alter fen hydrology and have resulted in gullying in the fen.
Extent: Impacts cover <10% of the site, but impacts extend well beyond the road.

Amphibian species present: none.
Avian species present: White-crowned Sparrow nesting, American Pipit, Horned Lark,
Mammal species present: Mule deer (*Odocoileus hemionus*), Northern pocket gopher (*Thomomys talpoides*) sign, yellow-bellied marmot (*Marmota flaviventris*), Long-tailed weasel (*Mustela frenata*), Montane vole (*Microtus montanus*)

Plant Communities:

1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 60% with 24% forbs and 34% graminoids; *E. quinqueflora* = 20%, mountain sedge (*Carex scopulorum)* = 14% and other graminoids = 2% of graminoid cover. Forb cover is dominated by marsh marigold (*Caltha leptosepala*). Bryophyte cover = 90%.
2. Co-dominant: Mesic forb herbaceous vegetation
   Total cover 90% with 50% forbs and 40% graminoids. Bryophyte cover = 80%
3. Co-dominant: Planeleaf willow-Barrenground willow/Mesic forb (*Salix planifolia-S. brachycarpa/*Mesic forb) shrubland.
   Total shrub cover 50%; total herbaceous cover 50% with 30% forbs and 20% graminoids. Bryophyte cover = 20%.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Eleocharis quinqueflora
Carex scopulorum
Carex aquatilis
Carex nova
Carex microptera
Carex ebenea
Carex nigricans
Carex illota
Juncus mertensianus
Juncus saximontanus
Juncus drummondii
Deschampsia cespitosa
Saxifraga rhomboidea
Saxifraga oregana
Pedicularis groenlandica
Pedicularis sudetica scopulorum
Erigeron peregrinus
Penstemon whippleanus
Trollius laxus

Anemone narcissiflora
Sedum rhodanthum
Potentilla diversifolia
Caltha leptosepala
Oreoxis alpina
Artemesia scopulorum
Senecio crocatus
Castilleja rhexifolia
Castilleja occidentalis
Senecio triangularis
Senecio crocatus
Bistorta bistortoides
Bistorta vivipara
Viola adunca
Veronica wormskjoldii
Primula parryi
Salix planifolia
Salix brachycarpa

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 31479

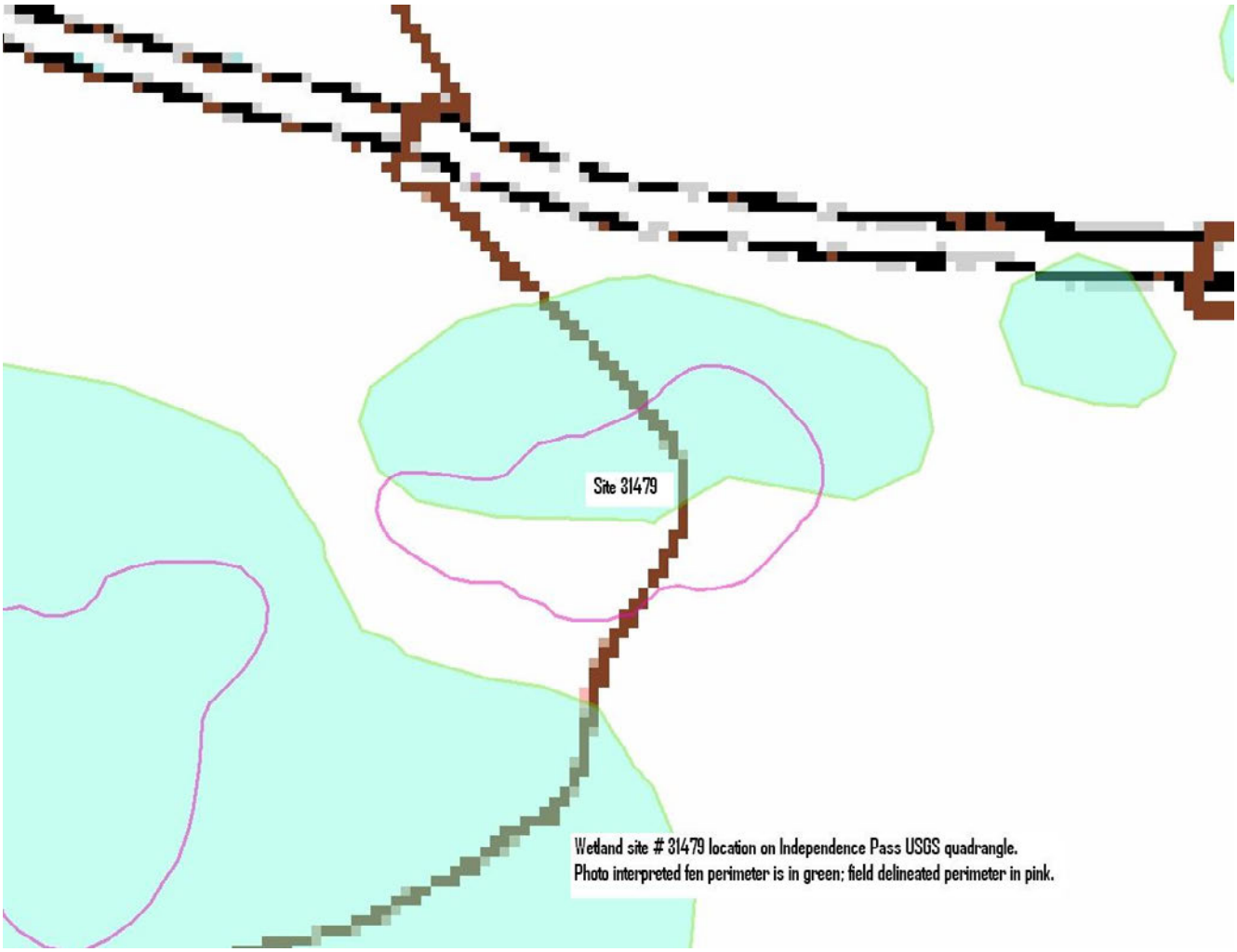
Site Panorama (Clockwise from left): Starting Azimuth220 °, UTM point E 364437/N4329877

Photo Point: Azimuth of center photo 290 °, UTM point E 364443/N4329874

Soil Pit:UTM E 364433/N4329894

Road disrupts water flow to the fen.

Snowmelt and permafrost provide an abundant source of water to maintain these fens.



Wetland site # 31479 location on Independence Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/1/2011
Wetland Site ID: 31488
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes

General Description: This wetland fen is located in the alpine zone on Independence Pass in the Sawatch Range on the west slope of the Continental Divide at the headwaters of the Roaring Fork Watershed. Topographically this fen occupies a gently inclined high slope on a saddle that is Independence Pass. This site was likely not glaciated during the Pleistocene ice age, lying above the ice fields that sculpted the steep walls of the Roaring Fork valley below. Gently rolling mountaintops, with steep, glacially sculpted mountain sides and dramatic cirques characterize the landscape in the immediate vicinity of Independence pass.

Gently undulating slopes, an alpine climate and animal activity have acted together to created a complex microtopography that has resulted in a rich habitat mosaic of wetlands and tarns, forb and turf meadows, fellfields, boulder fields and scree and talus slopes. Snowmelt and permafrost provide the most important sources of moisture for wetland and fen development in this alpine environment. These environmental conditions provide a constant and consistent source of moisture that enables the development of peat which insulates and preserves the underlying permafrost. Here, at the top of Independence Pass, due to the interaction of natural communities, climate, and topography a complex of fens have developed. Fen habitat here is characterized by a mosaic of herbaceous graminoid and forb communities and shrublands that have developed in response to soil and moisture conditions. Saturated soils have formed solifluction terraces and lobes, behind which melting water accumulates and fens have formed.

Wetland characterization
Elevation (feet): 12,071
Aspect: 330^{o}
Slope: 5%
Tile probe depth: 60cm
Peat depth: 60cm
Von Post peat classification: H4
Soil Characteristics: saturated peat
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater flow from snowmelt on surrounding northwest-facing slopes, and also from permafrost that likely underlies peat soils, dominates both inflow and outflow. There is no evidence of surface channel into or out of the fen.
Water Quality:
pH: 9.30
Conductivity (microsiemens): 54
Temperature (C^{o}): 14.9

Disturbance:

Type: Constructed road in buffer zone.
Intensity: Low intensity; highway 82 is located >10m downslope of the fen; hydrologic alteration likely occurs but only minimally impacts wetland function.
Extent: Impact covers <10% of buffer.

Amphibian species present: none.
Avian species present: White-crowned sparrow, American Pipit, White-tailed Ptarmigan.
Mammal species present: Mule deer (*Odocoileus hemionus*), Northern pocket gopher (*Thomomys talpoides*) sign, yellow-bellied marmot (*Marmota flaviventris*), Long-tailed weasel (*Mustela frenata*), Montane vole (*Microtus montanus*)

Plant Communities:

1. Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.
   Total cover 60% with 12% forbs and 48% graminioids; *E. quinqueflora* = 20%, mountain sedge (*Carex scopulorum)* = 14% and other graminoids = 2% of graminoid cover. Bryophyte cover = 50%.
2. Co-dominant: Mesic forb herbaceous vegetation
   Total cover 70% with 49% forbs and 21% graminoids. Bryophyte cover = 50%
3. Co-dominant: Planeleaf willow/Mesic forb (*Salix planifolia-S. brachycarpa/*Mesic forb) shrubland.
   Total shrub cover 20%; total herbaceous cover 60% with 36% forbs and 24% graminoids. Bryophyte cover = 50%.
4. Co-dominant: Mesic graminoid herbaceous vegetation.
   Total cover = 50% with 15% forbs and 35% graminoids; Carex scopulorum = 25% of graminoid cover with 10% mixed graminoids. Bryophyte cover = 50%.

Plant List:

CNHP Tracked, TEP or RFSS plant species (*appendix I): none.
Other plant species present:
Eleocharis quinqueflora
Carex scopulorum
Carex aquatilis
Carex nova
Carex microptera
Carex ebenea
Carex nigricans
Carex illota
Juncus mertensianus
Juncus saximontanus
Juncus drummondii
Deschampsia cespitosa
Saxifraga rhomboidea
Saxifraga oregana
Pedicularis groenlandica
Pedicularis sudetica scopulorum

Erigeron peregrinus
Penstemon whippleanus
Trollius laxus
Anemone narcissiflora
Sedum rhodanthum
Potentilla diversifolia
Caltha leptosepala
Oreoxis alpina
Artemesia scopulorum
Senecio crocatus
Castilleja rhexifolia
Castilleja occidentalis
Senecio triangularis
Senecio crocatus
Bistorta bistortoides
Bistorta vivipara
Viola adunca
Veronica wormskjoldii
Primula parryi
Salix planifolia
Salix brachycarpa

Noxious weed species present (noxious weed form attached): none.

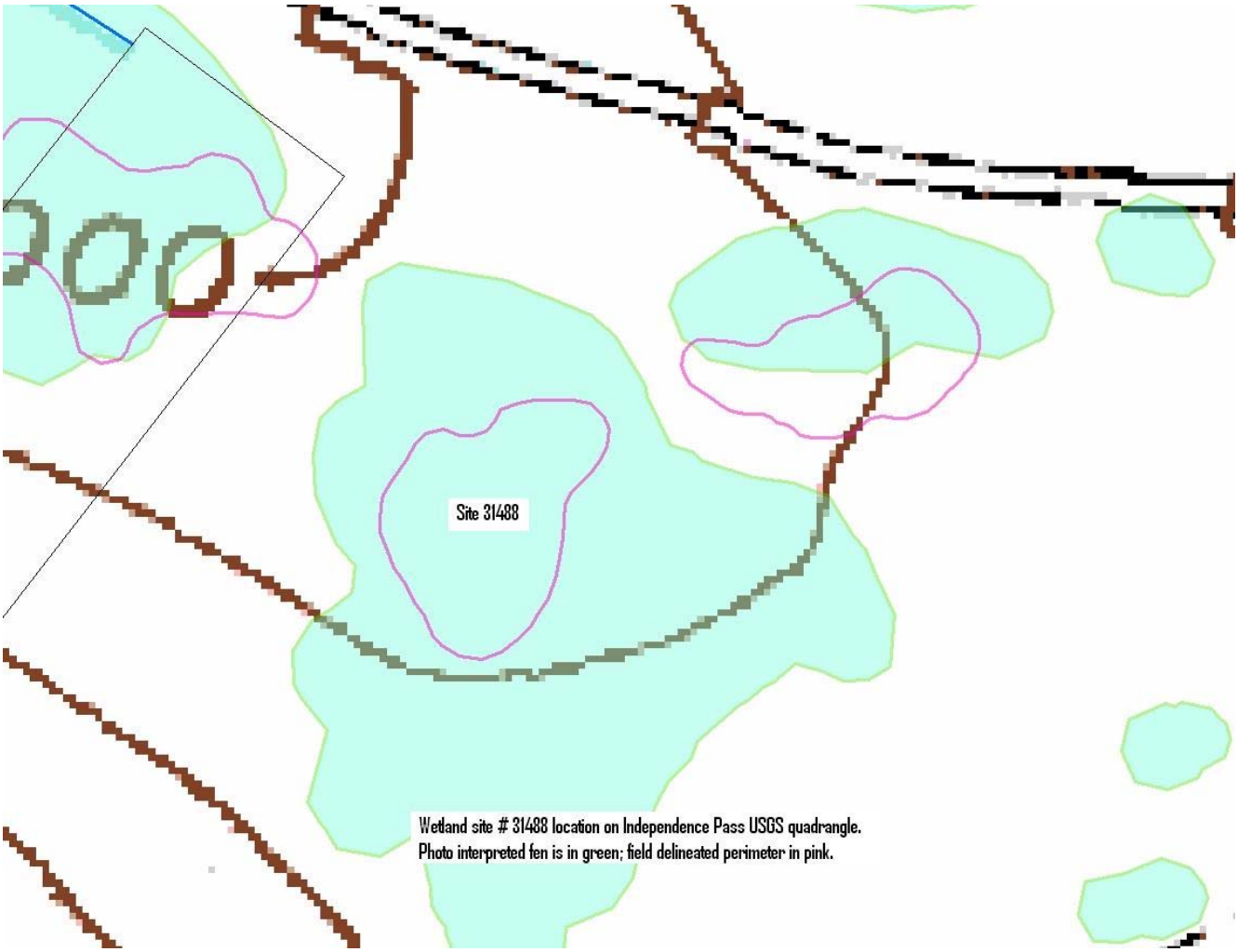
Photo Documentation Wetland Site # 31488

Site Panorama (Clockwise from left): Starting Azimuth 280 °, UTM point E364298/N 4329811

Photo Point: Azimuth of center photo 350 °, UTM point E 364279/N4329798

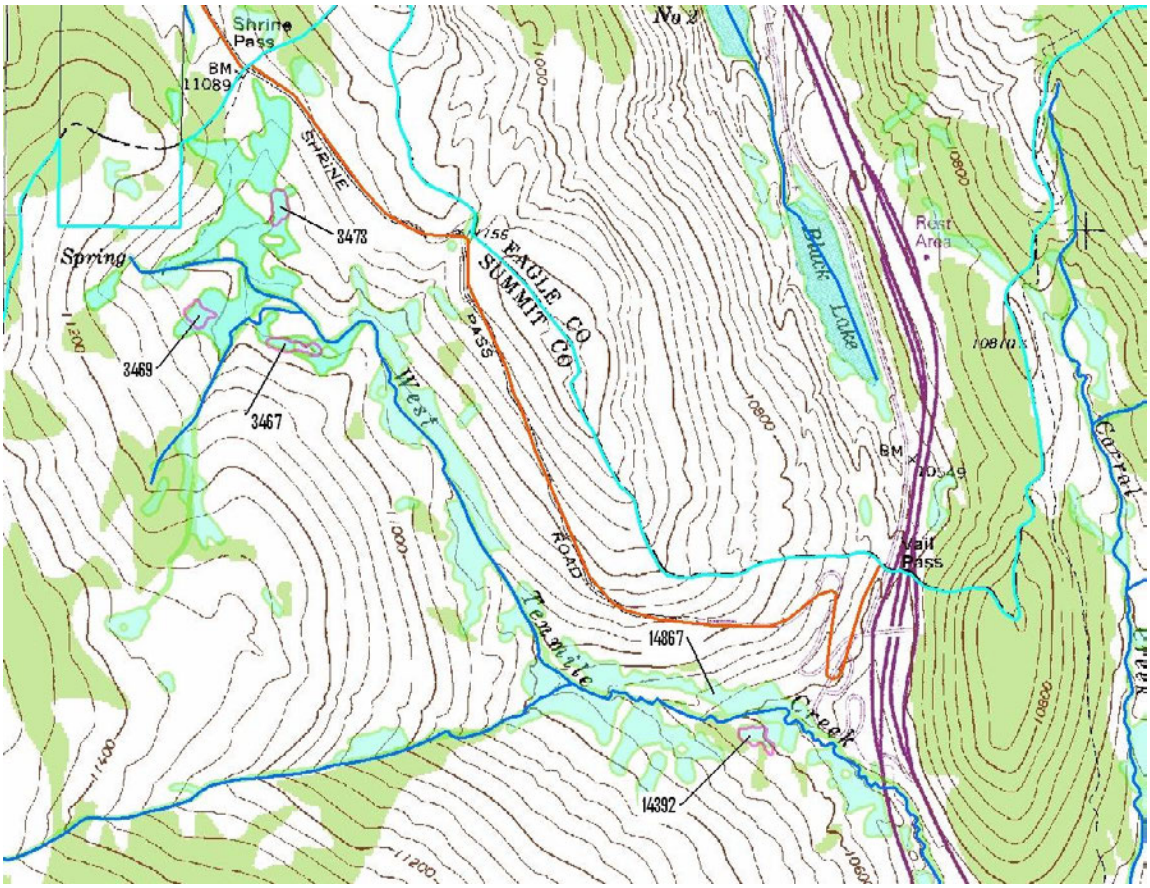
Soil Pit:UTM E 364294/N4329840

Ponds and tarns abound across this tundra fen



Wetland site # 31488 location on Independence Pass USGS quadrangle. Photo interpreted fen is in green; field delineated perimeter is in pink.

Dillon Ranger District: Vail and Shrine Pass Overview Map



Overview map for fen survey sites on Shrine Pass 3467, 3469, 3473, and on Vail Pass 14392 and 14867.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 8/13/2011
Wetland Site ID: 14392
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes
General Description: This wetland fen is located in the subalpine zone of the Gore Range on Vail Pass on the east side of the Continental Divide. The fen occupies a low gradient northeast-facing slope of a narrow saddle that drains into Ten Mile Creek which flows to the southeast.

Soils in this fen are saturated peat that has slumped forming microtopography of alternating terraces and slopes. Fen habitat is a mosaic of mesic herbaceous forb and graminoid communities and willow (*Salix* spp.) and non-willow shrublands that vary with soil characteristics and slope. Upland habitat is a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest, willow and non-willow shrublands and mesic forb and graminoid meadows. Riparian habitat is characterized by a dense cover of willow. Beaver (*Castor canadensis*) are common along West Ten Mile Creek and have built numerous dams that help conserve flows.

Wetland characterization
Elevation (feet): 10,631
Aspect: 60^{o} to 40^{o}
Slope: 11% to 12%
Tile probe depth: 94cm
Peat depth: 98cm
Von Post peat classification: H3
Soil Characteristics: saturated peat with hummock formation on the perimeter of the site.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Groundwater dominates both inflow and outflow. Additionally however, surface flow occurs where shallow groundwater discharges at topographic changes in gradient at the upland/wetland boundary and where slumping soils have created terrace/slope microtopography.
Water Quality:
pH: 6.44
Conductivity (microsiemens): 105.
Temperature (C^{o}): 20
Disturbance:
Type: Tracks from ATVs
Intensity: Moderate; vehicle passes occurring every few years in 2-5 places; not healing; bare soil above normal limits.
Extent: covers <10% of fen.

Amphibian species present: none observed.
Avian species present: Yellow Warbler, Lincoln's Sparrow,
Mammal species present: none observed.

Plant Communities:
1. Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies terraces).
Total cover 30% with 15% forb cover and 25% graminoid cover.
2. Co-dominant: Mesic forb herbaceous vegetation (occupies slopes and hummocks).
Total cover 90% with 63% forbs and 27% graminoids.
3. Co-dominant: Shrubby cinquefoil/Mesic forb (*Dasiphora floribunda*/Mesic forb) shrubland (occupies low-gradient slopes).
Total shrub cover 20%; herbaceous cover 80% with 48% forbs and 32% graminoids.
4. Bog birch/Mesic forb-Mesic graminoid (*Betula nana*/Mesic forb-Mesic graminoid) shrubland (occupies perimeter of fen)

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):
*Slender cottongrass (*Eriophorum gracile*)
Bog birch/Mesic forb-Mesic graminoid (*Betula nana*/Mesic forb-Mesic graminoid) shrubland.
Other plant species present:
Eleocharis quinqueflora
Carex capillaris
Carex disperma
Carex aquatilis
Carex scopulorum
Carex utriculata
Carex nova
Carex ebenea
Thalictrum alpinum
Limnorchis hyperborea
Gentianopsis thermalis
Deschampsia cespitosa
Bistorta vivipara
Erigeron peregrinus
Swertia perennis
Senecio crocatus
Caltha leptosepala
Viola adunca
Pedicularis groenlandica
Parnassia fimbriata
Sedum rhodanthum
Oxypolis fendleri
Trollius laxus
Gentiana fremontii
Betula nana
Dasiphora floribunda
Salix planifolia
Salix brachycarpa
Noxious weed species present (noxious weed form attached): none

Photo Documentation Wetland Site # 14392

Site Panorama (Clockwise from left): Starting Azimuth 300°, UTM E395025/N4375910

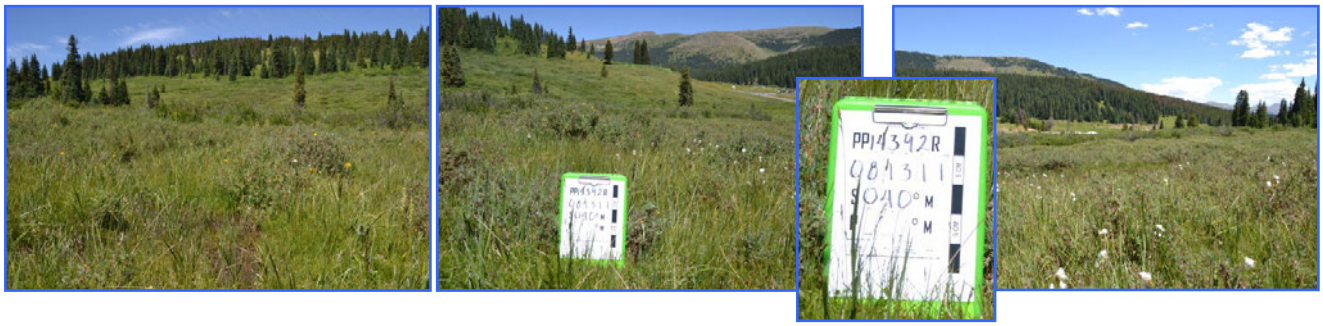
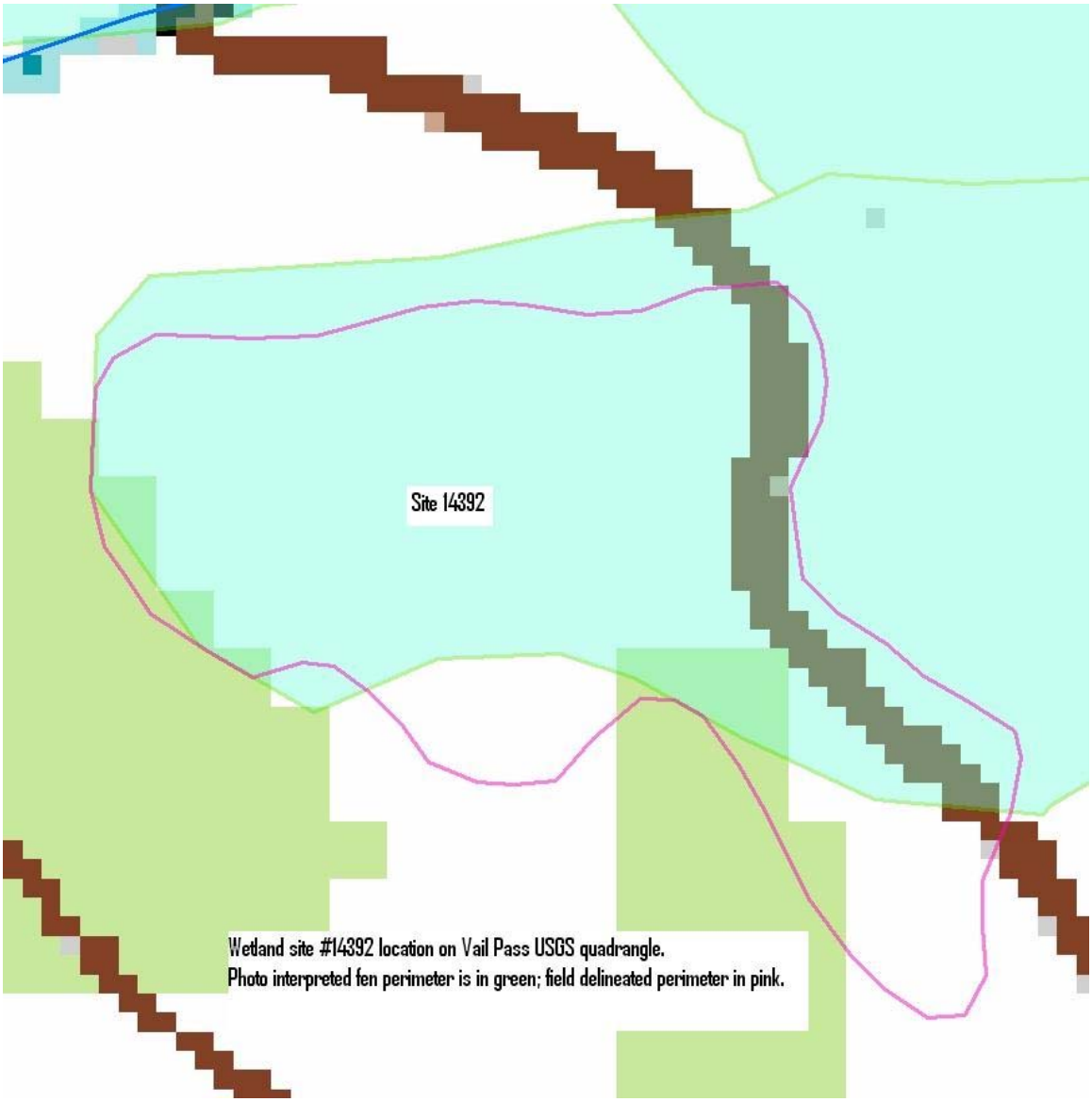


Photo Point: Azimuth of center photo 40°, UTM E395030/N4375911

Soil Pit:UTM E395032/N4375913

ATV tracks through fen are not healing.

Slender cottongrass (*E. gracile*) is scattered throughout this fen.



Wetland site #14392 location on Vail Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date:8/13/2011
Wetland Site ID: 14867
Wetland Classification: Palustrine; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? No.

General Description: This shrub wetland is located in the subalpine zone of the Gore Range on Vail Pass on the east side of the Continental Divide. The wetland occupies a terrace on a southwest-facing slope of a narrow saddle that drains into West Ten Mile Creek which flows to the southeast.

Wetland habitat is dominated by a dense willow cover (*Salix* spp.). Upland habitat is a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest, forb and graminoid meadows and shrublands. Riparian habitat is characterized by a dense cover of willow. Beaver (*Castor canadensis*) are common along West Ten Mile Creek and have built numerous dams that help conserve flows.

Wetland characterization
Elevation (feet): 10,732
Aspect: southwest
Slope: 3% to 5%
Tile probe depth: 20cm
Peat depth: na
Von Post peat classification: na
Soil Characteristics: moist shallow peat underlain by mineral soils
Organic/Mineral content percent:
Soil gley in upper 40cm? na
Water source and flow direction characteristics: groundwater dominates both inflow and outflow. However, a few small surface channels contribute to outflow.
Water Quality: na.
pH: na.
Conductivity (microsiemens): na
Temperature (C^o): na
Disturbance:
Type: Ski trail cut through shrubland habitat.
Intensity: Moderate
Extent: covers 10% to 25% of site.

Amphibian species present: none observed.
Avian species present: White-crowned Sparrow, Lincoln's Sparrow, Yellow Warbler, Stellar's Jay, Ruby-crowned Kinglet, Red-naped Sapsucker.
Mammal species present: none observed.

Plant Communities:

1) Dominant: Wolf willow/ Mesic forb (*Salix wolfii/*Mesic forb) shrubland.
Total cover 65% with 46% *S. wolfii* and 19% *Salix brachycarpa* and *Betula nana*; herbaceous cover = 90% with 54% forbs and 36% graminoids.

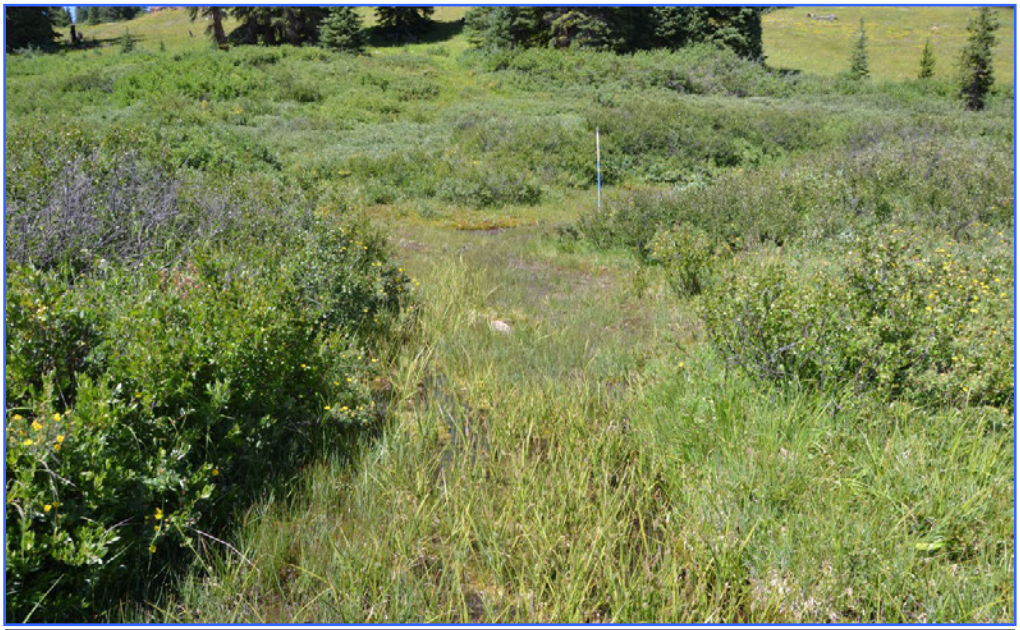
Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*Appendix I):
Wolf willow/ Mesic forb (*Salix wolfii/*Mesic forb) shrubland

Other plant species present:
Achillea lanulosa
Caltha leptosepala
Valeriana edulis
Zigadenus elegans
Oxypolis fendleri
Eleocharis quinqueflora
Pedicularis groenlandica
Phleum alpinum
Delphinium barbeyi
Aconitum columbianum
Senecio bigelovii
Calamagrostis canadensis
Erigeron peregrinus
Castilleja occidentalis
Swertia perennis
Geranium fremontii
Gentianopsis thermalis
Arnica latifolia
Trollius laxus
Bistorta vivipara
Bistorta bistortoides
Erigeron speciosus
Geum triflorum
Erigeron speciosus
Dasiphora floribunda
Betula nana
Salix wolfii
Salix brachycarpa

Noxious weed species present: None

Photo Documentation Wetland Site # 14867



A ski trail has been cut through the shrubland wetland.

These shrublands provide habitat for breeding White-Crowned Sparrows;
A fledgling White-crowned Sparrow quietly hides in the dense shrub cover.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 9/2/2011
Wetland Site ID: 3467
Wetland Classification: Palustrine; emergent persistent; scrub-shrub, broad-leaved deciduous; non-tidal saturated.
Fen? Yes
General Description: This slope wetland fen complex is located in the upper subalpine zone on Shrine Pass in the Gore Range on the east slope of the Continental Divide. Geology on top of the pass is Pennsylvanian Age sedimentary rock with remnant patches of Pleistocene Age glacial drift of Pinedale and Bull Lake glaciations.

This fen is part of a larger complex of fens which are the source headwaters for West Ten Mile Creek. Topographically this fen occupies a high slope just below the summit of Shrine Pass on the Divide. Landscape on the pass is characterized by low rolling hills and swales with alternating slopes and terraces. Wetlands occupy swales and slopes. Saturated soils in these sites have often slumped to produce microtopography of alternating slopes and terraces. Wetland plant communities vary with soil moisture and are a complex mosaic of lush herbaceous mesic meadows typically and willow (*Salix* spp.) shrublands. Upland hillslopes and ridges are occupied by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forests, shrublands and xeric grasslands.

Shrine Pass was the major route between Denver and Grand Junction prior to 1940. Evidence of development activities and habitat alteration still exist although much natural recovery has occurred.

Wetland characterization
Elevation (feet): 10,987
Aspect: 0 ^{o}
Slope: 1% on terraces; 8% on slopes.
Tile probe depth: 40cm, 82 cm.
Peat depth: 70cm.
Von Post peat classification: H3
Soil Characteristics:
Organic/Mineral content percent: moist to saturated peat.
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater from surrounding northeast-facing slopes dominates inflow. Additionally, shallow groundwater discharge results in surface flow where topographic changes in gradient occur. Outflow occurs by both shallow groundwater flow and by surface channels and gullies.

Water Quality:
pH: 6.89
Conductivity (microsiemens): 229
Temperature (C^{o}): 15.3

Disturbance:

Type: Tracks from ATV/snowmobile use

Intensity: High; vehicle passes occurring frequently and annually.

Extent: Covers 10% to 25% of site.

Amphibian species present: none observed.

Avian species present: White-Crowned Sparrow, Lincoln's Sparrow, Stellar's Jay, Gray Jay, Mountain Bluebird

Mammal species present: none observed.

Plant Communities:

1. Dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation. Total cover 60% with 6% forbs and 54% graminoids; E. quinqueflora = 49% of graminoid cover, water sedge (*Carex aquatilis*) = 5%; elephantella (Pedicularis groenlandica) = 5% of forb cover, other forbs = 1%. Bryophyte cover = 80%.
2. Mesic forb herbaceous vegetation.
3. Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland.
4. Wolf willow/Mesic forb (*Salix wolfii*/Mesic forb) shrubland.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):

*Slender cottongrass (*Eriophorum gracile*)

*Wolf willow/Mesic forb (*Salix wolfii*/Mesic forb) shrubland.

Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland.

Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation

Other plant species present:

Juncus drummondii
Juncus mertensianus
Juncus longistylis
Carex ebenea
Carex utriculata
Phleum alpinum
Luzula parviflora
Deschampsia cespitosa
Thalictrum alpinum
Calamagrostis canadensis
Caltha leptosepala
Trollius laxus
Anaphalis margaritacea
Swertia perennis
Gentianopsis thermalis
Pedicularis groenlandica
Parnassia fimbriata
Bistorta vivipara
Valeriana edulis
Limnorchis dilatata
Castilleja rhexifolia
Pneumonanthe parryi

Oreoxis alpina
Anemone narcissiflora
Gentiana fremontii
Betula nana
Salix planifolia
Salix brachycarpa
Salix wolfii
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 3467

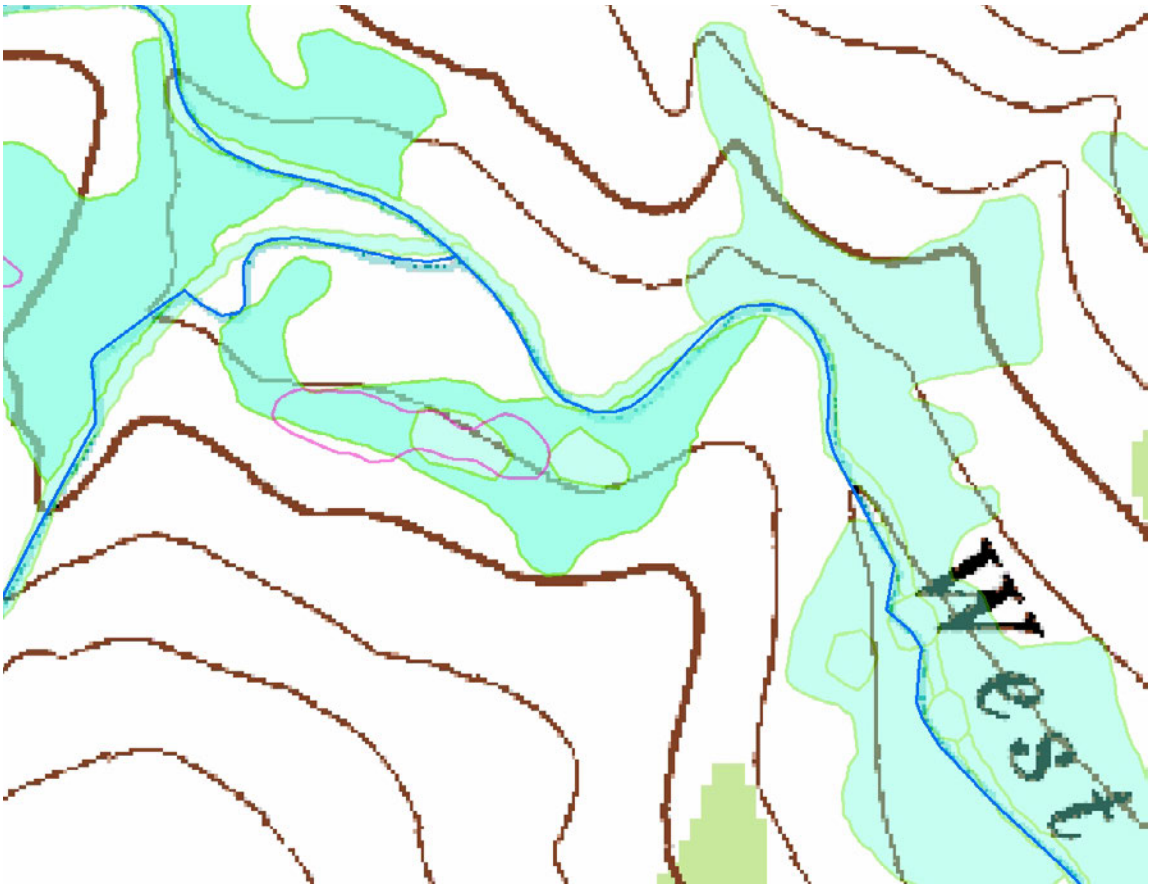
Site Panorama (Clockwise from left): Starting Azimuth 320°, UTM

Photo Point: Azimuth of center photo 340°, UTM E

Soil Pit:UTM E

ATV tracks through fen

Saturated peat soils have slumped, creating a slope/terrace microtopography that enhances habitat richness.



Wetland site # 3467 location on Vail Pass USGS Quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 9/2/2011
Wetland Site ID: 3469
Wetland Classification: Palustrine; scrub-shrub, broad-leaved deciduous; non-tidal saturated.
Fen?Yes.
General Description: This slope wetland fen is located in the upper subalpine zone on Shrine Pass in the Gore Range on the east slope of the Continental Divide. Geology on top of the pass is Pennsylvanian Age sedimentary rock with remnant patches of Pleistocene Age glacial drift of Pinedale and Bull Lake glaciations.

This fen is part of a larger complex of fens which are the source headwaters for West Ten Mile Creek. Topographically this fen occupies a high slope just below the summit of Shrine Pass on the Divide. Landscape on the pass is characterized by low rolling hills and swales with alternating slopes and terraces. Wetlands occupy swales and slopes. Saturated soils in these sites have often slumped to produce microtopography of alternating slopes and terraces. Wetland plant communities vary with soil moisture and are a complex mosaic of lush herbaceous mesic meadows typically and willow (*Salix* spp.) shrublands. Upland hillslopes and ridges are occupied by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forests, shrublands and xeric grasslands.

Shrine Pass was the major route between Denver and Grand Junction prior to 1940. Evidence of development activities and habitat alteration still exist although much natural recovery has occurred.

Wetland characterization
Elevation (feet): 11,035
Aspect: 110^{o}
Slope: 5% to 6%.
Tile probe depth: 56cm, 60cm.
Peat depth: 68cm.
Von Post peat classification: H2
Soil Characteristics: saturated peat, hummocky with dense moss cover; soils are not slumping.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater from northeast-facing slopes dominates inflow. Additionally, shallow groundwater discharge results in surface flow where topographic changes in gradient occur. Outflow occurs by shallow ground and surface flow and by three surface channels.
Water Quality:
pH: 6.8
Conductivity (microsiemens): 153
Temperature (C^{o}): 15.9
Disturbance:
Type: Human recreational hiking trail in buffer
Intensity: Low; this is a very high use recreational trail but the trail is located well out of fen; the trail may however slightly impact groundwater flow.
Extent: covers <10% of buffer.

Amphibian species present: none observed.
Avian species present: Wilson's Warbler, Yellow Warbler, White-Crowned Sparrow
Mammal species present: none observed.

Plant Communities:
1. Dominant: Wolf willow/Mesic forb (*Salix wolfii/*Mesic forb) shrubland.
   Total shrub cover 40%; total herbaceous cover 65% with 32.5% forbs and 32.5% Graminoids. Bryophyte cover =85%.
2. Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland (fen perimeter)
3. Planeleaf willow/Water sedge (*S. planifolia*/*Carex aquatilis*) shrubland (fen perimeter).
4. Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (terraces).

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I):

1)*Wolf willow/Mesic forb (*Salix wolfii/*Mesic forb) shrubland.
2) Planeleaf willow/Mesic forb (*Salix planifolia*/Mesic forb) shrubland
3) Planeleaf willow/Water sedge (*S. planifolia*/*Carex aquatilis*) shrubland
4) Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation.

Other plant species present:

Carex microptera
Carex nova
Carex mertensii
Carex vesicaria
Carex saxatilis
Carex capillaris
Carex nigricans
Deschampsia cespitosa
Cymopteris lemmonii
Hippochaete variegata
Gentianopsis thermalis
Gentiana fremontii
Pedicularis groenlandica
Senecio crocatus
Caltha leptosepala
Arnica mollis
Trollius laxus
Anemone narcissiflora
Betula nana
Conioselinum scopulorum
Ligusticum tenuifolium

Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 3469

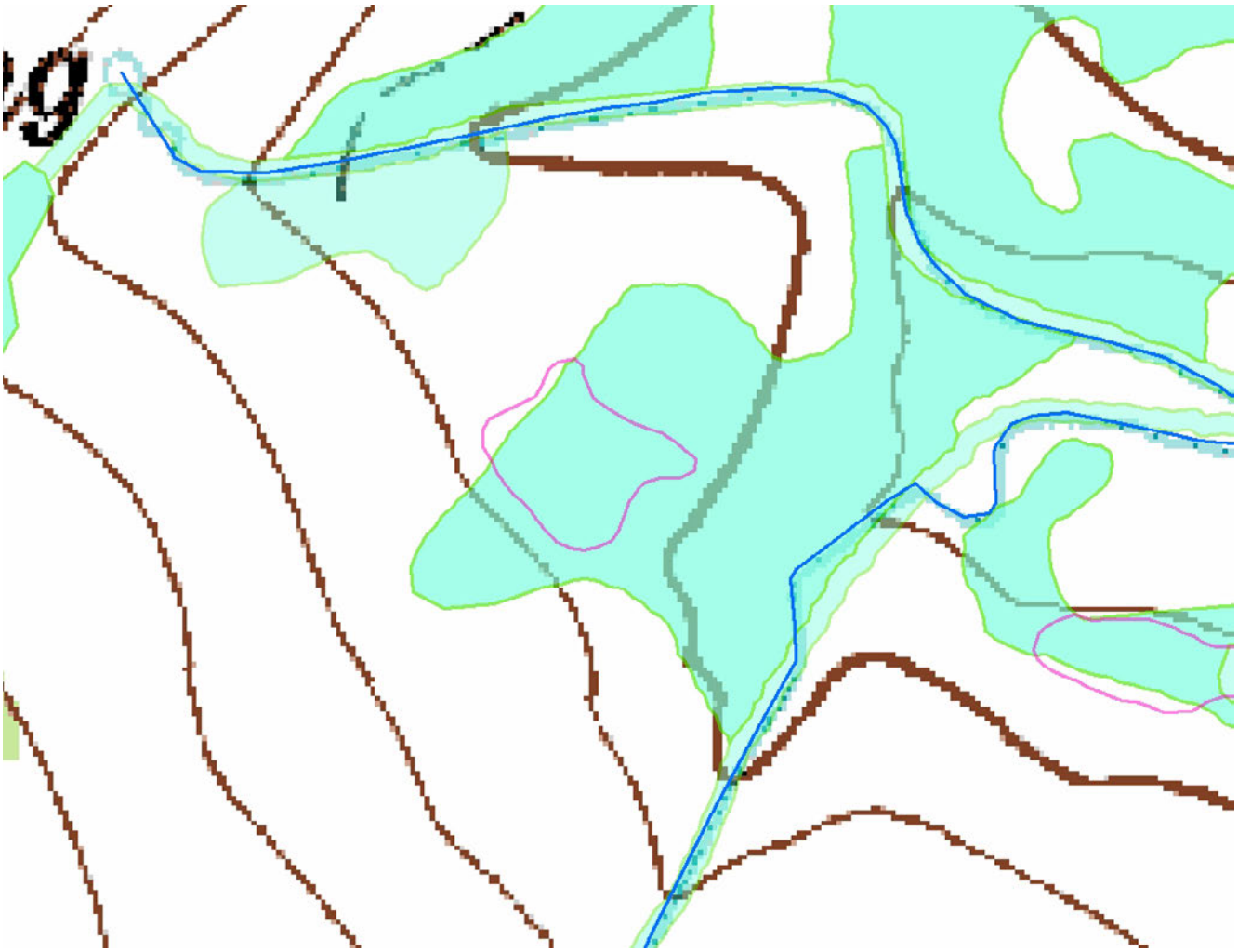
Site Panorama (Clockwise from left): Starting Azimuth 350°, UTM E393179/N4377317

Photo Point: Azimuth of center photo 60°, UTM E393175/N4377319

Soil Pit:UTM E393174/N4377320

Evidence of historic development

A lush cover of low willow and forbs, with abundant shallow surface water flow characterizes habitat in this fen.



Wetland site #3469 location on Vail Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

White River National Forest Fen Inventory 2011: Data Collection Summary

Survey Date: 9/2/2011
Wetland Site ID: 3473
Wetland Classification: Palustrine; emergent persistent; scrub-shrub broad-leaved deciduous; non-tidal saturated.
Fen? Yes.
General Description: This slope wetland fen complex is located in the upper subalpine zone on Shrine Pass in the Gore Range on the east slope of the Continental Divide. Geology on top of the pass is Pennsylvanian Age sedimentary rock with remnant patches of Pleistocene Age glacial drift of Pinedale and Bull Lake glaciations.

This fen is part of a larger complex of fens which are the source headwaters for West Ten Mile Creek. Topographically this fen occupies a high slope just below the summit of Shrine Pass on the Divide. Landscape on the pass is characterized by low rolling hills and swales with alternating slopes and terraces. Wetlands occupy swales, low-gradient slopes and terraces where soil moisture is high. Wetland plant communities vary with soil moisture and are a complex mosaic of lush herbaceous mesic meadows typically and willow (*Salix* spp.) shrublands. Upland hillslopes and ridges are occupied by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forests, shrublands and xeric grasslands.

Shrine Pass was the major route between Denver and Grand Junction prior to 1940. Evidence of development activities and habitat alteration still exist although much natural recovery has occurred.

Wetland characterization
Elevation (feet): 11,029
Aspect: 190^{o}
Slope: 7%
Tile probe depth: 49cm, 60cm, 69cm
Peat depth: 70cm
Von Post peat classification: H2/H3
Soil Characteristics: moist to saturated peat.
Organic/Mineral content percent:
Soil gley in upper 40cm? No.
Water source and flow direction characteristics: Shallow groundwater from surrounding south-facing hillslopes dominates inflow. Additionally, shallow groundwater discharge results in surface flow where topographic changes in gradient occur. Outflow occurs by both shallow groundwater flow and by surface channels and gullies.

Water Quality:
pH: 6.89
Conductivity (microsiemens): 165
Temperature (C^{o}): 14.8

Disturbance:

Type: 1) Tracks from snowmobile use; and 2) erosion
Intensity: 1) High-vehicle passes occurring frequently and annually, tracks getting deeper and wider and not healing; and 2) High – several gullies, some with headcuts, and >1m wide.
Extent: 1) covers all of site; and 2) covers <10% of site.

Amphibian species present: none observed.
Avian species present: White-Crowned Sparrow, Lincoln's Sparrow.
Mammal species present: none observed.

Plant Communities:
1. Co-dominant: Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation (occupies terraces).
2. Planeleaf willow-Barrenground willow/Mesic forb (*Salix planifolia-Salix brachycarpa*/Mesic forb) shrubland.
3. Wolf willow/Mesic forb (*Salix wolfii*/Mesic forb) shrubland (occupies slopes)
4. Rock sedge (*Carex saxatilis*) herbaceous vegetation.

Plant List:

CNHP Tracked, TEP or RFSS plant communities or species (*appendix I): none.
Few-flower spikerush (*Eleocharis quinqueflora*) herbaceous vegetation
Wolf willow/Mesic forb (*Salix wolfii/Mesic forb*) shrubland (occupies slopes)
Rock sedge (*Carex saxatilis*) herbaceous vegetation.
Other plant species present:
Eleocharis quinqueflora
Juncus drummondii
Juncus mertensianus
Juncus longistylis
Carex ebenea
Carex aquatilis
Carex utriculata
Phleum alpinum
Luzula parviflora
Deschampsia cespitosa
Thalictrum alpinum
Calamagrostis canadensis
Caltha leptosepala
Trollius laxus
Anaphalis margaritacea
Swertia perennis
Gentianopsis thermalis
Pedicularis groenlandica
Parnassia fimbriata
Bistorta vivipara
Valeriana edulis
Limnorchis dilatata

Castilleja rhexifolia
Pneumonanthe parryi
Oreoxis alpina
Anemone narcissiflora
Gentiana fremontii
Betula nana
Salix planifolia
Salix brachycarpa
Salix wolfii
Noxious weed species present (noxious weed form attached): none.

Photo Documentation Wetland Site # 3473

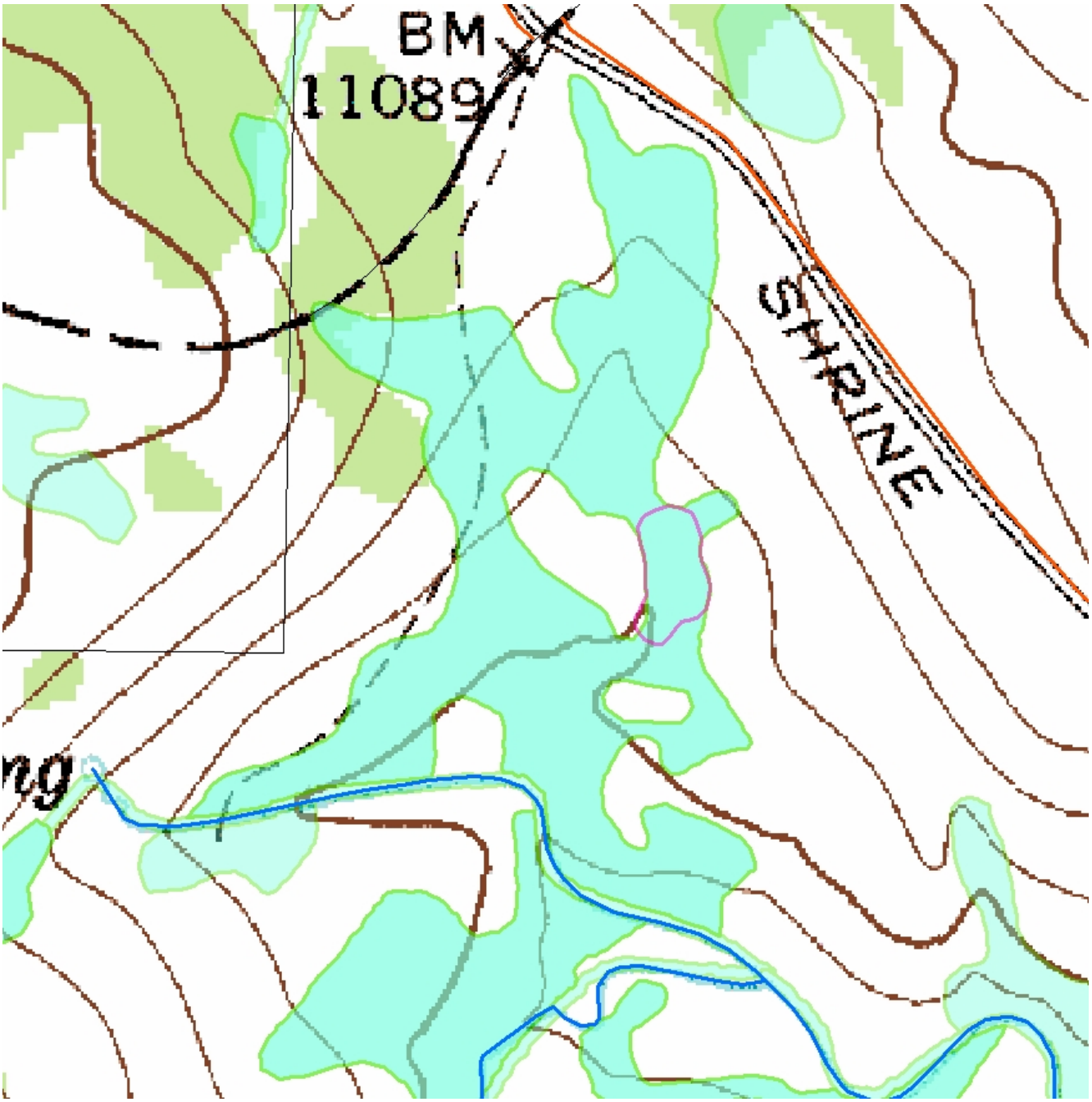
Site Panorama (Clockwise from left): Starting Azimuth 120°, UTM E393457/N4377634

Photo Point: Azimuth of center photo 140 °, UTM point E393468/N4377632

Soil Pit:UTM E393464/N4377633

ATV tracks through fen

Erosion and downcutting occurs in this channel that goes through this fen.



Wetland site # 3473 location in Vail Pass USGS quadrangle. Photo interpreted fen perimeter is in green; field delineated perimeter is in pink.

Appendix II. Threatened and Endangered Species forms

Element Occurrence Record forms for site 4452:
*Timber oatgrass (*Danthonia intermedia*) herbaceous vegetation

Element Occurrence Record forms for site 42855:
*Mud sedge (*Carex limosa*) herbaceous vegetation
*Buckbean (*Menyanthes trifoliata*) herbaceous vegetation

Element Occurrence Record forms for site 42811
*Quillwort (*Isoetes* spp.)

Element Occurrence Record forms for sites 12021, 12046, 12075
*Russet cottongrass (*Eriophorum chamissonis*)
*Sphagnum platyphyllum

Element Occurrence Record forms for site 12177
*Yellow pond lily (*Nuphar lutea* ssp. *polysepala*) herbaceous vegetation.

Element Occurrence Record forms for site 30589
*Altai cottongrass (*Eriophorum altaicum*)

Element Occurrence Record forms for site 32844
Quillwort (*Isoetes* spp.)

Element Occurrence Record forms for site 6982
*Slender cottongrass (*Eriophorum gracile*)
*Buxbaum sedge (*Carex buxbaumii*)

Element Occurrence Record forms for site 7566-1
*Russett cottongrass (*Eriophorum chamissonis*)

Element Occurrence Record forms for site 36695-2
*Russet cottongrass (*Eriophorum chamissonis*)

Element Occurrence Record forms for site 30946
*Rock sedge (*Carex saxatilis*) herbaceous vegetation

Element Occurrence Record forms for site 31430:
*Russet cottongrass (*Eriophorum chamissonis*)

Element Occurrence Record forms for site 32344:
*Bristle-stalk sedge (*Carex leptalea*)

Element Occurrence Record forms for site 37373:
*James' snowlover **(***Chionophila jamesii*)

Element Occurrence Record forms for site 31473
*James' snowlover (*Chionophila jamesii*)

Element Occurrence Record forms for site 14392
*Slender cottongrass (*Eriophorum gracile*)

Element Occurrence Record forms for site 14867
*Wolf willow/ Mesic forb (*Salix wolfii/*Mesic forb) shrubland

Element Occurrence Record forms for site 3467
*Slender cottongrass (*Eriophorum gracile*)

Element Occurrence Record forms for site 3469 and 3467
*Wolf willow/Mesic forb (*Salix wolfii/*Mesic forb) shrubland

COLORADO NATURAL HERITAGE PROGRAM
NATURAL COMMUNITY OCCURRENCE FIELD FORM

Element Scientific Name: *Danthonia intermedia* herbaceous vegetation
Project/File Name: WRNF fen inventory 4452
Survey Date:2011/09/19 Observer(s) Name(s): Malone, D.G.

Data Sensitivity
Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information (REQUIRED)
(Provide a photocopy of map with location of the occurrence marked or outlined)

Source ID	Source type	Uncertainty	Verified	Replace	New	Notes (# individuals)
					x	

USGS Quadrangle Name: North Mamm Peak Surveysite Name (from 7.5' quad): North Mamm Peak
County: Garfield Elevation (range if applicable): 10,641 to 10,753 ☒ feet ☐ meters
Legal Description: Township: _____ Range: _____ Section: _____ ¼ Sec: _____
Additional T/R/S, Sections or ¼ Secs: _____
Coordinates: UTM Zone: ☐ 12 ☒ 13 Northing: 4,363,674.44 Easting: 253,979.60
Datum: ☐ NAD27 ☒ NAD83 ☐ WGS84 ☐ Other: _____
GPS accuracy (if known): _____ ☐ autonomous (uncorrected) ☐ differentially corrected ☐ Other: _____

Directions (REQUIRED)
Driving and hiking directions and prominent topographical features: From the City of Rifle drive southwest on 317 road to the Beaver Creek trailhead. Walk the trail to the ridgetop below North Mamm Peak.

Survey Information
These grasslands are located in the subalpine zone on Battlement Mesa and occupy moderate-gradient south and southeast-facing slopes. Habitat is characterized by a mosaic of graminoid and forb meadows interspersed with stands of spruce-fir and in swales and depressions, wetland meadows, fens and open water ponds. Aspen (*Populus tremuloides*) woodlands dominate lower elevation upland habitat and dense willow (Salix spp.) shrublands characterize riparian habitat.
These uplands were historically impacted by clearcut logging. Logged habitat is recovering but has been replaced by open herbaceous meadows characterized by a mosaic of Timber oatgrass (*Danthonia intermedia*) and forb meadows.

Herbaceous cover totals 90% with 30% forbs and 70% graminoids. Timber oatgrass comprises 38% of the graminoid cover. Forb species are mixed and no one species dominates. Herbaceous species include *Carex ebenea, Pneumonanthe affinis, P. parryi, Poa alpina, Senecio serra, Frasera speciosa, Hymenoxys hoopsii, Bromus ciliata, Festuca thurberi, Antennaria pulcherrima, Anaphalis margaritacea*, and *Cirsium tioganum* var. *coloradense*.

Element Occurrence Data and Ranking Factors

Size Rank: ☐ A ☐ B ☒ C ☐ D
Size of Observed Feature: 77 **acres** (If Linear area**:** Length: _____ (m) Width: _____ (m))
Although this is a somewhat small site the occurrence likely extends well beyond the mapped boundaries.
Condition Rank (development/maturity, weedy, etc.): ☐ A ☒ B ☐ C ☐ D

Habitat here is currently undisturbed by anthropogenic development. Vegetative cover is high and rich in species. Habitat is a complex mosaic of communities with high horizontal diversity with consequently greater sustainability and wildlife value.

Landscape Context Rank (structure, condition, development/maturity and extent of surrounding landscape; abiotic physical/chemical factors): ☐ A ☒ B ☐ C ☐ D

The surrounding landscape is intact and generally not fragmented by recent anthropogenic development. Habitat is recovering from historic logging and is characterized by a complex mosaic of ecosystems that confer high sustainability and wildlife value.

EORANK: ☐ A ☒ B ☐ C ☐ D ☐ E ☐ F ☐ H ☐ X

EO Rank Specs Author/Version Date: (yr-m-d)

EO RANK SUMMARY COMMENTS:

This grassland community is vigorous and reproductively successful. Surrounding landscape is large and generally unfragmented or impacted by anthropogenic development. If current environmental conditions persist this community is also likely to persist for the long-term.

Community Information & Data

General Description (general surroundings description, environmental information, etc.):

Land use description:

Aspect: south to southwest
Slope: 2% to 15% or degrees (circle one)
Geology Comments:
Soil Comments:

Quantitative Method: ☒ None ☐ Plot ☐ Plotless Plot Code: _____

Protection Comments (Comments on any legal protections or strategies proposed or in place): Site is located within the White River National Forest and is managed for multiple uses.

Management Comments (e.g. effects on population viability due to mining, recreation, grazing, exotic species; etc. past/present/future recommendations): Maintaining roadless status is essential for continuing recovery of this habitat and to ensure habitat functions, such as soil and water conservation, that enable a sustainable watershed.

Ownership

Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ NPS ☐ Other: _____
Owner Name (or National Forest, BLM District, etc.): White River National Forest
Owner Comments (special requests, permissions, circumstances):

Documentation

Photographs Taken: ☒ Y ☐ N Photographer: Malone, D.G. Photo Number(s): North Mamm 009, 012
Repository: CNHP

NRIS Site ID for EO: 021506	Scientific Name: Carex limosa	NRCS Plant Code: CALI7
NRIS Survey ID: 42855	NRIS Survey Name: (Project name & unit Number) WRNF fen survey 42855 transfer trail	Data Entered in NRIS - ☐ Entered by: Date Entered:
Survey date 8/5/2011 (Month/day/year)	State/County/Region/Forest/District CO/Garfield /R2/WRNF/Rifle	GPS Data Collected? yes If Yes, What Type:(Point/Polygon) point

Observers:	
Name: Malone, D.G.	Qualifications: CNHP ecologist
Name:	Qualifications:
Name:	Qualifications:

Element Occurrence Data – **Bold** Fields are required

Number of Individuals: >3,000	EO Canopy Cover: 70%	Plant Count Type: estimated (Estimated or Actual)	Number of subpopulations: three	CNHP Information EO Form Complete: ☐ Date Completed:

Phenology by % (Sum to 100%)	
Vegetative	
Flower/Bud	100
Fruit/Dispersed	
Seedling/Juvenile	

Population Comments: (e.g., distribution, vigor, density, phenology, dispersal):
Population is widely distributed in specific and narrow habitat conditions. In this habitat the population is abundant and dense. Population is vigorous and is reproductively successful, as evidenced by high abundance and density.

Evidence of disease, competition, predation, trampling, or herbivory:
If yes, Comments: none observed

Site Description – **Bold** Fields are required

Elevation range(ft.): 10,416	Slope: 0% to 1%	Slope Position: basin	Aspect: North,south ,east, and west	Light Exposure: Full sun

Soil Type: peat	Parent Material: organic	Soil Moisture: inundated	Soil type/texture: limestone

Community Canopy Cover by % Life Form: (Sum to 100%)	
Tree	0
Shrub	20
Forb	60
Graminoid	40
Non-vascular	
Lichen	
Algae	

Habitat Description: Site is a montane herbaceous basin and slope wetland fen. The fen is ringed by mesic willow shrublands, then by mesic forb meadows and finally, on upland hillslopes by spruce-fir (Picea engelmannii-Abies lasiocarpa) forest. Numerous open water ponds occur throughout the site due to karst topography and abundant groundwater.

Current Land Use: recreation, including winter motorized recreation (Snowmobiles) through the fen

Disturbance/Threats: winter use by snowmobiles

EO Documentation – Specimen Collections and Photographs

Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository: CSU	Verification (Authority): Verified (Yes/No):

Photo taken?	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. Transfer 054 2. Transfer 056 3.	Photo Description: 1. C.limosa and habitat 2. C. limosa and habitat 3.
yes			

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 1)4,391,821.38 2)4,391,836.40 3)4,391,873.13 **E** **1)**297,853.59 2) 297,820.89 3) 297,756.11	Quad name Carbonate	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 42855Climosa			

Comments

Associated Species													
Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Carex utriculata					x								
Carex aquatilis					x								
Eleocharis quinqueflora					x								
Menyanthes trifoliata				x									
Salix planifolia					x								
Eriophorum angustifolium					x								
Salix brachycarpa					x								
Erigeron peregrinus					x								
Carex microglochin					x								
Sedum rhodanthum					x								
Limnorchis dilatata					x								
Spiranthes romanzoffiana					x								

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 42855 Carex limosa

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021506	**Scientific Name:** *Isoetes* spp.	**NRCS Plant Code:**
NRIS Survey ID: 42811	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey transfer trail 42811	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 8/9/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Garfield /R2/WRNF/Rifle	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point
Observers:		
Name: Malone, D.G.	**Qualifications:** CNHP ecologist	
Name:	**Qualifications:**	
Name:	**Qualifications:**	

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 3600	**EO Canopy Cover:**	**Plant Count Type:** estimated (Estimated or Actual)	**Number of subpopulations:** 0	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Population distribution is limited to one small sinkhole/pond. However, individuals are abundant and densely distributed in that pond. Population appears vigorous and is reproductively successful.
Vegetative	100	
Flower/Bud		
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory: potential herbivory If yes, Comments: The pond was also occupied by hundreds of tadpoles which may be foraging on the quillwort.
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 10,411	**Slope:** 0%	**Slope Position:** toeslope	**Aspect:** **0**	**Light Exposure:** Full sun

Soil Type:	**Parent Material:** unconsolidated	**Soil Moisture:** moist	**Soil type/texture:**

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: This site is located in the upper montane zone on the south rim of the White River Plateau on the West Slope of the Continental Divide. The sinkhole where the Quillwort is located occupies a low-gradient swale on a gently sloping plateau which tilts southward, ultimately draining down steep cliffs to the Colorado River near Glenwood Springs. Surrounding landscape is characterized by gently rolling forested hills and moist swales where dozens of lakes and wetlands have formed. Wetland habitat surrounding the occurrences is characterized by a mosaic of mesic graminoid and forb meadows, dense willow (*Salix* spp.) shrublands and open water sinkhole/ponds. Uplands are characterized by mixed spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and aspen (*Populus tremuloides*) woodlands.
Tree	0	
Shrub	0	Current Land Use: recreation
Forb	30	

Graminoid	20	
Non-vascular		Disturbance/Threats: none observed
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository: CSU		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. transfer trail 017 2. transfer trail 022 3.	Photo Description: 1. Isoetes spp 2. Isoetes habitat 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4,392,266.92 **E** 298,926.60	Quad name Carbonate	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 42811Isoetes			

Comments

Associated Species													
Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Eleocharis palustris				x									
Carex utriculata				x									
Calamagrostis canadensis						x							
Erigeron peregrinus						x							
Caltha leptosepala						x							
Carex aquatilis						x							
Lemna minor				x									
Potamogeton spp.				x									

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 42811 Isoetes

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021507	**Scientific Name:** Eriophorum chamissonis	**NRCS Plant Code:** ERCHA5

NRIS Survey ID:	**NRIS Survey Name:** (Project name & unit Number) WRNF Fen Survey 12075,12021,12046, Fryingpan	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 7/23/2011- 7/25/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Pitkin /R2/WRNF/07Sopris	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Delia G. Malone	**Qualifications:** Ecologist, CNHP
Name: John C. Emerick	**Qualifications:** Ecologist, Co. School of Mines
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 225	**EO Canopy Cover: 5%**	**Plant Count Type:** estimated (Estimated or Actual)	**Number of subpopulations:** three	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): E. chamissonis is widely distributed wit low to moderate density only in sites with saturated peat soils. In these soils individuals are vigorous and reproductively successful.
Vegetative		
Flower/Bud	100	
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: none observed.
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 10,852	**Slope:** 0-1%	**Slope Position:** Colluvial footslope	**Aspect:** **10 ^{o} to 40^{o}**	**Light Exposure:** sun

Soil Type: peat	**Parent Material:** soil	**Soil Moisture:** wet	**Soil type/texture:**

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: This slope wetland fen is located in the upper subalpine zone of the Sawatch Range in the upper Fryingpan watershed. These fen sites occupy low-gradient, northeast-facing, mid-slope benches above Ivanhoe Creek. A mosaic of plant communities characterize fen habitat and have developed as a result of saturated, slumping soils which have created terraces and slopes. Terraces have saturated soils with deep accumulations of peat while intervening slopes are better drained but also have peat soils. Graminoids dominate terraces habitat, mesic forbs dominate slopes and shrublands occupy the perimeter of the fen. Surrounding uplands are characterized by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and open forb and graminoid meadows. Riparian habitat is characterized by dense willow (*Salix* spp.) cover with a mesic forb and graminoid understory.
Tree		
Shrub		Current Land Use: recreation
Forb	10	
Graminoid	90	

Non-vascular	55	Disturbance/Threats: Ditch in buffer above site intercepts and diverts groundwater away from fen; 2) road and campground in buffer; and 3) recreational trampling .
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository:		Verification (Authority): Verified (Yes/No):
Photo taken? Yes	Photographer: Malone, D.G> Repository: CNHP	Photo Number: 1. FP 005 2. FP010 3.	Photo Description: 1. E. chamissonis 2. E. chamissonis 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** **1)**4348990.00; 2) 4348276.95 3) 369788.27 **E** **1)**368840.49 2) 369614.19 3) 4347969.09	Quad name NAST	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin GPS map 76csx			Waypoint or track name: 12075-ErCh 12021-ErCh, 12046-ErCh,			

Comments

Associated Species

Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Eleocharis quinqueflora													
Carex aquatilis													
Carex utriculata													
Carex canescens													
Carex microptera													
Carex illota													
Carex scopulorum													
Carex subnigricans													
Luzula parviflora													
Deschampsia cespitosa													
Phleum alpinum													
Juncus drummondii													

Pedicularis groenlandica													
Sedum rhodanthum													
Senecio crocatus													
Bistorta bistortoides													
Saxifraga oregana													
Senecio crocatus													
Viola adunca													
Trollius laxus													
Erigeron peregrinus													
Draba crassifolia													
Ranunculus altissimum													
Salix planifolia													
Salix brachycarpa													
Betula nana													
Vaccinium cespitosum													

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map file EO 12021

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021507	**Scientific Name:** Nuphar lutea ssp. polysepala	**NRCS Plant Code:** NULUP
NRIS Survey ID: 12177	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 12177 lily pad lake	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 7/24/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Pitkin /R2/WRNF/Sopris	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Malone, D.G.	**Qualifications:** CNHP ecologist
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 1500-3000	**EO Canopy Cover: 30%**	**Plant Count Type:** estimated (Estimated or Actual)	**Number of subpopulations:** 0	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal):
Vegetative	85	Population is widely dispersed throughout lake habitat with moderate density and abundance. The population is vigorous and reproductively successful.
Flower/Bud	15	
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory:
Seedling/Juvenile		If yes, Comments: none observed.

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 11,168	**Slope:** 0%	**Slope Position:** Basin floor	**Aspect:** North, south, east and west	**Light Exposure:** Full sun

Soil Type: peat	**Parent Material:** organic	**Soil Moisture:** Free water	**Soil type/texture:**

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: The site is a depressional wetland fen located in the upper subalpine and is a relic depression left in glacial moraine with a successional lake in the center of the depression. Lake habitat is characterized by yellow pond lily (*Nuphar lutea* ssp. *polysepala*) herbaceous vegetation with floating sedge mats on the lake perimeter indicating succession. Habitat immediately surrounding the lake is characterized by a complex mosaic of several types of mesic graminoid and mesic forb meadow communities. Soils here are saturated peat. Further away from the center of the depression, soils are less moist and habitat is characterized by willow (*Salix* spp.) shrublands. Uplands are characterized by a mosaic of spruce-fir forests and herbaceous parklands with mixed graminoids and forbs.
Tree	0	
Shrub	10	Current Land Use: recreation
Forb	10	
Graminoid	50	
Non-vascular	20	Disturbance/Threats: recreational hiking has resulted in vegetation trampling on lake shore
Lichen		

Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? no	Collector: Malone, D.G. Collection Number: Repository: CSU		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. FP 074 2. FP 077 3.	Photo Description: 1. N.lutea 2. N lutea habitat 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4,346,254.029 **E** 368,945.73	Quad name NAST	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 12177 Nuphar luteum			

Comments

Associated Species

Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Carex aquatilis													
Eleocharis quinqueflora													
Carex canescens													
Carex paupercula													
Carex utriculata													
Pedicularis groenlandica													

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 12177 Nuphar lutea

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021507	**Scientific Name:** Eriophorum altaicum	**NRCS Plant Code:** ERAL7

NRIS Survey ID: 30589	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 30589 rock creek	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 8/12/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Gunnison /R2/WRNF/Sopris	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Malone, D.G.	**Qualifications:** CNHP ecologist
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 218	**EO Canopy Cover:**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** 0	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Population is dense and abundant in a limited area of distribution. Within this area the population is vigorous and reproductively successful.
Vegetative		
Flower/Bud		
Fruit/Dispersed	100	Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: none observed
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 11,188	**Slope:** 5% to 6%	**Slope Position:** Basin floor	**Aspect:** northeast	**Light Exposure:** Full sun

Soil Type: Shallow peat/shale	**Parent Material:** Organic/glacial til	**Soil Moisture:** saturated	**Soil type/texture:** shale

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: Site occupies an alpine glacial cirque with abundant groundwater flow from snowmelt. Plant communities are a mosaic of mesic forb, graminoid and shrub wetland communities.
Tree	0	
Shrub	10	Current Land Use: recreation
Forb		
Graminoid		
Non-vascular		Disturbance/Threats: none observed
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs		
Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository: CSU	Verification (Authority): Verified (Yes/No):

Photo taken?	Photographer: Malone, D.G. Repository: CNHP	Photo Number:	Photo Description:
yes		1. Paradise 9092011 2. 3.	1. E.altaicum and habitat 2. 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4319071.18 **E** 320290.78	Quad name Snowmass Mountain	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name:30859 ErAl			

Comments

Associated Species													
Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Pedicularis groenlandica						x							
Deschampsia cespitosa						x							
Parnassia fimbriata						x							
Caltha leptosepala						x							
Carex nova						x							
Cardamine cordifolia						x							
Salix planifolia						x							
Swertia perennis						x							
Carex eleocharis						x							
Kobresia simpliciuscula						x							

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 30589 Eriophorum altaicum

General Information – **Bold** Fields are required			
NRIS Site ID for EO: 021507	**Scientific Name:** Isoetes spp.		**NRCS Plant Code:**
NRIS Survey ID **32844**	**NRIS Survey Name:** (Project name & unit Numb WRNF fen survey 32844 Paradise		**Data Entered in NRIS** - ☐ **Entered by:** **Date Entered:**
Survey date (Month/day/year)	**State/County/Region/Forest/District** CO/ /R2/WRNF/		**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point
Observers:			
Name: Malone, D.G.		**Qualifications:** CNHP ecologist	
Name:		**Qualifications:**	
Name:		**Qualifications:**	

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 2000	**EO Canopy Cover:** **30**	**Plant Count Type:** estimated (Estimated or Actual)	**Number of subpopulations:** 0	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Population is limited in distribution to one pond. Within that pond both abundance and density are high and individuals appear vigorous and reproductively successful.
Vegetative	100	
Flower/Bud		
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: none observed
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 11,067	**Slope:** **0%**	**Slope Position:**	**Aspect:**	**Light Exposure:**
Soil Type:	**Parent Material:**	**Soil Moisture:**	**Soil type/texture:**	

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat: This quillwort (Isoetes spp.)occurrence is located in a wetland fen site on the west side of the Continental Divide in the Elk Range in Paradise Basin. Here a quillwort population occupies a small pool in the wetland fen which on a lowslope on the west side of Paradise basin. Groundwater from northeast- and southeast-facing slopes is the primary source of water to the fen and the pool where this occurrence is located. Soils are deep, saturated peat that have slumped to form microtopography of alternating slopes and terraces and also depressions where these shallow ponds have formed. Terrestrial fen habitat is a mosaic of mesic herbaceous graminoid and forb meadows and shrublands while shallow ponds harbour aquatic communities such as this quillwort occurrence. Upland habitat is an expansive mosaic of herbaceous meadows, shrublands, krummholz spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and steep, unstable scree and talus slopes. Riparian habitat is characterized by a dense cover of willow (*Salix* spp.)
Tree		
Shrub		Current Land Use: Recreation
Forb		
Graminoid		
Non-vascular		Disturbance/Threats: Hydrologic alteration from roads.
Lichen		

Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected?	Collector: Malone, D.G. Collection Number: Repository: CSU		Verification (Authority): Verified (Yes/No):
Photo taken?	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. Paradise 021 2. Paradise 022 3.	Photo Description: 1. Isoetes spp. 2. Isoetes habitat 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** **E**	Quad name Oh-Be-Joyful	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 32844 Isoetes			

Comments
This small pond harbours a rich macroinvertebrate community with species such as caddisfly (*Trichoptera* spp.), leeches (*Hirudinea* spp.), fairy shrimp (*Anostraca* spp.), diving beetle (*Coleoptera* spp.), and dragonfly nymphs (*Odonata* spp.).

Associated Species

Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Potamogeton spp.													
Carex aquatilis													
Salix planifolia													

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 32844 Isoetes

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021505	**Scientific Name:** Carex buxbaumii	**NRCS Plant Code:** CABU6
NRIS Survey ID:	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 6982 gold park	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 9/12/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Eagle /R2/WRNF/Holy Cross	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Malone, D.G.	**Qualifications:** ecologist, CNHP
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: >1000	**EO Canopy Cover: 80%**	**Plant Count Type:** Estimated (Estimated or Actual)	**Number of subpopulations:** 0	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Population is limited to a small area but is abundant and densely distributed within the area. Vigor is high and the population is reproductively successful.
Vegetative		
Flower/Bud		
Fruit/Dispersed	100	Evidence of disease, competition, predation, trampling, or herbivory:
Seedling/Juvenile		If yes, Comments:

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 10,639	**Slope:** 0.5% to 1%	**Slope Position:** Basin floor	**Aspect:** south	**Light Exposure:** Full sun

Soil Type: peat	**Parent Material:** organic	**Soil Moisture:** saturated	**Soil type/texture:**

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: Site is a wide, low-gradient basin fen wetland . Plant communities are characterized by a mosaic of mesic graminoid associations that vary with soil moisture which is the least moist at the outer perimeter to saturated at the center of the basin. Communities at the perimeter are characterized by tufted hairgrass (Deschampsia cespitosa) herbaceous vegetation and at the center few-flower spikerush (Eleocharis quinqueflora) herbaceous vegetation
Tree	0	
Shrub		Current Land Use: recreation
Forb	18	
Graminoid	72	
Non-vascular	40	Disturbance/Threats: none observed
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs

Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository: CSU		Verification (Authority): Verified (Yes/No):
Photo taken? no	Photographer: Repository: CNHP	Photo Number: 1. 2. 3.	Photo Description: 1. 2. 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4,363,170.01 **E** 380,034.63	Quad name Mount of the Holy Cross	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 6982 Carex buxbaumii			

Comments

Associated Species													
Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Eleocharis quinqueflora					x								
Carex utriculata					x								
Deschampsia cespitosa					x								
Carex aquatila					x								
Caltha leptosepla					x								
Sedum rhodanthum					x								
Pedicularis groenlandica					x								
Eriophorum angustifolium					x								
Salix planifolia					x								
Betula nana					x								

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 6982 Carex buxbaumii

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021501	**Scientific Name:** Eriophorum chamissonis	**NRCS Plant Code:** ERCHA5
NRIS Survey ID:	**NRIS Survey Name:** (Project name & unit Number) WRNF Fen Survey 7566 warren lakes	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 7/29/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Pitkin /R2/WRNF/Aspen	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point
Observers:		
Name: Delia G. Malone	**Qualifications:** Ecologist, CNHP	
Name:	**Qualifications:**	
Name:	**Qualifications:**	

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 1,500	**EO Canopy Cover: 15%**	**Plant Count Type:** estimated (Estimated or Actual)	**Number of subpopulations:** none	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Population is widely and densely distributed throughout appropriate habitat. Individuals are vigorous and the population is reproductively successful.
Vegetative		
Flower/Bud	100	
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: none observed
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 10,668	**Slope:** 1.5%	**Slope Position:** footslope	**Aspect:** 60°,	**Light Exposure:** sun

Soil Type: peat	**Parent Material:** Unconsolidated, organic	**Soil Moisture:** wet	**Soil type/texture:** CL

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: These herbaceous slope wetland fens are located in the upper montane zone of the Sawatch Mountain Range in the Roaring Fork watershed. The site is comprised of three fens surrounded by wetlands that occupy low slopes on terrace benches above a north-south trending stream. Soils are saturated peat which has slumped, creating a complex microtopography of terraces, lobes, slopes and hummocks. Fen habitat is a complex mosaic of herbaceous plant communities that vary with microtopography and soil characteristics. Surrounding uplands are a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) and lodgepole pine (*Pinus contorta*) forest and aspen (*Populus tremuloides*) woodlands.
Tree		
Shrub	10	Current Land Use: Recreation
Forb	54	
Graminoid	36	
Non-vascular	60	Disturbance/Threats: 1) ATV tracks; 2) road in buffer; and 3) ditch in fen
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository:		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone,D.G. Repository:	Photo Number: 1.WL_062 2. WL_063 3.	Photo Description: 1. 2. 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4338667.01 **E** 347718.05	Quad name Aspen	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**			Waypoint or track name: 7566ErCh			

Comments

Associated Species													
Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Eleocharis quinqueflora													
Juncus drummondii													
Carex aquatilis													
Carex danescens													
Carex microptera													
Carex scopulorum													
Carex paupercula													
Carex utriculata													
Calamagrostis canadensis													
Deschampsia cespitosa													
Pedicularis groenlandica													
Limnorchis dilatata													
Senecio crocatus													
Saxifraga oregana													
Sedum rhodantum													
Castilleja rhexifolia													
Trollius laxus													
Erigeron peregrinus													
Caltha leptosepala													
Senecio triangularis													
Salix planifolia													

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 7566 Eriophorum chamissonis

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021401	**Scientific Name:** Eriophorum chamissonis	**NRCS Plant Code:** ERCHA5

NRIS Survey ID:	**NRIS Survey Name:** (Project name & unit Number) WRNF Fen Survey 36695-2 warren lakes	**Data Entered in NRIS** - ☐ **Entered by:** **Date Entered:**
Survey date 7/28/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Pitkin /R2/WRNF/Aspen	**GPS Data Collected?** **If Yes, What Type:**(Point/Polygon)

Observers:	
Name: Malone,D.G.	**Qualifications:** Ecologist, CNHP
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 424	**EO Canopy Cover:** **10**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** three	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)	
Vegetative	
Flower/Bud	100
Fruit/Dispersed	
Seedling/Juvenile	

Population Comments: (e.g., distribution, vigor, density, phenology, dispersal):
Individuals are widely distributed in appropriate habitat with low to moderate density. Population is reproductively successful and vigorous.

Evidence of disease, competition, predation, trampling, or herbivory:
If yes, Comments: none observed.

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 10,800 to 10881	**Slope:** 0% to 4%	**Slope Position:** lowslope	**Aspect:** 320 degrees M	**Light Exposure:** sun

Soil Type: peat	**Parent Material:** organic	**Soil Moisture:** wet	**Soil type/texture:** CL

Community Canopy Cover by % Life Form: (Sum to 100%)	
Tree	

Habitat Description: This depressional wetland is part of a large fen complex that is located in the upper montane zone on Smuggler Mountain in the Sawatch Range. The fens occupy relict depressions on top of lateral moraine that was deposited by the last local glaciation. Historically this site was a glacial lake that, over thousands of years, by accumulating peat, developed into fens. However, natural habitat conditions in the fen complex have been dramatically altered by a variety of anthropogenic activities including ditching, draining, damming and peat mining. This site was once part of one larger fen but now an earthen dam divides the site into two separate fens. Activities are underway to restore wetland/fen function. Wetland soils here are saturated deep peat with abundant shallow surface water. Saturated soils have resulted in slumping which has created a series of low terraces and lobes. Current habitat at this fen site is characterized by a mosaic of herbaceous mesic graminoid and forb communities with willow (*Salix* spp.) shrublands bordering the fen. Glacial erratics are evident on the periphery of the site where low-gradient hillslopes surround the fen. These upland habitats are characterized by a mosaic of spruce-fir (Picea engelmannii-Abies lasiocarpa) and lodgepole pine (*Pinus contorta*) forest, aspen (*Populus tremuloides*) woodlands and herbaceous parks with mixed graminoids and forbs.

Shrub	10	Current Land Use: recreation
Forb	40	
Graminoid	30	
Non-vascular	20	Disturbance/Threats: Ditching in wetland
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? yes	Collector: Collection Number: Repository:		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone,D.G. Repository:	Photo Number: 1. WL_022 2. WL_027 3.	Photo Description: 1. 2. 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 1) 4337188.25 2) 4337129.75 3) 4337082.05 **E** 1) 349522.69 2) 349560.14 3) 349651.29	Quad name Thimble Rock	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin GPS map 76CSx			Waypoint or track name: 366952ErCh3, 36695-2ErCh2 36695-2ErCh1			

Comments

Associated Species

Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Eleocharis quinqueflora													
Carex utriculata													
Carex aquatilis													
Sedum rhodanthum													
Carex scopulorum													
Carex microptera													
Betula nana													

Salix planifolia													
Caltha leptosepala													
Pedicularis groenlandica													
Saxifraga oregana													
Senecio crocatus													

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED

GIS map 36695-2 Eriophorum chamissonis

COLORADO NATURAL HERITAGE PROGRAM
NATURAL COMMUNITY OCCURRENCE FIELD FORM

Herbaceous

Element Scientific Name: *Carex saxatilis* herbaceous vegetation Project/File Name: WRNF fen inventory 30946
Survey Date: 2011/08/03(yyyy-mm-dd) Observer(s) Name(s): Malone, D.G.

Data Sensitivity
Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information (REQUIRED)
(Provide a photocopy of map with location of the occurrence marked or outlined)

Source ID	Source type	Uncertainty	Verified	Replace	New	Notes (# individuals)
					x	

USGS Quadrangle Name: Hayden Peak Surveysite Name (from 7.5' quad): McArthur Mountain
County: Pitkin Elevation (range if applicable): 11,769 ☒ feet ☐ meters
Legal Description: Township: _____ Range: _____ Section: _____ ¼ Sec: _____
Additional T/R/S, Sections or ¼ Secs: _____
Coordinates: UTM Zone: ☐ 12 ☒ 13 Northing: 1) 4,324,188.46; 2) 4,324,197.98; 3) 4,324,109.08 Easting: 1) 347,517.99; 2) 347,435.44; 3) 347,398.39
Datum: ☐ NAD27 ☒ NAD83 ☐ WGS84 ☐ Other: _____
GPS accuracy (if known): _____ ☐ autonomous (uncorrected) ☐ differentially corrected ☐ Other: _____

Directions (REQUIRED)
Driving and hiking directions and prominent topographical features: From the City of Aspen take Castle Creek Road south to Taylor Pass road. Take Taylor Pass road to Taylor Pass; at the top of the Pass turn north, staying on this road to the site which is on the west side of the road.

Survey Information
These populations of rock sedge (Carex saxatilis) occur in a wetland fen which is located in the lower alpine zone on the west slope of the Continental Divide on the flanks of the Sawatch Mountain Range. The wetland occupies a low-gradient basin on the shoulders of a wide, north-south trending ridge, Richmond Hill, which separates two deep valleys, Castle Creek valley to the west and Difficult Creek to the east. Groundwater is the source of water to this fen. Outflow occurs by groundwater and by a surface channel which is tributary to Castle Creek.

This fen wetland is characterized by a complex mosaic of mesic herbaceous meadows and shrublands. The rock sedge communities are one of the several types of communities in this fen which includes few-flowered spikerush (*Eleocharis quinqueflora*), mountain sedge (*Carex scopulorum*), water sedge (*Carex aquatilis*) and mesic forb meadows and planeleaf willow (*Salix planifolia*) shrublands and small open-water ponds. Uplands are an expansive mosaic of grasslands, spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest and patches of aspen woodlands. Ridgetops and rock outcrops are occupied by alpine fellfield communities and patches of flagged spruce-fir krummholz and in low, protected swales lush herbaceous wetland meadows develop where late-lying snowfields provide a constant source of water.

Rock sedge occupies topographic depressions in the fen where standing water is fairly deep (up to 1m). Rock sedge cover is typically totals 30% and is often the only plant species in the center of these depressions. Around the edges

of the depressions where water depth decreases other sedges including beaked sedge (*Carex utriculata*) and water sedge (Carex aquatilis) and forbs such as marsh marigold (Caltha leptosepala) and elephantella (Pedicularis groenlandica) often intergrades with rock sedge.

Russet sedge (*Carex saxatilis*) community total cover = 30% with 24% *C. saxatilis* and 6% other sedges including *C. aquatilis* and C. utriculata. Other nearby plant species include *Eleocharis quinqueflora, Carex canescens, Carex microptera, Carex scopulorum, Deschampsia cespitosa, Saxifraga oregana, Caltha leptosepala, Pedicularis groenlandica, Senecio crocatus, Sedum rhodanthum and Salix planifolia.*

Element Occurrence Data and Ranking Factors

Size Rank: ☐ A ☐ B ☒ C ☐ D
Size of Observed Feature: **acres** (If Linear area**:** Length: _____ (m) Width: _____ (m))
Patch size of individual rock sedge communities is somewhat small but numerous small patches are scattered throughout the fen making the overall size reasonably moderate.

Condition Rank (development/maturity, weedy, etc.): ☐ A ☒ B ☐ C ☐ D
Populations are vigorous and reproductively successful.

Landscape Context Rank (structure, condition, development/maturity and extent of surrounding landscape; abiotic physical/chemical factors): ☐ A ☒ B ☐ C ☐ D
Surrounding natural landscape is large although fragmented by old mining roads that are currently heavily used for motorized recreation during both summer and winter. Natural processes are mostly intact. Historic mining activities continue to impact the landscape although recovery has occurred over much of the area.

EORANK: ☐ A ☒ B ☐ C ☐ D ☐ E ☐ F ☐ H ☐ X
EO Rank Specs Author/Version Date: (yr-m-d)
The rock sedge populations are vigorous and reproductively successful. However, road-induced habitat fragmentation disconnects the wetland habitat from the uplands, disrupting the hydrologic connection upon which the wetlands depend. t

EO RANK SUMMARY COMMENTS:
This large, and generally natural landscape

Community Information & Data

General Description (general surroundings description, environmental information, etc.): Pleistocene ice age glaciers sculpted this landscape and although the ridgetop where this wetland community occurs was likely unglaciated, local glaciers certainly filled the valley's below and carved the steep slopes, cirques and basins that characterize these mountain slopes below the ridge. This fen occupies a large, low-gradient, west-facing basin just below the ridge of Richmond Hill. Groundwater flow from surrounding ridges maintains the mosaic of wetland communities. Water that flows through this fen gathers into surface flow forming a 1st order stream that eventually flows into Castle Creek.

Land use description: Complex faulting has occurred throughout this region and has brought mineral-rich rocks to the surface. As a consequence, from the 1880's through the early 1900's, hardrock mining and mineral exploration were extensive. Habitat alterations from mining and mining-related activities continue to impact the landscape. Currently motorized recreational use of the area is high and is enabled by a network of old mining roads.

Aspect: west
Slope: 1.5% % or degrees (circle one)
Geology Comments:
Soil Comments: deep, saturated to inundated peat
Quantitative Method: ☒ None ☐ Plot ☐ Plotless Plot Code: _____

Protection Comments (Comments on any legal protections or strategies proposed or in place): site is located in the WRNF which is managed for multiple uses.

Management Comments (e.g. effects on population viability due to mining, recreation, grazing, exotic species; etc. past/present/future recommendations): Long term sustainability of this rock sedge community and of the surrounding fen habitat is dependent on adequate groundwater flow to the fen. A popular motorized-use recreational road that runs along the ridgetop disrupts the natural hydrologic regime and may diminish the potential for long-term viability.

Ownership

Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ NPS ☐ Other: _____

Owner Name (or National Forest, BLM District, etc.): White River National Forest

Owner Comments (special requests, permissions, circumstances):

Documentation

Photographs Taken: ☒ Y ☐ N Photographer: Malone, D.G. Photo Number(s): _____ Repository: CNHP

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021501	**Scientific Name:** Eriophorum chamissonis	**NRCS Plant Code:** ERCHA5
NRIS Survey ID:	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 31430 Green Mountain	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 8/4/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/ /R2/WRNF/	**GPS Data Collected? Yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Malone, D.G.	**Qualifications:** CNHP ecologist
Name: Huggins, J.L.	**Qualifications:** CNHP botanist
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 236	**EO Canopy Cover: 8%**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** none	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Population is vigorous and reproductively successful. Abundance and density is moderate. Distribution is limited to the small area of wetland fen habitat.
Vegetative		
Flower/Bud		
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: 1)historic (7 -10 years ago) ATV use; 2) trampling from recreational hikers; and 3) elk use
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 11,662	**Slope:** 0%to 1%	**Slope Position:** Low slope	**Aspect:** North, east, and south	**Light Exposure:** Full sun

Soil Type: peat	**Parent Material:** organic	**Soil Moisture:** saturated	**Soil type/texture:** H3/H4

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: Upper subalpine zone herbaceous slope wetland fen surrounded by spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest.
Tree	0	
Shrub	5	Current Land Use: recreation
Forb	20	
Graminoid	50	
Non-vascular	80	Disturbance/Threats: historic ATV use; 2)current tramping impacts by recreational hikers; and 3) elk use
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs		
Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository: CSU	Verification (Authority): Verified (Yes/No):

Photo taken?	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. IP 008 2. 3.	Photo Description: 1. E. chamissonis and habitat 2. 3.
yes			

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4330301.07 **E** 359058.11	Quad name New York Peak	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 31430ErCh			

Comments

Associated Species

Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Eleocharis quinqueflora					x							x	
Pedicularis groenlandica					x							x	
Erigeron peregrinus					x							x	
Arnica mollis					x							x	
Caltha leptosepala					x							x	
Carex scopulorum					x							x	
Caerx aquatilis					x							x	
Carex nigricans					x							x	
Oxpolis fendleri					x							x	
Sedum rhodanthum					x							x	
Carex illota					x							x	

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 31430 Eriophorum chamissonis

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021501	**Scientific Name:** Carex leptalea	**NRCS Plant Code:** CALE4

NRIS Survey ID: 32344	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 32344 upper roaring	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 8/15/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Pitkin /R2/WRNF/Aspen	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Malone,D.G.	**Qualifications:** Ecologist, CNHP
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 93 large clumps	**EO Canopy Cover:**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** two	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Population is widely and densely dispersed through appropriate habitat. Individuals are reproductively successful and are vigorous.
Vegetative		
Flower/Bud		
Fruit/Dispersed	100	Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: none observed.
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 10,385	**Slope:** 2.5% to 6%	**Slope Position:** midslope	**Aspect:** North to west	**Light Exposure:** Full sun

Soil Type: peat	**Parent Material:** organic	**Soil Moisture:** Moist to wet	**Soil type/texture:** peat

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: subalpine zone slope wetland/fen, characterized by a mosaic of mesic shrubs and graminoids.
Tree	0	
Shrub	20	Current Land Use: recreational
Forb	20	
Graminoid	80	
Non-vascular	90	Disturbance/Threats: none observed
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? yes	Collector: Malone,D.G. Collection Number: Repository:		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. IP 005 2. IP 006 3.	Photo Description: 1. Carex leptalea 2. Habitat 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 1) 4331828.22 2) 4331854.22 **E** 1) 358246.58 2) 358186.57	Quad name New York Peak	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 32344 CaLe			

Comments

Associated Species

Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Carex paupercula					x							x	
Swertia perennis					x							x	
Thalictrum alpinum					x							x	
Dasiphora floribunda					x							x	
Oxypolis fendleri					x							x	
Sedum rhodanthum					x							x	
Betula nana					x							x	
Caltha leptosepala					x							x	
Carex scopulorum					x								
Bistortoides vivipara					x								
Deschampsia cespitosa					x								
Sphagnum spp.					x								

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 32344 Carex leptalea

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021501	**Scientific Name:** Chionophila jamesii	**NRCS Plant Code:** CHJA

NRIS Survey ID: 37373	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 37373 lost man	**Data Entered in NRIS** - ☐ **Entered by:** **Date Entered:**
Survey date (Month/day/year)	**State/County/Region/Forest/District** CO/ /R2/WRNF/	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Malone, D.G.	**Qualifications:** Ecologist, CNHP
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 53	**EO Canopy Cover:**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** two	**CNHP Information** **EO Form Complete:** **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Populations are vigorous, reproductively successful and distributed throughout appropriate habitat. Abundance is however typically somewhat low.
Vegetative		
Flower/Bud	100	
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: where the occurrence is near trails trampling occurs
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 12,702 to 12,775	**Slope:** 15% to 25%	**Slope Position:** High, mid, lowslope and ridgetop	**Aspect:** North, south, east	**Light Exposure:** Full sun

Soil Type: gravel	**Parent Material:** granite	**Soil Moisture:** moist	**Soil type/texture:** gravel

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: Alpine tundra fellfield ecosystem
Tree	0	
Shrub	10	Current Land Use: recreation
Forb	20	
Graminoid	5	
Non-vascular		Disturbance/Threats: trampling from recreational hiking
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? no	Collector: Collection Number: Repository:		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone, D.G. Repository:	Photo Number: 1. IP_59 2. 3.	Photo Description: 1. Chionophila jamesii 2. 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 1) 4334318.73 2) 4334533.51 **E** 1) 364585.63 2) 364503.87	Quad name Mount Champion	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 37373CHJA1,37373 CHJA2			

Comments

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 37373 Chionophila jamesii

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021501	**Scientific Name:** Chionophila jamesii	**NRCS Plant Code:** CHJA

NRIS Survey ID: 31473	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 31473 indy pass	**Data Entered in NRIS** - ☐ **Entered by:** **Date Entered:**
Survey date 8/1/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/ /R2/WRNF/	**GPS Data Collected?** **If Yes, What Type:**(Point/Polygon)

Observers:	
Name: Malone,D.G.	**Qualifications:**
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 36	**EO Canopy Cover:**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** none	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal):
Vegetative		
Flower/Bud	100	
Fruit/Dispersed		Evidence of disease, competition, predation, trampling, or herbivory:
Seedling/Juvenile		If yes, Comments: trampling from recreational hikers

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:**	**Slope:** 1%-2%	**Slope Position:** ridgetop	**Aspect:** south	**Light Exposure:** Full sun

Soil Type:	**Parent Material:** granite	**Soil Moisture:** moist	**Soil type/texture:** gravel

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: Alpine fellfield
Tree		
Shrub	10	Current Land Use: recreation
Forb	20	
Graminoid	10	
Non-vascular		Disturbance/Threats: trampling from recreational hiking
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? no	Collector: Collection Number: Repository:		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone, D.G. Repository:	Photo Number: 1. IP_051 2. IP_052 3.	Photo Description: 1. Chinophilla Jamesii 2. C. jamesii habitat 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4329444.68 **E** 363711.82	Quad name Independence Pass	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 331473 ChJa			

Comments

Associated Species													
Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Salix nivea													
Geum rossii													
Saxifraga rhomboidea													
Poa alpina													
Arenaria obtusiloba													
Bistorta bistortoides													

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 31473 Chionophila jamesii

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021503	**Scientific Name:** Eriophorum gracile	**NRCS Plant Code:** ERGR8

NRIS Survey ID: 14392	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 14392 Vail pass	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 8/13/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/Eagle /R2/WRNF/Dillon	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point

Observers:	
Name: Malone, D.G.	**Qualifications:** CNHP ecologist
Name:	**Qualifications:**
Name:	**Qualifications:**

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 260	**EO Canopy Cover:**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** two	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): Populations is distributed throughout appropriate habitat with moderate density and abundance. Individuals are vigorous and reproductively successful.
Vegetative		
Flower/Bud		
Fruit/Dispersed	100	Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: trampling has resulted from offroad ATV use through fen.
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:**	**Slope:** 13%	**Slope Position:** lowslope	**Aspect:** northeast	**Light Exposure:** Full sun

Soil Type: peat	**Parent Material:** organic	**Soil Moisture:** saturated	**Soil type/texture:** Von Post H3

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: Habitat is a slope wetland fen characterized by a mosaic of mesic shrub, graminoid and forb communities. Site topography is a series of terraces and slopes. Perimeter of site is hummocky with a dense cover of mosses.
Tree	0	
Shrub	20	Current Land Use: recreation
Forb	49	
Graminoid	21	
Non-vascular	70	Disturbance/Threats: off road ATV use
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs			
Specimen Collected? yes	Collector: Malone, D.G. Collection Number: Repository: CSU		Verification (Authority): Verified (Yes/No):
Photo taken? yes	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. Vail Pass 003 2. 3.	Photo Description: 1. Eriophorum gracile and habitat 2. 3.

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 1)4375919.18 2) 4375905.58 **E** 1) 394982.88 2) 395024.55	Quad name Vail Pass	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name: 14392ErGr			

Comments

Associated Species													
Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Thalictrum alpinum													
Limnorchis hyperborea													
Sphagnum spp.													
Parnassia fimbriata													
Swertia perennis													
Carex capillaris													
Dasiphora floribunda													
Betula nana													
Bistorta vivipara													
Gentiana fremontii													

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED
GIS map 14392 Eriophorum gracile

COLORADO NATURAL HERITAGE PROGRAM
NATURAL COMMUNITY OCCURRENCE FIELD FORM

Element Scientific Name: *Salix wolfii*/Mesic forb shrubland Project/File Name: WRNF fen inventory 14867
Survey Date: (2011/08/13) Observer(s) Name(s): Malone, D.G.

Data Sensitivity
Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information (REQUIRED)
(Provide a photocopy of map with location of the occurrence marked or outlined)

Source ID	Source type	Uncertainty	Verified	Replace	New	Notes (# individuals)
					x	

USGS Quadrangle Name: Vail Pass Surveysite Name (from 7.5' quad): Ten Mile Creek
County: Summit Elevation (range if applicable): 10,732 ☐ feet ☐ meters
Legal Description: Township: _____ Range: _____ Section: _____ ¼ Sec: _____
Additional T/R/S, Sections or ¼ Secs: _____
Coordinates: UTM Zone: ☐ 12 ☒ 13 Northing: 4,376,090.06 Easting: 394,679.03
Datum: ☐ NAD27 ☒ NAD83 ☐ WGS84 ☐ Other: _____
GPS accuracy (if known): _____ ☐ autonomous (uncorrected) ☐ differentially corrected ☐ Other: _____

Directions (REQUIRED)
Driving and hiking directions and prominent topographical features: From the town of Vail drive east on I-70 to Vail Pass and park at the pullout and parking lot on top of the pass. Walk west to Ten Mile Creek and then upstream staying on the leftbank of the stream and upslope to a terrace above the stream.

Survey Information
Wetland habitat is dominated by a dense cover of willow (*Salix spp.*) and non-willow shrub species with a rich and lush herbaceous layer of mixed forbs and graminoids. Upland habitat is a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest, forb and graminoid meadows and shrublands. Riparian habitat is characterized by a dense cover of willow. Beaver (*Castor canadensis*) are common along West Ten Mile Creek and have built numerous dams that conserve flows.

Total willow cover is 65% with 46% wolf willow (*S. wolfii*) and 19% barrenground willow (*Salix brachycarpa*) and bog birch (*Betula nana*). Herbaceous cover totals 90% with 54% forbs and 36% graminoids. Herbaceous species include *Achillea lanulosa, Caltha leptosepala, Valeriana edulis, Zigadenus elegans, Oxypolis fendleri, Eleocharis quinqueflora, Pedicularis groenlandica, Phleum alpinum, Delphinium barbeyi, Aconitum columbianum, Senecio bigelovii, Calamagrostis canadensis, Erigeron peregrinus, Castilleja occidentalis, Swertia perennis, Geranium fremontii, Gentianopsis thermalis, Arnica latifolia, Trollius laxus, Bistorta vivipara, Bistorta bistortoides, Erigeron speciosus, Geum triflorum, Erigeron speciosus, Dasiphora floribunda*

Element Occurrence Data and Ranking Factors

Size Rank: ☐ A ☐ B ☒ C ☐ D
Size of Observed Feature: 12 **acres** (If Linear area**:** Length: _____ (m) Width: _____ (m))

Condition Rank (development/maturity, weedy, etc.): ☐ A ☒ B ☐ C ☐ D

These shrublands have a dense cover with a good distribution of all age classes; individuals are vigorous and reproductively successful; elk browse is minimal and does not impact vigor.
Landscape Context Rank (structure, condition, development/maturity and extent of surrounding landscape; abiotic physical/chemical factors): ☐ A ☐ B ☒ C ☐ D

EORANK: ☐ A ☒ B ☐ C ☐ D ☐ E ☐ F ☐ H ☐ X
EO Rank Specs Author/Version Date: (yr-m-d)

EO RANK SUMMARY COMMENTS:
This wolf willow community is vigorous, reproductively successful and structurally diverse with a variety of age classes and high horizontal patchiness. These characteristics enable long-term viability and provide important wildlife habitat as evidenced by the abundance of breeding neo-tropical migrant bird species at this site.

Community Information & Data

General Description (general surroundings description, environmental information, etc.): This shrub wetland is located in the subalpine zone of the Gore Range on Vail Pass on the east side of the Continental Divide. The wetland occupies a terrace on a southwest-facing slope of a narrow saddle that drains into West Ten Mile Creek which flows to the southeast. Topographic position of this site conveys important water conservation and cleansing function to Ten Mile Creek.

Land use description: Recreation

Aspect: southwest
Slope: 3to 5 % (circle one)
Geology Comments:
Soil Comments: Soils are moist, shallow peat to 10cm underlain by mineral soils and rock.
Quantitative Method: ☒ None ☐ Plot ☐ Plotless Plot Code: _____

Protection Comments (Comments on any legal protections or strategies proposed or in place): site is in the White River National Forest and is managed for multiple uses.

Management Comments (e.g. effects on population viability due to mining, recreation, grazing, exotic species; etc. past/present/future recommendations): A recreational trail, approximately 3m wide, has been cut through these shrublands. The trail has resulted in weed invasion (*Trifolium repens*) and soil drying along the trail corridor. Restoring natural shrub cover and re-locating the trail to an upland site outside of this wetland would greatly benefit long-term sustainability and wetland functions.

Ownership

Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ NPS ☐ Other: _____
Owner Name (or National Forest, BLM District, etc.): White River National Forest
Owner Comments (special requests, permissions, circumstances):

Documentation

Photographs Taken: ☒ Y ☐ N Photographer: Malone, D.G. Photo Number(s): Vail Pass 032,034,043
Repository: CNHP

General Information – **Bold** Fields are required		
NRIS Site ID for EO: 021503	**Scientific Name:** Eriophorum gracile	**NRCS Plant Code:** ERGR8
NRIS Survey ID:	**NRIS Survey Name:** (Project name & unit Number) WRNF fen survey 3467 shrine pass	**Data Entered in NRIS -** ☐ **Entered by:** **Date Entered:**
Survey date 9/2/2011 (Month/day/year)	**State/County/Region/Forest/District** CO/ /R2/WRNF/	**GPS Data Collected? yes** **If Yes, What Type:**(Point/Polygon) point
Observers:		
Name: Malone, D.G.	**Qualifications:** CNHP ecologist	
Name:	**Qualifications:**	
Name:	**Qualifications:**	

Element Occurrence Data – **Bold** Fields are required				
Number of Individuals: 35	**EO Canopy Cover:**	**Plant Count Type:** actual (Estimated or Actual)	**Number of subpopulations:** 0	**CNHP Information** **EO Form Complete:** ☐ **Date Completed:**

Phenology by % (Sum to 100%)		Population Comments: (e.g., distribution, vigor, density, phenology, dispersal): This is a small population that is limited in distribution. Population is vigorous and reproductively successful though small.
Vegetative		
Flower/Bud		
Fruit/Dispersed	100	Evidence of disease, competition, predation, trampling, or herbivory: If yes, Comments: trampling results from off road ATV use.
Seedling/Juvenile		

Site Description – **Bold** Fields are required				
Elevation range(ft.)**:** 10,992	**Slope:** 1% to 7%	**Slope Position:** Low slope	**Aspect:** north	**Light Exposure:** Full sun

Soil Type: peat	**Parent Material:** organic	**Soil Moisture:** saturated	**Soil type/texture:** Von Post H3

Community Canopy Cover by % Life Form: (Sum to 100%)		Habitat Description: site is a slope wetland fen characterized by a mosaic of mesic herbaceous graminoid and forb communities. Saturated peat soils have slumped creating a microtopography of alternating slopes and terraces with differing moisture characteristics that select for differing plant communities.
Tree	0	
Shrub	10	Current Land Use: recreation
Forb	6	
Graminoid	54	
Non-vascular	80	Disturbance/Threats: illegal off road motorized ATV use
Lichen		
Algae		

EO Documentation – Specimen Collections and Photographs		
Specimen Collected? no	Collector: Malone, D.G. Collection Number: Repository: CSU	Verification (Authority): Verified (Yes/No):

Photo taken?	Photographer: Malone, D.G. Repository: CNHP	Photo Number: 1. Shrine Pass 019 2. Shrine Pass 044 3.	Photo Description: 1. E.gracile habitat 2. E.gracile 3.
yes			

Location Data						
UTM **Datum:**NAD83 **Zone:** 13 North	**N** 4377179.41 **E** 393560.60	Quad name Vail Pass	Township	Range	Section	¼ of ¼ section
GPS Equipment (Manufacturer and Model)**:**Garmin 76CSx			Waypoint or track name:3467ErGr			

Comments

Associated Species

Species	CODE	Cover, %	Exotic?	Aquatic	Fens	Other wetlands	Riparian	Moist seeps	Forest wetlands	Forest opening	Upland forest	Alpine/ subalpine	Notes
Eleocharis quinqueflora					x								
Pedicularis groenlandica					x								
Thalictrum alpinum					x								
Gentianopsis thermalis					x								
Sedum rhodanthum					x								
Saxifraga oregana					x								
Trollius laxus					x								
Swertia perennis					x								
Salix planifolia					x								
Salix wolfii					x								

ATTACH MAP OF SURVEY AREA, UNITS SURVEYED

GIS map 3467 Eriophorum gracile

COLORADO NATURAL HERITAGE PROGRAM
NATURAL COMMUNITY OCCURRENCE FIELD FORM

Element Scientific Name: *Salix wolfii*/Mesic forb shrubland Project/File Name: WRNF fen inventory 3469
Survey Date: 2011/09/02 Observer(s) Name(s): Malone,D.G.

Data Sensitivity
Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information (REQUIRED)
(Provide a photocopy of map with location of the occurrence marked or outlined)

Source ID	Source type	Uncertainty	Verified	Replace	New	Notes (# individuals)
					x	

USGS Quadrangle Name: Vail Pass Surveysite Name (from 7.5' quad): Shrine Pass
County: Summit Elevation (range if applicable): 11,022 to 10,966 ☒ feet ☐ meters
Legal Description: Township: _____ Range: _____ Section: _____ ¼ Sec: _____
Additional T/R/S, Sections or ¼ Secs: _____
Coordinates: UTM Zone: ☐ 12 ☒ 13 Northing: 4,377,373.29 Easting: 393,385.21
Datum: ☐ NAD27 ☒ NAD83 ☐ WGS84 ☐ Other: _____
GPS accuracy (if known): _____ ☐ autonomous (uncorrected) ☐ differentially corrected ☐ Other: _____

Directions (REQUIRED)
Driving and hiking directions and prominent topographical features: From the town of Red Cliff drive east on FS 709 to Shrine Pass. Walk southwest about 1.6 km to the site.

Survey Information
These wetlands are part of a large complex of wetlands which are the source headwaters for West Ten Mile Creek. Topographically this site occupies a high slope just below the summit of Shrine Pass on the Divide. Landscape on the pass is characterized by low rolling hills and swales with alternating slopes and terraces. Wetlands occupy swales and slopes. Saturated soils in these sites have often slumped to produce microtopography of alternating slopes and terraces. Wetland plant communities vary with soil moisture and are a complex patchy mosaic of lush herbaceous mesic meadows typically and willow (*Salix* spp.) shrublands. Upland hillslopes and ridges are occupied by a mosaic of spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forests, shrublands and xeric grasslands.

Wolf willow/Mesic forb (*Salix wolfii*/Mesic forb) shrublands typically occupy slopes that vary in gradient from 2% to 8%. Shrub cover varies but averages 40% with 28% wolf willow and 12% a mix of planeleaf (*Salix planifolia*) and barrenground (Salix brachycarpa) willow and bog birch (*Betula nana*). Herbaceous cover averages 65% with 60% forbs and 40% graminoids. Bryophyte cover averages = 85%. Herbaceous species present include *Carex microptera, Carex nova, Carex mertensii, Carex vesicaria, Carex saxatilis, Carex capillaris Carex nigricans, Deschampsia cespitosa, Cymopteris lemmonii, Hippochaete variegata, Gentianopsis thermalis, Gentiana fremontii, Pedicularis groenlandica, Senecio crocatus, Caltha leptosepala, Arnica mollis, Trollius laxus, Anemone narcissiflora, Betula nana, Conioselinum scopulorum, Ligusticum tenuifolium, Parnassia fimbriata, Bistorta vivipara, Valeriana edulis, Limnorchis dilatata, Castilleja rhexifolia, Pneumonanthe parryi, and Oreoxis alpina*

Element Occurrence Data and Ranking Factors

Size Rank: ☐ A ☒ B ☐ C ☐ D
Size of Observed Feature: 20 **acres** (If Linear area**:** Length: _____ (m) Width: _____ (m))

Condition Rank (development/maturity, weedy, etc.): ☐ A ☐ B ☒ C ☐ D
These shrublands are vigorous, and reproductively successful. Habitat is structurally complex with a variety of age classes and high habitat patchiness. However, motorized recreation disturbs and has altered soil and vegetation condition throughout the area.
Landscape Context Rank (structure, condition, development/maturity and extent of surrounding landscape; abiotic physical/chemical factors): ☐ A ☐ B ☒ C ☐ D
Surrounding landscape is disturbed by development, recreation and roads. These activities fragment ecological systems and processes, especially hydrology.

EORANK: ☐ A ☐ B ☒ C ☐ D ☐ E ☐ F ☐ H ☐ X
EO Rank Specs Author/Version Date: (yr-m-d)

EO RANK SUMMARY COMMENTS:
Although this is a somewhat large wetland shrubland habitat is disturbed by off road motorized use which has damaged vegetation and soils and consequently altered the hydrology that sustains the system.

Community Information & Data
General Description (general surroundings description, environmental information, etc.): This slope wetland fen is located in the upper subalpine zone on Shrine Pass in the Gore Range on the east slope of the Continental Divide. Geology on top of the pass is Pennsylvanian Age sedimentary rock with remnant patches of Pleistocene Age glacial drift of Pinedale and Bull Lake glaciations.

Land use description: Recreation

Aspect: south
Slope: 2% to 8% (circle one)
Geology Comments: sedimentary rock with remnant patches of Pleistocene Age glacial drift
Soil Comments: soils vary with slope from saturated deep peat on terraces to shallower, moist peat and mineral soils on slopes.
Quantitative Method: ☒ None ☐ Plot ☐ Plotless Plot Code: _____

Protection Comments (Comments on any legal protections or strategies proposed or in place): this site is in the White River National Forest and managed for multiple uses.

Management Comments (e.g. effects on population viability due to mining, recreation, grazing, exotic species; etc. past/present/future recommendations): Illegal motorized off-road use has damaged wetland vegetation and soils resulting in excessive erosion and habitat instability. Eliminating illegal off-road use is essential to maintain the long-term viability of these wetlands.

Ownership
Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ NPS ☐ Other: _____
Owner Name (or National Forest, BLM District, etc.): White River National forest
Owner Comments (special requests, permissions, circumstances):

Documentation
Photographs Taken: ☒ Y ☐ N Photographer: Malone, D.G. Photo Number(s): Shrine Pass 005,009
Repository: CNHP

Strata:		**Height class for Strata:**		***Cover Scale for Strata:***	
T1 Emergent	H1Graminoids	01 <0.5 m	06 10-15 m		
T2 Canopy	H2 Forbs	02 0.5-1 m	07 15-20 m	T 0-1%	5 >45-55%
T3 Sub-canopy	H3 Ferns	03 1-2 m	08 20-35 m	P >1-5%	6 >55-65%
S1 Tall shrub	H4 Seedlings	04 2-5 m	09 25-50 m	1 >5-15%	7 >65-75%
S2 Short shrub	N Non-vascular	05 5-10 m	10 > 50 m	2 >15-25%	8 >75-85%
S3 Dwarf-shrub	V Vine/liana			3 >25-35%	9 >85-95%

		4 >35-45% 10 >95%

Appendix III: Sphagnum Specimen Labels

Fen site # 11471

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Sopris Ranger District_____

Taxon:____Sphagnum platyphyllum_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 11471_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,353,899___UTM e: 365,801____ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _10,537_ ft**. Slope: _11__% Aspect: __30_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. __72511-11471-1-0 Coll. Date: __7/25/11_____
Verified by: _____ Date: _____ Notes:

collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.

Fen survey site # 11505

BRYOPHYTES or LICHENS OF:

Admin. Unit:___White River National Forest_Sopris Ranger District_____

Taxon:__Sphagnum squarrosum_____

State: __CO____ County:_Pitkin___ Location:__Wetland site #11505_____

T_____R_____S_____ Meridian: D, H, W; UTM n: _4353724_UTM e: _363558____ Zone: __13N___

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus**, peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _10804___ ft**. Slope: _8____% Aspect: _10____°**
Topography: cut bank, ditch, meadow, roadside, ridge, slope, trail, or valley
Habitat: bog/**fen,** dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: _Malone, D.G._Coll. No. 072211_____ Coll. Date: ___7/22/2011_____
Verified by: _____ Date: __7/26/2011_____ Notes:

Fen survey site# 12021

BRYOPHYTES or LICHENS OF:

Admin. Unit:_White River National Forest, Sopris Ranger District_____

Taxon:_Sphagnum platyphyllum_____

State: _CO_____ County:__Pitkin____ Location: Wetland site # 12021_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,349,167_UTM e: 368,569 Zone: _13N___

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus**, peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _10,804____ ft**. Slope: __8___% Aspect: _10___°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: _____Malone, D.G._____Coll. No. 72311-12021-1-0__ Coll. Date: 7/23/11_
Verified by: _____ Date: _7/26/11_____ Notes:

Fen survey site # 12021

BRYOPHYTES or LICHENS OF:

Admin. Unit:_White River National Forest, Sopris Ranger District_____

Taxon:_Sphagnum phlatyphyllum_____

State: _CO_____ County:__Pitkin____ Location: Wetland site # 12021_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,349,133_UTM e: 368,586 Zone: _13N___

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus**, peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _10,804____ ft**. Slope: __8___% Aspect: _10___°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: _____Malone, D.G._____Coll. No. 72311-12021-2-0__ Coll. Date: 7/23/11_
Verified by: _____ Date: _7/26/11_____ Notes:

Fen survey site# 12075

BRYOPHYTES or LICHENS OF:

Admin. Unit:_White River National Forest, Sopris Ranger District_____

Taxon:__Sphagnum platyphyllum_____

State: __CO____ County:_Pitkiin___ Location:__Wetland site # 12075_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,347,989_____UTM e: 369,776__ Zone: _13N__

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:___na_____ **location:** base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, **partial shade**, full shade **Elevation:** __11,011__ ft**. Slope: 9-20_**% **Aspect: _65-100°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No.72411-12075-1-0 _ Coll. Date: 7/24/2011____
Verified by: _____ Date: ____7/26/2011_____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site # 12177

BRYOPHYTES or LICHENS OF:

Admin. Unit: White River National Forest, Sopris Ranger District_____

Taxon:__Sphagnum russowii_____

State: _CO_____ County:__Pitkin_ Location:__site #12177_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,346,247_____UTM e: 3368,978_ Zone: _13N

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat,** moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** 11,168___ ft**. Slope: 1____**% **Aspect: _330__°**
Topography: cut bank, ditch, meadow, roadside, ridge, slope, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone,D.G._____Coll. No. 72411-12177-1-0 Coll. Date: 7/24/11_____
Verified by: _____ Date: __7/26/11_____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.))

Fen Survey site #30589

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Sopris Ranger District_____

Taxon:____Sphagnum squarrosum_____

State: _CO_____ County:__Gunnison____ Location:__wetland site # 30589_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,319,539__UTM e: 320,976__ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:____na_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: **full sun**, partial shade, full shade **Elevation:** _10,917_ ft**. Slope: 36_% Aspect: _130_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, **moist**, or wet
Collector: __Malone, D.G._____Coll. No. 08122011-30589-1-2 Coll. Date: __8/12/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen Survey site # 6982

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Holy Cross Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Gunnison____ Location:__wetland site # 6982_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,363,356__UTM e: 380,131__ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:__Betula nana_____ location: **base**, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, **partial shade**, full shade **Elevation:** _10,642_ ft**. Slope: 1_% Aspect: _250_°**
Topography: cut bank, ditch, **meadow**, roadside, ridge, slope, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 09122011-6982-1-3Coll. Date: __9/12/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site # 6982

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Holy Cross Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Gunnison____ Location:__wetland site # 6982_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,363,356__UTM e: 380,131__ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:__na_____ **location:** base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, **partial shade**, full shade **Elevation:** _10,640_ ft**. Slope: 0.5**_% **Aspect: _220_°**
Topography: cut bank, ditch, **meadow**, roadside, ridge, slope, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 09122011-6982-2-3Coll. Date: __9/12/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site # 6969

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Holy Cross Ranger District_____

Taxon:____Sphagnum russowii_____

State: _CO_____ County:__Gunnison____ Location:__wetland site # 6969_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,363,132__UTM e: 380,148__ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:__Betula nana_____ **location: base,** trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, **partial shade**, full shade **Elevation:** _10,650_ ft**. Slope: 0.5**_% **Aspect: _290_°**
Topography: cut bank, ditch, **meadow**, roadside, ridge, slope, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 09122011-6969-4-2 Coll. Date: __9/12/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site# 6969

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Holy Cross Ranger District_____

Taxon:____Sphagnum russowii_____

State: _CO_____ County:__Gunnison____ Location:__wetland site # 6969_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,363,169__UTM e: 380,115__ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:__Betula nana_____ **location: base,** trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, **partial shade**, full shade **Elevation:** _10,638_ ft**. Slope: 0.5**_% **Aspect: _260_°**
Topography: cut bank, ditch, **meadow**, roadside, ridge, slope, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 09122011-6969-3-3 Coll. Date: __9/12/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site #36695-2

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 36695-2_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,337,101___UTM e: 349,765____ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _10,881_ ft**. Slope: _2.5__**% **Aspect: _290_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. _72811-36695(2)-1-2 Coll. Date: __7/28/11_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site # 30850

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 30850_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,327,537__UTM e: 346,384___ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:____na_____ **location:** base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: **full sun**, partial shade, full shade **Elevation:** _11,321_ ft**. Slope: 2._% Aspect: _250_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, **moist**, or wet
Collector: __Malone, D.G._____Coll. No. 08082011-30850-1-2 Coll. Date: __8/08/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site #30850

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 30850_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,327,548__UTM e: 346,546__ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:____na_____ **location:** base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: **full sun**, partial shade, full shade **Elevation:** _11,307_ ft**. Slope: 2._% Aspect: _260_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, **moist**, or wet
Collector: __Malone, D.G._____Coll. No. 08082011-30850-2-3 Coll. Date: __8/08/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen survey site #30850

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 30850_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,327,571__UTM e: 346,501__ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:____na_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _11,326_ ft**. Slope: 2._% Aspect: _250_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, **moist**, or wet
Collector: __Malone, D.G._____Coll. No. 08082011-30850-3-3 Coll. Date: __8/08/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen site # 31430

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum spp._____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 31430_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,330,313__UTM e: 359,049___ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:____na_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _11,668_ ft**. Slope: __4_% Aspect: _50_°**
Topography: cut bank, ditch, **meadow**, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 08042011-31430-1-2 Coll. Date: __8/4/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen site #32344

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 32344_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,331,840__UTM e: 358,247___ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:____na_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _10,388_ ft**. Slope: 2.5-6_% Aspect: _0_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, **moist**, or wet
Collector: __Malone, D.G._____Coll. No. 08152011-32344-1-3 Coll. Date: __8/15/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen Site # 32439

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 32439_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,330,294__UTM e: 363,312___ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_____na_____ location: base, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: full sun, partial shade, full shade **Elevation:** _10,538_ ft**. Slope: _12_% Aspect: _300_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 08022011-32439-1-2 Coll. Date: __8/2/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound).

Fen Site# 3245

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 3245_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,331,695__UTM e: 359,656____ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_Salix planifolia, Betula nana **location:** **base**, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: **full sun**, partial shade, full shade **Elevation:** _10,538_ ft**. Slope: _3%__% Aspect: _280_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 08012011-3245-1-3 Coll. Date: __8/1/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Fen Site 3245

BRYOPHYTES or LICHENS OF:

Admin. Unit:__White River National Forest, Aspen Ranger District_____

Taxon:____Sphagnum warnstorfii_____

State: _CO_____ County:__Pitkin____ Location:__wetland site # 3245_____

T_____R_____S_____ Meridian: D, H, W; UTM n: 4,331,695__UTM e: 359,656____ Zone: 13N____

Substrate & Site Characteristics (circle all that apply):

Soil: mineral soil, gravel, sand, loam, silt, clay, litter, duff, humus, **peat**, moss, or litter-fall
Rock type: granitic, serpentine, metamorphic, sedimentary, volcanic, or calcareous
Rock feature: outcrop, boulder, cliff, crevice, ledge, talus, or under-hang
Tree or Shrub: species:_Salix planifolia, Betula nana **location:** **base**, trunk, branch , root, stump, snag, recently fallen tree, rotten log (decay class: ____), bark, wood, or tree root-wad
Light: **full sun**, partial shade, full shade **Elevation:** _10,538_ ft**. Slope: _3%__% Aspect: _280_°**
Topography: cut bank, ditch, meadow, roadside, ridge, **slope**, trail, or valley
Habitat: bog/**fen**, dense/open/cut forest, lake/pond, meadow, seep, spring, swamp, waterfall, stream /creek /river (intermittent), wetland, seasonally wet area, splash zone, or submerged
Site Moisture Regime: dry, mesic, moist, or **wet**
Collector: __Malone, D.G._____Coll. No. 08012011-3245-2-2 Coll. Date: __8/1/2011_____
Verified by: _____ Date: _____ Notes:

(collection # = date-site #-specimen #- position (0=flat,1=bottom of mound, 2=mid mound, 3=top of mound.)

Appendix IV. Von Post Scale for Assessing Peat Decomposition

Degree of Decomposition	Nature of Squeezed Liquid	Proportion of Peat Extruded	Nature of Plant Residues	Description
H1	Clear, Colourless	None	Plant structure unaltered Fibrous, elastic	Undecomposed
H2	Almost clear, yellow-brown	None	Plant structure distinct, almost unaltered.	Almost undecomposed
H3	Slightly turbid, brown	None	Plant structures distinct, most remains easily identifiable	Very weakly decomposed
H4	Strongly turbid, brown	None	Plant structure distinct, most remains identifiable	Weakly decomposed
H5	Strongly turbid, contains a little peat in suspension	Very little	Plant structure clear but indistinct and difficult to identify	Moderately decomposed
H6	Muddy, much peat in suspension	One third	Plant structure indistinct but clearer in residue, most remains undefinable	Well decomposed
H7	Strongly muddy	One half	Plant structure indistinct	Strongly decomposed
H8	Thick mud, little free water	Two thirds	Plant structure very indistinct – only resistant material such as roots	Very strongly decomposed
H9	No free water	Nearly all	Plant structure almost unrecognisable	Almost completely decomposed
H10	No free water	All	Plant structure not recognisable, amorphous	Completely decomposed

Appendix V. Wetland Walkthrough Forms

Battlement Mesa

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 1

(★REQUIRED FIELDS)

★START 07/19/2011 END 07/20/2011	★INVESTIGATORS: Moore, P.G.	★CELL NUMBER

AREA: ☐Elk Mountains ☐Mosquito Range ☐Flat Tops ☐Sawatch Mountains ☐Gore Range ☒Grand Mesa ☐White River Plateau DISTRICT Rifle

①

★ POLYGON CODE: AA52

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
40 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT 1	● CT	● CT

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 248,305.16
★UTM NORTH 4,361,953.84
★GPS DATUM: NAD83 UTM ZONE 13 N
★GPS ELEVATION: 10,343

PHOTO SERIES	FROM	TO

②

★ POLYGON CODE: A295

★NEW POLYGON? ☒NEW ☐ PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
50 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT 1	● CT	● CT

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 254,569.23
★UTM NORTH 4,363,445.48
★GPS DATUM: NAD83 UTM ZONE 13 N
★GPS ELEVATION: 10,652

PHOTO SERIES	FROM	TO

③

★ POLYGON CODE: A285

★NEW POLYGON? ☒NEW ☐ PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
10 CM	20 CM	12 CM
● ☐ FEN ☒NOT FEN ☐ UNCERTAIN	● ☐ FEN ☒NOT FEN ☐ UNCERTAIN	● ☐ FEN ☒NOT FEN ☐ UNCERTAIN
● CT 1	● CT 2	● CT 3

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 253,685.0
★UTM NORTH 4,363,738.0
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,740

PHOTO SERIES	FROM	TO

④

★ POLYGON CODE: _____

★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.

★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
CM	CM	CM
● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT	● CT	● CT

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST
★UTM NORTH
★GPS DATUM: UTM ZONE
★GPS ELEVATION:

PHOTO SERIES	FROM	TO

SAWATCH - TAYLOR RIVER

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 2

(★REQUIRED FIELDS)

★START 07/22/2011 END 07/25/2011	★INVESTIGATORS: Moore, D.G.	★CELL NUMBER

AREA: ☐Elk Mountains ☑Sawatch Mountains ☐Mosquito Range ☐Gore Range ☐Flat Tops ☐Grand Mesa ☐White River Plateau DISTRICT SoPiris

①

★POLYGON CODE: 11505

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☑NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐RIPARIAN ☐UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

CM	CM	CM
☑FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS. NAIP QUAD

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,363,521.__
★UTM NORTH 4,253,689.__
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,214

PHOTO SERIES	FROM	TO

②

★POLYGON CODE: 12021

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐RIPARIAN ☐UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

>60 CM	CM	CM
☑FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,368,616.42
★UTM NORTH 4,349,063.53
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,852

PHOTO SERIES	FROM	TO

③

★POLYGON CODE: 11471

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐RIPARIAN ☐UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

106 CM	CM	CM
☑FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,365,801.33
★UTM NORTH 4,353,899.75
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,537

PHOTO SERIES	FROM	TO

④

★POLYGON CODE: 12046

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐RIPARIAN ☐UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

60 CM	CM	CM
☑FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,369,651.06
★UTM NORTH 4,348,282.22
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,972

PHOTO SERIES	FROM	TO

★ **BACK** OF SHEET NO. 2 OF 2

★START 07/22/2011	★CELL NUMBER
END 07/25/2011	

⑤

★ POLYGON CODE: 12030	★ ☒ WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐ PRESENT ☐ NO BEAVER ACTIVITY
★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.	○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)	POINT LOCATION IN NAD83 CON.US:
★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	60 CM / CM / CM	★UTM EAST 369,185.82
	○ ☑ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH 4,348,398.09
	○ CT ___ / ○ CT ___ / ○ CT ___	★GPS DATUM: NAD 83 UTM ZONE 13 N
		★GPS ELEVATION:

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

PHOTO SERIES	FROM	TO

COMMENTS.

⑥

★ POLYGON CODE: 12313	★ ☒ WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐ PRESENT ☒ NO BEAVER ACTIVITY
★NEW POLYGON? ☒ NEW ☐ PHOTOINTERP.	○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)	POINT LOCATION IN NAD83 CON.US:
★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	105 CM / CM / CM	★UTM EAST 370,523.21
	○ ☒ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH 4,347,671.13
	○ CT ___ / ○ CT ___ / ○ CT ___	★GPS DATUM: NAD83 UTM ZONE 13 N
		★GPS ELEVATION: 10,965

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

PHOTO SERIES	FROM	TO

COMMENTS.

⑦

★ POLYGON CODE: 12174	★ ☒ WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐ PRESENT ☒ NO BEAVER ACTIVITY
★NEW POLYGON? ☒ NEW ☐ PHOTOINTERP.	○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)	POINT LOCATION IN NAD83 CON.US:
★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	117 CM / CM / CM	★UTM EAST 368,988.98
	○ ☒ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH 4,316,216.54
	○ CT ___ / ○ CT ___ / ○ CT ___	★GPS DATUM: NAD83 UTM ZONE 13 N
		★GPS ELEVATION: 11,169

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

PHOTO SERIES	FROM	TO

COMMENTS.

⑧

★ POLYGON CODE: 12075	★ ☒ WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐ PRESENT ☒ NO BEAVER ACTIVITY
★NEW POLYGON? ☒ NEW ☒ PHOTOINTERP.	○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)	POINT LOCATION IN NAD83 CON.US:
★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	90 CM / CM / CM	★UTM EAST 369,774.18
	○ ☒ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH 4,347,992.23
	○ CT ___ / ○ CT ___ / ○ CT ___	★GPS DATUM: NAD83 UTM ZONE 13 N
		★GPS ELEVATION: 11,008

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

PHOTO SERIES	FROM	TO

COMMENTS.

Mosquito Range

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 2

(★REQUIRED FIELDS)

★START 7/31/2011 END 8/1/29/2011	★INVESTIGATORS: Mosquito Range	★CELL NUMBER

AREA: ☐Elk Mountains ☐Mosquito Range ☐Flat Tops ☐White River Plateau DISTRICT _____
☑Sawatch Mountains ☐Gore Range ☐Grand Mesa

①

★POLYGON CODE: 366950(1)

★NEW POLYGON? ☐NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐RIPARIAN ☐UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

40 CM	CM	CM
O ☑FEN ☐NOT FEN ☐UNCERTAIN	O ☐FEN ☐NOT FEN ☐UNCERTAIN	O ☐FEN ☐NOT FEN ☐UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,311,137.38
★UTM NORTH 4,337,697.__
★GPS DATUM: NAD83 UTM ZONE 13S
★GPS ELEVATION: 10,890

PHOTO SERIES	FROM	TO

COMMENTS.

②

★POLYGON CODE: 366950(2)

★NEW POLYGON? ☐NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐RIPARIAN ☐UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

105 CM	CM	CM
O ☑FEN ☐NOT FEN ☐UNCERTAIN	O ☐FEN ☐NOT FEN ☐UNCERTAIN	O ☐FEN ☐NOT FEN ☐UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,319,510.07
★UTM NORTH 4,337,110.87
★GPS DATUM: NAD83 UTM ZONE 13S
★GPS ELEVATION: 10,381

PHOTO SERIES	FROM	TO

COMMENTS.

③

★POLYGON CODE: 4590__

★NEW POLYGON? ☐NEW ☐PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐RIPARIAN ☐UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

0 CM	CM	CM
O ☐FEN ☒NOT FEN ☐UNCERTAIN	O ☐FEN ☐NOT FEN ☐UNCERTAIN	O ☐FEN ☐NOT FEN ☐UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,318,__6.51
★UTM NORTH 4,337,206.22
★GPS DATUM: NAD83 UTM ZONE 13S
★GPS ELEVATION: 10,828

PHOTO SERIES	FROM	TO

COMMENTS.

NOTE: WETLAND #4590 HAS BEEN DELINEATED AS NON ADJACENT WETLAND #4566 IS A CLIMAX MEADOW - NO PEAT

④

★POLYGON CODE: 4566__

★NEW POLYGON? ☐NEW ☐PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐RIPARIAN ☐UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

45 CM	40 CM	40 CM
O ☒FEN ☐NOT FEN ☐UNCERTAIN	O ☒FEN ☐NOT FEN ☐UNCERTAIN	O ☒FEN ☐NOT FEN ☐UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,321,429.95
★UTM NORTH 4,336,660.91
★GPS DATUM: NAD83 UTM ZONE 13S
★GPS ELEVATION: 10,668

PHOTO SERIES	FROM	TO

COMMENTS.

(4)

★ **BACK** OF SHEET NO. 2 OF 2

★START ___/___/_____	_____
END ___/___/_____	★CELL NUMBER

⑤

★ POLYGON CODE: 7524___	★ ☒ WETLAND ☐ RIPARIAN ☐ UPLAND			★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY
★NEW POLYGON? ☒NEW ☒PHOTOINTERP.	● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)			POINT LOCATION IN NAD83 CON.US:
	CM	CM	CM	★UTM EAST 3[illegible],[illegible].2
★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	● ☐ FEN ☒ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH 4,329,333.17
	● CT ___	● CT ___	● CT ___	★GPS DATUM: [illegible] UTM ZONE 1[illegible]
				★GPS ELEVATION: 10,505

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

PHOTO SERIES	FROM	TO

⑥

★ POLYGON CODE: ___	★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND			★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY
★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.	● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)			POINT LOCATION IN NAD83 CON.US:
	CM	CM	CM	★UTM EAST ___,___,___.__
★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH ___,___,___.__
	● CT ___	● CT ___	● CT ___	★GPS DATUM: ___ UTM ZONE ___
				★GPS ELEVATION:

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

PHOTO SERIES	FROM	TO

⑦

★ POLYGON CODE: ___	★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND			★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY
★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.	● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)			POINT LOCATION IN NAD83 CON.US:
	CM	CM	CM	★UTM EAST ___,___,___.__
★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH ___,___,___.__
	● CT ___	● CT ___	● CT ___	★GPS DATUM: ___ UTM ZONE ___
				★GPS ELEVATION:

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

PHOTO SERIES	FROM	TO

⑧

★ POLYGON CODE: ___	★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND			★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY
★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.	● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)			POINT LOCATION IN NAD83 CON.US:
	CM	CM	CM	★UTM EAST ___,___,___.__
★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH ___,___,___.__
	● CT ___	● CT ___	● CT ___	★GPS DATUM: ___ UTM ZONE ___
				★GPS ELEVATION:

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

PHOTO SERIES	FROM	TO

(INTERSECTION OF PASS)

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 3

(★REQUIRED FIELDS)

★START 07/30/2011 END 08/01/2011	★INVESTIGATORS: MALONE, D.G.	★CELL NUMBER

AREA: ☐Elk Mountains ☒Sawatch Mountains ☐Mosquito Range ☐Gore Range ☐Flat Tops ☐Grand Mesa ☐White River Plateau DISTRICT _____

①

★ POLYGON CODE: 31464

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
82 CM	CM	CM
○ ☒FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
○ CT ___	○ CT ___	○ CT ___

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,364,376.51
★UTM NORTH 4,330,071.21
★GPS DATUM: NAD83 UTM ZONE 13 N
★GPS ELEVATION: 12,078

PHOTO SERIES	FROM	TO

②

★ POLYGON CODE: 31467

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
78 CM	CM	CM
○ ☒FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
○ CT ___	○ CT ___	○ CT ___

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,369,621.29
★UTM NORTH 4,330,115.65
★GPS DATUM: NAD83 UTM ZONE 13 N
★GPS ELEVATION: 12,110

PHOTO SERIES	FROM	TO

③

★ POLYGON CODE: 31457

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
40 CM	CM	CM
○ ☒FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
○ CT ___	○ CT ___	○ CT ___

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,364,132.83
★UTM NORTH 4,330,113.00
★GPS DATUM: NAD83 UTM ZONE 13 N
★GPS ELEVATION: 12,026

PHOTO SERIES	FROM	TO

④

★ POLYGON CODE: 37373

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐ RIPARIAN ☐ UPLAND

○ DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
90 CM	CM	CM
○ ☐FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	○ ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
○ CT ___	○ CT ___	○ CT ___

★. Required for all Polygons.
○. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,363,833.54
★UTM NORTH 4,333,660.85
★GPS DATUM: NAD83 UTM ZONE 13 N
★GPS ELEVATION: 12,309

PHOTO SERIES	FROM	TO

★START 07/30/2011
END 08/04/2011

★CELL NUMBER

⑤

★ POLYGON CODE: 37193

★NEW POLYGON? ☑ NEW ☐ PHOTOINTERP.

★OWNERS ☑NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑ WETLAND ☐ RIPARIAN ☐ UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

10 CM	CM	CM
O ☐ FEN ☒ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS. NO PHOTO POINT OR PANORAMA — SITE IS A CIRQUE AND BOTTOMS A HANGING LAKE

★BEAVER: ☐ DOMINANT ☐PRESENT ☒ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST __,362,635.12
★UTM NORTH 4,332,632.37
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 12,184

PHOTO SERIES	FROM	TO

⑥

★ POLYGON CODE: 31479

★NEW POLYGON? ☑ NEW ☐ PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑ WETLAND ☐ RIPARIAN ☐ UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

105 CM	CM	CM
O ☒ FEN ☐ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☑ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST __,361,443.69
★UTM NORTH 4,329,874.63
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 12,096

PHOTO SERIES	FROM	TO

⑦

★ POLYGON CODE: 31488

★NEW POLYGON? ☑ NEW ☑ PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑ WETLAND ☐ RIPARIAN ☐ UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

60 CM	CM	CM
O ☒ FEN ☐ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☑ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST __,364,279.39
★UTM NORTH 4,329,798.23
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 12,091

PHOTO SERIES	FROM	TO

⑧

★ POLYGON CODE: 31473

★NEW POLYGON? ☑ NEW ☐ PHOTOINTERP.

★OWNERS ☑NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑ WETLAND ☐ RIPARIAN ☐ UPLAND

O DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

52 CM	CM	CM
O ☒ FEN ☐ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	O ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
O CT ___	O CT ___	O CT ___

★. Required for all Polygons.
O. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS. HISTORIC DISTURBANCE FROM SHEEP RANCHING & OLD JEEP TRAIL ROAD BUT NONE RECENT

★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST __,364,201.09
★UTM NORTH 4,329,920.41
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 12,029

PHOTO SERIES	FROM	TO

(7)

INDEX-DECO PAGE CONT.

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 3 OF 3

(★REQUIRED FIELDS)

★START 07/30/2011 END 08/04/2011	★INVESTIGATORS:	★CELL NUMBER

AREA: ☐Elk Mountains ☐Mosquito Range ☐Flat Tops ☐White River Plateau DISTRICT _____
☐Sawatch Mountains ☐Gore Range ☐Grand Mesa

①

★ POLYGON CODE: 3245

★NEW POLYGON? ☑NEW ☑PHOTOINTERP.

★OWNERS ☑NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

65 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS. DEPTH TO PEAT VARIES ± 10cm DUE TO UNDERLYING BOULDERS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 359,642.29
★UTM NORTH 4,331,685.12
★GPS DATUM: NAD 83 UTM ZONE 13N
★GPS ELEVATION: 10,638

PHOTO SERIES	FROM	TO

②

★ POLYGON CODE: 32439

★NEW POLYGON? ☐NEW ☐ PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

100 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 363,299.24
★UTM NORTH 4,330,292.28
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 11,176

PHOTO SERIES	FROM	TO

③

★ POLYGON CODE: 31430

★NEW POLYGON? ☐ NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

72 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 359,048.46
★UTM NORTH 4,330,310.28
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 11,658

PHOTO SERIES	FROM	TO

④

★ POLYGON CODE: 32314

★NEW POLYGON? ☐ NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

95 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 358,211.89
★UTM NORTH 4,331,835.10
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION:

PHOTO SERIES	FROM	TO

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM — COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL — ★ FRONT OF SHEET NO. 1 OF 1

(★ REQUIRED FIELDS)

★START 08/03/2011 END 08/08/2011	★INVESTIGATORS: [illegible]	★CELL NUMBER

AREA: ☒ Elk Mountains ☐ Sawatch Mountains ☐ Mosquito Range ☐ Gore Range ☐ Flat Tops ☐ Grand Mesa ☐ White River Plateau DISTRICT _____

①

★ POLYGON CODE: 31802

★NEW POLYGON? ☒ NEW ☒ PHOTOINTERP.

★OWNERS ☒ NFS ☐ PVT ☐ BLM ☐ STA ☐ NPS ☐ OTH

★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

97 CM	CM	CM
☒ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐ PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,319,018.89

★UTM NORTH 4,322,822.12

★GPS DATUM: NAD83 UTM ZONE 13 N

★GPS ELEVATION: 12,078

PHOTO SERIES	FROM	TO

COMMENTS.

②

★ POLYGON CODE: 30916

★NEW POLYGON? ☒ NEW ☒ PHOTOINTERP.

★OWNERS ☒ NFS ☐ PVT ☐ BLM ☐ STA ☐ NPS ☐ OTH

★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

87 CM	CM	CM
☒ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐ PRESENT ☒ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,317,406.06

★UTM NORTH 4,321,135.26

★GPS DATUM: NAD83 UTM ZONE 13 N

★GPS ELEVATION: 11,969

PHOTO SERIES	FROM	TO

COMMENTS.

③

★ POLYGON CODE: 30850

★NEW POLYGON? ☒ NEW ☒ PHOTOINTERP.

★OWNERS ☒ NFS ☐ PVT ☐ BLM ☐ STA ☐ NPS ☐ OTH

★ ☒ WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

90 CM	CM	CM
☒ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐ PRESENT ☒ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,316,448.89

★UTM NORTH 4,327,576.92

★GPS DATUM: NAD83 UTM ZONE 13 N

★GPS ELEVATION: 11,289'

PHOTO SERIES	FROM	TO

COMMENTS.

④

★ POLYGON CODE: ______

★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.

★OWNERS ☐ NFS ☐ PVT ☐ BLM ☐ STA ☐ NPS ☐ OTH

★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

CM	CM	CM
☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐ PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:

★UTM EAST ___,___,___.__

★UTM NORTH ___,___,___.__

★GPS DATUM: _____ UTM ZONE ___

★GPS ELEVATION:

PHOTO SERIES	FROM	TO

COMMENTS.

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM — **COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL** ★ **FRONT** OF SHEET NO. 1 OF 1

(★REQUIRED FIELDS)

★START 08/05/2011 END 08/05/2011	★INVESTIGATORS: [illegible]	★CELL NUMBER

AREA: ☐Elk Mountains ☐Mosquito Range ☒Flat Tops ☐White River Plateau
☐Sawatch Mountains ☐Gore Range ☐Grand Mesa

DISTRICT _____

①

★ POLYGON CODE: 42855

★NEW POLYGON? ☒NEW ☐PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐RIPARIAN ☐UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

105 CM	CM	CM
● ☒FEN ☐NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS. PEAT DEPTH VARIES ± 20 TO 30 cm WITH UNDERLYING GRAVEL

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,297,709.81
★UTM NORTH 4,391,941.41
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,416

PHOTO SERIES	FROM	TO

②

★ POLYGON CODE: 42811

★NEW POLYGON? ☒NEW ☐PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐RIPARIAN ☐UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

20 CM	CM	CM
● ☐FEN ☒NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,298,322.__
★UTM NORTH 4,392,090.__
★GPS DATUM: _____ UTM ZONE 13N
★GPS ELEVATION: 10,453 – 10,476

PHOTO SERIES	FROM	TO

③

★ POLYGON CODE: 42865

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐RIPARIAN ☐UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

110 CM	CM	CM
● ☐FEN ☒NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,298,672.__
★UTM NORTH 4,391,114.__
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION:

PHOTO SERIES	FROM	TO

④

★ POLYGON CODE: _____

★NEW POLYGON? ☐NEW ☐PHOTOINTERP.

★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐RIPARIAN ☐UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

CM	CM	CM
● ☐FEN ☐NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN	● ☐FEN ☐NOT FEN ☐UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐DOMINANT ☐PRESENT ☐NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,___,___.___
★UTM NORTH ___,___,___.___
★GPS DATUM: _____ UTM ZONE _____
★GPS ELEVATION:

PHOTO SERIES	FROM	TO

VAIL B...

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 1

(★REQUIRED FIELDS)

★START 8/13/2011 END 8/13/2011	★INVESTIGATORS: [illegible]	★CELL NUMBER

AREA: ☐Elk Mountains ☐Sawatch Mountains ☐Mosquito Range ☒Gore Range ☐Flat Tops ☐Grand Mesa ☐White River Plateau DISTRICT _____

①

★ POLYGON CODE: 14392

★NEW POLYGON? ☐ NEW ☑ PHOTOINTERP.

★OWNERS ☑NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

CM	CM	CM
☒FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,321,022.42
★UTM NORTH 4,345,812.59
★GPS DATUM: NAD83 UTM ZONE 13D
★GPS ELEVATION: 10,631

PHOTO SERIES	FROM	TO

COMMENTS. No beaver activity occurs above or adjacent to this but beaver activity does occur below the 10 acre to intermittent and/or flowing surface flows.

②

★ POLYGON CODE: 11867

★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.

★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☑WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

20 CM	CM	CM
☐ FEN ☒ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,321,___.___
★UTM NORTH 4,376,092.06
★GPS DATUM: _____ UTM ZONE ____
★GPS ELEVATION: 10,732

PHOTO SERIES	FROM	TO

COMMENTS. [illegible] WETLAND ENHANCEMENTS

③

★ POLYGON CODE: ______

★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.

★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

CM	CM	CM
☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,___,___.___
★UTM NORTH ___,___,___.___
★GPS DATUM: _____ UTM ZONE ____
★GPS ELEVATION:

PHOTO SERIES	FROM	TO

COMMENTS.

④

★ POLYGON CODE: ______

★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.

★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

CM	CM	CM
☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN	☐ FEN ☐ NOT FEN ☐ UNCERTAIN
CT ___	CT ___	CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,___,___.___
★UTM NORTH ___,___,___.___
★GPS DATUM: _____ UTM ZONE ____
★GPS ELEVATION:

PHOTO SERIES	FROM	TO

COMMENTS.

(11)

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 1

(★REQUIRED FIELDS)

★START 08/10/2011 END 08/12/2011	★INVESTIGATORS: Mallory, B.G. and Emerick, J.C.	★CELL NUMBER

AREA: ☒Elk Mountains ☐Mosquito Range ☐Flat Tops ☐White River Plateau DISTRICT _____
☐Sawatch Mountains ☐Gore Range ☐Grand Mesa

①

★ POLYGON CODE: 32844

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
98 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,321,184.99
★UTM NORTH 4,317,922.58
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 11,060

PHOTO SERIES	FROM	TO

②

★ POLYGON CODE: 32800

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
72 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,321,722.29
★UTM NORTH 4,318,374.91
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 11,044

PHOTO SERIES	FROM	TO

③

★ POLYGON CODE: 32833

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
70 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,321,864.71
★UTM NORTH 4,317,891.97
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 11,216

PHOTO SERIES	FROM	TO

④

★ POLYGON CODE: 30589

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)		
50 CM	CM	CM
● ☒FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN
● CT ___	● CT ___	● CT ___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,321,026.65
★UTM NORTH 4,319,129.21
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,862

PHOTO SERIES	FROM	TO

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 1

(★REQUIRED FIELDS)

★START 09/02/2011 END 09/02/2011	★INVESTIGATORS: Malone, D.G.	★CELL NUMBER

AREA: ☐Elk Mountains ☐Mosquito Range ☐Flat Tops ☐White River Plateau DISTRICT_____
☐Sawatch Mountains ☒Gore Range ☐Grand Mesa

① ★ POLYGON CODE: 3473

★NEW POLYGON? ☒NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

70 CM	CM	CM
☒FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT___	CT___	CT___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 393,164.27
★UTM NORTH 4,377,633.85
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 11,031

PHOTO SERIES	FROM	TO

② ★ POLYGON CODE: 3467

★NEW POLYGON? ☒NEW ☐PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

70 CM	CM	CM
☒FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT___	CT___	CT___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 393,494.51
★UTM NORTH 4,377,198.00
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 10,992

PHOTO SERIES	FROM	TO

③ ★ POLYGON CODE: 3469

★NEW POLYGON? ☐NEW ☒PHOTOINTERP.

★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

68 CM	CM	CM
☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT___	CT___	CT___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST 393,174.94
★UTM NORTH 4,377,520.36
★GPS DATUM: NAD83 UTM ZONE 13N
★GPS ELEVATION: 11,035

PHOTO SERIES	FROM	TO

④ ★ POLYGON CODE: _____

★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.

★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH

★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND

DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)

CM	CM	CM
☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN	☐FEN ☐NOT FEN ☐UNCERTAIN
CT___	CT___	CT___

★. Required for all Polygons.
●. Complete up to three readings in different CTs, if needed to determine wetland and fen.

COMMENTS.

★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY

POINT LOCATION IN NAD83 CON.US:
★UTM EAST ___,___,___.__
★UTM NORTH ___,___,___.__
★GPS DATUM: _____ UTM ZONE ___
★GPS ELEVATION:

PHOTO SERIES	FROM	TO

WHITE RIVER NATIONAL FOREST

WETLAND WALKTHROUGH FORM COMPLETE ONE FORM FOR EACH 1 Km × 1 Km CELL ★ **FRONT** OF SHEET NO. 1 OF 1

(★REQUIRED FIELDS)

★START 09/12/2011 END 09/12/2011	★INVESTIGATORS: Moore, D.G.	★CELL NUMBER

AREA: ☐Elk Mountains ☐Mosquito Range ☐Flat Tops ☐White River Plateau DISTRICT_____
☐Sawatch Mountains ☑Gore Range ☐Grand Mesa

①

★ POLYGON CODE: 6952	★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐PRESENT ☒NO BEAVER ACTIVITY
★NEW POLYGON? ☐ NEW ☒ PHOTOINTERP.	● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)	POINT LOCATION IN NAD83 CON.US:
★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	92 CM / CM / CM	★UTM EAST 380,036.91
	● ☒FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH 4,363,245.71
	● CT ___ / ● CT ___ / ● CT ___	★GPS DATUM: NAD83 UTM ZONE 13 N
★. Required for all Polygons. ●. Complete up to three readings in different CTs, if needed to determine wetland and fen.		★GPS ELEVATION: 10,622

PHOTO SERIES	FROM	TO

COMMENTS.

②

★ POLYGON CODE: 6969	★ ☒WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐PRESENT ☒ NO BEAVER ACTIVITY
★NEW POLYGON? ☒NEW ☐PHOTOINTERP.	● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)	POINT LOCATION IN NAD83 CON.US:
★OWNERS ☒NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	CM / CM / CM	★UTM EAST 380,151.96
	● ☒FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH 4,363,121.33
	● CT ___ / ● CT ___ / ● CT ___	★GPS DATUM: NAD83 UTM ZONE 13 N
★. Required for all Polygons. ●. Complete up to three readings in different CTs, if needed to determine wetland and fen.		★GPS ELEVATION: 10659

PHOTO SERIES	FROM	TO

COMMENTS.

③

★ POLYGON CODE:	★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY
★NEW POLYGON? ☐ NEW ☐ PHOTOINTERP.	● DEPTH PEAT TO ROCKS OR MINERAL CONTACT (NO PEAT BELOW)	POINT LOCATION IN NAD83 CON.US:
★OWNERS ☐NFS ☐PVT ☐BLM ☐STA ☐NPS ☐OTH	CM / CM / CM	★UTM EAST ___,___,___.__
	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH ___,___,___.__
	● CT ___ / ● CT ___ / ● CT ___	★GPS DATUM: _____ UTM ZONE ___
★. Required for all Polygons. ●. Complete up to three readings in different CTs, if needed to determine wetland and fen.		★GPS ELEVATION:

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COMMENTS.

④

★ POLYGON CODE:	★ ☐ WETLAND ☐ RIPARIAN ☐ UPLAND	★BEAVER: ☐ DOMINANT ☐PRESENT ☐ NO BEAVER ACTIVITY
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	● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN / ● ☐ FEN ☐ NOT FEN ☐ UNCERTAIN	★UTM NORTH ___,___,___.__
	● CT ___ / ● CT ___ / ● CT ___	★GPS DATUM: _____ UTM ZONE ___
★. Required for all Polygons. ●. Complete up to three readings in different CTs, if needed to determine wetland and fen.		★GPS ELEVATION:

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COMMENTS.