55 Gallon Springs ID# 159346

Survey Date:	9/20/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	unknown, hillslope
Aspect (TN):	205
Elevation (m):	1425
Coordinates	37 51 11.9 Latitude -119 51 0.7 Longitude
Area:	54 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	3	Pinus ponderosa
Shrub	4	Pinus ponderosa
Graminoid	1	Carex
Forb	2	Nasturtium officinale
Aquatic		
Bryophyte	5	
Unknown		

Survey Notes

This was formerly a wet meadow that has been excavated to focus flow into a channel. A 55 gallon drum serves as the spring box. Effects from the 2013 Rim Fire are very limited. Unburned wood and live trees remain in the surrounding meadow. The flow passes into a culvert 33m from the source, then continues under the road and downslope. Surveyors recommend fencing the source, removing the drum and piping, restoring the wet meadow, and allowing cattle to access water below the road.

Hydrology, Geology, and Soil Notes

This site is an anthropogenic spring. Depth to the mineral layer was 12 cm; the texture was gritty gravel. There were no redox concentrations, depletions, or reduced matrices. The Hydrogen sulfide odor was likely due to cow scat and soil compaction.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	
Surface water	Extensive standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	52

Water Quality (Single Location)

pH	6.27
Specific conductance (uS/cm)	330.3
Dissolved oxygen (mg/L)	3.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	13.6

55 Gallon Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Nasturtium officinale, NAOF	
Plantago, PLANT	cf lanceolata
Cyperus eragrostis, CYER	star sedge
unknown Forb, dicot, 2FD	Dicot 1 seedling
Pinus ponderosa, PIPO	
Equisetum arvense, EQAR	
Taraxacum officinale ssp. officinale, TAOF	
Carex, CAREX	cf nebrascensis
Sidalcea, SIDAL	California checker mallow
Achillea millefolium, ACMI2	
Agrostis, AGROS2	
Calocedrus decurrens, CADE27	
Plantago major, PLMA2	
Veronica, VERON	
moss, 2MOSS	
Juncus orthophyllus, JUOR	
Trifolium repens, TRRE3	
Hypericum anagalloides, HYAN2	

55 Gallon Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Dark-eyed Junco, Junco hyemalis	obs	
domestic cow, Bos taurus	sign	tracks and scat
Red-breasted Nuthatch, Sitta canadensis	call	
Steller's Jay, Cyanocitta stelleri	call	

Invertebrate Species	Detection	Stage	Comments
HYM Apidae Apis mellifera	obs	Adult	
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	

Fauna Notes

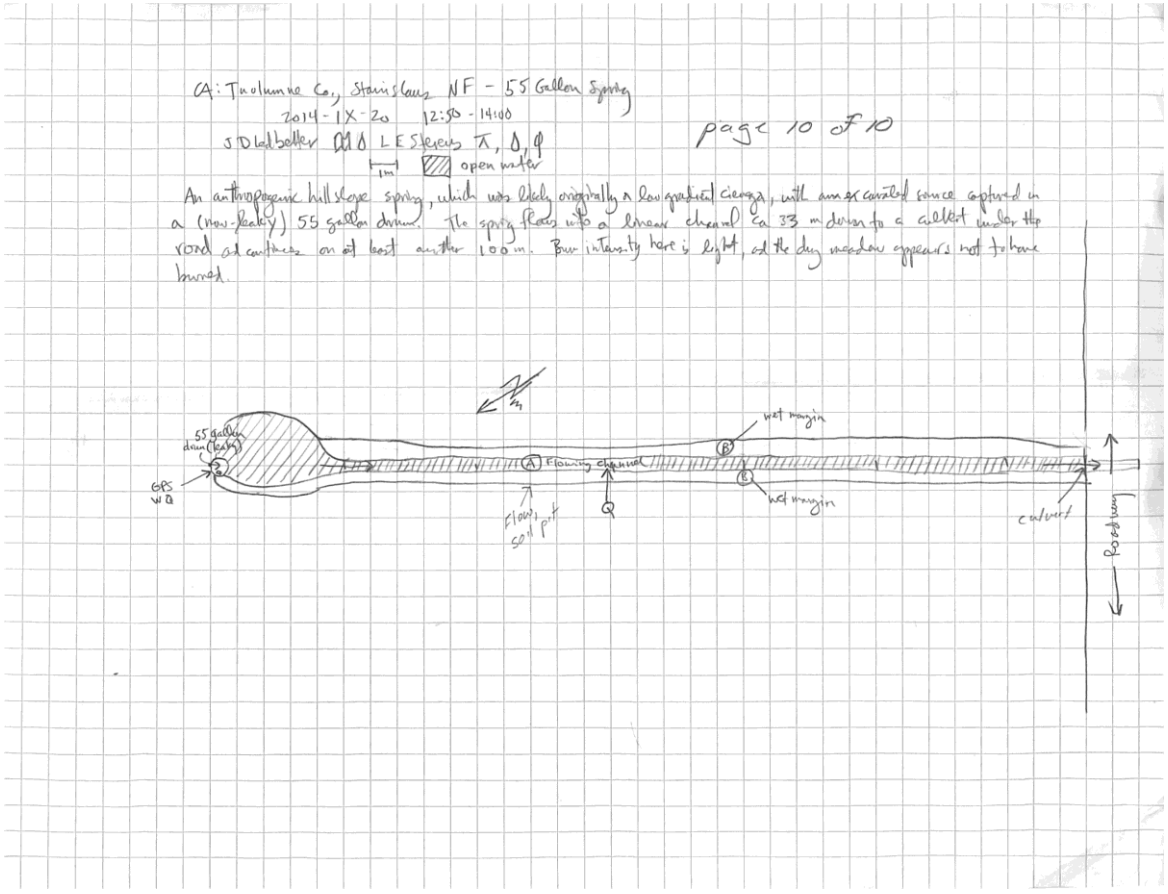
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

55 Gallon Springs (continued)

Sketchmap



Disturbance

Hydrology: Water diversion (water eventually returns to site);	Recreational effects:
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

55 Gallon Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Site is heavily grazed, trampled and excavated
Geomorphology and Soils		
4) Landform stability not altered	False	Site is heavily grazed, trampled and excavated
5) Runout channel functioning naturally	False	Flow focused into channel, then passes through culvert under Rd
6) Soil integrity not altered	False	Excavated site, heavily trampled, runout altered.
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Site is heavily browsed by livestock
9) TES, SOI/SOC flora as anticipated	False	Habitat is too altered to support SOC
10) Faunal species as anticipated	False	Few aquatic invertebrates present due to site alteration
11) TES, SOI/SOC fauna as anticipated	False	Habitat insufficient to support SOC
12) Invasive species not established	False	Plantago, Taraxacum, Nasturtium are abundant
Disturbances		
13) Flow reg. not adversely affecting site	False	Excavated
14) Construction, Roads not affecting	False	Road passes across runout at 33 m
15) Fencing functions properly	False	Fencing not present, but would help
16) Herbivory not adversely affecting site	False	Heavily trampled, grazed and browsed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	True	Low effects from Rim Fire.
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

66762217 NHD_ID ID# 159402

Survey Date:	9/20/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): hypocrene

Aspect (TN): 175

Elevation (m): 1420

Coordinates 37 50 32.1 Latitude
-119 50 50.9 Longitude

Area: unknown

Surrounding Vegetation: Herbaceous/nonvascular dominated

Surficia Material:

Lithology:

Bryophyte Abundance: None

Lifeform	Rank	Dominant Species
Tree		
Shrub		
Graminoid		
Forb		
Aquatic		
Bryophyte		
Unknown		

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This site clearly was once a wet meadow. Across the entire area, to 300 m upslope, there is no evidence of recent moisture. The lower section near the NHD point has a small dry channel, offering the only geomorphic evidence of past flow. The entire area has been heavily trampled, grazed and browsed by cattle in the past, as well as recently. All live plants are chewed to the ground by livestock. Burn severity is moderate.

Hydrology, Geology, and Soil Notes

This site was clearly a wet meadow that is either dry or ephemeral. There was no visible moisture at the site; no flow or water chemistry was possible. No soil pits indicated, as the site is long dry.

Plant Species of Interest

66762217 NHD_ID (continued)

Fauna

Vertebrate Species	Detection	Comments
deer, Odocoileus	sign	tracks
domestic cow, Bos taurus	sign	tracks and scat
horse, Equus caballus	sign	tracks and scat

Invertebrate Species	Detection	Stage	Comments
HYM Apidae Apis mellifera	obs	Adult	
HYM Siricidae	obs	Adult	
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	
ODO Aeshnidae	obs	Adult	

Fauna Notes

Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

66762217 NHD_ID (continued)

Sketchmap

Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: Camp sites; Tracks or trails by vehicles (ATV, 4WD, etc);
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Compaction; Erosion (general); Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance; Other structures observed--see disturbance notes;	Other structural disturbance - mysterious excavation.

66762217 NHD_ID (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Dry
2) Watershed (surface water) not altered	False	Dry
3) WQ changes not affecting site	False	Dry
Geomorphology and Soils		
4) Landform stability not altered	False	Heavily trampled, excavated
5) Runout channel functioning naturally	False	Channel incised
6) Soil integrity not altered	False	Heavily trampled, grazed, and excavated
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Little living vegetation at time of survey
9) TES, SOI/SOC flora as anticipated	False	Habitat not supportive of TES/SOC plants
10) Faunal species as anticipated	False	No water or moist soil
11) TES, SOI/SOC fauna as anticipated	False	Habitat no longer supports T&E or SOC spp.
12) Invasive species not established	False	Many non-native and invasive plant spp
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	No fencing present
16) Herbivory not adversely affecting site	False	Heavily trampled and grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

66762247 NHD_ID ID# 159409

Survey Date:	9/20/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): helocrene

Aspect (TN): 139

Elevation (m): 1412

Coordinates

Area: unknown

Surrounding Vegetation: Herbaceous/nonvascular dominated

Surficia Material: Colluvium

Lithology: Igneous intrusive , Diorite

Bryophyte Abundance: None

Lifeform	Rank	Dominant Species
Tree	5	Pinus ponderosa
Shrub	2	Pinus ponderosa
Graminoid	1	Poa
Forb	2	Achillea millefolium
Aquatic		
Bryophyte		
Unknown		

Survey Notes

This site likely fed a meadow that is in the USFS meadows layer. There is no evidence of recent flow. The site has been heavily trampled, grazed,and browsed by domestic cattle, in the past, as well as recently. Burn severity in the area was moderate. Surveyors completed a partial survey that included disturbance and management indicators. However, they did not complete a sketchmap or calculate area, as this appears to no longer be a GDE.

Hydrology, Geology, and Soil Notes

No soil pit is indicated as the site is dry.

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

66762247 NHD_ID (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Calycadenia mollis, CAMO4	

66762247 NHD_ID (continued)

Fauna

Vertebrate Species	Detection	Comments
California ground squirrel, Spermophilus beeche	obs	
Common Raven, Corvus corax	obs	
domestic cow, Bos taurus	sign	tracks and scat
gopher, Thomomys sp	sign	holes
woodpecker, picidae fam	call	pecking

Invertebrate Species	Detection	Stage	Comments
ODO Aeshnidae	obs	Adult	

Fauna Notes

Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

66762247 NHD_ID (continued)

Sketchmap

Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Erosion (general); Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

66762247 NHD_ID (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Spring is dry
2) Watershed (surface water) not altered	False	Spring is dry
3) WQ changes not affecting site	False	Spring is dry
Geomorphology and Soils		
4) Landform stability not altered	False	Excavation, trampling, 2013 Rim Fire
5) Runout channel functioning naturally	NA	No runout channel
6) Soil integrity not altered	False	Spring is dry
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Dry - little living ground cover
9) TES, SOI/SOC flora as anticipated	False	No TES/SOC spp detected
10) Faunal species as anticipated	False	Dry - no aquatic or wetland invertebrates or vertebrates
11) TES, SOI/SOC fauna as anticipated	False	TES/SOC spp resources insufficient to support their population
12) Invasive species not established	False	Non-native grasses abundant (e.g., Poa pratensis)
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	No fencing present
16) Herbivory not adversely affecting site	False	Heavily trampled, grazed and browsed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	2013 Rim fire, excavation, and trampling
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Aquarius Springs ID# 159357

Survey Date:	9/20/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): rheocrene

Aspect (TN): 122

Elevation (m): 1424

Coordinates 37 51 12.3 Latitude
-119 52 30.4 Longitude

Area: 49 square meters

Surrounding Vegetation: Tree dominated

Surficia Material: Alluvium

Lithology: Igneous intrusive , Granite

Bryophyte Abundance: Minor component

Lifeform	Rank	Dominant Species
Tree	1	Pinus lambertiana
Shrub		
Graminoid	2	Agrostis
Forb	3	unknown Forb, dicot
Aquatic	4	algae sp
Bryophyte	5	
Unknown		

Survey Notes

This spring emerges in an incised channel in an area moderately affected by the 2013 Rim Fire. There was no flow, but there was standing water in several pools- the largest being about 2m in diameter.

Hydrology, Geology, and Soil Notes

The secondary lithology is tonalite. Surveyors were unable to measure flow due to no outflow. No soil pits were indicated as this is a rheocrene heavily influence by surface flows.

Hydrologic Attribute	Results
Water table type	
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH	6.54
Specific conductance (uS/cm)	238.8
Dissolved oxygen (mg/L)	1.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	17.5

Aquarius Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Salix scouleriana, SASC	?
Ribes, RIBES	med; dissected leaf
Fabaceae,	
Epilobium ciliatum, EPCI	
Equisetum arvense, EQAR	
Pseudognaphalium stramineum, PSST7	sp2 - small *
unknown Forb, dicot, 2FD	Dicot 3 Asteracea -Aster subulatus
Carex, CAREX	cf aurea
Gnaphalium palustre, GNPA	
Pinus lambertiana, PILA	
Calystegia malacophylla, CAMA38	
Arnica, ARNIC	
Taraxacum officinale ssp. officinale, TAOF	
Glyceria elata, GLST	
Ribes nevadense, RINE	
Conyza canadensis, COCA5	
Trifolium wormskioldii, TRWO	
moss, 2MOSS	
Hypericum, HYPER	
unknown shrub, 2SHRUB	1 Populus-like sdlg, sent to MW for ID
Carex, CAREX	cf alma
Galium triflorum, GATR3	
Agrostis stolonifera, AGST2	
Pinus, PINUS	cf lambertiana seedling
Dysphania pumilo,	?
Deschampsia, DESCH	cf. danthonioides
Veronica catenata, VECA7	
Pseudoroegneria spicata, PSSPS	*
Chamaebatia foliolosa, CHFO	mountain misery/Chamaebatia
Calamagrostis purpurascens, CAPU	

Aquarius Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Black-throated Gray Warbler, Dendroica nigresc	obs	bathing in pool
Common Raven, Corvus corax	call	
Red-breasted Nuthatch, Sitta canadensis	call	
Yellow Warbler, Dendroica petechia	obs	

Invertebrate Species	Detection	Stage	Comments
HEM Gerridae Aquarius remigis	obs	Adult	
ODO Aeshnidae	obs	Adult	

Fauna Notes

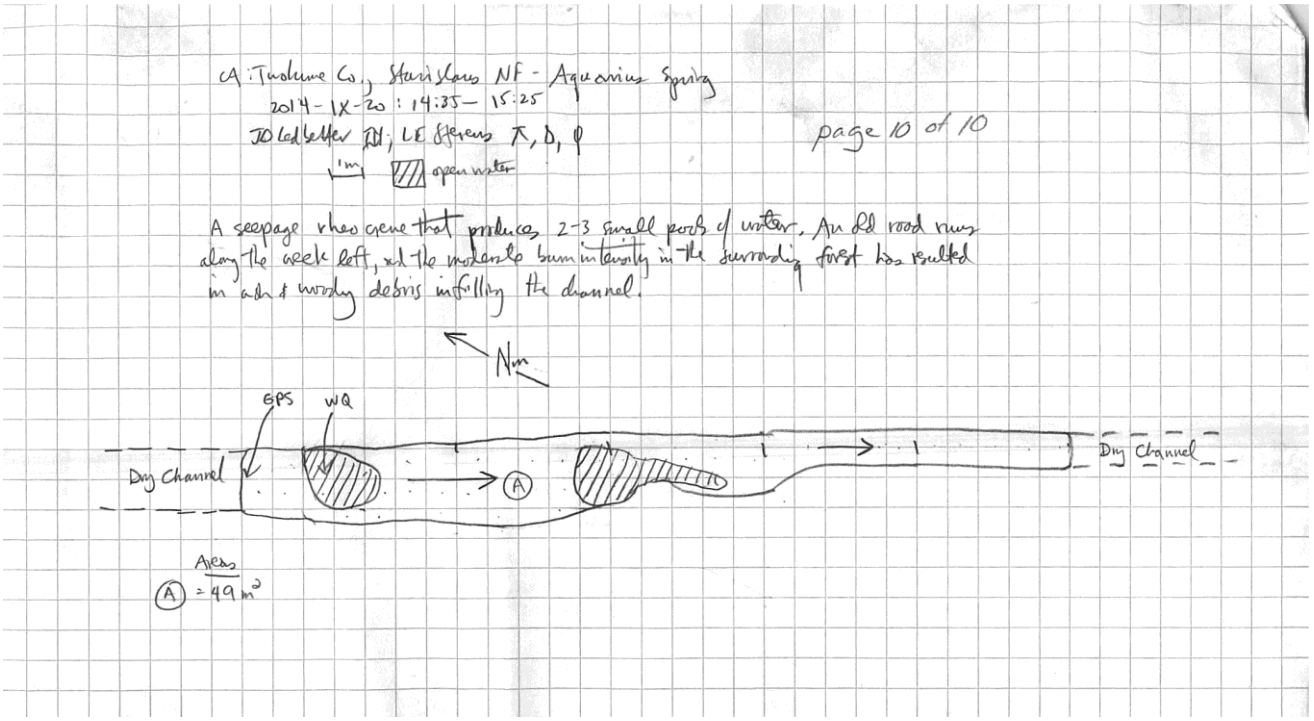
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Aquarius Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: Camp sites;
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Ground disturbance (general); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Aquarius Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Fire effects/incision
Geomorphology and Soils		
4) Landform stability not altered	False	Channel is incised, probably due to fire
5) Runout channel functioning naturally	False	Channel is incised, probably due to fire
6) Soil integrity not altered	False	Channel is incised, probably due to fire
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Immature growth, surface littered with fire debris
9) TES, SOI/SOC flora as anticipated	False	Site heavily disturbed by post-fire flooding/treefall
10) Faunal species as anticipated	False	Few aquatic inverts, all native invasives
11) TES, SOI/SOC fauna as anticipated	False	Habitat does not support focal fauna
12) Invasive species not established	False	Agrostis stolonifera and Taraxacum common at site
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	UA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	2013 Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Bathtub Springs ID# 159421

Survey Date:	9/24/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hillslope
Aspect (TN):	182
Elevation (m):	1371
Coordinates	37 49 41.8 Latitude -119 52 55.7 Longitude
Area:	25 square meters
Surrounding Vegetation:	Shrub dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	1	Cercocarpus
Graminoid	3	Agrostis stolonifera
Forb	2	Machaeranthera canescens
Aquatic		
Bryophyte	4	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.028

Water Quality (Single Location)

pH	6.01
Specific conductance (uS/cm)	187.8
Dissolved oxygen (mg/L)	2.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	13.6

Survey Notes

This site was formerly a hillslope that has been excavated and piped, although the piping is now nonfunctional, into a bathtub by the road. Effects of the 2013 Rim Fire were severe in this area.

Hydrology, Geology, and Soil Notes

No soil pit was indicated, as this was a steep, rocky, incised channel.

Bathtub Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Juncus covillei, JUCO5	
Cirsium vulgare, CIVU	
Salix scouleriana, SASC	
Agrostis stolonifera, AGST2	
Carex, CAREX	cf nebrascensis
Anaphalis margaritacea, ANMA	
Aquilegia formosa, AQFO	
Elymus, ELYMU	
Ribes, RIBES	
Carex, CAREX	cf alma
Trifolium repens, TRRE3	
unknown Forb, dicot, 2FD	cf. Hosackia sp.
liverwort fam,	Sent to MW for ID
Poa pratensis ssp. pratensis, POPRP2	
unknown shrub, 2SHRUB	* ovate, dentate leaves; Sent to MW to ID
Quercus kelloggii, QUKE	black seedling
Dieteria canescens,	var. canescens
moss, 2MOSS	
Potentilla, POTEN	* prostrate; Sent to MW to ID
Cercocarpus, CERCO	Sent to MW to ID
Carex, CAREX	
Ceanothus, CEANO	long stem
Chamaebatia foliolosa, CHFO	
Hypericum, HYPER	
Epilobium, EPILO	cf ciliatum
Arctostaphylos, ARCTO3	seedling
Mimulus, MIMUL	cf guttatus - no heads
Panicum acuminatum,	?

Bathtub Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
domestic cow, Bos taurus	sign	tracks/scat
Loggerhead Shrike, Lanius ludovicianus	call	
Northern Flicker, Colaptes auratus	call	

Invertebrate Species	Detection	Stage	Comments
COL Dytiscidae Agabus	obs	Adult	nr pictus
COL Hydraenidae	obs	Adult	
HEM Gerridae Aquarius remigis	obs	Adult	
HEM Notonectidae Notonecta	obs	Adult	nr kirbii
HYM Apidae Apis mellifera	obs	Adult	
HYM Siricidae	obs	Adult	tremax?
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	
MOLL Sphaeriidae Pisidium	obs	Adult	
PLE Capniidae	obs	Larvae	
ZP Ostracoda	obs		

Fauna Notes

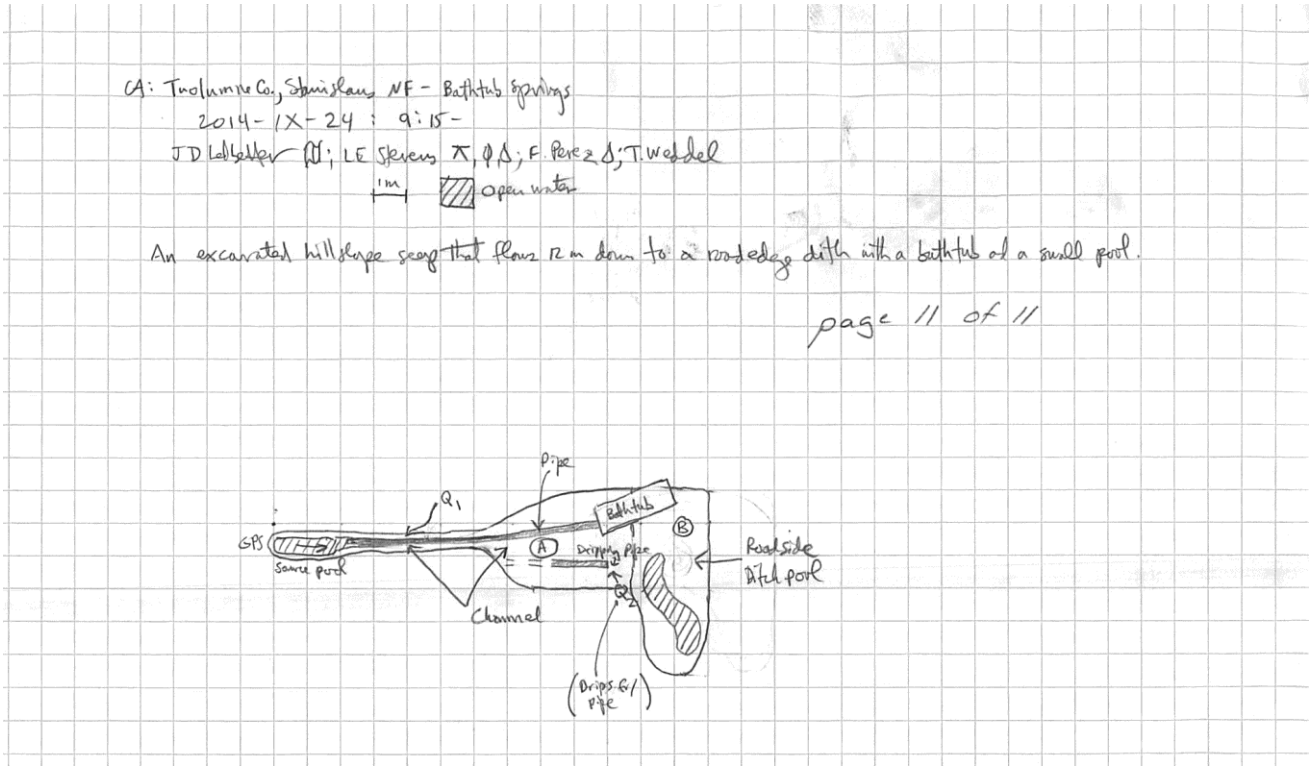
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Bathtub Springs (continued)

Sketchmap



Disturbance

Hydrology: Water diversion (water eventually returns to site);	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Excavation; Ground disturbance (general); Pipes;	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Enclosure (such as spring house, spring box, or concrete enclosure; Road (includes construction and maintenance; Other structures observed--see disturbance notes;	

Bathtub Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Heavy fire influence, channel incised
5) Runout channel functioning naturally	False	Incised and piped
6) Soil integrity not altered	False	Incised channel, flow focused
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Alteration by the fire, grazing, and flow regulations
10) Faunal species as anticipated	False	Limited habitat for aquatic invertebrates
11) TES, SOI/SOC fauna as anticipated	False	Not likely to see species here due to alteration
12) Invasive species not established	False	Non native species include clover, bent grass, and bull thistle
Disturbances		
13) Flow reg. not adversely affecting site	False	Piped channel incised
14) Construction, Roads not affecting	False	Runout inot roadside ditch
15) Fencing functions properly	False	No fencing present
16) Herbivory not adversely affecting site	False	Trampled and grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Heavy 2013 Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Bedrock Pools Springs ID# 159349

Survey Date:	9/28/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): hillslope, rheocrene

Aspect (TN): 345

Elevation (m): 823

Coordinates 37 51 54.4 Latitude
-120 9 23.9 Longitude

Area: 157 square meters

Surrounding Vegetation: Tree dominated

Surficia Material: Rock (no surficial material present), Alluvium

Lithology: Metamorphic , Schist

Bryophyte Abundance: Minor component

Lifeform	Rank	Dominant Species
Tree	1	Alnus incana ssp. tenuifolia
Shrub	4	Alnus incana ssp. tenuifolia
Graminoid	3	Poa
Forb	2	Lycopus
Aquatic	5	Lemna valdiviana
Bryophyte		
Unknown		

Survey Notes

This is a small rheocrenic hillslope spring that emerges from a formerly fenced, excavated, and rockwalled cistern, seeping into an unnamed tributary of Indian Creek.

Hydrology, Geology, and Soil Notes

No soil pit was indicated as this was a bedrock channel.

Hydrologic Attribute	Results
Water table type	Ponding
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Extensive standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.041

Water Quality (Single Location)

pH	7.48
Specific conductance (uS/cm)	769.0
Dissolved oxygen (mg/L)	7.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	14.4

Bedrock Pools Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Pteridiophyta fam,	fern
Epilobium ciliatum, EPCI	
Toxicodendron diversilobum, TODI	
Cynosurus echinatus, CYEC	tall, short-cylindrical spiny inflorescence
Salix scouleriana, SASC	*
Brassicaceae fam,	Brassica
Cephalanthus occidentalis, CEOC2	pointy-leaf Cornus, sent to MW for ID
Poa, POA	sp?
moss, 2MOSS	
Rubus armeniacus, RUAR9	
Alnus incana ssp. tenuifolia, ALINT	
Festuca arundinacea, SCPH	
Calocedrus decurrens, CADE27	
Carex, CAREX	cf alma
Artemisia ludoviciana, ARLU	
Quercus agrifolia, QUAG	CA live oak
Datisca glomerata, DAGL2	
Nasturtium officinale, NAOF	
unknown Forb, dicot, 2FD	Dicot 1 Not Apiaceae
Lycopus, LYCOP4	
Rumex, RUMEX	cf crispus
Mentha pulegium, MEPU	
Elymus glaucus, ELGL	
Lemna valdiviana, LEVA	
Holcus lanatus, HOLA	yellow grass
Dieteria canescens,	var. canescens; purple
Symphoricarpos, SYMPH	sent to MW for ID

Bedrock Pools Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Acorn Woodpecker, Melanerpes formicivorus	call	
California Quail, Callipepla californica	obs	
Northern Flicker, Colaptes auratus	call	
Scrub Jay, Aphelocoma californica	obs	

Invertebrate Species	Detection	Stage	Comments
COL Gyrinidae Gyrinus	obs	Adult	
EPH	obs		
HEM Corixidae	obs	Adult	
HEM Gerridae Aquarius remigis	obs	Adult	
HEM Veliidae	obs	Adult	
LEP Pieridae Pieris rapae	spot	Adult	
ODO Aeshnidae	obs	Larvae	

Fauna Notes

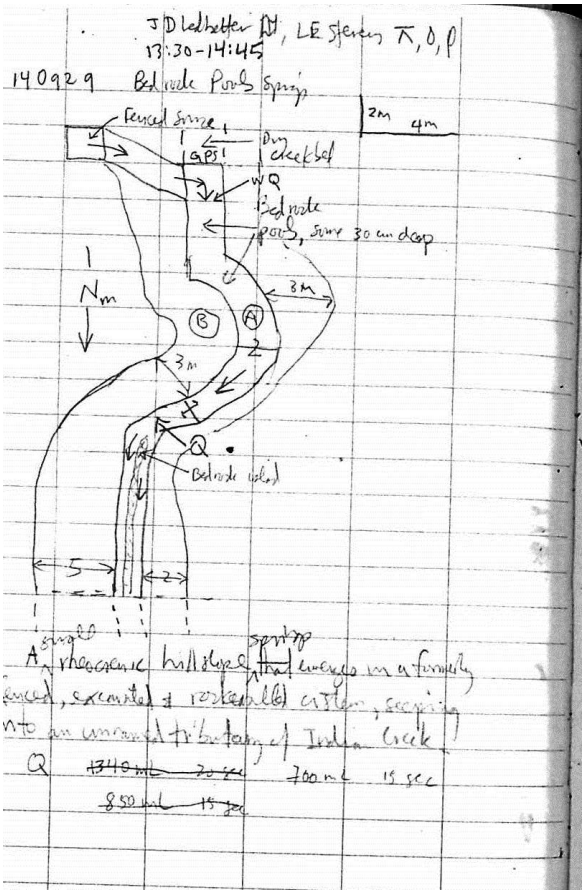
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Bedrock Pools Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: No recreational effects noted
	Animal effects: Wild animals; Trails by animals and people;
Soil alteration: Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Exclosure fence; Road (includes construction and maintenance; Other structures observed--see disturbance notes;	The fencing is ineffective; there was a wooden pallet in the channel.

Bedrock Pools Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	True	
5) Runout channel functioning naturally	True	
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Site flooding likely to limit SOC plant presence
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	False	Habitat insufficient to support SOC fauna
12) Invasive species not established	False	Nasturtium, Rumex, Rubus armenicus abound at site
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fencing down
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Mild effects from 2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Box Spring ID# 159443

Survey Date:	9/4/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	hillslope, helocrene
Aspect (TN):	28
Elevation (m):	1499
Coordinates	38 1 36.5 Latitude -120 4 10.9 Longitude
Area:	283 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Lahar
Lithology:	Igneous extrusive , Andesite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	3	Alnus incana ssp. tenuifolia
Shrub		
Graminoid	1	Carex
Forb	2	Taraxacum officinale ssp. officinale
Aquatic		
Bryophyte	5	
Unknown		

Survey Notes

There was evidence in the surrounding area of moderate fire intensity from the 2013 Rim Fire. Management recommendations include fencing the source area, recontouring and backfilling pedestals, and occasional monitoring. The area was determined by the sketch map.

Hydrology, Geology, and Soil Notes

Soils are primarily weathered andesitic sand with organic matter. Depth to the mineral layer was 2 cm, sand texture, black 2.5 YR 25/0. The hole depth was 40 cm.

Hydrologic Attribute	Results
Water table type	
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	10
Flow estimate (L/sec)	0.0021

Water Quality (Single Location)

pH	6.37
Specific conductance (uS/cm)	178.9
Dissolved oxygen (mg/L)	1.72
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	15.6

Box Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Carex, CAREX	cf alma
Hypericum, HYPER	
Pteridium aquilinum, PTAQ	
Arnica, ARNIC	
Epilobium, EPILO	
Boraginaceae,	
Viola, VIOLA	
Taraxacum officinale ssp. officinale, TAOF	
Ribes nevadense, RINE	
Galium triflorum, GATR3	
Poa, POA	cf pratensis
Cirsium vulgare, CIVU	
Ribes, RIBES	small leaf, sent to MW for ID
Alnus incana ssp. tenuifolia, ALINT	many
Pseudotsuga menziesii, PSME	seedling sp?
moss, 2MOSS	
unknown Graminoid (grass or grasslike), 2GRAM	Grass 1 no id able parts
Pinus, PINUS	seedling
Calocedrus decurrens, CADE27	
Quercus kelloggii, QUKE	seedling
Veronica catenata, VECA7	
Eleocharis, ELEOC	cf bella
Rumex crispus, RUCR	cf crispus
Veratrum californicum, VECA2	
Mimulus moschatus, MIMO3	
Asarum caudatum, ASCA2	

Box Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
domestic cow, Bos taurus	obs	several - ran away
Steller's Jay, Cyanocitta stelleri	call	
Yellow-rumped Warbler, Dendroica coronata	obs	

Invertebrate Species	Detection	Stage	Comments
HYM Apidae Apis mellifera	obs	Adult	many
LEP Hesperiidae	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	patch
LEP Nymphalidae Speyeria	obs	Adult	sp 1
LEP Nymphalidae Speyeria	obs	Adult	sp 2
LEP Nymphalidae Vanessa	obs	Adult	
ORT	obs	Case	aquatic grasshopper

Fauna Notes

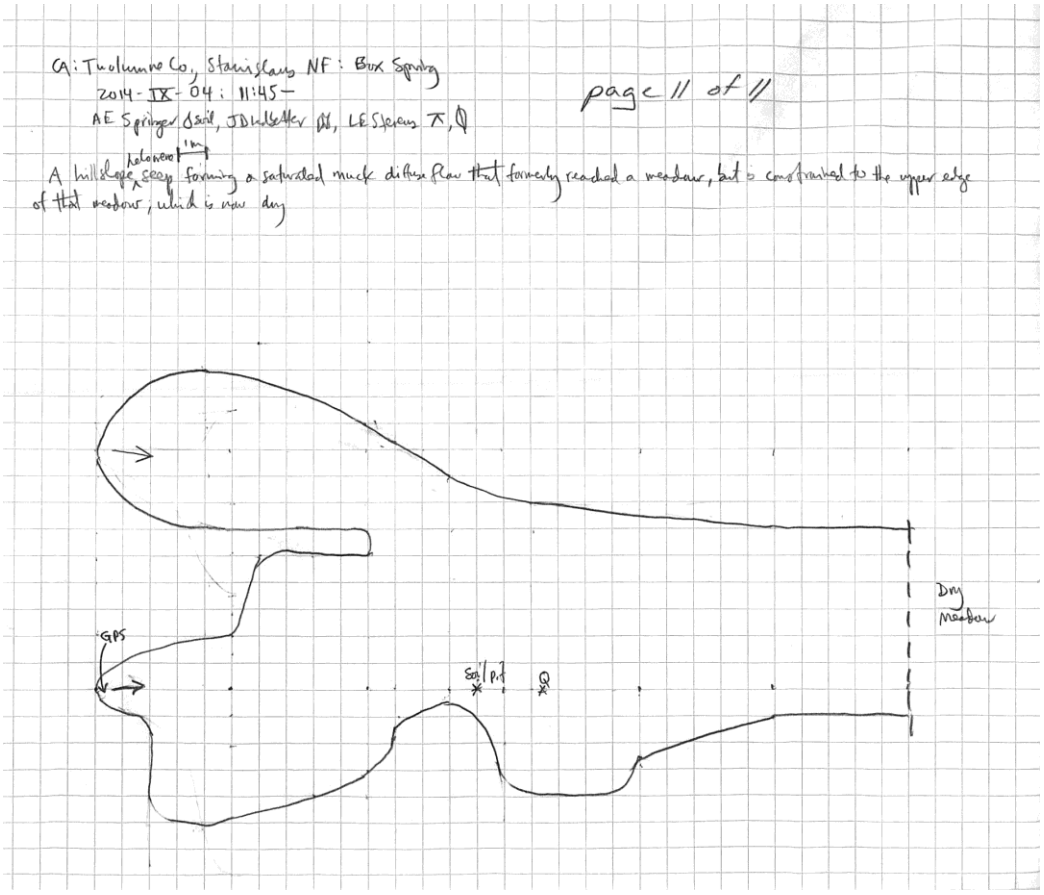
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Box Spring (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Erosion (general); Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Box Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Heavily trampled & grazed
Geomorphology and Soils		
4) Landform stability not altered	False	Heavily trampled & grazed
5) Runout channel functioning naturally	False	Heavily trampled & grazed
6) Soil integrity not altered	False	Heavily trampled & grazed
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavily grazed/browsed
9) TES, SOI/SOC flora as anticipated	False	Heavily grazed/browsed
10) Faunal species as anticipated	False	Little AQ habitat, just ooze dwelling spp present
11) TES, SOI/SOC fauna as anticipated	False	Habitat quality insufficient to support ES birds and SOI/SOC
12) Invasive species not established	False	Cirsium vulgare and Taraxacum officinale
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fencing would be helpful
16) Herbivory not adversely affecting site	False	Heavily trampled and grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Moderate fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Brackenfern Hanging Garden ID# 159384

Survey Date:	9/23/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): hanging garden

Aspect (TN): 210

Elevation (m): 1177

Coordinates 37 47 59.1 Latitude
-119 59 11.7 Longitude

Area: 122 square meters

Surrounding Vegetation: Herbaceous/nonvascular dominated

Surficia Material: Colluvium

Lithology: Igneous intrusive

Bryophyte Abundance: Common component

Lifeform	Rank	Dominant Species
Tree	2	Calocedrus decurrens
Shrub	4	Quercus kelloggii
Graminoid	5	Carex
Forb	1	Pteridium aquilinum
Aquatic		
Bryophyte	3	
Unknown		

Survey Notes

The hanging garden, rare on the forest, is in an area heavily affected by the 2013 Rim Fire. It emerges on a steep slope and cascades down a cliff at the side of Packard Canyon Road. The outflow joins with flow from another spring upstream and flows diwn the roadside ditch. This area is heavily trampled by cattle.

Hydrology, Geology, and Soil Notes

A soil pit was not indicated as the site is a hanging garden that flows into a roadside ditch.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.17

Water Quality (Single Location)

pH	5.39
Specific conductance (uS/cm)	34.5
Dissolved oxygen (mg/L)	5.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	15.6

Brackenfern Hanging Garden (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Cirsium vulgare, CIVU	
Hypericum, HYPER	
Eleocharis, ELEOC	cf bella
Lactuca, LACTU	cf serriola
Lotus oblongifolius, LOOB2	
moss, 2MOSS	
Pinus lambertiana, PILA	
Calocedrus decurrens, CADE27	
Pseudotsuga menziesii, PSME	
unknown Bryophyte (moss, liverwort, hornwort), 2BRY	
Pteridium aquilinum, PTAQ	
unknown Forb, dicot, 2FD	Dicot 1
Carex, CAREX	cf alma
Leptosiphon harknessii, LEHA11	
Spiranthes romanzoffiana, SPRO	
Lupinus, LUPIN	
Pseudognaphalium, PSEUD43	
Sonchus, SONCH	cf asper
Alnus incana ssp. tenuifolia, ALINT	seedling
Mimulus floribundus, MIFL2	
Quercus kelloggii, QUKE	
Persicaria punctata, POPUP4	

Brackenfern Hanging Garden (continued)

Fauna

Vertebrate Species	Detection	Comments
domestic cow, Bos taurus	obs	thirsty
hummingbird, Archilochus fam	call	
Northern Flicker, Colaptes auratus	call	
Northern Goshawk, Accipiter gentilis	obs	
Steller's Jay, Cyanocitta stelleri	obs	
woodpecker, picidae fam	obs	white headed

Invertebrate Species	Detection	Stage	Comments
AMPH	obs		cave sp?
COL Dytiscidae	obs	Adult	
COL Dytiscidae Agabus	obs	Adult	
COL Staphylinidae	spot	Adult	sp 1
COL Staphylinidae	spot	Adult	sp 2
COL Staphylinidae	spot	Adult	sp 3
DIP Chironomidae	spot	Larvae	
DIP Chloropidae	obs	Adult	face flies
HEM Veliidae	spot	Mixed	
ISOP	spot	Adult	Terrestrial
ISOP Crangonyctidae Stygobromus	spot	Adult	1 collected
LEP Hesperiidae	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	
LEP Nymphalidae Vanessa cardui	obs	Adult	
LEP Pieridae Pieris rapae	obs	Adult	
ODO Aeshnidae	obs	Adult	
ODO Coenagrionidae Argia	obs	Adult	many
TURB	spot	Adult	~ Planaria

Fauna Notes

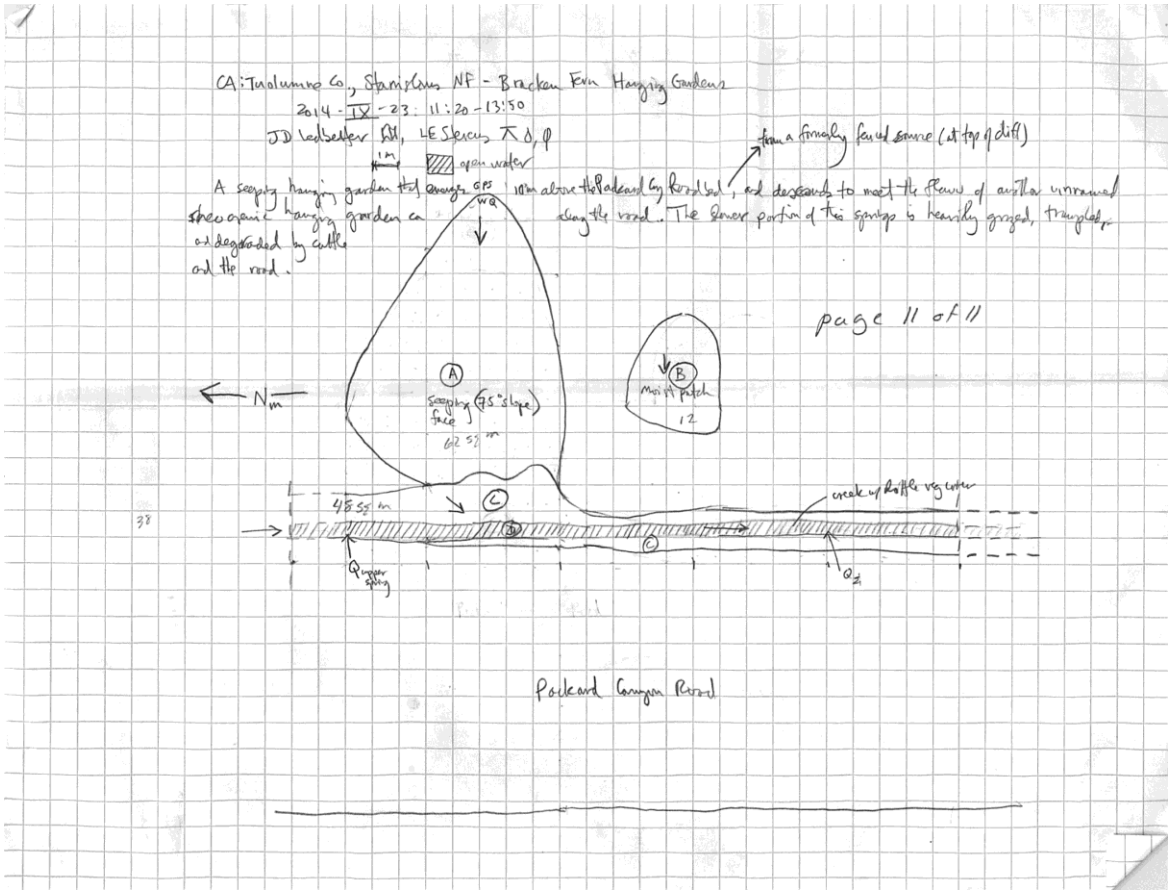
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Brackenfern Hanging Garden (continued)

Sketchmap



Disturbance

Hydrology: Downgradient capture of surface water or groundwater (post-spring emergence);	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Erosion (general); Ground disturbance (general); Pedestals (small-scale, rain-splash induced); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Brackenfern Hanging Garden (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Runout is in road ditch and heavily trampled by cattle
Geomorphology and Soils		
4) Landform stability not altered	False	Runout is in road ditch and heavily trampled by cattle
5) Runout channel functioning naturally	False	Runout is in road ditch and heavily trampled by cattle
6) Soil integrity not altered	False	Runout is in road ditch and heavily trampled by cattle
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	woody vegetation is severely grazed and burned, but Polygon A is exc
9) TES, SOI/SOC flora as anticipated	False	Habitat is insuffienceint in rounout channel to support SOC plants
10) Faunal species as anticipated	False	Runout channel highly disturbed by grazing, fire, and road.
11) TES, SOI/SOC fauna as anticipated	False	Runout CH does not provide habitat for SOC, but spring in good shape
12) Invasive species not established	False	Polygonum, Sonchus, Cirsium at site.
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Runout is into roadside ditch
15) Fencing functions properly	False	Fence is down
16) Herbivory not adversely affecting site	False	Heavily trampled
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Burnt Log Meadow ID# 159379

Survey Date:	8/21/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	194
Elevation (m):	1794
Coordinates	37 59 45.2 Latitude -119 57 28.5 Longitude
Area:	1315 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Other (explain in "Notes on Geology")
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	4	Pinus lambertiana
Shrub	3	Salix lutea
Graminoid	1	Juncus effusus
Forb	2	Cirsium vulgare
Aquatic		
Bryophyte	5	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.014

Water Quality (Single Location)

pH	5.43
Specific conductance (uS/cm)	67.0
Dissolved oxygen (mg/L)	6.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	8.6

Survey Notes

This site is within the 2013 Rim Fire perimeter, with moderate effects including dead trees and scorched ground.

Hydrology, Geology, and Soil Notes

This is a seepage/filtration spring; soils were surficial material throughout most of the site. Surveyors dug a 47 cm soil pit at the center of the site. Depth to the mineral layer was 47 cm, with roots in the top 9 cm. The color was 5Y-3/2 to 9 cm; 2.5YR-2.5/0 to 57 cm, with sandy loam texture. There were no redox concentrations, depletions, reduced matrices, reaction to HCl, or Hydrogen Sulfide odor.

Burnt Log Meadow (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Salix scouleriana, SASC	
Viola, VIOLA	
Cirsium vulgare, CIVU	
Prunus emarginata, PREM	
Festuca arundinacea, SCPH	
Phleum pratense, PHPR3	
Potentilla, POTEN	
Symphoricarpos, SYMPH	
Epilobium, EPILO	
Dactylis, DACTY	
Veratrum californicum, VECA2	
Achillea millefolium, ACMI2	
Hackelia, HACKE	Mertensia like/blue flower
Lotus oblongifolius, LOOB2	
Scirpus, SCIRP	cf diffusus
Verbascum thapsus, VETH	
Prunella vulgaris, PRVU	
Cyperus eragrostis, CYER	
Bromus tectorum, BRTE	
Veronica, VERON	
Rumex, RUMEX	
Aquilegia formosa, AQFO	
Mimulus, MIMUL	sp
Luzula comosa, LUCO6	
Salix lutea, SALU2	
Alopecurus pratensis, ALPR3	
Eleocharis, ELEOC	
Ribes roezlii, RIRO	
Agrostis, AGROS2	cf stolonifera
Pteridium aquilinum, PTAQ	
Carex praegracilis, CAPR5	sp
Pinus lambertiana, PILA	
Polygonum, POLYG4	
Festuca occidentalis, FEOC	
Ceanothus cordulatus, CECO	
Epilobium, EPILO	
Abies concolor, ABCO	
Eleocharis bella, ELBE	
Juncus oxymeris, JUOX	
Hypericum anagalloides, HYAN2	

Burnt Log Meadow (continued)

Fauna

Vertebrate Species	Detection	Comments
domestic cow, Bos taurus	sign	tracks and scat
goldfinch, Carduelis	call	
Hairy Woodpecker, Picoides villosus	call	
Northern Flicker, Colaptes auratus	call	
Red-tailed Hawk, Buteo jamaicensis	call	
Scrub Jay, Aphelocoma californica	call	

Invertebrate Species	Detection	Stage	Comments
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
LEP Nymphalidae Vanessa virginiensis	obs	Adult	

Fauna Notes

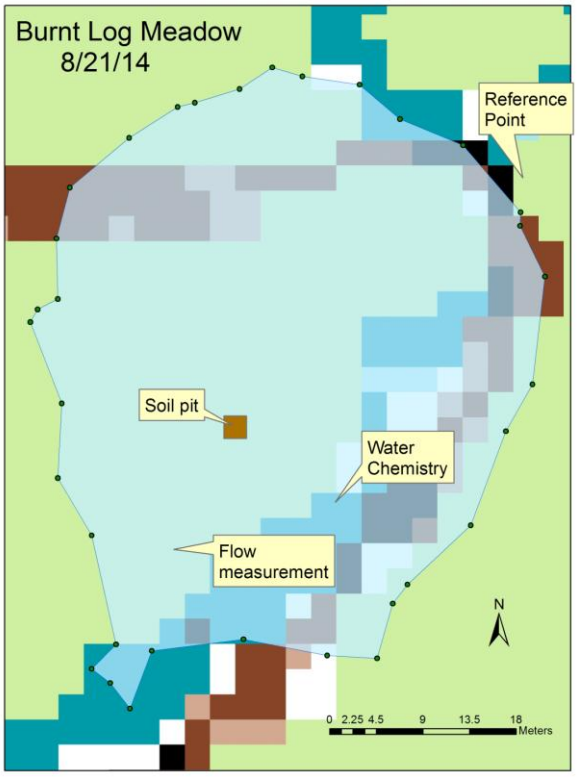
No benthic sampling was possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Burnt Log Meadow (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: Other recreational effects observed--see disturbance notes;
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Compaction; Erosion (general); Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Other structures observed--see disturbance notes;	Hunter's blind, detritis

Burnt Log Meadow (continued)

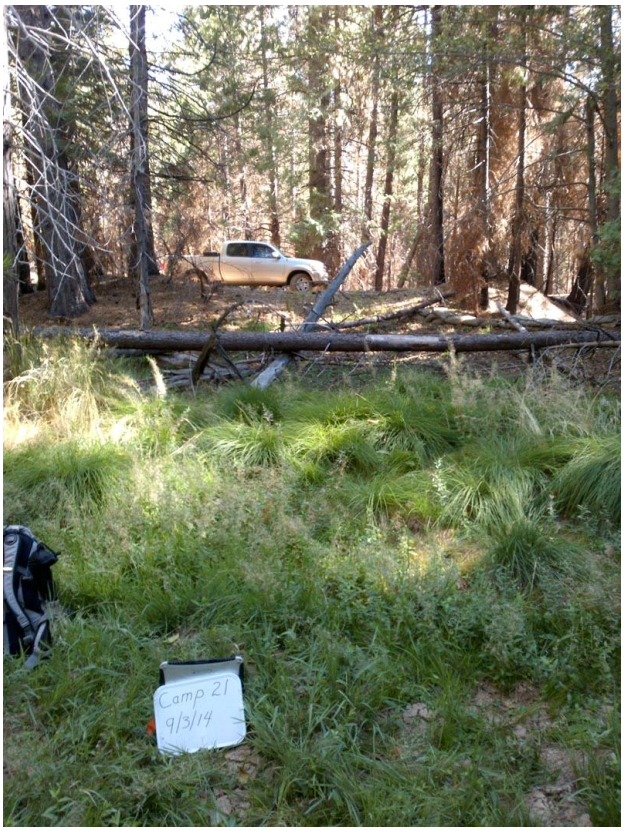
Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Heavy grazing and trampling
Geomorphology and Soils		
4) Landform stability not altered	False	Heavy grazing and trampling
5) Runout channel functioning naturally	False	Heavy grazing and trampling
6) Soil integrity not altered	False	Heavy grazing and trampling
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavy grazing and trampling
9) TES, SOI/SOC flora as anticipated	False	No orchids, rare plants in this large wet meadow
10) Faunal species as anticipated	False	No aquatic inverts
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Bull thistle & mullein abundant
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	No fencing present
16) Herbivory not adversely affecting site	False	Heavy grazing and trampling
17) Recreation not adversely affecting	False	Hunting debris
18) Other dist. not adversely affecting	False	Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Camp Twentyone Spring ID# 159446

Survey Date:	9/3/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne



GDE Type(s):	rheocrene, helocrene
Aspect (TN):	20
Elevation (m):	1579
Coordinates	38 0 24.3 Latitude -120 4 26.3 Longitude
Area:	375 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium, Human cause/constructed
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree	3	Calocedrus decurrens
Shrub	4	Cornus stolonifera
Graminoid	1	Carex lenticularis
Forb	2	Epilobium ciliatum
Aquatic		
Bryophyte		
Unknown		

Survey Notes

This site has been excavated (likely by a bulldozer) and dammed. The 2013 Rim Fire intensity was light. There was no water and the soil was dry.

Hydrology, Geology, and Soil Notes

Most of the site was anthropogenic. Flow and water quality measurements were not possible, as the site was dry. The depth to the mineral layer was 1 cm; texture was clay/silty sand, with a dusky red 3/22.5 YR. The soil hole depth was 40 cm, at the center of the site. The area has been heavily disturbed.

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Mixed groundwater and surface inflow
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Camp Twentyone Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Calamagrostis purpurascens, CAPU	
Carex lenticularis, CALE8	
Ribes, RIBES	
Hypericum anagalloides, HYAN2	
Ceanothus, CEANO	cf. integerrimus, sent to MW for ID
Veronica catenata, VECA7	
Juncus effusus var. pacificus, JUEFP	
Mimulus moschatus, MIMO3	sticky
Juncus articulatus, JUAR4	ssp articulatus
Alnus, ALNUS	
Pseudotsuga menziesii, PSME	
Cornus stolonifera, COSES	
Epilobium ciliatum, EPCI	ssp glandulosum
unknown Graminoid (grass or grasslike), 2GRAM	grass 1
Cirsium, CIRSI	
Juncus saximontanus, JUSA	
Quercus kelloggii, QUKE	black
Lactuca serriola, LASE	
Galium triflorum, GATR3	
Ribes nevadense, RINE	
Prunus, PRUNU	cf emarginata
Anaphalis margaritacea, ANMA	
Pinus ponderosa, PIPO	
Viola, VIOLA	
Eleocharis bella, ELBE	
Asarum caudatum, ASCA2	
Agrostis scabra, AGSC5	
unknown Forb, dicot, 2FD	K.O. called it Populus alba, but is an herb,
Calocedrus decurrens, CADE27	
Sonchus asper, SOAS	
Brassicaceae fam,	
Epilobium, EPILO	gray-green leaves
Eleocharis acicularis, ELAC	"Carex med."

Camp Twentyone Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
California ground squirrel, Spermophilus beeche	sign	holes
House Wren,	obs	
Red-breasted Nuthatch, Sitta canadensis	call	
Steller's Jay, Cyanocitta stelleri	call	

Invertebrate Species	Detection	Stage	Comments
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	

Fauna Notes

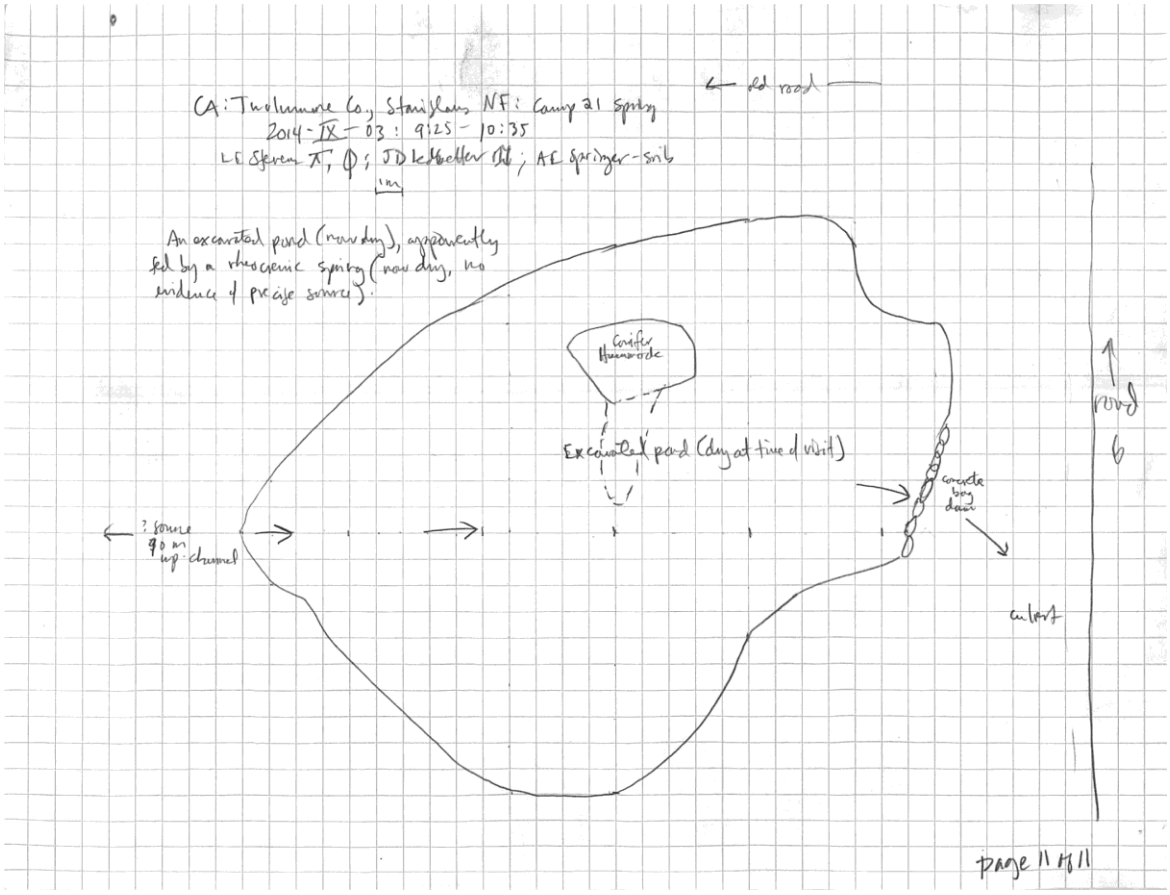
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Camp Twentyone Spring (continued)

Sketchmap



Disturbance

Hydrology: Regulated water flow by impoundment/dam; Other hydrologic alteration observed--see Disturbance notes	Recreational effects: Camp sites;
	Animal effects: Trails by animals and people;
Soil alteration: Compaction; Excavation; Ground disturbance (general); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
	Excavated and dammed
Structures: Road (includes construction and maintenance;	

Camp Twentyone Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	site is dry
2) Watershed (surface water) not altered	False	site is dry
3) WQ changes not affecting site	False	Site is dry
Geomorphology and Soils		
4) Landform stability not altered	False	Excavation and roads
5) Runout channel functioning naturally	False	Dammed and covered by road
6) Soil integrity not altered	False	site is dry
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Site dewatered
9) TES, SOI/SOC flora as anticipated	False	Anthropogenic site - many weeds
10) Faunal species as anticipated	False	No water/no aquatic inverts
11) TES, SOI/SOC fauna as anticipated	False	Surounding veg would provide scout habitat for T& E birds
12) Invasive species not established	False	Many NN plants - grasses, herbs
Disturbances		
13) Flow reg. not adversely affecting site	False	Excavated, dammed
14) Construction, Roads not affecting	False	Roads surround site
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site		
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Cardinal Springs ID# 164146

Survey Date:	9/3/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s): rheocrene

Aspect (TN): 135

Elevation (m): 1492

Coordinates 38 0 40.5 Latitude
-120 6 14.1 Longitude

Area: 68 square meters

Surrounding Vegetation: Tree dominated

Surficia Material: Alluvium

Lithology: Igneous intrusive , Diorite

Bryophyte Abundance: Common component

Lifeform	Rank	Dominant Species
Tree	1	Alnus
Shrub	2	Ribes nevadense
Graminoid	5	unknown Graminoid (grass or grasslike)
Forb	3	Mimulus cardinalis
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

There were light effects from 2013 Rim fire. Flow emerges in a channel, forming pools, then soaks into the ground within 5 m. The channel is greater than 25 m in length and is moist downstream, as well as upstream. Management recommendations include excluding livestock from the source and terraces, but providing access to water downstream. The area is determined by the attached sketchmap.

Hydrology, Geology, and Soil Notes

No flow measurement was possible due to no outflow. No soil pits were indicated, as this was a rheocrene with a rocky streambed and no soils.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Mixed groundwater and surface inflow
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH	5.71
Specific conductance (uS/cm)	36.8
Dissolved oxygen (mg/L)	0.96
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	12.0

Cardinal Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
unknown Forb, dicot, 2FD	Myrtle?
Ribes, RIBES	cf. Inerme, sent to MW to ID
Alnus, ALNUS	
Prunus armeniaca, PRAR3	
Epilobium, EPILO	cf ciliatum
Cornus stolonifera, COSES	
Aquilegia formosa, AQFO	
Carex, CAREX	cf alma
Pinus ponderosa, PIPO	
Mimulus cardinalis, MICA3	
unknown Graminoid (grass or grasslike), 2GRAM	
Galium, GALIU	large *
Aster, ASTER	
moss, 2MOSS	
Ribes, RIBES	small-leaf, sent to MW to ID
Fragaria, FRAGA	
Arnica, ARNIC	
Prunella vulgaris, PRVU	
Veronica, VERON	
Pseudoroegneria, PSEUD22	
Salix, SALIX	tree - lasiolepis? *
Verbascum thapsus, VETH	
Ranunculus, RANUN	
Cercocarpus, CERCO	long stem
Pteridium aquilinum, PTAQ	
Taraxacum officinale ssp. officinale, TAOF	

Cardinal Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
California alligator lizard, Elgaria multicarinata	obs	stalking Asilidae
domestic cow, Bos taurus	sign	
Red-tailed Hawk, Buteo jamaicensis	call	

Invertebrate Species	Detection	Stage	Comments
COL	obs	Adult	aquatic sp 1
COL	obs	Adult	aquatic sp 2
COL	obs	Adult	aquatic sp 3
COL	obs	Adult	aquatic sp 4
DIP Asilidae	obs	Adult	stalked by lizard
HEM Gerridae Aquarius remigis	obs	Adult	many
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Nymphalidae Speyeria	obs	Adult	nokomis?
Moll	obs	Adult	slug

Fauna Notes

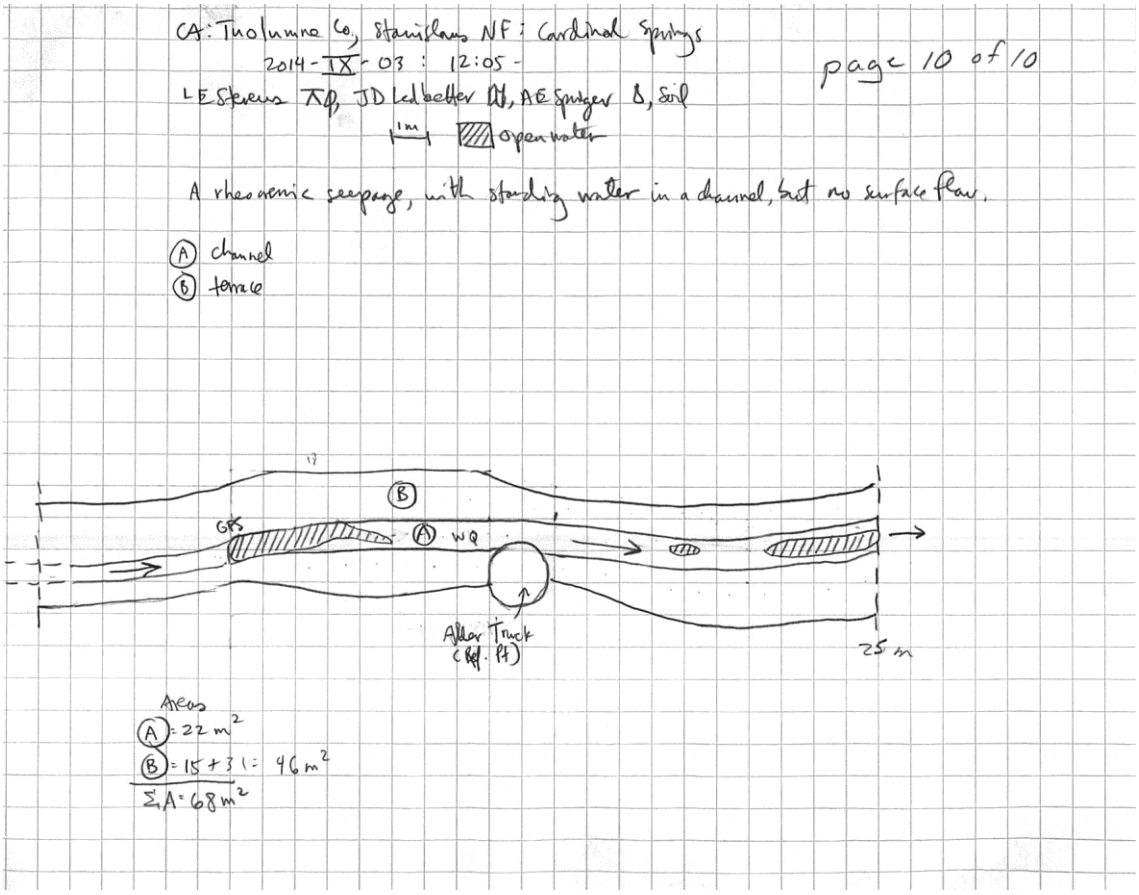
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Cardinal Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Erosion (general); Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

Cardinal Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Very little flow, well nearby
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Old road adjacent, cattle grazing
5) Runout channel functioning naturally	False	Cattle grazing, incision
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavy grazing/browsing
9) TES, SOI/SOC flora as anticipated	False	Limited groundcover due to grazing
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Prunus vulgaris, Taraxacum
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Abandoned road adjacent
15) Fencing functions properly	False	Site has been heavily trampled
16) Herbivory not adversely affecting site	False	Site has been heavily trampled
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Primarily effects of runoff below fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Chickadee Springs ID# 159388

Survey Date:	9/19/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	307
Elevation (m):	1434
Coordinates	37 48 5.3 Latitude -119 53 44.9 Longitude
Area:	338 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	5	Calocedrus decurrens
Shrub	3	Calocedrus decurrens
Graminoid	1	Holcus lanatus
Forb	2	Veronica catenata
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

This seep is at the top of a somewhat open dry meadow that is being heavily colonized by Calocedrus. The burn intensity at the spring is light, but the surrounding landscape has been heavily burned.

Hydrology, Geology, and Soil Notes

Surveyors dug a 40 cm soil pit at the center of the site, and did not reach a mineral layer. They found only rich soil, 5 YR 2.5/1. There was no peat or muck. There were no redox concentrations, depletions, reduced matrices, Hydrogen Sulfide odor, or reaction to HCl. Some fen characteristics were observed at the site.

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)	
pH	7.05
Specific conductance (uS/cm)	169.0
Dissolved oxygen (mg/L)	4.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	19.2

Chickadee Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Juncus effusus, JUEF	
Fabaceae,	ground-covering
Rhododendron occidentale, RHOC	
Taraxacum officinale, TAOF	
Rumex, RUMEX	cf. crispus
Epilobium, EPILO	cf. ciliatum
Calocedrus decurrens, CADE27	
Veronica catenata, VECA7	long-stem/red stem
Juncus, JUNCU	cf. balticus - no heads
Veratrum californicum, VECA2	
Hypericum anagalloides, HYAN2	
Asarum lemmonii, ASLE	veinless
Holcus lanatus, HOLA	
Fragaria, FRAGA	
Lotus oblongifolius, LOOB2	
Viola, VIOLA	
Stachys albens, STAL	tall, pale-green mint
Lichen, 2LICHN	
Aquilegia formosa, AQFO	
Prunella vulgaris, PRVU	
Alnus incana ssp. tenuifolia, ALINT	
Perideridia parishii, PEPA21	
Spiranthes romanzoffiana, SPRO	
Cirsium vulgare, CIVU	
moss, 2MOSS	
Ribes, RIBES	dissected leaves, single golden thorn
Oxypolis occidentalis, OXOC	
Equisetum arvense, EQAR	
Pteridium aquilinum, PTAQ	
Carex, CAREX	cf. alma
Poa, POA	P. pratensis or Agrostis?

Chickadee Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Common Raven, Corvus corax	call	
Dark-eyed Junco, Junco hyemalis	obs	
domestic cow, Bos taurus	sign	old scat and tracks
Mountain Chickadee, Poecile gambeli	obs	
Red-breasted Nuthatch, Sitta canadensis	call	
warbler, Parulidae	obs	

Invertebrate Species	Detection	Stage	Comments
DIP Chloropidae	obs	Adult	many
HYM Apidae Apis mellifera	obs	Adult	
LEP Pieridae Pieris rapae	obs	Adult	

Fauna Notes

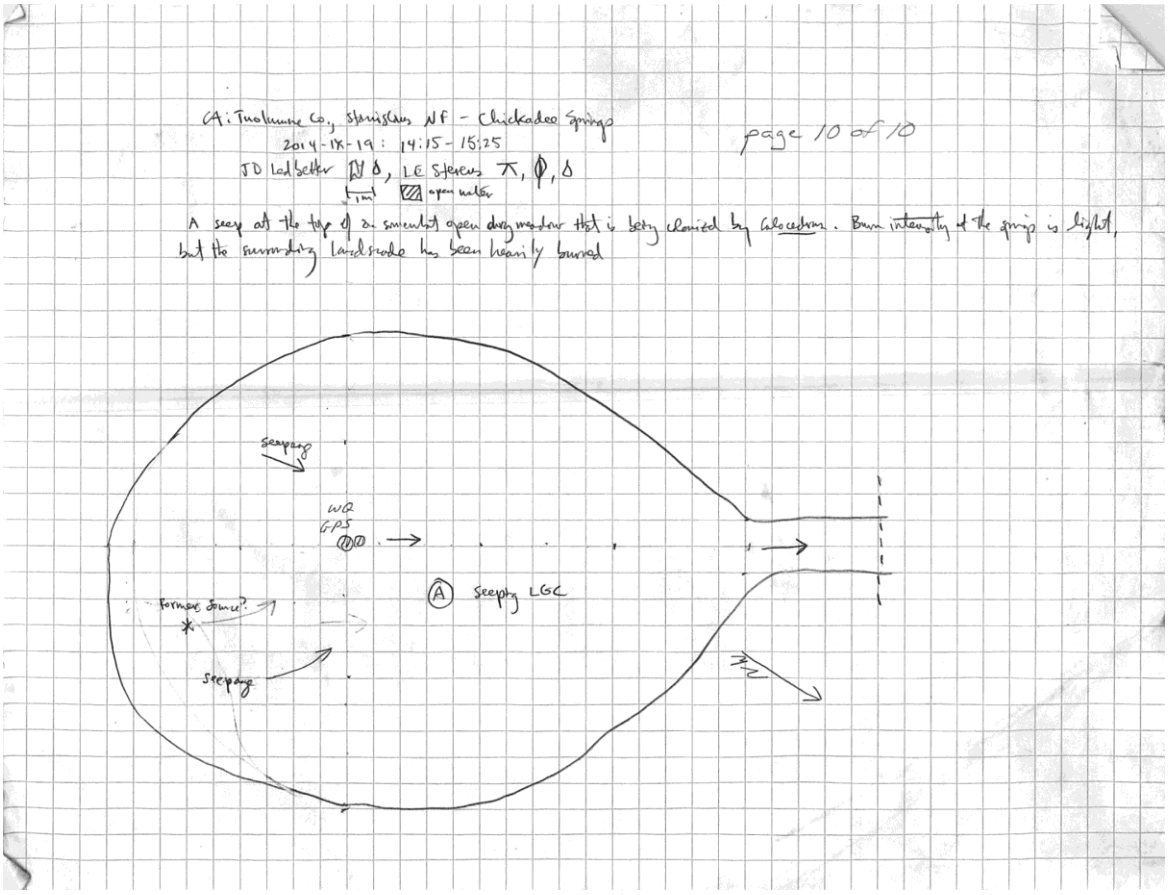
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Chickadee Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Livestock; Trails by animals and people;
Soil alteration: Compaction; Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Chickadee Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Moderate effects from Rim Fire, pedestals from livestock
5) Runout channel functioning naturally	False	Channelized due to livestock
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	little aquatic habitat and no aquatic invertebrates
11) TES, SOI/SOC fauna as anticipated	False	habitat heavily affected by fire and, prior to 2013, grazing
12) Invasive species not established	False	many NN plants - cirsium, grass, prunella
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	No fencing present, but is indicated
16) Herbivory not adversely affecting site	False	no recent use, but heavy past effects from livestock
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	moderate effects from 2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Conyza Seep ID# 159434

Survey Date:	9/27/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	hillslope
Aspect (TN):	209
Elevation (m):	749
Coordinates	37 53 15.6 Latitude -120 5 21.1 Longitude
Area:	70 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Metamorphic , Metavolvanic Rocks
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	4	Pinus ponderosa
Shrub	4	Cornus stolonifera
Graminoid	3	Juncus anthelatus
Forb	1	Pteridium aquilinum
Aquatic		
Bryophyte	2	
Unknown		

Survey Notes

This spring appears to be heavily manipulated and affected by the road upslope. There is significant erosion between the road and the site. The area was moderately burned in the 2013 Rim Fire; some live trees remain.

Hydrology, Geology, and Soil Notes

There was no outflow at the site; therefore no water quality or flow measurements were taken during the survey. No soil pit was indicated, due to amount of manipulation and steepness of the slope at the site.

Hydrologic Attribute	Results
Water table type	
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH	
Specific conductance (uS/cm)	
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	

Conyza Seep (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Juncus anthelatus, JUAN3	like balticus (dominant sp above)
Lotus oblongifolius, LOOB2	
Pseudognaphalium, PSEUD43	sp 2
moss, 2MOSS	
Conyza canadensis, COCA5	
Perideridia parishii, PEPA21	
unknown Forb, dicot, 2FD	seedling
Juncus saximontanus, JUSA	lily-like, but with effusus-like heads
Juncus bufonius var. occidentalis, JUBUO	*
Toxicodendron diversilobum, TODI	
Plantago lanceolata, PLLA	
Hypericum anagalloides, HYAN2	* yellow flower
Ceanothus integerrimus, CEIN3	long-stem
Polypogon australis, POAU3	grass sp 1
Cyperus eragrostis, CYER	star sedge
Torilis arvensis, TOAR	
Potentilla, POTEN	prostrate
Salix, SALIX	cf lasiolepis
Datisca glomerata, DAGL2	
Rubus parviflorus, RUPA	
Pseudognaphalium canescens, PSCA11	sp 1
Pteridium aquilinum, PTAQ	
Gastridium phleoides, GAPH2	grass sp 2
Cornus stolonifera, COSES	
Pinus ponderosa, PIPO	
Mimulus cardinalis, MICA3	
Anaphalis margaritacea, ANMA	

Conyza Seep (continued)

Fauna

Vertebrate Species	Detection	Comments
Dark-eyed Junco, Junco hyemalis	obs	
hummingbird, Archilochus fam	obs	

Fauna Notes

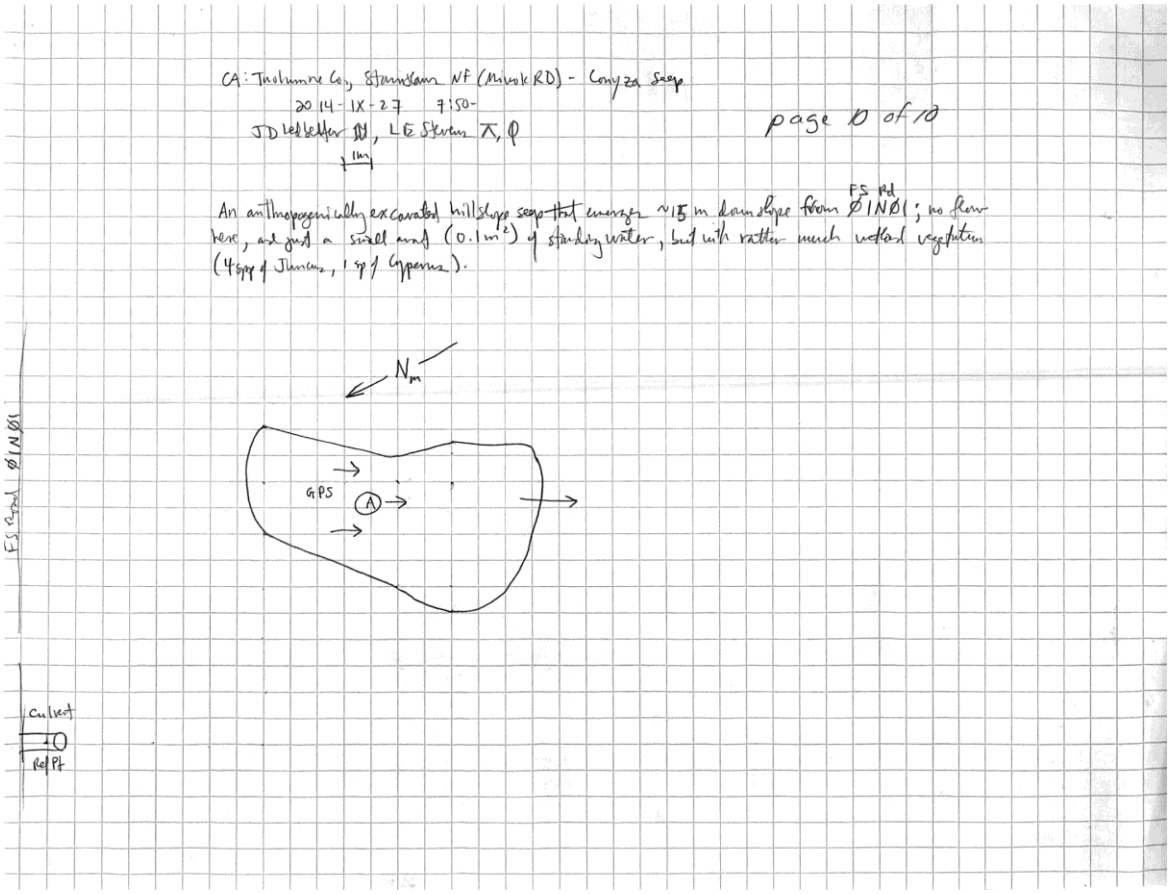
Survey was conducted early in the day. It was cold and there was not much faunal activity. Benthic sampling was not possible due to no flow.

Inverts Collected ☐

Number of Reps:

Conyza Seep (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Erosion (general); Excavation; Rill erosion;	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Conyza Seep (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	NA	No flow at the site
Geomorphology and Soils		
4) Landform stability not altered	False	Effects from road and fire
5) Runout channel functioning naturally	False	Channel is forming due to erosion
6) Soil integrity not altered	False	Significant erosion
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Highly eroded condition precludes potential presence of SOC plants
10) Faunal species as anticipated	False	Highly eroded; absence of soils precludes wetland inverts
11) TES, SOI/SOC fauna as anticipated	False	Habitat not supportive of SOC, especially due to erosion
12) Invasive species not established	True	
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Fugitive dust and erosion resulting from road construction
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Significant effects from 2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Cordulegaster Springs ID# 159351

Survey Date:	8/29/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hillslope, rheocrene
Aspect (TN):	149
Elevation (m):	1097
Coordinates	37 55 4.1 Latitude -119 58 7 Longitude
Area:	228 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Alluvium, Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	5	Acer macrophyllum
Shrub	2	Prunus emarginata
Graminoid	3	Polypogon monspeliensis
Forb	1	Chamaesaracha nana
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

This rheocrenic hillslope spring emerges approximately 0.5 km upslope from the Cherry Lake Rd in an unnamed tributary. The 2013 Rim fire burn intensity was high. The creek has incised at 0.3 m due to flooding in the 2014 season. The stream was already deeply incised (@ 9m) into the granitic colluvium. Area was determined by the attached sketch map.

Hydrology, Geology, and Soil Notes

Geologic structure type classified as seepage. Soil pits were not indicated, as this site is in a rocky channel with heavy surface flow.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.084

Water Quality (Single Location)

pH	6.32
Specific conductance (uS/cm)	226.8
Dissolved oxygen (mg/L)	3.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	17.1

Cordulegaster Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
unknown Graminoid (grass or grasslike), 2GRAM	Grass 1
Anaphalis margaritacea, ANMA	
Lupinus, LUPIN	
Chamaesaracha nana, LENA3	
Prunus emarginata, PREM	
Mimulus bolanderi, MIBO3	
Solidago velutina, SOVE6	tall
Vitis californica, VICA5	round leaf
Cyperus eragrostis, CYER	
Eriodictyon californicum, ERCA6	shrub Yerba buena
Helminthotheca echioides,	Very hairy, flowers mostly closed
Salix, SALIX	lance leaf cf. lasiandra
Verbascum thapsus, VETH	
Phleum pratense, PHPR3	
Convolvulus, CONVO	
Leptochloa fusca ssp. fascicularis, LEFUF	sp? Upright, rough grass
Lotus oblongifolius, LOOB2	
Cirsium vulgare, CIVU	
Rumex acetosella, RUAC3	
Epilobium, EPILO	cf ciliatum
Juncus effusus, JUEF	
Solanum, SOLAN	
Polypogon, POLYP2	cf. australis
Artemisia douglasiana, ARDO3	
Aster, ASTER	Eurybia?
Toxicodendron diversilobum, TODI	
Mimulus floribundus, MIFL2	small yellow flower
Lycopus, LYCOP4	One of several small herb spp., sent to M
Conyza canadensis, COCA5	
Dysphania pumilo,	
Datisca glomerata, DAGL2	
Gnaphalium, GNAPH	
Pteridium aquilinum, PTAQ	
Echinochloa crus-galli, ECCR	sp?
Acer macrophyllum, ACMA3	
Ceanothus, CEANO	Sent to MW for ID
Artemisia, ARTEM	no odor
unknown Forb (herbaceous, not grass nor grasslike), 2FORB	vine-like, pointed leaves

Cordulegaster Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Acorn Woodpecker, Melanerpes formicivorus	obs	
deer, Odocoileus	sign	tracks
hummingbird, Archilochus fam	obs	
Steller's Jay, Cyanocitta stelleri	call	

Invertebrate Species	Detection	Stage	Comments
HEM Gerridae Aquarius remigis	obs	Adult	many
LEP Nymphalidae Danaus plexippus	obs	Adult	
LEP Nymphalidae Vanessa virginiensis	obs	Adult	
LEP Pieridae Colias eurytheme	obs	Adult	
ODO Coenagrionidae Argia vivida	obs	Adult	
ODO Cordulegasteridae Cordulegaster dorsalis	obs	Adult	

Fauna Notes

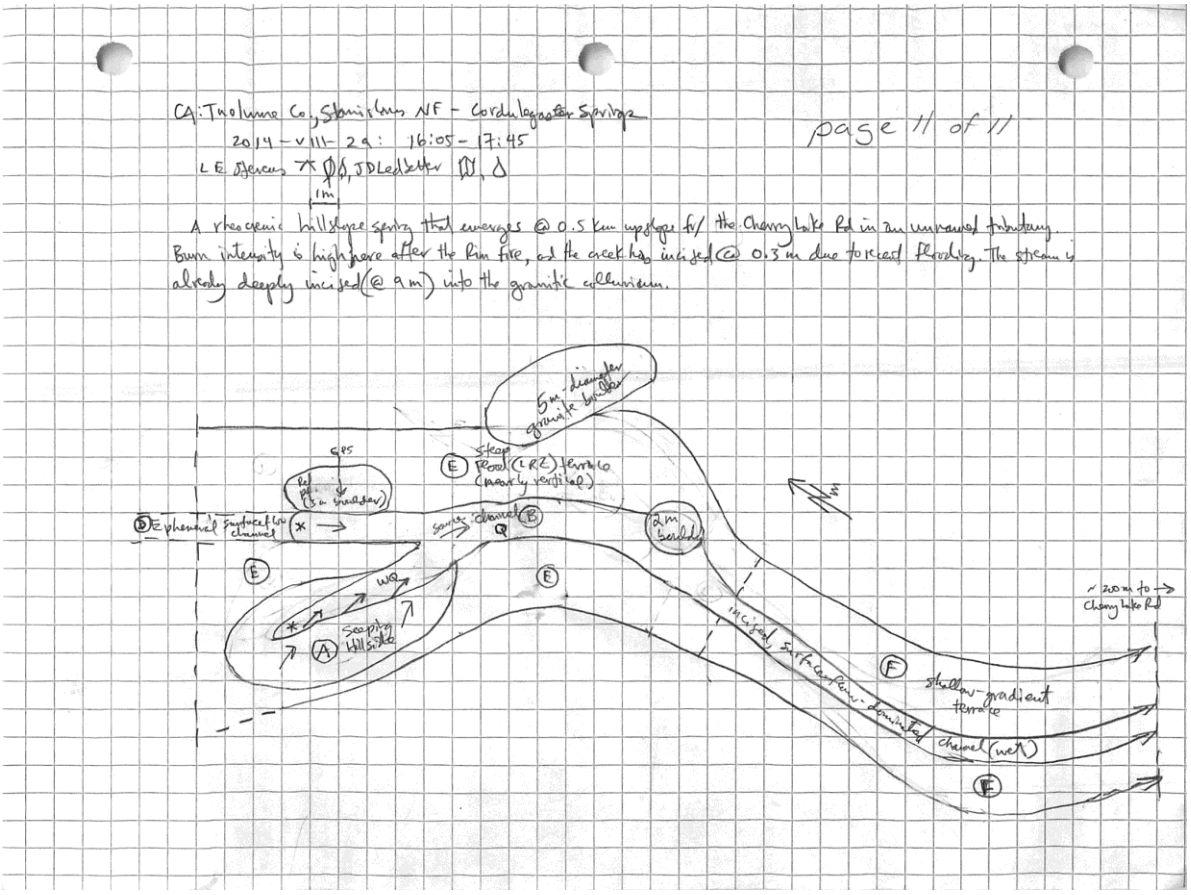
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Cordulegaster Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Trails by animals and people;
Soil alteration: Channel erosion; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Cordulegaster Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Effects of 2013 Rim Fire
Geomorphology and Soils		
4) Landform stability not altered	False	Incised due to runoff from Rim Fire
5) Runout channel functioning naturally	False	Incised due to runoff from Rim Fire
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	Burn eliminated mid and tall canopy conifers
11) TES, SOI/SOC fauna as anticipated	False	Burn eliminated mid and tall canopy conifers
12) Invasive species not established	False	Cirsium vulgare, polypogon monspeliensis
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	UA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Cottonwood Road Spring ID# 159420

Survey Date:	8/20/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	155
Elevation (m):	1681
Coordinates	37 58 58.5 Latitude -119 57 39.4 Longitude
Area:	2300 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Other (explain in "Notes on Geology")
Lithology:	Unconsolidated , Glacial Deposit
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree	4	Sequoiadendron
Shrub	3	Salix lutea
Graminoid	1	Juncus
Forb	2	Perideridia parishii
Aquatic		
Bryophyte		
Unknown		

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	0
Flow estimate (L/sec)	0

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This site was within the 2013 Rim Fire perimeter, but the burn intensity appeared to be relatively low. Some live trees remain. There was no water at the spring at the time of the survey.

Hydrology, Geology, and Soil Notes

Surface material was primarily soils; this is likely a seepage/filtration spring. No flow or water chemistry measurements were possible, as the site was dry. Surveyors dug three soil pits from 10 - 20 cm; all were dry. A 10 cm targeted soil pit at the center of the site had hard packed histosol throughout. The texture was sandy loam, 7.5 YR-4/2. There were no redox concentrations, reduced matrices, depletions, reaction to HCl, or Hydrogen Sulfide odor. The top 3 cm were histosolic root matrix, with 7 cm of sandy histosol below. The pit was dry.

Cottonwood Road Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Cirsium vulgare, CIVU	
Muhlenbergia, MUHLE	cf andina
Anaphalis margaritacea, ANMA	
Perideridia parishii, PEPA21	
Juncus, JUNCU	cf balticus var maxicanus
Poa, POA	cf compressa
Hosackia crassifolia, LOCRC	
Perideridia parishii, PEPA21	
Salix lutea, SALU2	
Rumex acetosella, RUAC3	
Elymus glaucus, ELGL	
Elymus, ELYMU	cf elymoides
Elymus spicatus, PSSPS	
Verbascum thapsus, VETH	
Juncus, JUNCU	cf nevandensis
Juncus balticus, JUBA	
Bromus tectorum, BRTE	
Sequoiadendron, SEQUO2	
Quercus kelloggii, QUKE	

Cottonwood Road Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
Common Raven, Corvus corax	obs	
domestic cow, Bos taurus	sign	tracks and scat
gopher, Thomomys sp	sign	holes
Steller's Jay, Cyanocitta stelleri	obs	

Invertebrate Species	Detection	Stage	Comments
HYM Apidae Apis mellifera	obs	Adult	several
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
LEP Nymphalidae Speyeria	obs	Adult	
LEP Papilionidae Papilio	obs	Larvae	
ODO Aeshnidae	obs	Adult	red abdomen

Fauna Notes

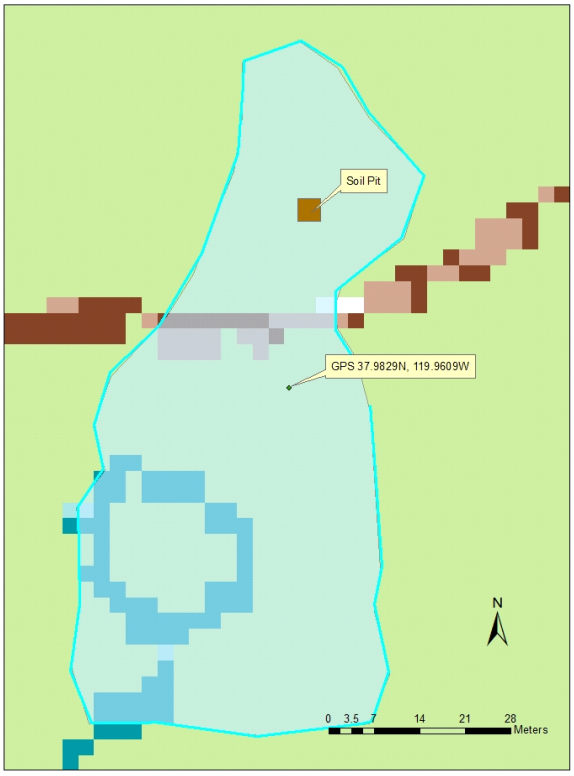
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Cottonwood Road Spring (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: Other recreational effects observed--see disturbance notes;
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Excavation; Pedestals or hummocks (by people or animals); Pipes; Trails (by people or animals);	Miscellaneous effects: Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Other structures observed--see disturbance notes;	Site has been excavated and channelized; there were ineffective fencing remnants, and some recreational trash.

Cottonwood Road Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Site is dry
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	NA	No water at the site
Geomorphology and Soils		
4) Landform stability not altered	False	Excavated and channelized; heavily trampled
5) Runout channel functioning naturally	False	Channel trenched, heavily trampled
6) Soil integrity not altered	False	Site is dry
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Site is dry, heavily trampled
9) TES, SOI/SOC flora as anticipated	False	Site is dry
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Cheat grass
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fencing remnants, ineffective
16) Herbivory not adversely affecting site	False	Heavy livestock use, trampling
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim Fire 2013
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Cowbell Meadow Spring ID# 159347

Survey Date:	8/22/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	155
Elevation (m):	1700
Coordinates	37 58 44.4 Latitude -119 57 29.5 Longitude
Area:	5200 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Other (explain in "Notes on Geology")
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	1	Pinus lambertiana
Shrub	3	Prunus emarginata
Graminoid	5	Cyperus eragrostis
Forb	4	Hypericum anagalloides
Aquatic		
Bryophyte	2	
Unknown		

Survey Notes

This large wet meadow has been heavily trampled by domestic cows, which were present at the time of the survey and the day prior to it. Burn intensity is very low in this area.

Hydrology, Geology, and Soil Notes

Seepage/Filtration - structure; soils - surficial material Soil pit in center of upper wetland. Depth to mineral layer is unknown. Rooting layer to 6 cm, mucky peat below.

Hydrologic Attribute	Results
Water table type	Ponding
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Patches of standing water; Extensive standing water; Some developing channels;
Water table depth single location (cm)	0
Flow estimate (L/sec)	0.61

Water Quality (Single Location)

pH	5.49
Specific conductance (uS/cm)	88.8
Dissolved oxygen (mg/L)	3.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	9.9

Cowbell Meadow Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Rumex, RUMEX	cf crispus
Juncus effusus, JUEF	
Phleum pratense, PHPR3	
Equisetum arvense, EQAR	
Ranunculus, RANUN	sp2
Carex lemmonii, CALE7	
moss, 2MOSS	
Holcus lanatus, HOLA	
Sidalcea oregana, SIOR	
Mimulus moschatus, MIMO3	
Viola macloskeyi, VIMA2	
Pinus lambertiana, PILA	
Scirpus, SCIRP	cf microcarpus
Lotus oblongifolius, LOOB2	
Veronica peregrina, VEPE2	ssp alapensis
Achillea millefolium, ACMI2	
Polygonum bistortoides, POBI6	
Muhlenbergia filiformis, MUFI2	
erythranthe guttata,	
Scirpus diffusus, SCDI	
Trifolium repens, TRRE3	
Trifolium wormskioldii, TRWO	
Carex echinata, CAEC	
Aster occidentalis, SYSPS	
Taraxacum officinale ssp. officinale, TAOF	
Hypericum anagalloides, HYAN2	
Agrostis stolonifera, AGST2	
Rosa woodsii, ROWO	
Carex alma, CAAL7	
Rumex acetosella, RUAC3	
Oxypolis fendleri, OXFE	
Prunus emarginata, PREM	
Gentianopsis holopetala, GEHO3	
Cornus stolonifera, COSES	
Dactylis glomerata, DAGL	
Oxypolis occidentalis, OXOC	
Cyperus eragrostis, CYER	
Cirsium vulgare, CIVU	
Luzula comosa, LUCO6	sp
Potentilla gracilis, POGR9	
Poa compressa, POCO	
Anaphalis margaritacea, ANMA	yellow grass
Anthoxanthum odoratum, ANOD	
Ribes nevadense, RINE	
Helenium hoopesii, HYHO	
Scirpus, SCIRP	cf congdonii
Ranunculus occidentalis, RAOC	
Fragaria, FRAGA	
Asarum lemmonii, ASLE	
Ribes roezlii, RIRO	

Plantago, PLANT	cf lanceolata
Prunella vulgaris, PRVU	
Veratrum californicum, VECA2	
Lotus oblongifolius, LOOB2	
Epilobium, EPILO	cf oreganum
Juncus oxymeris, JUOX	
Heracleum lanatum, HEMA80	
Spiranthes romanzoffiana, SPRO	
Ceanothus cordulatus, CECO	

Cowbell Meadow Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
American Robin, Turdus migratorius	obs	
Black-backed Woodpecker, Picoides arcticus	obs	
California ground squirrel, Spermophilus beeche	obs	
Dark-eyed Junco, Junco hyemalis	obs	
deer, Odocoileus	sign	
domestic cow, Bos taurus	sign	tracks and scat
gopher, Thomomys sp	sign	holes
Northern Flicker, Colaptes auratus	call	
Red-tailed Hawk, Buteo jamaicensis	obs	
vole, Microtus sp	sign	holes
warbler, Parulidae	obs	sp 1
warbler, Parulidae	obs	sp 2

Invertebrate Species	Detection	Stage	Comments
DIP Apioceridae Apiocera	obs	Adult	
LEP Hesperiidae	obs	Adult	
LEP Hesperiidae Pyrgus communis	obs	Adult	
LEP Lycaenidae Plebejus	obs	Adult	
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
LEP Nymphalidae Speyeria	spot	Adult	collected
LEP Pieridae Colias	obs	Adult	
ODO Aeshnidae	obs	Adult	sp1
ODO Aeshnidae	obs	Adult	sp2
ODO Coenagrionidae Argia	obs	Adult	nr vivida
ODO Libellulidae	obs	Adult	blue

Fauna Notes

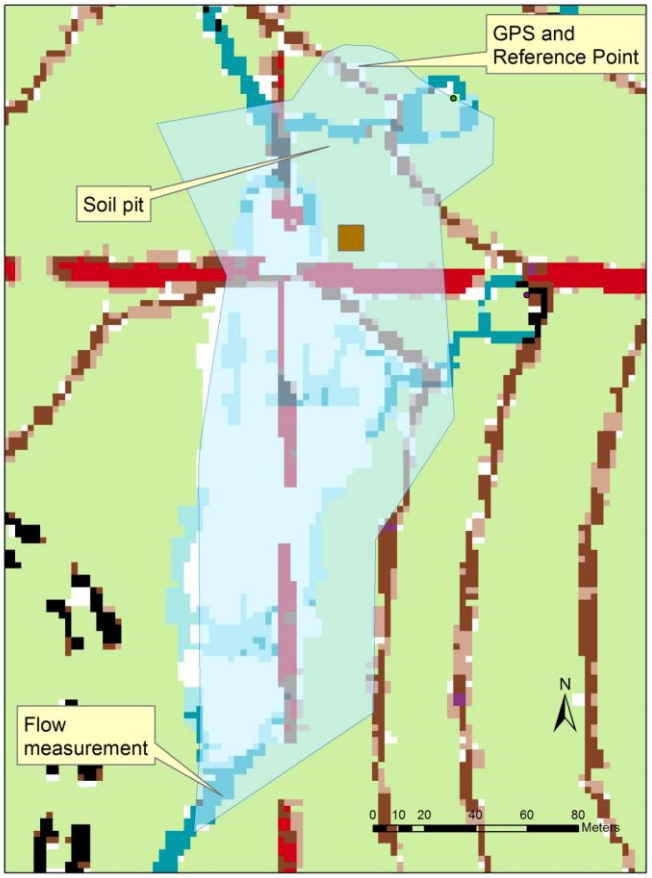
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Cowbell Meadow Spring (continued)

Sketchmap



Disturbance

Hydrology: Water diversion (water eventually returns to site);	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Wild animals; Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Compaction; Erosion (general); Excavation; Ground disturbance (general); Gully erosion; Pedestals or hummocks (by people or animals); Pipes; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Enclosure (such as spring house, spring box, or concrete enclosure; Other structures observed--see disturbance notes;	The exclosure fencing was down.

Cowbell Meadow Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Trampling/ground disturbance
Geomorphology and Soils		
4) Landform stability not altered	False	Heavy trampling/grazing/channelization
5) Runout channel functioning naturally	False	Channel excavated
6) Soil integrity not altered	False	Heavy trampling
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	False	Grazed heavily
9) TES, SOI/SOC flora as anticipated	False	Some species present/not abundant
10) Faunal species as anticipated	False	No aquatic insects
11) TES, SOI/SOC fauna as anticipated	False	No frogs
12) Invasive species not established	False	Bull thistle, Poa pratensis
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fence down
16) Herbivory not adversely affecting site	False	Heavily grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	True	
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Damselfly Springs ID# 159426

Survey Date:	9/21/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	125
Elevation (m):	1037
Coordinates	37 50 42.7 Latitude -119 59 44.1 Longitude
Area:	154 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree		
Shrub	1	Vitis californica
Graminoid		
Forb	2	Ehrendorferia chrysantha
Aquatic		
Bryophyte	3	
Unknown		

Survey Notes

This spring emerges in a steep, rocky, disturned channel that was heavily affected by the 2013 Rim Fire. The channel is incised and eroded, but vegetation is healthy and many birds are present, as well as damselflies, dragonflies, and hylid frogs.

Hydrology, Geology, and Soil Notes

No soil pits were indicated, as the site is in a heavily disturbed rocky channel.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.036

Water Quality (Single Location)

pH	7.81
Specific conductance (uS/cm)	246.1
Dissolved oxygen (mg/L)	9.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	19.3

Damselfly Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
unknown Graminoid (grass or grasslike), 2GRAM	*
Scrophularia desertorum, SCDE	Large Urtica-like leaves at base, ball capsu
Sisymbrium altissimum, SIAL2	annual sahara
Cercocarpus, CERCO	cf montanus
Gastridium phleoides, GAPH2	
Acer macrophyllum, ACMA3	
Helianthus californicus, HECA5	
unknown Forb, dicot, 2FD	annual with dropping lantern flowers; Se
Cirsium vulgare, CIVU	
Ceanothus, CEANO	sp., sent to MW for ID
Datisca glomerata, DAGL2	
Ribes nevadense, RINE	
Populus trichocarpa, POTR15	Sp? Seedling
Pseudognaphalium canescens ssp. beneolens, PSCAB	
Quercus, QUERC	cf berberidifolia
Lactuca serriola, LASE	
Eriodictyon californicum, ERCA6	
moss, 2MOSS	
Salix lasiandra var. lasiandra,	cf lasiolepis
Sambucus nigra, SANI4	
Pteridium aquilinum, PTAQ	
Mimulus cardinalis, MICA3	
Alnus incana ssp. tenuifolia, ALINT	seedling
Vitis californica, VICA5	
Lotus oblongifolius, LOOB2	
Conyza canadensis, COCA5	
unknown shrub, 2SHRUB	cf. Oxytenia acerosa - Sent to MW to ID
Ehrendorferia chrysantha, EHCH	yellow flower
unknown Forb, dicot, 2FD	upright, spikey (15 cm tall), Sent to MW f
Epilobium ciliatum, EPCI	
Rubus armeniacus, RUAR9	Blackberry
Quercus kelloggii, QUKE	

Damselfly Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
frog, Bufo sp.	call	Sierran Treefrog
hummingbird, Archilochus fam	obs	green
kinglet,	obs	?
Northern Flicker, Colaptes auratus	obs	
Turkey Vulture, Cathartes aura	sign	feather

Invertebrate Species	Detection	Stage	Comments
HYM Apidae Apis mellifera	obs	Adult	
ODO Aeshnidae	obs	Adult	gold Cordulegaster
ODO Coenagrionidae	obs	Adult	mating

Fauna Notes

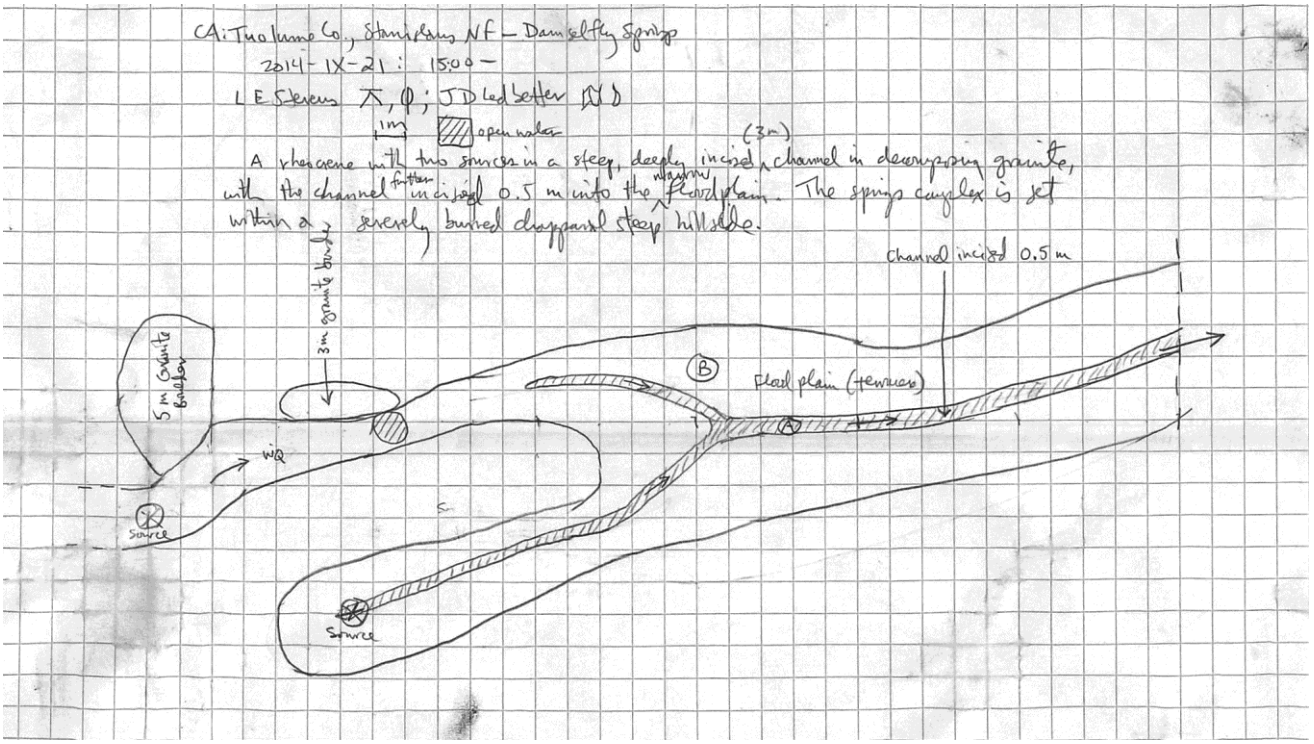
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Damselfly Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion;	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

Damselfly Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Incised, steep, rocky channel
5) Runout channel functioning naturally	False	Incised 3 m
6) Soil integrity not altered	False	Severely burned, incised channel
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	or even excessive growth
9) TES, SOI/SOC flora as anticipated	False	SOC present; other SOC spp. likely occurred here pre-fire
10) Faunal species as anticipated	False	Few AQ inverts; stream choked with ash and debris and is incising
11) TES, SOI/SOC fauna as anticipated	False	Insufficient habitat to support T&E & SOC spp.
12) Invasive species not established	False	Lactuca, Epilobium non-natives
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Heavy fire influences
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Elmeri Springs ID# 159343

Survey Date:	8/20/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	183
Elevation (m):	1659
Coordinates	37 58 51 Latitude -119 57 25.6 Longitude
Area:	1230 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Other (explain in "Notes on Geology")
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Prunus emarginata
Graminoid	1	Juncus nevadensis
Forb	2	Helenium hoopesii
Aquatic		
Bryophyte	4	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This site is within the 2013 Rim Fire perimeter; however, there was little evidence of recent fire influence and the burn intensity was low. There was no standing water, although the soils were moist. Clearly this spring has produced reliable water, with evidence of past flow and manipulation.

Hydrology, Geology, and Soil Notes

Soils were the surficial material throughout the site. Water table depth unknown; the spring was dry at the time of the visit. The depth to the mineral layer is unknown. The hole depth was 43 cm, with wetland roots in the upper 11 cm and peat from 11 cm to refusal. There were no redox concentrations, depletions, recuded matrices, or hydrogen sulfide odor.

Elmeri Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Fabaceae,	
Juncus saximontanus, JUSA	
Epilobium ciliatum, EPCI	
Hypericum anagalloides, HYAN2	n wetland indicator
Boerhavia coccinea, BOCO	
Carex, CAREX	
Juncus effusus var. pacificus, JUEFP	
Pseudognaphalium canescens, PSCA11	
Sequoiadendron, SEQUO2	planted
Sambucus nigra ssp. cerulea, SANIC5	
Salix lutea, SALU2	just off plot
Galium triflorum, GATR3	
Taraxacum officinale ssp. officinale, TAOF	
Cirsium vulgare, CIVU	
Fragaria, FRAGA	sp
Apiaceae fam, APIACE	
Veronica catenata, VECA7	cf
Carex nigricans, CANI2	cf
Verbascum thapsus, VETH	
Prunella vulgaris, PRVU	native
Sibbaldia, SIBBA	
Sisyrinchium elmeri, SIEL3	
Pteridium aquilinum, PTAQ	
Lotus oblongifolius, LOOB2	
Helenium hoopesii, HYHO	
Symphoricarpos mollis, SYMO	
Arabis, ARABI2	
Symphoricarpos mollis, SYMO	
Ribes divaricatum, RIDI	
Veratrum californicum, VECA2	
Bromus tectorum, BRTE	
Elymus, ELYMU	
Holcus lanatus, HOLA	
Salix, SALIX	cf gooddingii (planted)
Achillea millefolium, ACMI2	
Trifolium longipes, TRLO	cf longipes
Pseudognaphalium macounii, PSMA11	
Prunus emarginata, PREM	
Hymenoxys hoopesii, HYHO	
Poa pratensis, POPR	
Anthoxanthum odoratum, ANOD	
Euphorbia, EUPHO	
Muhlenbergia filiformis, MUFI2	
Luzula, LUZUL	
Agrostis, AGROS2	
Carex, CAREX	cf. nebraskensis
Aquilegia formosa, AQFO	
Viola, VIOLA	sp
Alnus rhombifolia, ALRH2	
Anaphalis margaritacea, ANMA	Yellow grass

Philonotis fontana, PHFO6	voles attacking moss/check sp
Juncus nevadensis, JUNE	

Elmeri Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
California ground squirrel, Spermophilus beeche	obs	white throat, long tail
domestic cow, Bos taurus	sign	tracks and scat
gopher, Thomomys sp	sign	holes
Steller's Jay, Cyanocitta stelleri	call	
vole, Microtus sp	obs	

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae	obs	Adult	
LEP Hesperiidae	obs	Adult	
LEP Lycaenidae	obs	Adult	Plebejus - blue
LEP Nymphalidae Danaus plexippus	obs	Adult	
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
LEP Papilionidae Papilio	obs	Adult	

Fauna Notes

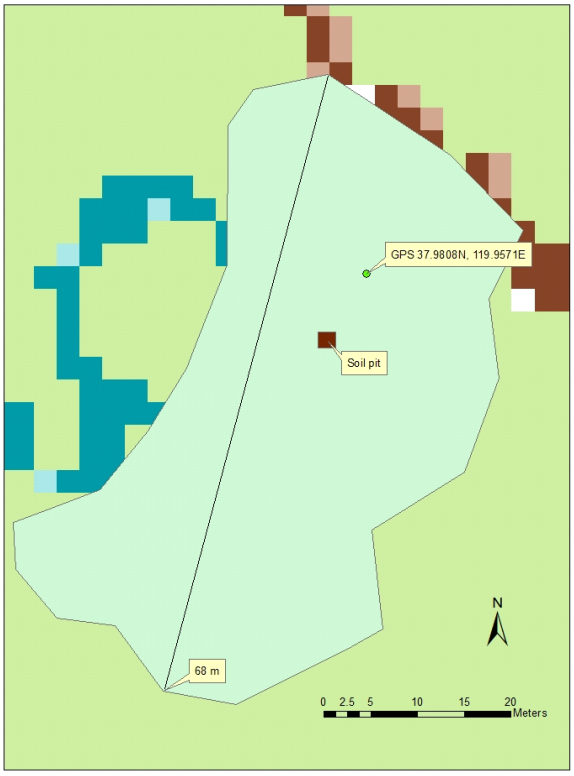
Surveyors could not conduct quantitative sampling as there was no flowing water. All invertebrates noted were observed.

Inverts Collected ☐

Number of Reps:

Elmeri Springs (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Wild animals; Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Compaction; Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Other structures observed--see disturbance notes;	The site has been excavated; the exclosure fencing is down and ineffective.

Elmeri Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Evidence of past flow; spring is dry
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	NA	spring is dry
Geomorphology and Soils		
4) Landform stability not altered	False	Excavation, trampling
5) Runout channel functioning naturally	False	Trampled and excavated
6) Soil integrity not altered	False	site is dry, trampled
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	False	Heavy grazing
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	Dry - no aquatic species
11) TES, SOI/SOC fauna as anticipated	False	Dry spring
12) Invasive species not established	False	Cirsium vulgari, mullein, bromus tectorum
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fencing down and not effective
16) Herbivory not adversely affecting site	False	Heavily tampled and grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	True	
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Fallen Cedar Springs ID# 159412

Survey Date:	9/1/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene, hillslope
Aspect (TN):	215
Elevation (m):	1619
Coordinates	38 0 56.3 Latitude -120 0 9.7 Longitude
Area:	158 square meters
Surrounding Vegetation:	Shrub dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	3	Calocedrus decurrens
Shrub	4	Cornus stolonifera
Graminoid	1	Juncus effusus
Forb	2	Asarum
Aquatic		
Bryophyte	5	
Unknown		

Survey Notes

This site had moderate fire influence from the 2013 Rim Fire. There was a large fallen tree through the center of the channel.

Hydrology, Geology, and Soil Notes

Geologic Structure - seepage No soil pits were indicated as it is in a heavily disturbed, rocky channel.

Hydrologic Attribute	Results
Water table type	Artesian
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.031

Water Quality (Single Location)

pH	6.00
Specific conductance (uS/cm)	105.1
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	10.2

Fallen Cedar Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Mimulus, MIMUL	cf. guttatus
Galium triflorum, GATR3	
Epilobium ciliatum, EPCI	
Calocedrus decurrens, CADE27	
Fragaria, FRAGA	
Carex, CAREX	cf alma
Juncus balticus, JUBA	
Pseudotsuga menziesii, PSME	
Ribes, RIBES	
Glyceria elata, GLST	
Veronica, VERON	
Arnica, ARNIC	
Boerhavia coccinea, BOCO	
Poa, POA	
Dieteria canescens,	
Galium aparine, GAAP2	tiny white spray
Spiranthes romanzoffiana, SPRO	
Prunella vulgaris, PRVU	
Equisetum arvense, EQAR	
Chrysolepis sempervirens, CHSE11	
Asarum, ASARU	
Viola, VIOLA	
Ribes nevadense, RINE	
Juncus effusus, JUEF	
Deschampsia danthonioides, DEDA	
moss, 2MOSS	
Acer, ACER	cf. macrophyllum
Cornus stolonifera, COSES	
Mimulus moschatus, MIMO3	
Lotus oblongifolius, LOOB2	
Apium graveolens, APGR2	
Prunus emarginata, PREM	
Lupinus, LUPIN	
Sonchus asper, SOAS	
Bromus, BROMU	

Fallen Cedar Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Dark-eyed Junco, Junco hyemalis	obs	
Northern Flicker, Colaptes auratus	obs	
warbler, Parulidae	obs	wood warbler

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae	obs	Adult	mosquitoes
HYM Apidae Apis mellifera	obs	Adult	
HYM Vespidae Dolichovespula	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	

Fauna Notes

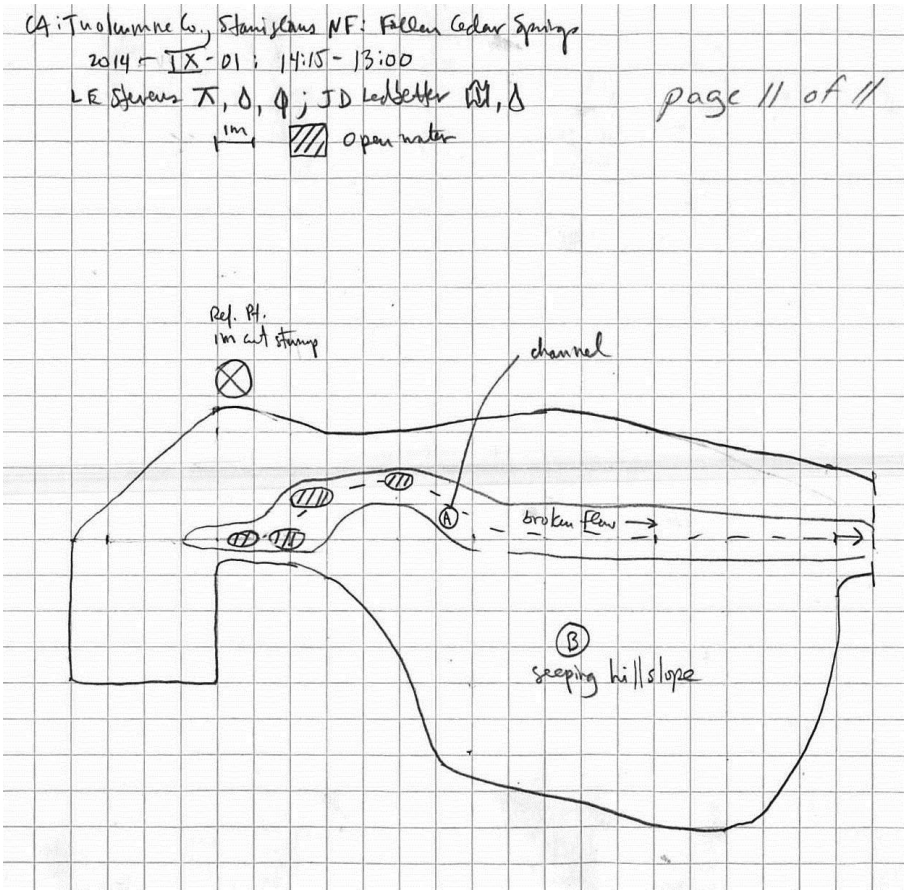
Surveyors were unable to conduct benthic sampling, as there was insufficient flow.

Inverts Collected ☐

Number of Reps:

Fallen Cedar Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Erosion (general); Ground disturbance (general); Gully erosion; Pipes;	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Fallen Cedar Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Fire influence, erosion
Geomorphology and Soils		
4) Landform stability not altered	False	Fire influence, erosion, evidence of excavation, piping
5) Runout channel functioning naturally	False	Fire influence, erosion, evidence of excavation, piping
6) Soil integrity not altered	False	some erosion
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	Stream filled with litter, so little open water
11) TES, SOI/SOC fauna as anticipated	UA	Unable to assess
12) Invasive species not established		
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Granite Ditch Springs ID# 159437

Survey Date:	8/25/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hypocrene, helocrene, rheocrene
Aspect (TN):	234
Elevation (m):	1286
Coordinates	37 55 55.6 Latitude -119 57 29.5 Longitude
Area:	64 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granodiorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub		
Graminoid	2	Juncus oxymeris
Forb	1	Mimulus floribundus
Aquatic		
Bryophyte		
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This seep is located in a ditch by an abandoned road. Although there was no standing or flowing water, there was healthy wetland vegetation and the soil was moist. The area suffered moderate effects from the 2013 Rim Fire.

Hydrology, Geology, and Soil Notes

This is a seepage/filtration spring. No water chemistry measurements and no flow measurements were possible as there was no standing or flowing water. The upper 3 cm is sandy histosol with wet silica sand below.

Granite Ditch Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Juncus effusus, JUEF	
Verbena bracteata, VEBR	cf; purple tight stalk/upright
Viola, VIOLA	
Myosotis discolor, MYDI	Asteracea
Carex, CAREX	little
Madia glomerata, MAGL2	aster/tall open inflorescence
Galium aparine, GAAP2	
Arctostaphylos, ARCTO3	seedling; same as at Nettle Ditch Spr, Sen
Conyza canadensis, COCA5	
Deschampsia danthonioides, DEDA	yellow headed
Ribes nevadense, RINE	
Lupinus, LUPIN	tall blue
Prunella vulgaris, PRVU	
Fragaria, FRAGA	
Carex, CAREX	little sedge 1
Taraxacum officinale ssp. officinale, TAOF	
Polypogon monspeliensis, POMO5	
Acer macrophyllum, ACMA3	
Mimulus floribundus, MIFL2	sticky
erythranthe guttata,	
Verbascum thapsus, VETH	
Epilobium ciliatum, EPCI	ssp ciliatum
Agrostis exarata, AGEX	
Mimulus cardinalis, MICA3	
Calamagrostis purpurascens, CAPU	
Trifolium repens, TRRE3	
Cerastium fontanum, CEFO2	ssp vulgare
Plantago lanceolata, PLLA	
Salix scouleriana, SASC	
Carex, CAREX	cf. alma
Ceanothus integerrimus, CEIN3	broad leaf
Equisetum arvense, EQAR	
Lotus oblongifolius, LOOB2	
unknown Graminoid (grass or grasslike), 2GRAM	grass 2
Juncus oxymeris, JUOX	
Cephalanthus occidentalis, CEOC2	Sent to MW for ID
Geum, GEUM	or Orobanchaceae?, sent to MW for ID
unknown Forb, dicot, 2FD	Asteraceae, sent to MW for ID
unknown shrub, 2SHRUB	Sent to MW for ID
unknown Forb (herbaceous, not grass nor grasslike), 2FORB	Seedling

Granite Ditch Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Dark-eyed Junco, Junco hyemalis	obs	
deer, Odocoileus	sign	tracks
hummingbird, Archilochus fam	obs	
Northern Flicker, Colaptes auratus	sign	feather
Red-tailed Hawk, Buteo jamaicensis	obs	

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae	obs	Adult	many
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	?
LEP Nymphalidae Danaus plexippus	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	
LEP Pieridae Colias eurytheme	spot	Adult	?
LEP Pieridae Pontia beckerii	obs	Adult	

Fauna Notes

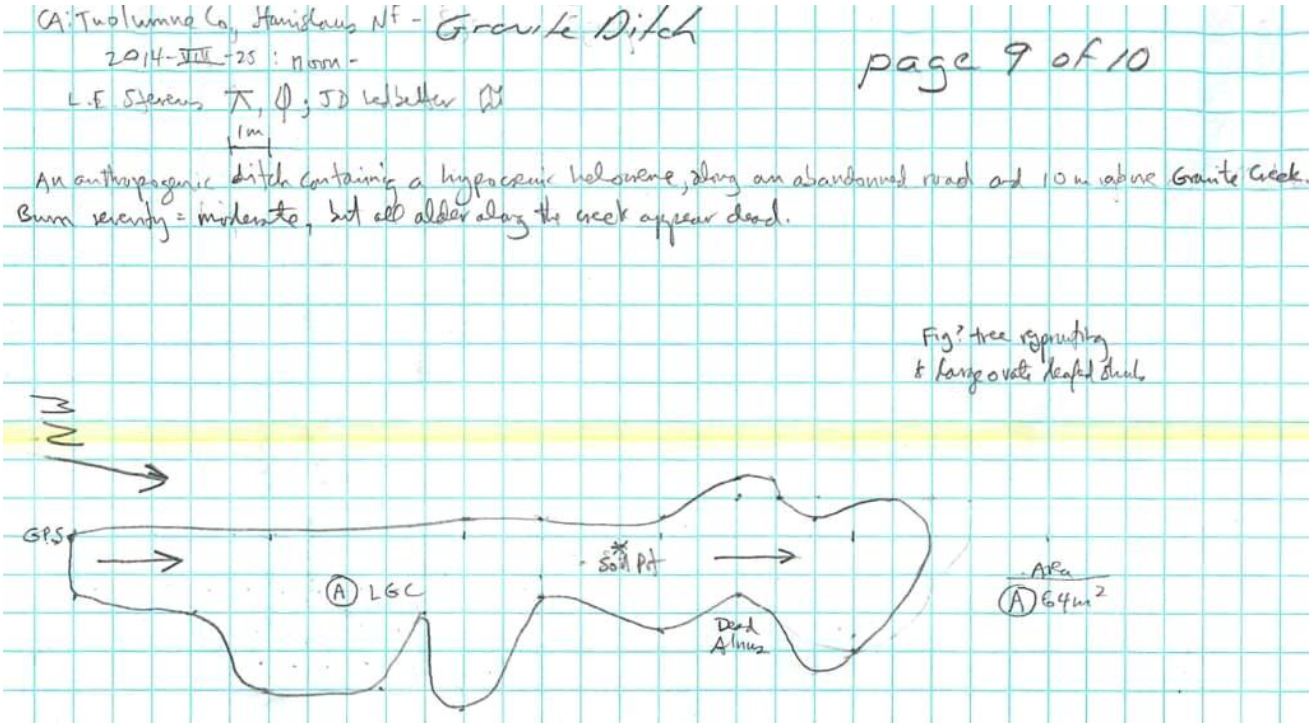
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Granite Ditch Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: Tracks or trails by vehicles (ATV, 4WD, etc);
	Animal effects: No animal effects noted
Soil alteration: Excavation; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
	There were animal trails nearby.
Structures: No structures noted	

Granite Ditch Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Excavated channel along abandoned road
5) Runout channel functioning naturally	False	Excavated channel along abandoned road
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	No unusual or rare spp.
10) Faunal species as anticipated	False	No aquatic invertebrates
11) TES, SOI/SOC fauna as anticipated	False	No aquatic invertebrates
12) Invasive species not established	False	Many NN plant spp
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Emerges in a ditch beside an abandoned road
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Moderate effects from 2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Himalaya Springs ID# 159419

Survey Date:	9/24/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hillslope
Aspect (TN):	240
Elevation (m):	922
Coordinates	37 50 21.3 Latitude -119 58 27.5 Longitude
Area:	125 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Toxicodendron rydbergii
Graminoid	2	Pseudoroegneria
Forb	1	Mimulus cardinalis
Aquatic		
Bryophyte		
Unknown		

Survey Notes

This hillslope spring emerges above a dry meadow near the middle fork of the Tuolumne River. The area was severely burned by the 2013 Rim Fire. No live trees remain.

Hydrology, Geology, and Soil Notes

No soil pits were indicated; this is a hillslope spring.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.0067

Water Quality (Single Location)

pH	6.78
Specific conductance (uS/cm)	301.0
Dissolved oxygen (mg/L)	3.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	15.8

Himalaya Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
unknown Forb, dicot, 2FD	same shrub as Bathtub spr
Epilobium, EPILO	cf ciliatum
Ribes, RIBES	small, highly dissected lv.
Alnus incana ssp. tenuifolia, ALINT	
Lotus oblongifolius, LOOB2	powder pea
Nasturtium officinale, NAOF	
Quercus kelloggii, QUKE	re-sprouted sapling
Convolvulus, CONVO	
Muhlenbergia, MUHLE	annual
Aira caryophyllea, AICA	yellow grass
Toxicodendron diversilobum, TODI	
Mimulus cardinalis, MICA3	
Carex, CAREX	cf alma
Mimulus, MIMUL	cf. M. guttatus
Cirsium vulgare, CIVU	
Trifolium wormskioldii, TRWO	annual - dead
Plantago lanceolata, PLLA	
Arctostaphylos, ARCTO3	seedling
Salix lasiolepis, SALA6	
Rubus armeniacus, RUAR9	
Juncus effusus, JUEF	
Cyperus eragrostis, CYER	big star sedge
Agrostis stolonifera, AGST2	
Pteridium aquilinum, PTAQ	check sp
Pinus lambertiana, PILA	seedling
Erigeron canadensis,	cf canadensis
Lactuca serriola, LASE	
Pseudoroegneria, PSEUD22	
Madia glomerata, MAGL2	
Polypogon australis, POAU3	
Lupinus, LUPIN	big - purple

Himalaya Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Red-tailed Hawk, Buteo jamaicensis	obs	
woodpecker, picidae fam	obs	hairy or white headed

Fauna Notes

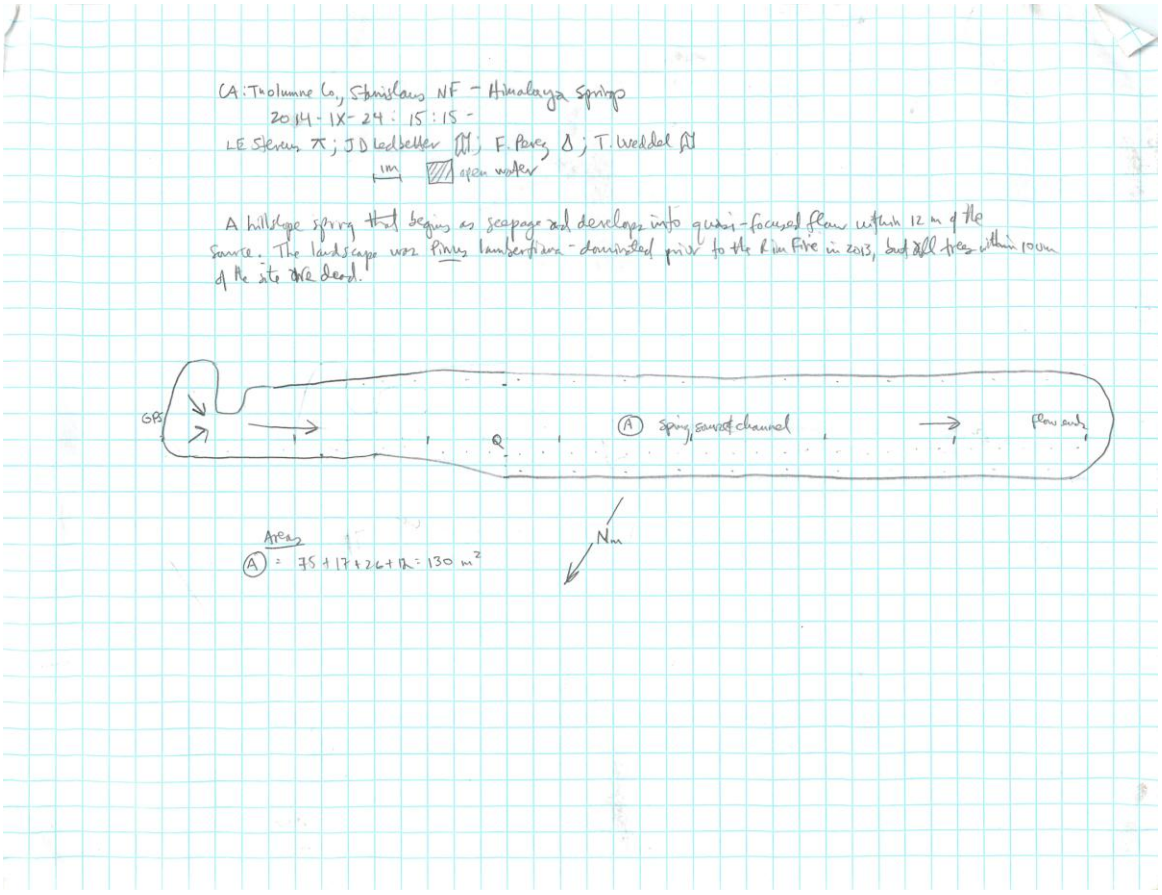
No benthic sampling was possible due to too little accessible flow.

Inverts Collected ☐

Number of Reps:

Himalaya Springs (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Ground disturbance (general);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Other structures observed--see disturbance notes;	Old metal and piping indicates some manipulation in the past.

Himalaya Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Fire effects are significant
5) Runout channel functioning naturally	True	
6) Soil integrity not altered	False	highly disturbed by 2013 Rim Fire
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	No rare plant spp or orchids
10) Faunal species as anticipated	False	few aquatic insects, little suitable habitat
11) TES, SOI/SOC fauna as anticipated	False	habitat of insufficient quality to support SOC
12) Invasive species not established	False	NN nasturtium, polypogon, cirsium, convolvulus
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	severe fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Hope Springs ID# 159401

Survey Date:	9/5/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	limnocrene, hillslope
Aspect (TN):	49
Elevation (m):	1646
Coordinates	38 4 16.1 Latitude -120 1 38.5 Longitude
Area:	200 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Human cause/constructed
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	4	Calocedrus decurrens
Shrub	5	Pseudotsuga menziesii
Graminoid	2	Carex
Forb	3	Arnica
Aquatic	1	algae sp
Bryophyte		
Unknown		

Survey Notes

This anthropogenic limnocrene was a hillslope spring prior to excavation. The 2013 Rim Fire intensity was low in this area. The area was determined by measuring length and width, then calculating the area from a sketchmap.

Hydrology, Geology, and Soil Notes

This GDE is an anthropogenic limnocrene No soil pit was dug due to the site being so heavily excavated.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Extensive standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.6

Water Quality (Single Location)

pH	6.73
Specific conductance (uS/cm)	209.0
Dissolved oxygen (mg/L)	5.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	7.8

Hope Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Prunella vulgaris, PRVU	
Juncus effusus, JUEF	
Juncus, JUNCU	
Ribes, RIBES	small leaf, sent to MW for ID
Poa, POA	cf pratensis
moss, 2MOSS	
Pinus flexilis, PIFL2	
Pinus lambertiana, PILA	
Cercocarpus, CERCO	
Cornus stolonifera, COSES	
Spiranthes romanzoffiana, SPRO	
Mimulus moschatus, MIMO3	
Abies concolor, ABCO	
Trifolium repens, TRRE3	
Veronica, VERON	cf catenata
Rhamnus, RHAMN	
Tragopogon dubius, TRDU	
unknown Forb (herbaceous, not grass nor grasslike), 2FORB	cf. Arnica
Ribes nevadense, RINE	
Epilobium ciliatum, EPCI	
Fragaria, FRAGA	
Pseudotsuga menziesii, PSME	
Equisetum arvense, EQAR	
Agrostis scabra, AGSC5	
Taraxacum officinale ssp. officinale, TAOF	
Hypericum anagalloides, HYAN2	
Viola, VIOLA	
algae sp, 2ALGA	
Carex, CAREX	cf alma
Calocedrus decurrens, CADE27	
unknown shrub, 2SHRUB	parallel-vein, opp. Lvs, sent to MW for ID

Hope Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
common raven, Corvus corax	call	
domestic cow, Bos taurus	sign	tracks/scat
garter snake, Thamnophis sp	obs	
Northern Flicker, Colaptes auratus	call	
Red-breasted Nuthatch, Sitta canadensis	obs	
Steller's Jay, Cyanocitta stelleri	call	
warbler, Parulidae	obs	
Western Tanager, Piranga ludoviciana	obs	female

Invertebrate Species	Detection	Stage	Comments
ANNE Oligochaetae	benth	Adult	
COL Carabidae	benth	Other	
DIP	benth	Larvae	
DIP Chironomidae	benth	Larvae	
EPH Baetidae	benth	Larvae	Sp 1
EPH Baetidae	benth	Larvae	Sp 2
HEM Gerridae Aquarius remigis	obs	Adult	many
HYM Ichneumonidae Megarhyssa atrata	obs	Adult	
HYM Vespidae	benth	Other	
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
LEP Nymphalidae Speyeria	obs	Adult	
MOLL Physidae Physa	benth	Adult	
TRI	benth	Larvae	
TRI Limnephilidae	benth	Larvae	
TURB	benth	Mixed	

Fauna Notes

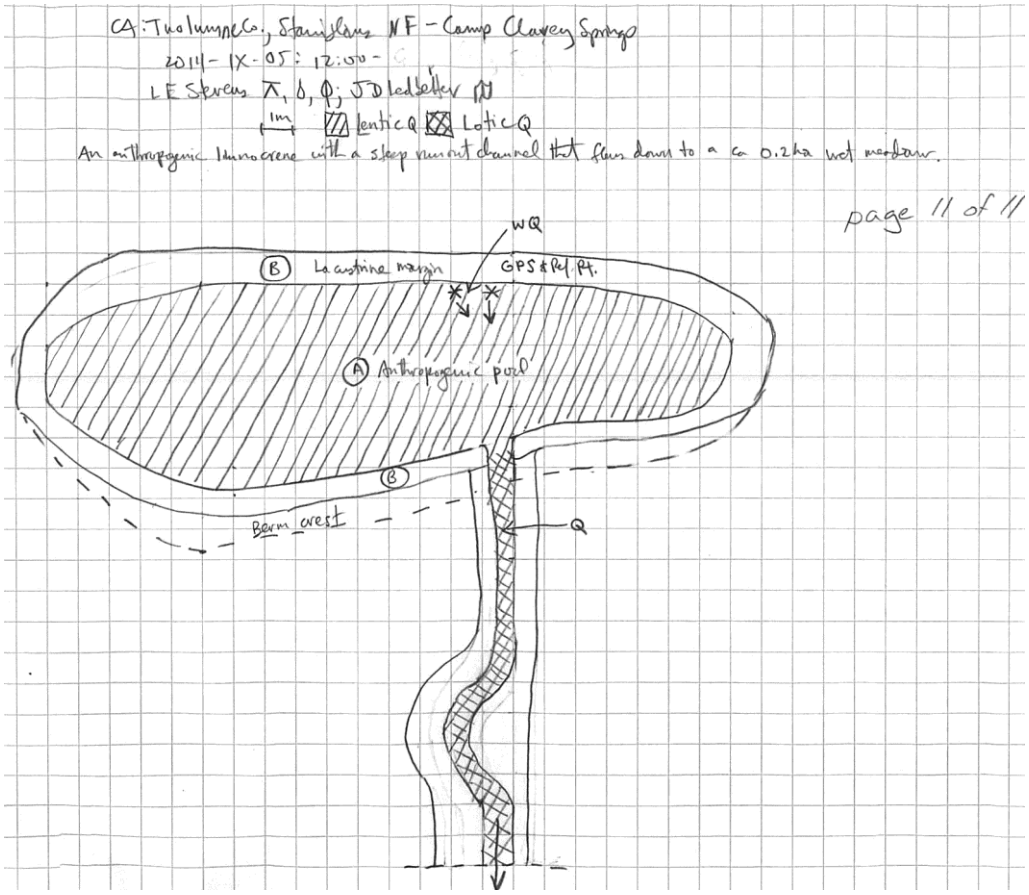
benthic sample #1: .02 m2; velocity = .15 m/sec; depth=5 cm; gravel and MOC SO/SO

Inverts Collected ☑

Number of Reps: 1

Hope Springs (continued)

Sketchmap



Disturbance

Hydrology: Regulated water flow by impoundment/dam; Other hydrologic alteration observed--see Disturbance notes	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Erosion (general); Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals); Pipes; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	The fencing is ineffective. The site has been excavated and bermed.

Hope Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Site has been excavated
Geomorphology and Soils		
4) Landform stability not altered	False	Site has been excavated
5) Runout channel functioning naturally	False	Unnatural geomorphology; trampled
6) Soil integrity not altered	False	channel trampled, incised
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	The soils have been flooded, eroded, & modified; limited plant growth
9) TES, SOI/SOC flora as anticipated	False	Site modification likely eliminated focal floral species of plants
10) Faunal species as anticipated	False	Site has been heavily modified into an anthropogenic pool
11) TES, SOI/SOC fauna as anticipated	False	Habitat insufficient or likely to support amphibious or other SOI/SOC
12) Invasive species not established	False	Veronica, agrostis, poa, and prunella are established
Disturbances		
13) Flow reg. not adversely affecting site	False	site has been excavated/bermed
14) Construction, Roads not affecting	False	site has been excavated/bermed
15) Fencing functions properly	False	fencing is down
16) Herbivory not adversely affecting site	False	trampled and grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Excavation & Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Hopeful Springs ID# 159373

Survey Date:	8/29/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	151
Elevation (m):	1078
Coordinates	37 55 3.5 Latitude -119 57 59.1 Longitude
Area:	42 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Quercus kelloggii
Graminoid	2	Cyperus eragrostis
Forb	1	
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

There were heavy effects from the 2013 Rim Fire in the area. All the trees were dead at the site. Area was determined by sketch map.

Hydrology, Geology, and Soil Notes

No soil pits were indicated, as this site is in a heavily disturbed, rocky channel.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.0018

Water Quality (Single Location)

pH	5.98
Specific conductance (uS/cm)	231.6
Dissolved oxygen (mg/L)	1.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	19.9

Hopeful Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Solidago, SOLID	
Gayophytum diffusum ssp. parviflorum, GADIP	
Echinochloa crus-galli, ECCR	
Rhamnus crocea, RHCR	
Fabaceae,	sp 2
Sporobolus, SPORO	cf giganteus
Allophyllum divaricatum, ALDI4	tiny purple flower - deep tube
Carex, CAREX	
Ceanothus, CEANO	Sent to MW for ID
unknown shrub, 2SHRUB	Quercus? - spikey leaves, sent to MW for I
Chamaebatia foliolosa, CHFO	
Lactuca serriola, LASE	
Mimulus floribundus, MIFL2	
Ambrosia, AMBRO	sp 2
Verbascum thapsus, VETH	
Pinus lambertiana, PILA	seedling sp?
Datisca glomerata, DAGL2	sp 1
Cyperus eragrostis, CYER	
Equisetum laevigatum, EQLA	
Vitis californica, VICA5	
Acmispon nevadensis var. nevadensis,	sp 1
Quercus kelloggii, QUKE	resprouting
Asclepias, ASCLE	
Chenopodium pratericola, CHPR5	
Mimulus cardinalis, MICA3	
Juncus, JUNCU	cf effusus
Leptochloa fusca ssp. fascicularis, LEFUF	
Eriodictyon californicum, ERCA6	
Oryza sativa, ORSA	
Ribes, RIBES	
unknown Forb, dicot, 2FD	Dicot 2
moss, 2MOSS	
Salix lutea, SALU2	
Anaphalis margaritacea, ANMA	
Artemisia, ARTEM	
Erigeron canadensis,	cf subulatus
Persicaria punctata, POPUP4	

Hopeful Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Acorn Woodpecker, Melanerpes formicivorus	obs	
Mourning Dove, Zenaida macroura	call	
Northern Saw-whet Owl,	call	
Olive-sided Flycatcher, Contopus cooperi	obs	
Scrub Jay, Aphelocoma californica	obs	
Steller's Jay, Cyanocitta stelleri	obs	

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae	obs	Adult	

Fauna Notes

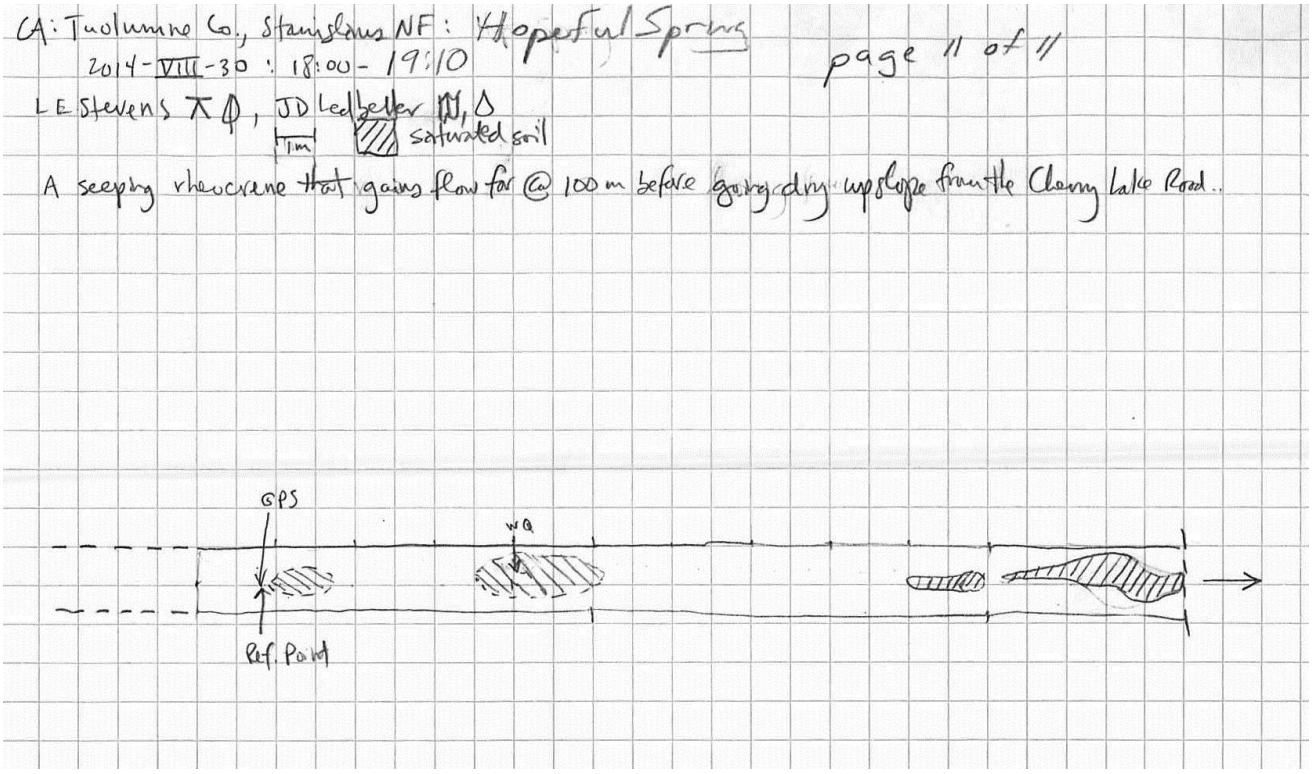
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Hopeful Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Gully erosion; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other); Other miscellaneous effects observed--see disturbance notes;
	Disturbance Notes
	Erosion control - hay
Structures: No structures noted	

Hopeful Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Incision of channel - effects of Rim Fire
Geomorphology and Soils		
4) Landform stability not altered	False	Incision of channel - effects of Rim Fire
5) Runout channel functioning naturally	False	Incision of channel - effects of Rim Fire
6) Soil integrity not altered	False	Incision of channel - effects of Rim Fire
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Many non-native species and open soil patches
10) Faunal species as anticipated	False	Nearly no aquatic invertebrates
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Several non-native grasses, e.g. Sporobolus cf giganteus
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	UA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Incense Springs ID# 159418

Survey Date:	9/29/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): rheocrene

Aspect (TN): 287

Elevation (m): 1016

Coordinates 37 51 59.8 Latitude
-120 0 35.8 Longitude

Area: 100 square meters

Surrounding Vegetation: Tree dominated

Surficia Material: Alluvium

Lithology: Igneous intrusive , Diorite

Bryophyte Abundance:

Lifeform	Rank	Dominant Species
Tree	1	Calocedrus decurrens
Shrub	2	Alnus incana ssp. tenuifolia
Graminoid	3	Datisca glomerata
Forb	4	unknown Graminoid (grass or grasslike)
Aquatic	5	Nasturtium officinale
Bryophyte	5	
Unknown		

Survey Notes

This is a small rheocrene located in a lightly burned portion of the forest. Four Calocedrus trees were killed by fire here and have been uprooted. Lush growth and a refreshing scent of cedar were a welcome relief to the kilometer of charred chaparral through which we descended to reach the springs.

Hydrology, Geology, and Soil Notes

The flow measurement was likely influenced by surface flow, as there had been heavy rains prior to the survey. No soil pits were indicated; this is a rheocrene heavily influenced by surfact flow. There is no wetland habitat and the soil is burned.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.032

Water Quality (Single Location)

pH	6.51
Specific conductance (uS/cm)	226.0
Dissolved oxygen (mg/L)	1.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	14.1

Incense Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
unknown Forb, dicot, 2FD	dicot 3 Arnica? No repro
Prunella vulgaris, PRVU	
Pseudoroegneria, PSEUD22	
Mimulus cardinalis, MICA3	nr cardinalis
Viola, VIOLA	
Alnus incana ssp. tenuifolia, ALINT	
algae sp, 2ALGA	
Taraxacum officinale, TAOF	
Torilis arvensis, TOAR	burr-weed
Pinus, PINUS	seedling
Galium triflorum, GATR3	large
Juncus covillei, JUCO5	
Carex, CAREX	
Apiaceae fam, APIACE	seedling
unknown Forb, dicot, 2FD	burr weed
Conyza, CONYZ	no flowers
Pycnanthemum californicum, PYCA	cloval mint
Artemisia douglasiana, ARDO3	
Toxicodendron diversilobum, TODI	
Hieracium argutum, HIAR2	dicot 2 hairy-leaf nettle
Quercus kelloggii, QUKE	
Calocedrus decurrens, CADE27	
Ribes, RIBES	prostrate
Epilobium ciliatum, EPCI	
Aquilegia formosa, AQFO	
Datisca glomerata, DAGL2	dicot 1 urtica-like Lycopus?
Pteridium aquilinum, PTAQ	
unknown Graminoid (grass or grasslike), 2GRAM	setaria? No heads, semi-aquatic
Nasturtium officinale, NAOF	
Acer macrophyllum, ACMA3	
unknown Graminoid (grass or grasslike), 2GRAM	
unknown Forb, dicot, 2FD	Brassicaceae, sent to MW for ID
Rumex acetosella, RUAC3	

Incense Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Dark-eyed Junco, Junco hyemalis	obs	
deer, Odocoileus	sign	tracks and scat
Steller's Jay, Cyanocitta stelleri	call	
woodpecker, picidae fam	call	3-toed?

Invertebrate Species	Detection	Stage	Comments
COL Dytiscidae	obs	Adult	
COL Dytiscidae Agabus	obs	Adult	200+ beetles!
COL Hydraenidae	obs	Adult	
COL Hydrophilidae	obs	Adult	
DIP Chironomidae	obs	Larvae	
DIP Chloropidae	obs	Adult	
HEM Gerridae Aquarius remigis	obs	Adult	
HEM Veliidae	obs	Adult	
HYM Apidae Apis mellifera	obs	Adult	
LEP Pieridae Pieris rapae	obs	Adult	
MOLL Physidae	obs	Adult	
PLE Capniidae	obs	Larvae	stonefly

Fauna Notes

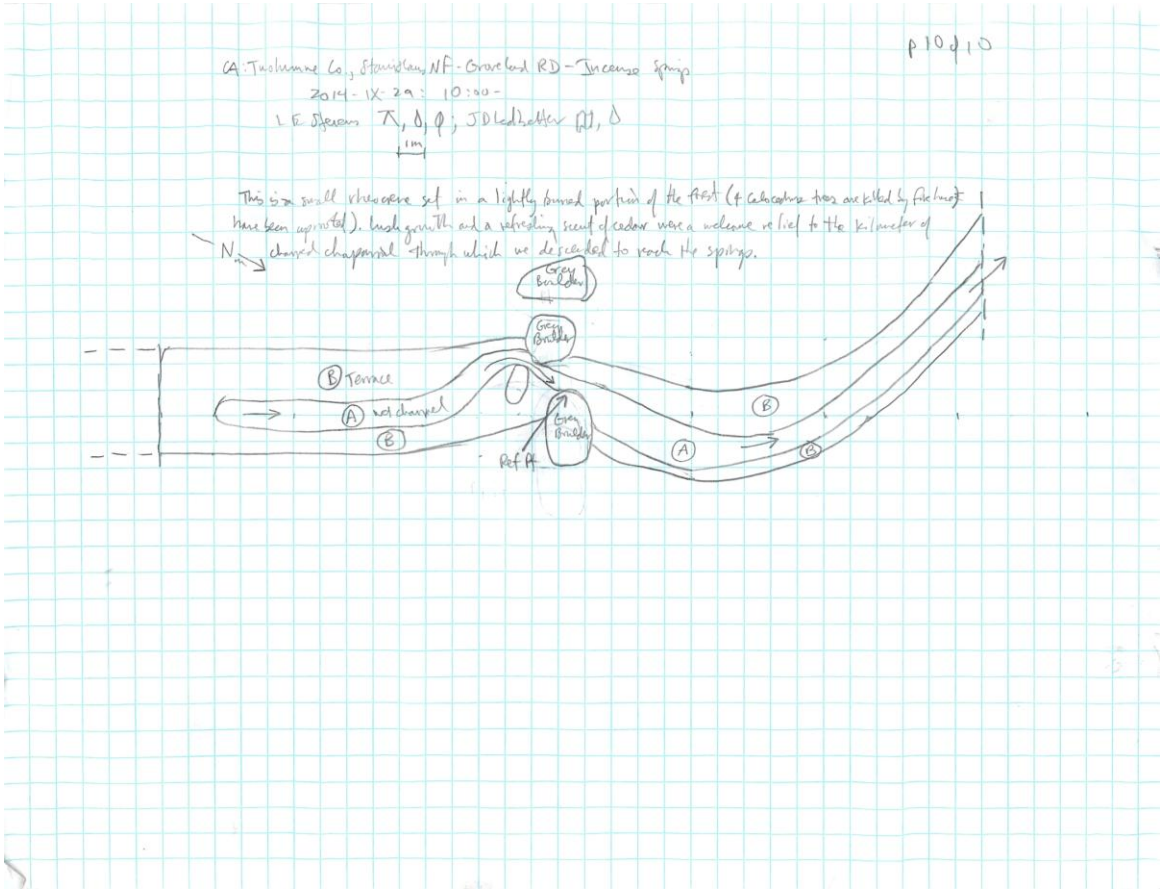
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Incense Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: No recreational effects noted
	Animal effects: Wild animals; Trails by animals and people;
Soil alteration: Channel erosion; Erosion (general); Ground disturbance (general); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

Incense Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	2013 Rim Fire effects
5) Runout channel functioning naturally	False	Entrenched, fire effects
6) Soil integrity not altered	False	erosion and burn effects
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Rheocrene setting and fire effects reduce likelihood of SOC plants
10) Faunal species as anticipated	False	no amphibians or mammals present
11) TES, SOI/SOC fauna as anticipated	False	burn severity in adjacent upland limits habitat
12) Invasive species not established	False	taraxacum established
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	moderate effects from Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Indian Spring ID# 159449

Survey Date:	9/27/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	97
Elevation (m):	1214
Coordinates	37 54 54.1 Latitude -120 5 13.6 Longitude
Area:	710 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Metamorphic , Metavolvanic Rocks
Bryophyte Abundance:	Very abundant

Lifeform	Rank	Dominant Species
Tree		
Shrub		
Graminoid		
Forb	2	Pteridium aquilinum
Aquatic		
Bryophyte	1	
Unknown		

Survey Notes

This springs ecosystem was severely burned in the 2013 Rim Fire. Soils were burned off, all the trees are dead, and many have fallen and been uprooted. It has been heavily grazed and trampled by cattle since the burn; with cows present during the survey. This site is 300 m upslope from where Indian Springs is marked on the maps. That spring is a tank that collects from this spring, as well as Indian Middle and Indian East. Restoration potential is enormous and urgent.

Hydrology, Geology, and Soil Notes

Rain during the survey likely affected flow measurements. There is up to 2 cm of muck and charcoal ash on top of gray clay. The entire organic horizon was burned off.

Hydrologic Attribute	Results
Water table type	Ponding
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	0
Flow estimate (L/sec)	0.22

Water Quality (Single Location)

pH	6.61
Specific conductance (uS/cm)	188.0
Dissolved oxygen (mg/L)	4.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	12.5

Indian Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Agrostis stolonifera, AGST2	
Cirsium vulgare, CIVU	
liverwort fam,	
Aquilegia formosa, AQFO	
Pseudognaphalium, PSEUD43	
Ribes, RIBES	smaller incised leaf
Pinus lambertiana, PILA	seedling
Veronica, VERON	
Ribes nevadense, RINE	
unknown Bryophyte (moss, liverwort, hornwort), 2BRY	moss
Juncus, JUNCU	cf balticus
Pteridium aquilinum, PTAQ	
Salix scouleriana, SASC	
Alnus incana ssp. tenuifolia, ALINT	
Fabaceae,	annual - no heads
Hypericum, HYPER	
Galium triflorum, GATR3	large
unknown Forb, dicot, 2FD	3-leaf purple cone/n shrub
Typha latifolia, TYLA	
unknown Graminoid (grass or grasslike), 2GRAM	grass 1 no heads
Rubus laciniatus, RULA	spiney, clematis like
Hoita macrostachya, HOMA4	
Juncus effusus, JUEF	
Perideridia, PERID	?
moss, 2MOSS	
unknown Bryophyte (moss, liverwort, hornwort), 2BRY	liverwort
Rubus armeniacus, RUAR9	
Taraxacum officinale ssp. officinale, TAOF	

Indian Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
Common Raven, Corvus corax	obs	
Dark-eyed Junco, Junco hyemalis	obs	
domestic cow, Bos taurus	sign	lots of scat and trampling
Hairy Woodpecker, Picoides villosus	obs	
hummingbird, Archilochus fam	obs	
Western Bluebird, Sialia mexicana	obs	
White-crowned Sparrow, Zonotrichia leucophry	obs	
Yellow Warbler, Dendroica petechia	obs	

Fauna Notes

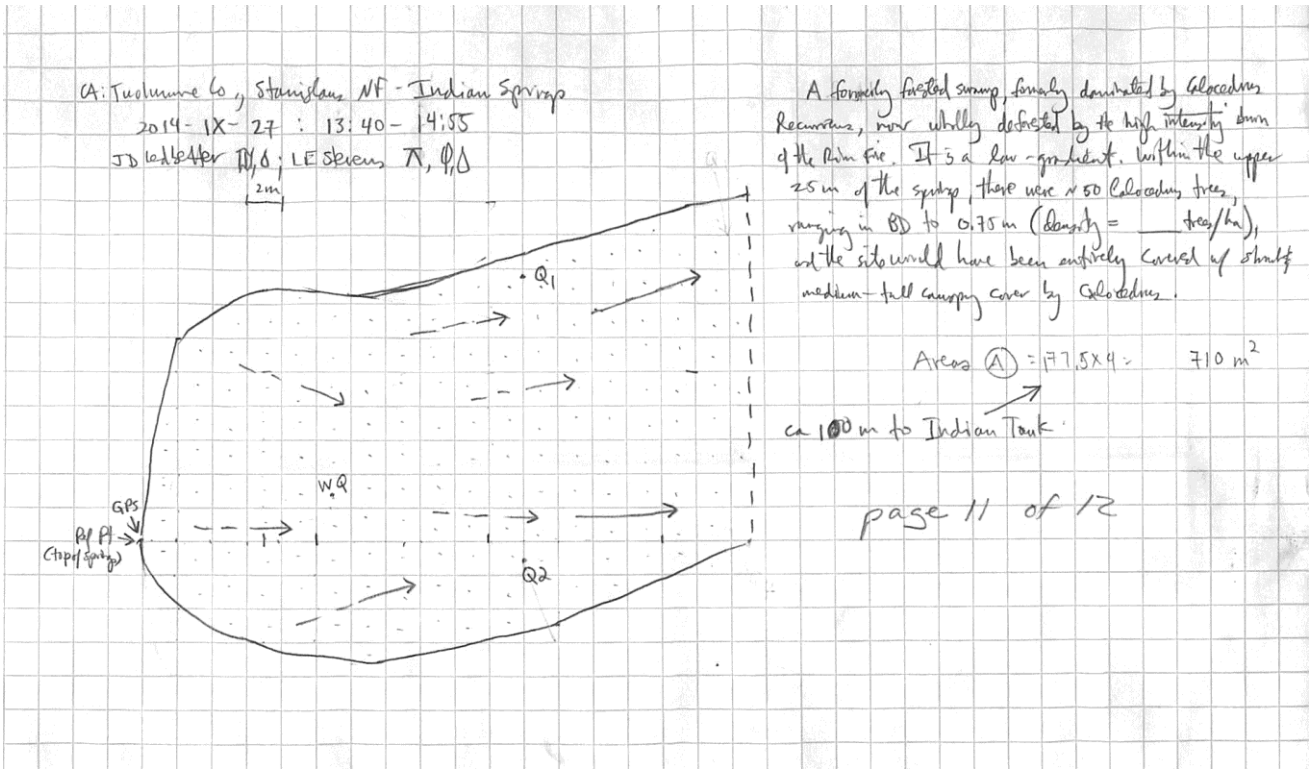
There was no invertebrate and little vertebrate activity due to chilly and rainy weather.

Inverts Collected ☐

Number of Reps:

Indian Spring (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Erosion (general); Ground disturbance (general); Pedestals or hummocks (by people or animals); Pipes; Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Other structures observed--see disturbance notes;	piping

Indian Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Severe effects from 2013 Rim Fire; heavily trampled by cattle
Geomorphology and Soils		
4) Landform stability not altered	False	Severe effects from 2013 Rim Fire. Heavily trampled by cattle
5) Runout channel functioning naturally	False	Channel trampled and manipulated
6) Soil integrity not altered	False	Soil burned off/trampling.
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Site growth is much depressed due to fire
9) TES, SOI/SOC flora as anticipated	False	Although two unusual plant spp, no SOC orchids, or other spp detecte
10) Faunal species as anticipated	False	No AQ invertebrates detected; no amphibians detected
11) TES, SOI/SOC fauna as anticipated	False	No suitable habitat for SOC vertebrates
12) Invasive species not established	False	Cirsium vulgare
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fencing down and ineffective
16) Herbivory not adversely affecting site	False	Heavily trampled and grazed.
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Severely burned in 2013 Rim Fire. No live trees, all soils burned off.
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Liverwort Springs ID# 164152

Survey Date:	8/31/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	210
Elevation (m):	1167
Coordinates	37 55 15.2 Latitude -119 55 25.4 Longitude
Area:	157 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree		
Shrub	5	Salix scouleriana
Graminoid	2	Carex
Forb	1	Pteridium aquilinum
Aquatic		algae sp
Bryophyte	3	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.44

Water Quality (Single Location)

pH	6.31
Specific conductance (uS/cm)	293.3
Dissolved oxygen (mg/L)	3.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	16.6

Survey Notes

This springs ecosystem is not marked on topographic maps; nor is it included in the NHD database. There were severe effects at this site from the 2013 Rim fire. There were no live trees, and much incision of the channel. The spring is heavily influenced by surface water runoff. Occassional monitoring is recommended.

Hydrology, Geology, and Soil Notes

No soil pits were indicated, as this is a rocky, disturbed channel.

Liverwort Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Veronica, VERON	
Pseudognaphalium, PSEUD43	
algae sp, 2ALGA	Cladophora like - filamentous green
Pteridium aquilinum, PTAQ	
Cirsium vulgare, CIVU	
Juncus, JUNCU	
unknown Bryophyte (moss, liverwort, hornwort), 2BRY	liverwort
unknown Forb, dicot, 2FD	not Euphorbia - non milky: spurge, sent t
unknown Forb, dicot, 2FD	Dicot 2, sent to MW for ID
Salix, SALIX	cf lasiolepis
Lycopus, LYCOP4	cf uniflorus, sent to MW for ID
Aquilegia formosa, AQFO	
liverwort fam,	
Mimulus bolanderi, MIBO3	pink-purple ?
Carex, CAREX	cf alma
Perideridia, PERID	cf parishii seedling
moss, 2MOSS	
Taraxacum officinale ssp. officinale, TAOF	
Conyza canadensis, COCA5	
Mimulus cardinalis, MICA3	
Stachys albens, STAL	
Mimulus moschatus, MIMO3	
Ceanothus integerrimus, CEIN3	
unknown Forb, dicot, 2FD	
Epilobium, EPILO	
Salix scouleriana, SASC	
Arctostaphylos, ARCTO3	recovering from fire
Rubus parviflorus, RUPA	
Anaphalis margaritacea, ANMA	
Lupinus, LUPIN	

Liverwort Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Acorn Woodpecker, Melanerpes formicivorus	obs	
American black bear, Ursus americanus	sign	scat
hummingbird, Archilochus fam	obs	

Invertebrate Species	Detection	Stage	Comments
LEP Hesperiidae	obs	Adult	med orange
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Nymphalidae Coenomorpha tullia	obs	Adult	
LEP Nymphalidae Danaus plexippus	obs	Adult	
LEP Nymphalidae Junonia coenia	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	2 species
LEP Nymphalidae Vanessa virginiensis	obs	Adult	
LEP Pieridae Colias	obs	Adult	sulfur
ODO Coenagrionidae Argia	obs	Adult	
ODO Cordulegasteridae Cordulegaster dorsalis	obs	Adult	

Fauna Notes

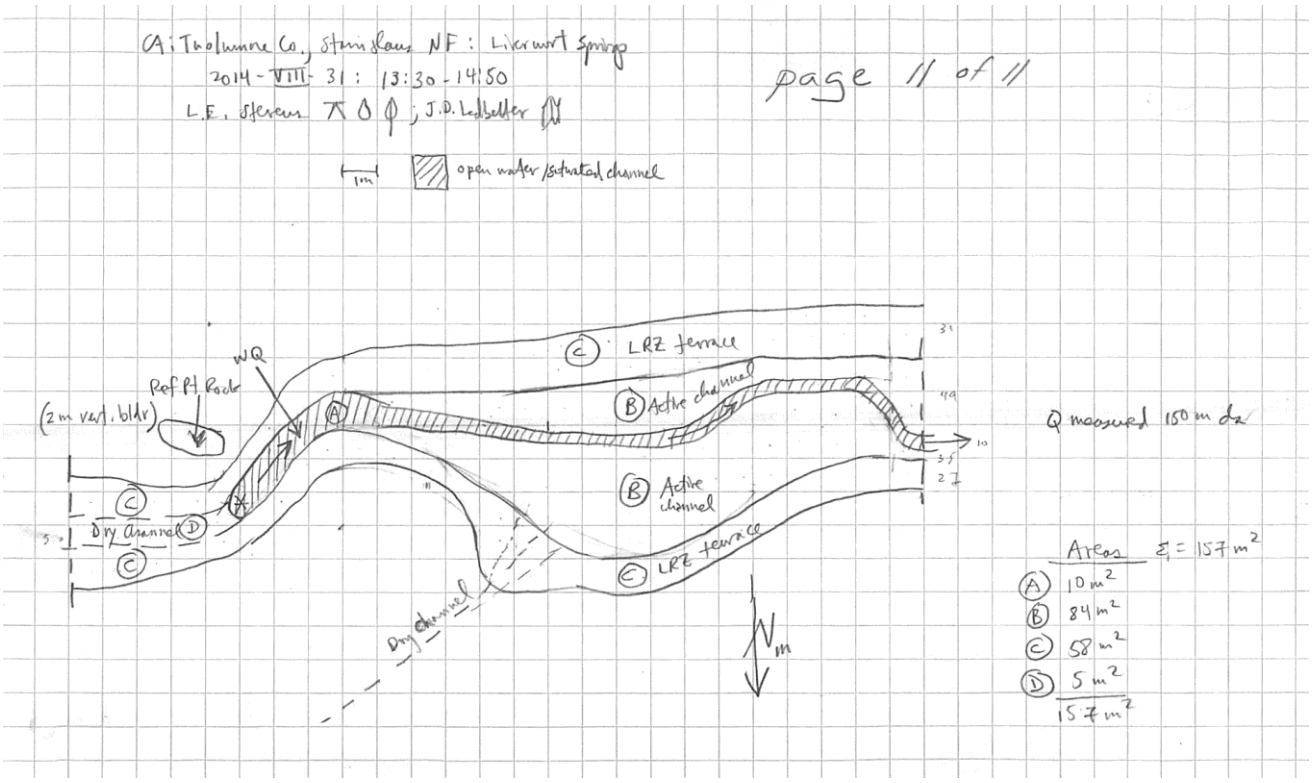
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Liverwort Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Erosion (general); Gully erosion; Rill erosion; Trails (by people or animals); Other soil alteration observed--see disturbance notes;	Miscellaneous effects: Fire;
	Disturbance Notes
	Slurry-flow (fire related flooding)
Structures: No structures noted	

Liverwort Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Extensive incision, effects from Rim Fire
Geomorphology and Soils		
4) Landform stability not altered	False	Erosion/incision result of fire
5) Runout channel functioning naturally	False	Erosion/incision result of fire
6) Soil integrity not altered	False	Erosion/incision result of fire
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Heavy fire impacts on stream geomorphology & many non-native plar
10) Faunal species as anticipated	False	No DPT, aquatic bettles, but one Cordulegaster
11) TES, SOI/SOC fauna as anticipated	False	Heavy fire impacts on adjacent landscape but many monarchs.
12) Invasive species not established	False	Cirsium vulgare
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	UA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Heavy impacts from Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Milk Ranch Spring ID# 159450

Survey Date:	9/4/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	138
Elevation (m):	1620
Coordinates	38 2 40.2 Latitude -120 4 20.8 Longitude
Area:	315 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	5	Calocedrus decurrens
Shrub	4	Calocedrus decurrens
Graminoid	2	Eleocharis
Forb	1	Hypericum
Aquatic		
Bryophyte	3	
Unknown		

Survey Notes

This dry meadow is located 70 m downslope from the NHD point. However, no evidence of a spring was found at that location. This site was dry, but there had been obvious flow in the past. Impact from the 2013 Rim Fire was relatively light. The survey was cut short due to presence of bear cubs nearby; surveyors did not complete a sketchmap.

Hydrology, Geology, and Soil Notes

There was evidence of past flow at the site. This is likely a seepage/filtration spring. The aquifer source is likely alluvium. Surveyors could not measure flow or water quality as the site was dry. No soil pits were indicated, as the site was dry and there were no fen characteristics observed.

Hydrologic Attribute	Results
Water table type	
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0
Water Quality (Single Location)	
pH	
Specific conductance (uS/cm)	
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	

Milk Ranch Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Carex, CAREX	
Calocedrus decurrens, CADE27	
Luzula comosa var. comosa,	*
Ribes, RIBES	small-leaf
Juncus saximontanus, JUSA	lily-like
Juncus effusus, JUEF	
Cirsium vulgare, CIVU	
Epilobium, EPILO	cf ciliatum
Hypericum, HYPER	
Eleocharis, ELEOC	cf. bella
Asarum, ASARU	
Viola, VIOLA	
Taraxacum, TARAX	
Mimulus moschatus, MIMO3	
moss, 2MOSS	
Ribes nevadense, RINE	
unknown Graminoid (grass or grasslike), 2GRAM	poa?

Milk Ranch Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
Accipeter hawk, Accipiter	obs	goshawk?
American black bear, Ursus americanus	obs	nearby
domestic cow, Bos taurus	sign	tracks, scat, & pedistals
Red-breasted Nuthatch, Sitta canadensis	call	

Fauna Notes

Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Milk Ranch Spring (continued)

Sketchmap

Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: Tracks or trails by vehicles (ATV, 4WD, etc);
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Erosion (general); Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Milk Ranch Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Site is dry; excavation upslope
2) Watershed (surface water) not altered	False	Site is dry; excavation upslope
3) WQ changes not affecting site	False	No water, heavily trampled and grazed
Geomorphology and Soils		
4) Landform stability not altered	False	No water, heavily trampled and grazed
5) Runout channel functioning naturally	False	Entrenched
6) Soil integrity not altered	False	Heavily trampled and grazed
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavily grazed
9) TES, SOI/SOC flora as anticipated	False	Desiccated and heavily grazed by cattle
10) Faunal species as anticipated	False	No aquatic habitat or species
11) TES, SOI/SOC fauna as anticipated	False	Site does not provide suitable habitat for prey of T & E birds
12) Invasive species not established	False	Taraxacum & cirsium NN are abundant
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road is adjacent to the site
15) Fencing functions properly	NA	No fencing is present
16) Herbivory not adversely affecting site	False	Heavily trampled, grazed, and browsed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	2013 Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Mosspool Springs ID# 159376

Survey Date:	8/23/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	144
Elevation (m):	1167
Coordinates	37 55 4.8 Latitude -119 58 37.2 Longitude
Area:	18.5 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree		
Shrub		
Graminoid	2	Polypogon australis
Forb	1	Pteridium aquilinum
Aquatic		
Bryophyte	3	
Unknown		

Survey Notes

The site is heavily influenced by the 2013 Rim Fire. It is adjacent to a road and pullout, and is influenced by the flow fom the culvert.

Hydrology, Geology, and Soil Notes

This is a seepage or filtration spring. Soil pits were not indicated due to rocky substrate and road influence.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.0016

Water Quality (Single Location)

pH	6.20
Specific conductance (uS/cm)	219.0
Dissolved oxygen (mg/L)	4.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	19.8

Mosspool Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Juncus bufonius, JUBU	cf bufonius
Prunella vulgaris, PRVU	
Rumex crispus, RUCR	
Lamiaceae fam,	
Salix, SALIX	cf lasiolepis
Pseudognaphalium, PSEUD43	
Trifolium repens, TRRE3	
Rumex, RUMEX	cf crispus
Chamaebatia foliolosa, CHFO	
Epilobium torreyi, EPTO4	
Potentilla, POTEN	low-growing, sent to MW for ID
Mimulus moschatus, MIMO3	
Acmispon americanus var. americanus,	Lotus a. americanus
Calystegia malacophylla, CAMA38	Collected
Juncus mertensianus, JUME3	
Digitaria sanguinalis, DISA	
Pteridium aquilinum, PTAQ	
Dysphania pumilo,	
Arctostaphylos, ARCTO3	
Juncus effusus, JUEF	
Pinus lambertiana, PILA	seedling
Fabaceae,	
unknown Forb, dicot, 2FD	Dicot 4 cf. Pedicularis, sent to MW for ID
Salix scouleriana, SASC	
Ambrosia, AMBRO	
Rumex acetosella, RUAC3	
moss, 2MOSS	
Persicaria punctata, POPUP4	
Verbascum thapsus, VETH	
Eleocharis, ELEOC	cf bella
Cirsium vulgare, CIVU	
Polypogon australis, POAU3	
Croton setigerus, CRSE11	
Panicum acuminatum,	
Genista monspessulana, GEMO2	
Cyperus eragrostis, CYER	
Conyza canadensis, COCA5	
Epilobium ciliatum, EPCI	
Agrostis stolonifera, AGST2	
Taraxacum officinale ssp. officinale, TAOF	
Anaphalis margaritacea, ANMA	
unknown shrub, 2SHRUB	cf. Ceanothus, Sent to MW for ID
Heterocodon rariflorum, HERA3	

Mosspool Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Acorn Woodpecker, Melanerpes formicivorus	obs	
Dark-eyed Junco, Junco hyemalis	call	
deer, Odocoileus	sign	tracks
Red-tailed Hawk, Buteo jamaicensis	obs	
Steller's Jay, Cyanocitta stelleri	obs	

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae Culiseta incidens	obs	Larvae	
HEM Gerridae Aquarius remigis	obs	Adult	
LEP Hesperiidae	obs	Adult	black skipper sp2
LEP Hesperiidae Erynnis	obs	Adult	
LEP Lycaenidae Plebejus	obs	Adult	
LEP Lycaenidae Polyommatinae	obs	Adult	
LEP Nymphalidae Junonia coenia	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	
LEP Nymphalidae Speyeria	obs	Adult	
LEP Nymphalidae Vanessa virginiensis	obs	Adult	
LEP Pieridae Colias eurytheme	obs	Adult	
LEP Pieridae Pontia	obs	Adult	cf beckerii

Fauna Notes

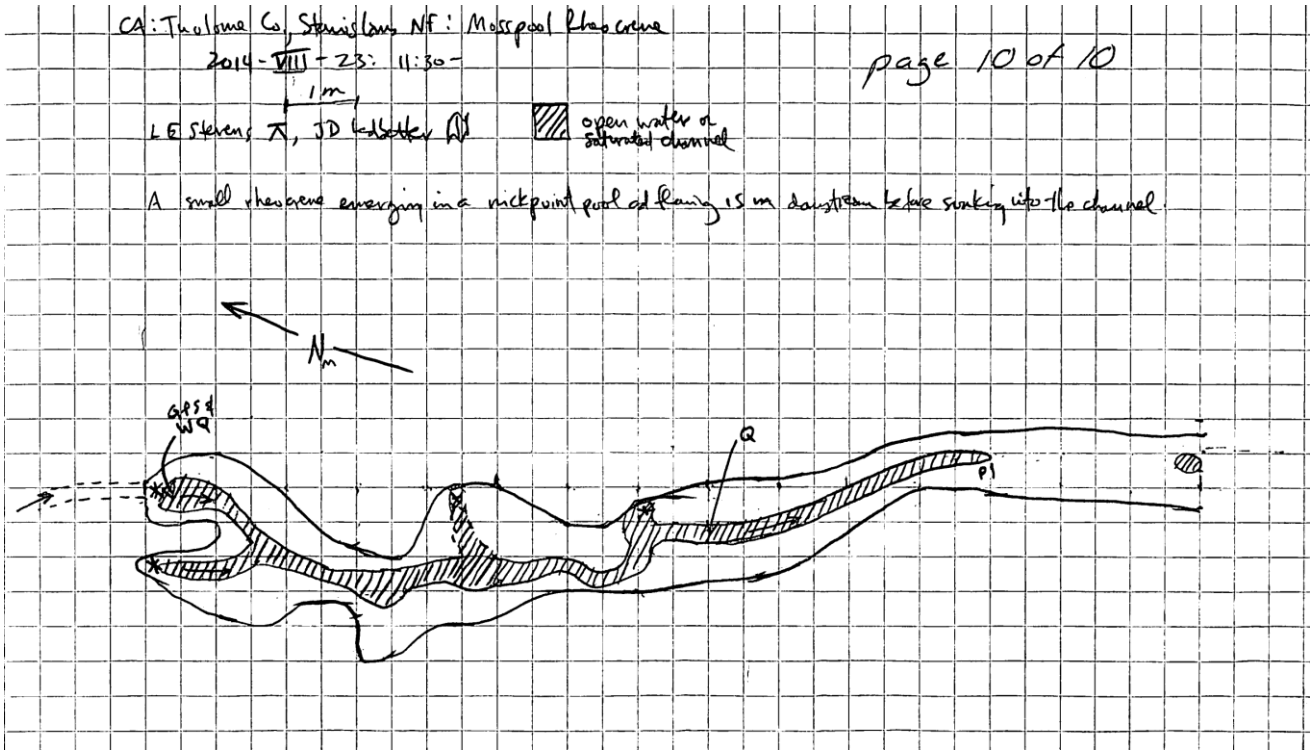
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Mosspool Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Wild animals;
Soil alteration: Channel erosion; Compaction; Excavation; Ground disturbance (general);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	Huge amount of ash in the channel

Mosspool Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Fire effects from surface water ash
Geomorphology and Soils		
4) Landform stability not altered	False	Fire effects from surface water ash
5) Runout channel functioning naturally	False	Deeply incising channel
6) Soil integrity not altered	False	Deeply incising
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Too many NN
10) Faunal species as anticipated	False	Very few AQ invertebrates
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Many NN plant spp.
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road adjacent
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Heavy effects from Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Nettle Ditch Springs ID# 159345

Survey Date:	8/22/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hillslope
Aspect (TN):	169
Elevation (m):	1119
Coordinates	37 55 10 Latitude -119 58 19.7 Longitude
Area:	248 square meters
Surrounding Vegetation:	Shrub dominated
Surficia Material:	Human cause/constructed
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Salix lutea
Graminoid	2	Juncus effusus
Forb	1	Datisca glomerata
Aquatic		
Bryophyte		
Unknown		

Survey Notes

This spring emerges beside a road bed and flows through a ditch into a rock construction and culvert under the road. The site is heavily affected by the 2013 Rim Fire. The source is 20 m from the NHD location.

Hydrology, Geology, and Soil Notes

This is a seepage or filtration spring. The source emerged from a heavily disturbed roadside ditch. The water table depth is unknown. A 10-cm deep soil pit was dug at the lower part of the site; only roadside sediments were observed.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Mixed groundwater and surface inflow
Outflow pattern	Surface water outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.019

Water Quality (Single Location)

pH	6.65
Specific conductance (uS/cm)	226.0
Dissolved oxygen (mg/L)	5.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	16.1

Nettle Ditch Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Pseudognaphalium canescens, PSCA11	
Conyza canadensis, COCA5	
Acmispon americanus var. americanus,	Lotus americanus var americanus
unknown Forb, dicot, 2FD	Scrophulariaceae?, Sent to MW for ID
Salix, SALIX	cf. lutea
Mimulus, MIMUL	cf. albicaulis
Epilobium ciliatum, EPCI	
Lupinus, LUPIN	
Lupinus, LUPIN	cf. albicaulis
Arctostaphylos, ARCTO3	
Trifolium, TRIFO	cf repens
Juncus articulatus, JUAR4	cf articulatus
Polypogon australis, POAU3	
Ericameria nauseosa, ERNA10	
Juncus effusus, JUEF	
Datisca glomerata, DAGL2	Sent to MW for ID
Cyperus eragrostis, CYER	
Lactuca serriola, LASE	
Prunella vulgaris, PRVU	
Artemisia douglasiana, ARDO3	
Plantago lanceolata, PLLA	
Stephanomeria virgata ssp. pleurocarpa, STVIP	candelabra plant
Cirsium vulgare, CIVU	
unknown Forb, dicot, 2FD	non-milky spurge, sent to MW for ID

Nettle Ditch Springs (continued)

Fauna

None

Invertebrate Species	Detection	Stage	Comments
DIP	spot		collected
ODO Coenagrionidae Argia	obs	Adult	nr vivida
ODO Coenagrionidae Argia	obs	Larvae	collected

Fauna Notes

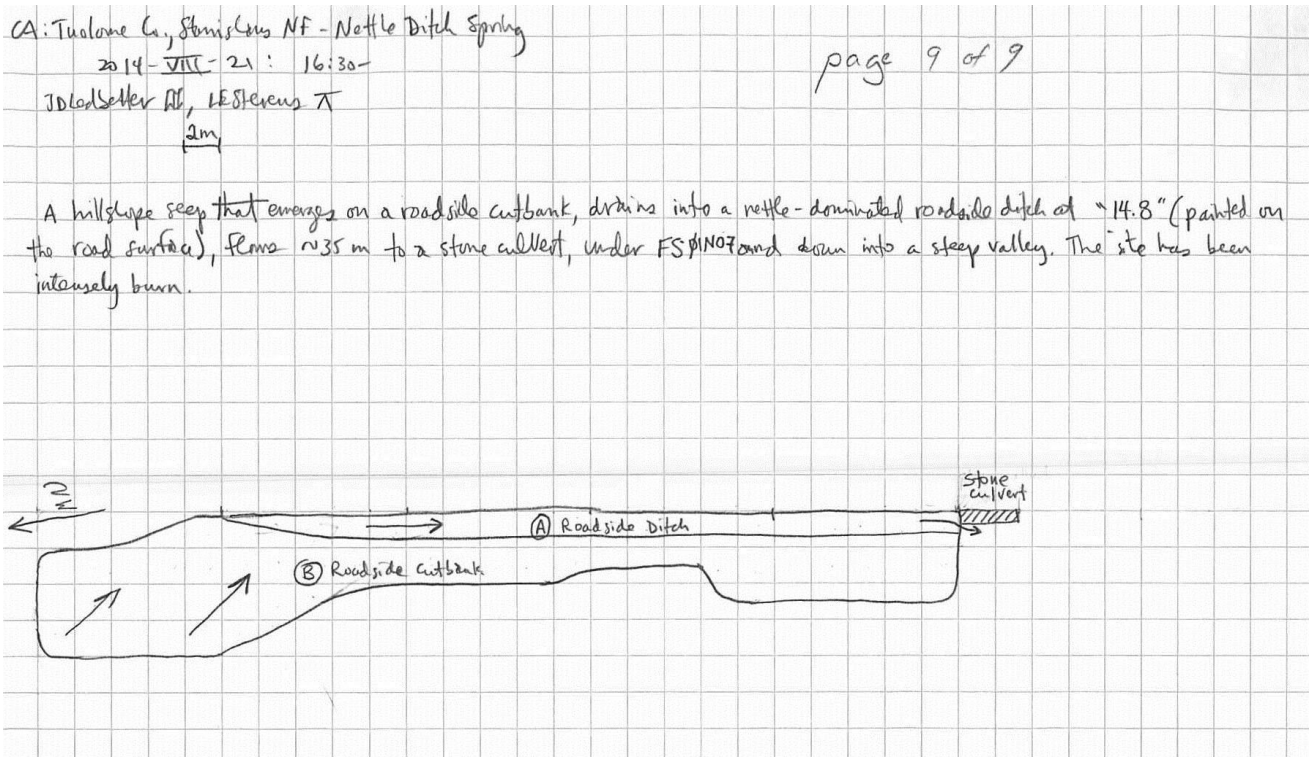
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Nettle Ditch Springs (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: Other recreational effects observed--see disturbance notes;
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Erosion (general); Excavation; Ground disturbance (general); Gully erosion;	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Road (includes construction and maintenance;	Hydrologic alteration from road construction at source. Recreational effects from road at source.

Nettle Ditch Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	False	Upslope modification - road
3) WQ changes not affecting site	False	Road construction
Geomorphology and Soils		
4) Landform stability not altered	False	Road
5) Runout channel functioning naturally	False	Road ditch
6) Soil integrity not altered	False	Road ditch
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Weeds' no sensitive spp
10) Faunal species as anticipated	False	Damselfly larvae, little else
11) TES, SOI/SOC fauna as anticipated	False	Damselfly larvae, little else
12) Invasive species not established	False	Polypogon, Trifolium repens, several others
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	False	Road
18) Other dist. not adversely affecting	False	Heavy Fire impacts
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Newt Springs ID# 164171

Survey Date:	9/25/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	310
Elevation (m):	1061
Coordinates	37 48 27 Latitude -119 59 9.6 Longitude
Area:	200 square meters
Surrounding Vegetation:	Shrub dominated
Surficia Material:	Colluvium
Lithology:	Metamorphic , Schist
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree		
Shrub	1	Acer grandidentatum
Graminoid		
Forb	2	Ceanothus integerrimus
Aquatic		
Bryophyte	3	
Unknown		

Survey Notes

This rheocrene emerges about 30m above FS0113C in a steep channel. The heavily forested area was severely affected by the 2013 Rim Fire. Surveyors found at least 6 newts in the lower area near and in the road.

Hydrology, Geology, and Soil Notes

No water table measurements were possible. Temperature, pH, and Salinity were measured above the trail; DO could only be measured downslope of the trail, which was heavily trampled. Soil pits were not indicated, as this site is located on a steep, rocky cliff and the runout is heavily disturbed by a road.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.048

Water Quality (Single Location)	
pH	7.49
Specific conductance (uS/cm)	90.0
Dissolved oxygen (mg/L)	7.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	14.1

Newt Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Pseudognaphalium, PSEUD43	
Ribes nevadense, RINE	
Aquilegia formosa, AQFO	
Nasturtium officinale, NAOF	
Taraxacum officinale ssp. officinale, TAOF	
Salix scouleriana, SASC	
Agrostis stolonifera, AGST2	
liverwort fam,	
Arnica, ARNIC	
Acer, ACER	cf. Glabrum
Carex, CAREX	sp 1
unknown Bryophyte (moss, liverwort, hornwort), 2BRY	liverwort
unknown Bryophyte (moss, liverwort, hornwort), 2BRY	moss
Ceanothus integerrimus, CEIN3	sp?
unknown Forb, dicot, 2FD	
Claytonia parviflora, CLPA5	
Viola, VIOLA	
Cirsium vulgare, CIVU	
Epilobium ciliatum, EPCI	
Mimulus cardinalis, MICA3	
Cornus stolonifera, COSES	
Alnus incana ssp. tenuifolia, ALINT	
Pteridium aquilinum, PTAQ	
moss, 2MOSS	
unknown Forb, dicot, 2FD	dicot 1 seedling
Polygonum, POLYG4	skinny = Persicaria punctata?
unknown shrub, 2SHRUB	cf. Philadelphus lewisii sent to MW for ID

Newt Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
California newt, Taricha torosa	obs	
Common Raven, Corvus corax	call	
domestic cow, Bos taurus	sign	tracks and scat
Northern Flicker, Colaptes auratus	call	

Invertebrate Species	Detection	Stage	Comments
DIP Chloropidae	obs	Adult	many
DIP Tipulidae	obs	Adult	

Fauna Notes

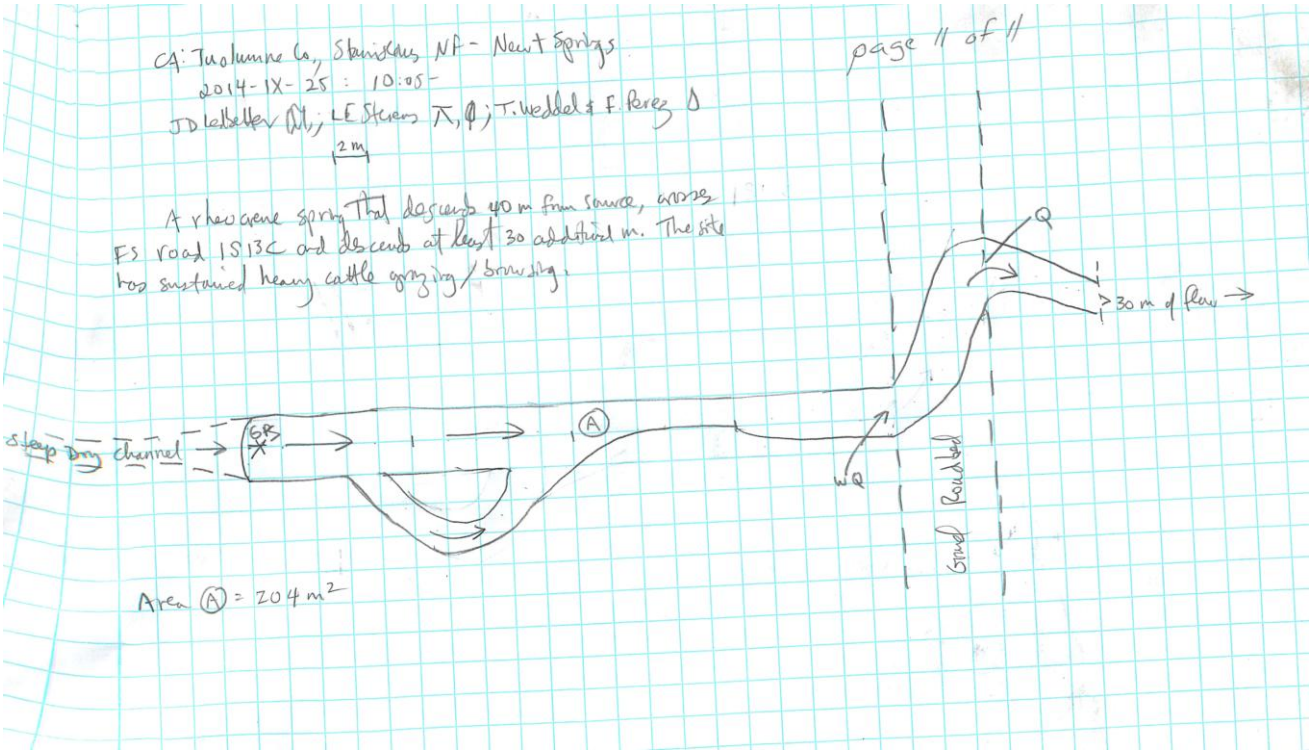
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Newt Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: Tracks or trails by vehicles (ATV, 4WD, etc);
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Debris flow; Erosion (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Newt Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	heavy grazing
Geomorphology and Soils		
4) Landform stability not altered	False	Road, cattle effects
5) Runout channel functioning naturally	False	Fire effects
6) Soil integrity not altered	False	fire and grazing
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	grazing
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	highly disturbed, but note presence of newts
11) TES, SOI/SOC fauna as anticipated	False	habitat does not support SOC birds
12) Invasive species not established	False	agrostis and nasturtium present
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	road
15) Fencing functions properly	False	Fencing may be appropriate
16) Herbivory not adversely affecting site	False	cattle
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Pedestal Springs ID# 159344

Survey Date:	9/3/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	151
Elevation (m):	1622
Coordinates	38 2 32.6 Latitude -120 4 55.7 Longitude
Area:	1204 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	5	Calocedrus decurrens
Shrub	3	Salix scouleriana
Graminoid	1	Poa
Forb	2	Hypericum anagalloides
Aquatic		
Bryophyte	3	
Unknown		

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	45
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH	5.36
Specific conductance (uS/cm)	31.4
Dissolved oxygen (mg/L)	0.21
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	12.8

Survey Notes

This is a now-dry spring that feeds a now-dry meadow. The site was heavily trampled. Fire effects were light in the surrounding forest; however there were no effects of fire evident in the meadow.

Hydrology, Geology, and Soil Notes

There is evidence of channelization. The site was dry and there was no outflow. Water quality was measured in a settled soil pit. A targeted soil pit at the center of the site, 40 cm deep, had rich organic material over soil with peat at depth of 23 cm. The texture was silty clay, dark brown 7.5 YR 3/2. There were no depletions, reduced matrices, Hydrogen Sulfide odor, or reaction to HCl.

Pedestal Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Juncus effusus, JUEF	
Muhlenbergia richardsonis, MURI	cf.
Taraxacum officinale, TAOF	
Angelica, ANGEL	
Rhododendron occidentale, RHOC	
Calocedrus decurrens, CADE27	
Salix scouleriana, SASC	
Juncus saximontanus, JUSA	lilly-like
Hypericum anagalloides, HYAN2	
Pinus ponderosa, PIPO	
Lonicera, LONIC	
Poa, POA	
Hosackia oblongifolia, LOOBO2	
Crepis capillaris, CRCA3	
Prunus emarginata, PREM	

Pedestal Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
deer, Odocoileus	obs	
domestic cow, Bos taurus	obs	huge amount of scat/trampling

Invertebrate Species	Detection	Stage	Comments
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Nymphalidae Junonia coenia	obs	Adult	
LEP Pieridae Colias eurytheme	obs	Adult	
ODO Aeshnidae Anax junius	obs	Adult	many

Fauna Notes

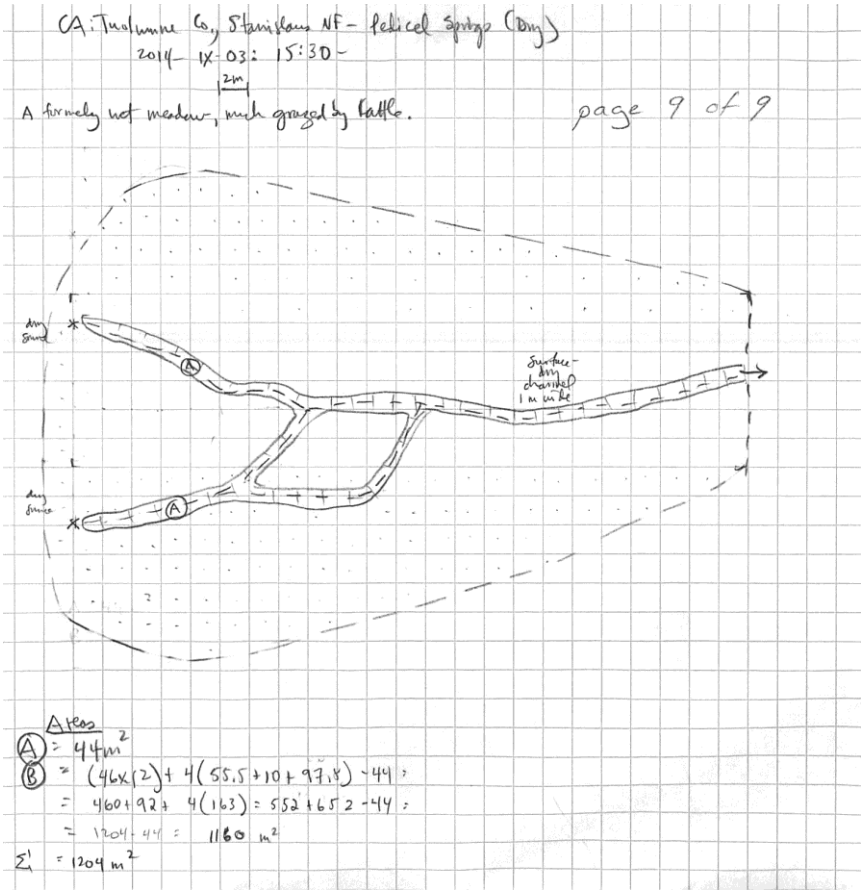
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Pedestal Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Livestock; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Compaction; Erosion (general); Ground disturbance (general); Gully erosion; Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Pedestal Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Site is dry
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Heavily trampled and grazed
Geomorphology and Soils		
4) Landform stability not altered	False	Heavily trampled and grazed
5) Runout channel functioning naturally	False	Incised trampled
6) Soil integrity not altered	False	Incised trampled
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavily grazed down
9) TES, SOI/SOC flora as anticipated	False	If any focal species exist, they are not presently detectable
10) Faunal species as anticipated	False	No voles or AQ insects
11) TES, SOI/SOC fauna as anticipated	False	The site is unlikely to support T & E birds or their prey
12) Invasive species not established	False	Taraxacum, Poa, Cirsium vulgare present
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fencing would be appropriate
16) Herbivory not adversely affecting site	False	Heavily trampled and grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Heavily trampled and grazed
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Peltigera Source Springs ID# 164144

Survey Date:	8/21/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene, hillslope
Aspect (TN):	290
Elevation (m):	1805
Coordinates	37 59 52.8 Latitude -119 57 42.3 Longitude
Area:	296 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	3	Abies concolor
Shrub	5	Ribes nevadense
Graminoid	1	Juncus effusus
Forb	2	Hypericum anagalloides
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

This springs ecosystem is not marked on topographic maps; nor is it included in the NHD database. It is located within the 2013 Rim Fire perimeter, but was not burned. This rheocrene is in a heavily forested area with roads nearby on 3 sides.

Hydrology, Geology, and Soil Notes

The channel is rocky. The targeted soil pit had organic soil mixed with sand and gravel, with refusal at 9 cm. Texture was sandy loam with some gravel, color 5YR 2.5/2. There were no depletions, reduced matrices, Hydrogen Sulfide odor, or reaction to HCl.

Hydrologic Attribute	Results
Water table type	
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Extensive standing water; Some developing channels;
Water table depth single location (cm)	1
Flow estimate (L/sec)	0.25

Water Quality (Single Location)

pH	5.55
Specific conductance (uS/cm)	63.0
Dissolved oxygen (mg/L)	4.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	10.7

Peltigera Source Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Muhlenbergia, MUHLE	
Viola, VIOLA	cf macloskeyi
Veronica, VERON	
Mimulus cardinalis, MICA3	
Eleocharis bella, ELBE	
Galium bifolium, GABI	
Arceuthobium abietinum, ARAB4	
Chrysolepis sempervirens, CHSE11	
Prunella vulgaris, PRVU	
Abies concolor, ABCO	
Epilobium glaberrimum, EPGL	
Carex, CAREX	sp.1, C. cf. praegracilis
moss, 2MOSS	
Calocedrus decurrens, CADE27	
Agrostis, AGROS2	cf stolonifera
Glyceria elata, GLST	
Juncus effusus, JUEF	
Hypericum anagalloides, HYAN2	
Luzula comosa, LUCO6	
Barbarea, BARBA	
Spiranthes romanzoffiana, SPRO	
Galium triflorum, GATR3	
Mimulus moschatus, MIMO3	
Aquilegia formosa, AQFO	
Philonotis, PHF06	fontana?
Achillea millefolium, ACMI2	
Senecio triangularis, SETR	
Mimulus tilingii, MITI	
Mimulus, MIMUL	
Equisetum arvense, EQAR	
Ribes nevadense, RINE	

Peltigera Source Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Black-backed Woodpecker, Picoides arcticus	obs	
Cooper's Hawk, Accipiter cooperii	sign	feather
deer, Odocoileus	sign	tracks/scat
domestic cow, Bos taurus	sign	tracks/scat
House Wren,	obs	
Mountain Chickadee, Poecile gambeli	call	
Northern Flicker, Colaptes auratus	call	
Red-breasted Nuthatch, Sitta canadensis	obs	
Red-tailed Hawk, Buteo jamaicensis	call	
Rufus Hummingbird, Selasphorus rufus	obs	
Steller's Jay, Cyanocitta stelleri	call	

Invertebrate Species	Detection	Stage	Comments
COL Dytiscidae	obs	Adult	
COL Hydrophilidae	benth	Adult	
COL Staphylinidae	benth	Adult	
DIP Asilidae	obs	Adult	
DIP Chironomidae	benth	Larvae	
EPH	benth	Larvae	
EPH Baetidae	benth	Larvae	
HEM Gerridae Aquarius remigis	obs	Adult	
HYM Sphecidae Ammophila	obs	Adult	wasp
LEP Lycaenidae	obs	Adult	
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
MOLL Sphaeriidae Pisidium	obs	Adult	clam
ODO Aeshnidae	obs	Adult	
PLE	benth	Larvae	
TRI	benth	Larvae	
TRI Limnephilidae	benth	Larvae	
TURB	benth	Adult	

Fauna Notes

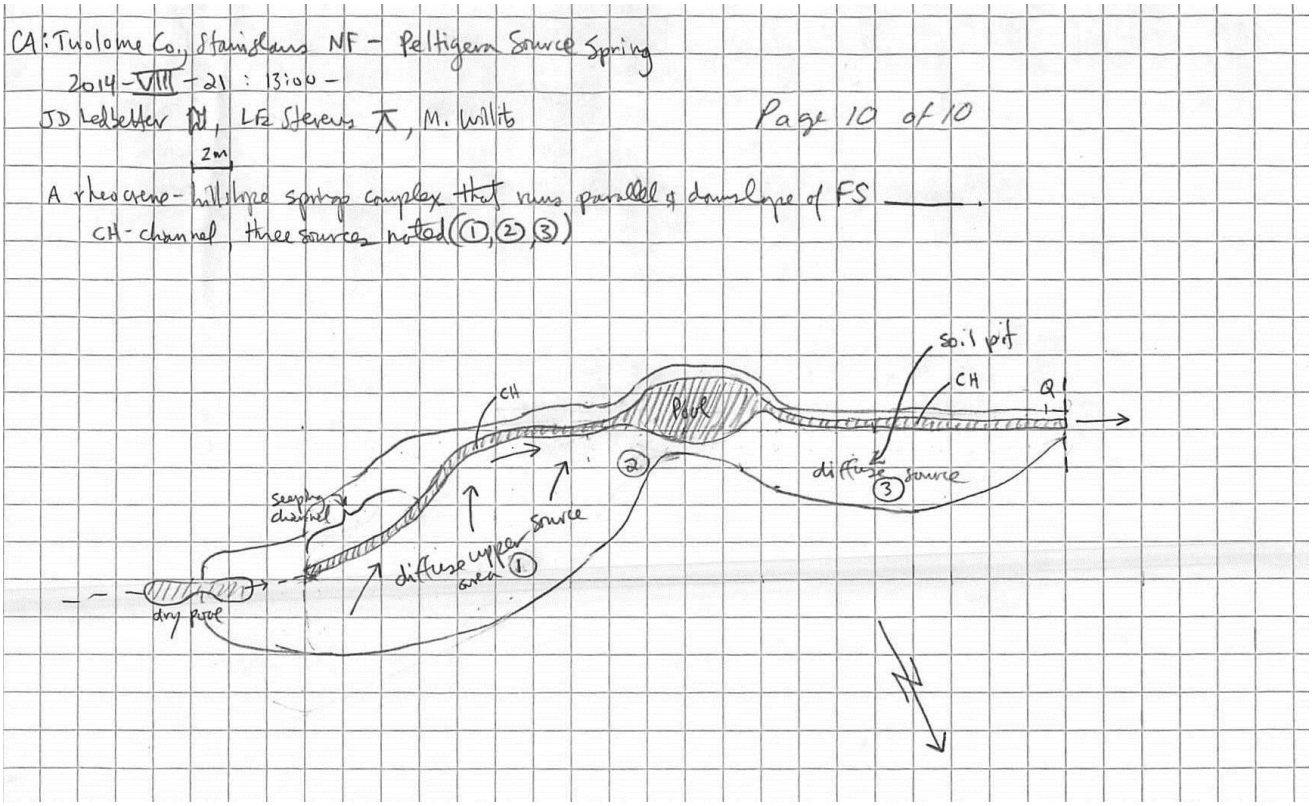
Rep 1 benthic sampling 0.05 m2 substrate 6 = 80%, 5 = 20%, 1 minute at 35 m on tape.

Inverts Collected ☑

Number of Reps: 1

Peltigera Source Springs (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Wild animals; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Trails (by people or animals);	Miscellaneous effects:
	Disturbance Notes
Structures: No structures noted	Old nonfunctional piping, and roads nearby on 3 sides

Peltigera Source Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	True	
5) Runout channel functioning naturally	True	
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Prunella and Agrostis are NN and established at the site.
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road on 3 sides
15) Fencing functions properly	True	
16) Herbivory not adversely affecting site		
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	True	
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Powerline Springs ID# 159407

Survey Date:	9/28/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	340
Elevation (m):	957
Coordinates	37 49 41.3 Latitude -120 4 6.1 Longitude
Area:	160 square meters
Surrounding Vegetation:	No dominant life form
Surficia Material:	Colluvium
Lithology:	Metamorphic , Metavolvanic Rocks
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree		
Shrub	1	Rubus armeniacus
Graminoid		
Forb	2	Cirsium vulgare
Aquatic		
Bryophyte		
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.2

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This site is located under a powerline tower pad. The area has been bulldozed and excavated, with a gravel pad constructed in the middle. The area was severely burned during the 2013 Rim Fire. No trees remained alive and soils were destroyed. The channel is incised. Due to rain prior to and during the survey, it was impossible to tell how much influence was due to surface flow.

Hydrology, Geology, and Soil Notes

Surveyors did not measure flow or water chemistry due to flooding during heavy rain, and the unknown contribution of surface flow. They estimated flow, however. No soil pits were indicated because this is an incised and manipulated rheocrene.

Powerline Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Toxicodendron diversilobum, TODI	
Festuca idahoensis, FEID	
Melilotus albus, MEAL2	
Bromus sterilis, BRST2	
Pteridium aquilinum, PTAQ	
Conyza canadensis, COCA5	
Lotus oblongifolius, LOOB2	
Pseudognaphalium, PSEUD43	
Cyperus eragrostis, CYER	
Quercus kelloggii, QUKE	
Lactuca serriola, LASE	
Epilobium ciliatum, EPCI	
Cornus stolonifera, COSES	
Torilis arvensis, TOAR	
Salix lutea, SALU2	
Nasturtium officinale, NAOF	
Juncus effusus, JUEF	
Cirsium vulgare, CIVU	
Rubus armeniacus, RUAR9	
Tragopogon, TRAGO	
Rumex, RUMEX	cf crispus

Powerline Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
California Quail, Callipepla californica	obs	

Fauna Notes

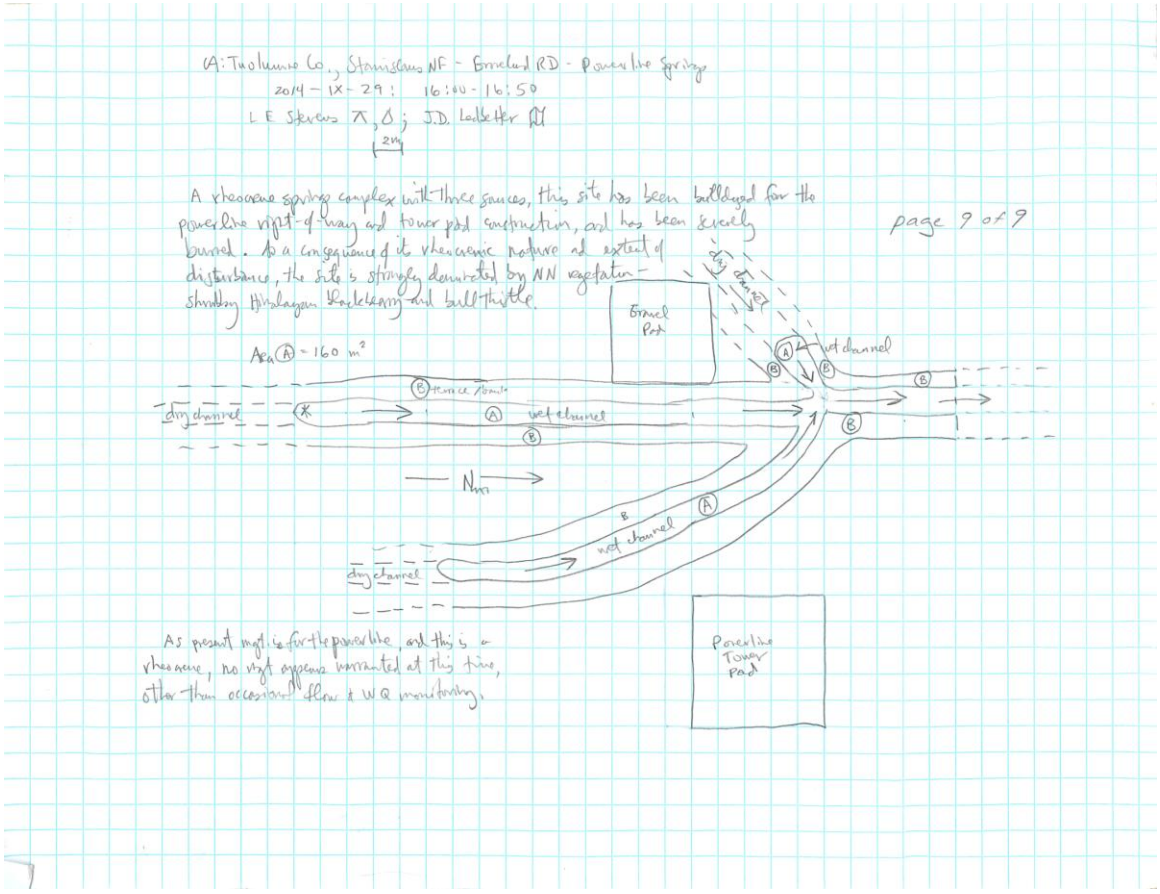
There was no insect activity, and very little vertebrate activity due to the heavy rain.

Inverts Collected ☐

Number of Reps:

Powerline Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Erosion (general); Excavation; Ground disturbance (general); Gully erosion; Rill erosion; Other soil alteration observed--see disturbance notes;	Miscellaneous effects: Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Power lines; Road (includes construction and maintenance; Other structures observed--see disturbance notes;	The area under the power line has been bull dozed, and a gravel pad was constructed under the power line.

Powerline Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	channel manipulated, incised; severe fire damage
Geomorphology and Soils		
4) Landform stability not altered	False	Area bulldozed for power line, gravel pad
5) Runout channel functioning naturally	False	Severely incised
6) Soil integrity not altered	False	bulldozed & burned; gravel pad
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Soil degradation for powerline and by Rim Fire eliminated habitat
10) Faunal species as anticipated	False	habitat alteration and rheocrenic springs type degraded habitat
11) TES, SOI/SOC fauna as anticipated	False	habitat insufficient quality
12) Invasive species not established	False	strongly dominated by NN blackberry, bull thistle
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	power line and road
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	severe effects from Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Propane Tank Springs ID# 159436

Survey Date:	9/1/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hillslope
Aspect (TN):	214
Elevation (m):	1913
Coordinates	38 2 15.8 Latitude -119 56 17.8 Longitude
Area:	266 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	0	
Shrub	5	Calocedrus decurrens
Graminoid	1	Poa pratensis
Forb	2	Trifolium wormskioldii
Aquatic	3	algae sp
Bryophyte	4	
Unknown		

Survey Notes

This area had light fire influence from the 2013 Rim Fire. Occassional monitoring and identification of the Corydalidae is advised.

Hydrology, Geology, and Soil Notes

The hole depth was 30 cm, and depth to the mineral layer was 13 cm, with mucky peat between. The mineral layer was sandy loam. There were no redox concentrations, no depletions, no reduced matrices, no Hydrogen Sulfide odor, and no reaction to HCl.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Extensive standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.1

Water Quality (Single Location)	
pH	7.14
Specific conductance (uS/cm)	178.8
Dissolved oxygen (mg/L)	7.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	10.8

Propane Tank Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Carex, CAREX	skinny star sedge
Trifolium wormskioldii, TRWO	
Lupinus, LUPIN	
Cirsium vulgare, CIVU	
Carex, CAREX	cf alma
Ribes, RIBES	cf. Inerme, sent to MW for ID
Epilobium ciliatum, EPCI	
Eleocharis acicularis, ELAC	
Pseudotsuga menziesii, PSME	
Scirpus diffusus, SCDI	
Boerhavia coccinea, BOCO	* cf. Arnica
Prunella vulgaris, PRVU	
unknown Forb, dicot, 2FD	Delicate spray - white flower
Ribes nevadense, RINE	
Carex, CAREX	
Polygonum douglasii, PODO4	
Rumex acetosella, RUAC3	
Abies concolor, ABCO	
Hypericum anagalloides, HYAN2	
Agrostis idahoensis, AGID	
Rosa, ROSA5	cf. woodsii var. ultramonana
unknown Forb, dicot, 2FD	Celery-like
Mimulus, MIMUL	
Cerastium fontanum, CEFO2	
Asarum lemmonii, ASLE	
Luzula comosa var. comosa,	
Taraxacum officinale ssp. officinale, TAOF	
Galium aparine, GAAP2	
Calamagrostis purpurascens, CAPU	
Calocedrus decurrens, CADE27	
Mimulus moschatus, MIMO3	
Achillea millefolium, ACMI2	
Juncus effusus, JUEF	
Poa pratensis, POPR	cf pratensis *
Anaphalis margaritacea, ANMA	
unknown shrub, 2SHRUB	cf. Symphoricarpos rotundifolius
Viola, VIOLA	
Arabis eschscholtziana, ARES5	
Spiranthes, SPIRA2	
Veronica catenata, VECA7	
Juncus saximontanus, JUSA	
Ranunculus, RANUN	
unknown Plant, 2PLANT	lanceolate leaf Sent to MW for ID

Propane Tank Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Acorn Woodpecker, Melanerpes formicivorus	obs	
Common Raven, Corvus corax	call	
hummingbird, Archilochus fam	obs	
Red-breasted Nuthatch, Sitta canadensis	obs	
Steller's Jay, Cyanocitta stelleri	call	

Invertebrate Species	Detection	Stage	Comments
HEM Gerridae Aquarius remigis	obs	Adult	
HYM Ichneumonidae Megarhyssa	obs	Adult	
HYM Vespidae Dolichovespula	obs	Adult	many
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Nymphalidae Polygonia	obs	Adult	
LEP Nymphalidae Speyeria	obs	Adult	
MEG Corydalidae	obs	Larvae	hellgrammite/several
ODO Aeshnidae	obs	Adult	
ODO Coenagrionidae	obs	Larvae	

Fauna Notes

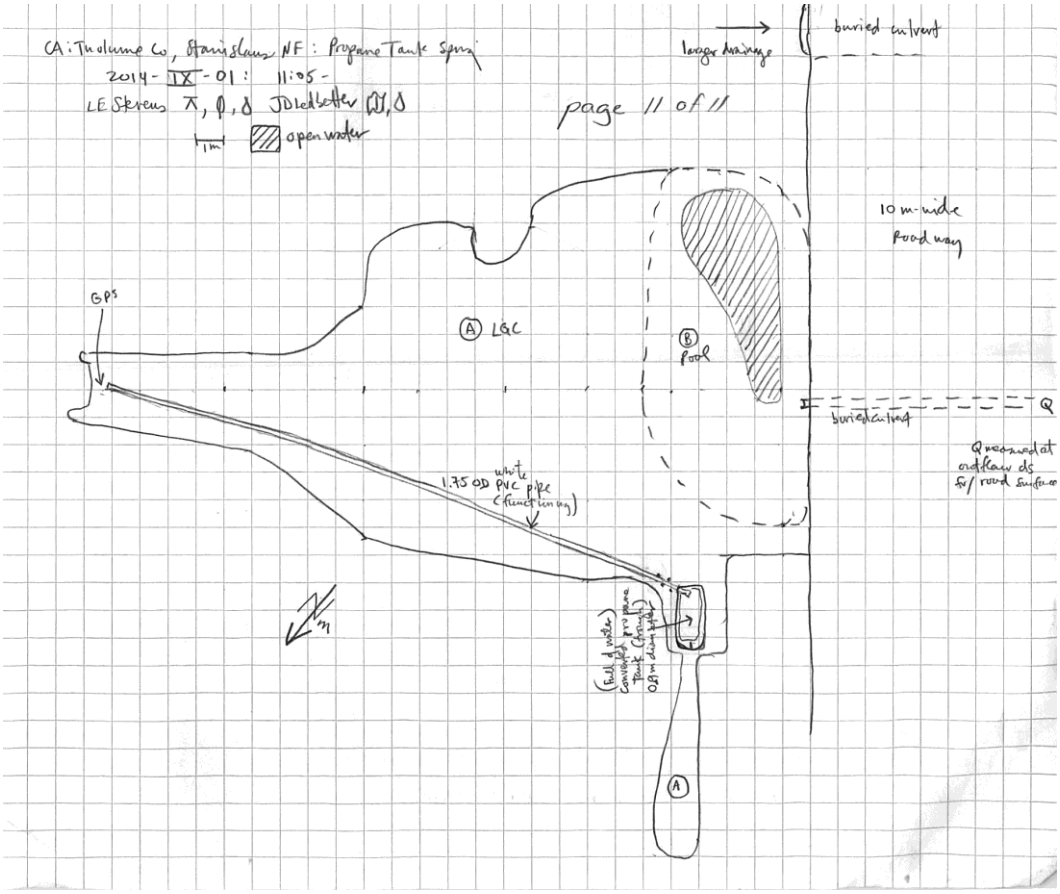
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Propane Tank Springs (continued)

Sketchmap



Disturbance

Hydrology: Water diversion (water eventually returns to site); Extraction of water at spring source; Regulated water flow by impoundment/dam; Other hydrologic alteration observed--see Disturbance notes0.044liters/second diverted; 44 % diverted	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals); Pipes;	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Enclosure (such as spring house, spring box, or concrete enclosure; Road (includes construction and maintenance;	

Propane Tank Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Site excavated and piped; road built over lower section
5) Runout channel functioning naturally	False	Goes through culvert
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	UA	Need the list, but Corydalidae are common. Habitat suitable for SOC
12) Invasive species not established	False	Taraxacum,Trifolium, and Poa are abundant; Cirsium vulgare
Disturbances		
13) Flow reg. not adversely affecting site	False	Diversion into tank.
14) Construction, Roads not affecting	False	Road constructed over lower section.
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim fire effects are limited, but present as evidenced by erosion.
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Rackerby Jack Big Springs ID# 164153

Survey Date:	9/2/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): helocrene

Aspect (TN): 104

Elevation (m): 1230

Coordinates 37 55 58.1 Latitude
-120 2 5 Longitude

Area: 2224 square meters

Surrounding Vegetation: Herbaceous/nonvascular dominated

Surficia Material: Alluvium

Lithology: Igneous intrusive , Quartz Diorite

Bryophyte Abundance: Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Calocedrus decurrens
Graminoid	1	Carex nebrascensis
Forb	2	Lilium parvum
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

The source appears to have shifted downslope. The site has sustained moderate burn intensity in the 2013 Rim Fire.

Hydrology, Geology, and Soil Notes

This appeared to be a seepage/filtration spring. The site is covered with an ash flow above shallow clay over gravel. A 16 cm soil pit at the center of the site was sapric muck to the mineral layer at 16 cm. The texture was gravelly clay, color 10 YR 3/2. There were no redox concentrations, depletions, reduced matrices, or reaction to HCL. There was Hydrogen Sulfide odor.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Patches of standing water; Extensive standing water; Some developing channels;
Water table depth single location (cm)	0
Flow estimate (L/sec)	0.024

Water Quality (Single Location)

pH	6.12
Specific conductance (uS/cm)	170.1
Dissolved oxygen (mg/L)	2.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	18.8

Rackerby Jack Big Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Perideridia parishii, PEPA21	* ssp. Latifolia
Panicum acuminatum,	
Pseudognaphalium, PSEUD43	
Apiaceae fam, APIACE	
Typha, TYPHA	spp
Angelica breweri, ANBR5	
Cirsium vulgare, CIVU	
Arctostaphylos, ARCTO3	
Cynosurus echinatus, CYEC	
Pteridium aquilinum, PTAQ	
Taraxacum officinale ssp. officinale, TAOF	
Salix scouleriana, SASC	
Anaphalis margaritacea, ANMA	
Ceanothus integerrimus, CEIN3	long stem
Cardamine oligosperma, CAOL	dk green/rosette mustard
Veronica catenata, VECA7	
Apiaceae fam, APIACE	
Equisetum arvense, EQAR	
Aquilegia formosa, AQFO	
Juncus saximontanus, JUSA	
Rhynchospora capitellata, RHCA12	
Quercus kelloggii, QUKE	
Conyza canadensis, COCA5	
Bromus, BROMU	droop grass
Prunella vulgaris, PRVU	
Mimulus moschatus, MIMO3	
Carex, CAREX	cf alma
Fragaria, FRAGA	
Agrostis, AGROS2	cf stolonifera
Epilobium ciliatum, EPCI	ssp ciliatum
unknown Forb, dicot, 2FD	cf Arnica, Sent to MW for ID
Holcus lanatus, HOLA	
Fabaceae,	
Juncus effusus, JUEF	
Vitis californica, VICA5	
Hypericum anagalloides, HYAN2	?
Barbarea orthoceras, BAOR	
Galium triflorum, GATR3	
Asarum, ASARU	
unknown shrub, 2SHRUB	skinny polygonum
Helenium hoopesii, HYHO	
Salix, SALIX	cf seedling
liverwort fam,	Sent to MW for ID
Lilium, LILIU	* 2 m tall, sent to MW for ID
Scirpus diffusus, SCDI	
Carex nebrascensis, CANE2	
Aster, ASTER	
Deschampsia danthonioides, DEDA	
Alnus incana ssp. tenuifolia, ALINT	
Spiranthes romanzoffiana, SPRO	

Viola, VIOLA	
Trifolium, TRIFO	large
Calocedrus decurrens, CADE27	
unknown Bryophyte (moss, liverwort, hornwort), 2BRY	liverwort
Calystegia malacophylla, CAMA38	cf Calystegia malacophylla
Pinus lambertiana, PILA	seedling sp?
Berula, BERUL	Berula
moss, 2MOSS	Sent to MW for ID
erythranthe guttata,	
Artemisia, ARTEM	Sent to MW for ID

Rackerby Jack Big Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
American black bear, Ursus americanus	sign	lots of scat
Dark-eyed Junco, Junco hyemalis	obs	
deer, Odocoileus	sign	tracks
domestic cow, Bos taurus	sign	scat and tracks

Invertebrate Species	Detection	Stage	Comments
ODO Coenagrionidae	obs	Larvae	

Fauna Notes

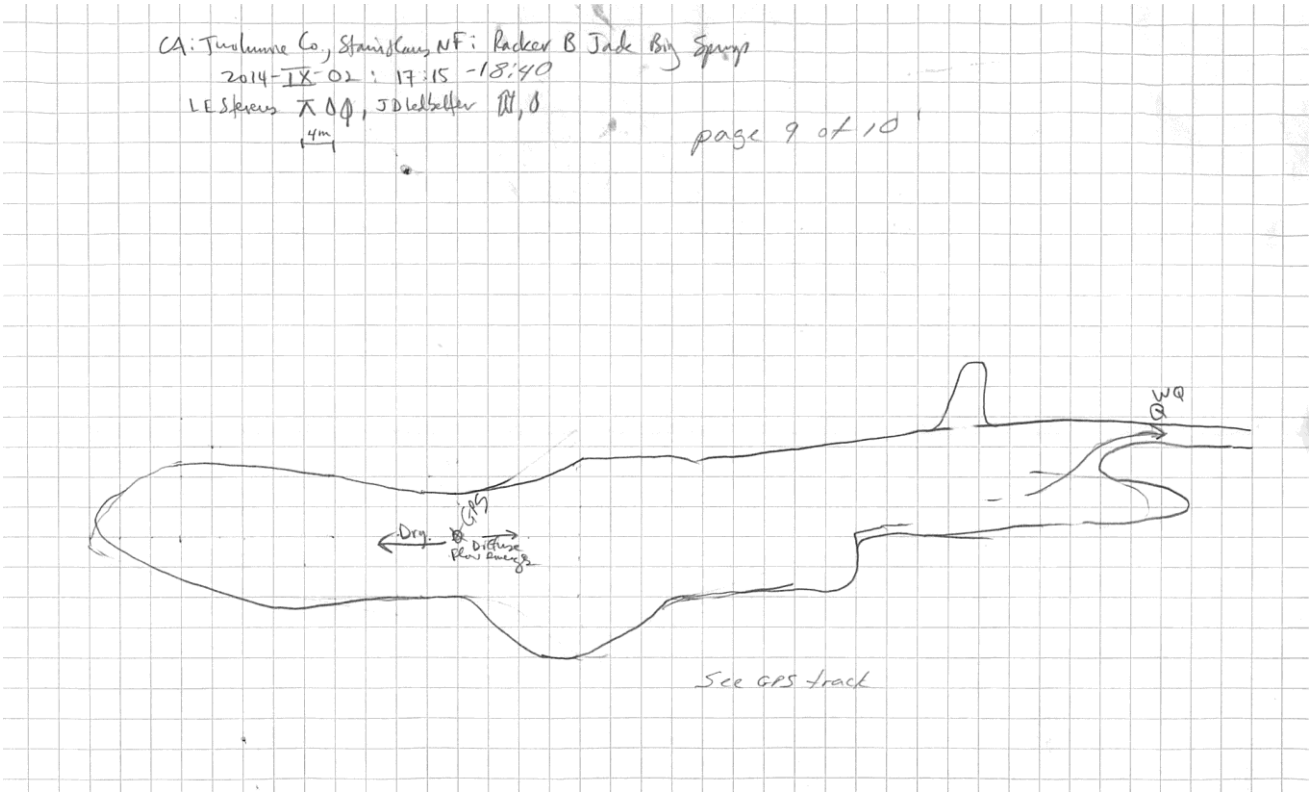
The flow was too diffuse for benthic sampling; there were few vertebrates as it was late in the day and cool.

Inverts Collected ☐

Number of Reps:

Rackerby Jack Big Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Erosion (general); Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Rackerby Jack Big Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Fire effects
Geomorphology and Soils		
4) Landform stability not altered	False	Fire and grazing effects
5) Runout channel functioning naturally	False	Fire and grazing effects
6) Soil integrity not altered	False	Fire and grazing effects
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	Few aquatic invertebrates -no sign of voles, signs of trampling
11) TES, SOI/SOC fauna as anticipated	False	Surrounding landscape does not appear sufficient to support T& E birc
12) Invasive species not established	False	Cirsium vulgare, Taraxacum abundant
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road surrounds site
15) Fencing functions properly	UA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Rackerby Jack Spring ID# 159453

Survey Date:	9/2/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	141
Elevation (m):	1231
Coordinates	37 56 0.6 Latitude -120 2 2.3 Longitude
Area:	1520 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	3	Pinus ponderosa
Shrub	4	Pinus ponderosa
Graminoid	1	Juncus effusus
Forb	2	Mimulus guttatus
Aquatic		
Bryophyte	5	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	0
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH	6.09
Specific conductance (uS/cm)	137.0
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	21.7

Survey Notes

Seepage emerges from this helocrene in a heavily forested area that is mostly surrounded by roads. The 2013 Rim Fire intensity was moderate. There were some live trees in an "island" hummock in the middle of the helocrene. The area was determined by the sketch map and walking the perimeter of the site.

Hydrology, Geology, and Soil Notes

Flow at this site was too diffuse to measure accurately. Surveyors measured water chemistry in a soil hole at the center of the site. Dissolved Oxygen readings were unreliable. Surveyors dug a 17 cm soil pit at the center of the site. Depth to the mineral layer was 11 cm. There was muck from 0-11 cm. The texture was clay, and color was 12.5 YR-3/2 and 10R 5/1. There were no redox concentrations or Hydrogen Sulfide odor. However, there was glaying in the clay, and reduced matrices.

Rackerby Jack Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Perideridia parishii, PEPA21	
Panicum acuminatum,	
unknown shrub, 2SHRUB	cf. Prunus, sent to MW for ID
Agrostis scabra, AGSC5	
Hypericum, HYPER	
Juncus effusus, JUEF	
Cirsium vulgare, CIVU	
Astragalus, ASTRA	astragalus like legume
Poa, POA	
Carex, CAREX	cf alma
erythranthe guttata,	big yellow
unknown Graminoid (grass or grasslike), 2GRAM	orchard grass? Grass 2
Astragalus, ASTRA	small astragulus like legume
Spiranthes, SPIRA2	Sent to MW for ID
Calocedrus decurrens, CADE27	
Polygonatum, POLYG2	elongate sp
Conyza canadensis, COCA5	
Epilobium, EPILO	cf ciliatum
Agrostis exarata, AGEX	
Alnus, ALNUS	seedling
Rumex acetosella, RUAC3	
Polypogon monspeliensis, POMO5	
Juncus articulatus ssp. Articulatus,	
Trifolium, TRIFO	
Equisetum arvense, EQAR	
Taraxacum officinale ssp. officinale, TAOF	
Bromus, BROMU	
Carex, CAREX	nebrascensis ?
Triticum, TRITI	cf. aestivum
Salix scouleriana, SASC	
Pinus ponderosa, PIPO	
Quercus kelloggii, QUKE	

Rackerby Jack Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
American black bear, Ursus americanus	sign	scat
domestic cow, Bos taurus	sign	old tracks and scat

Fauna Notes

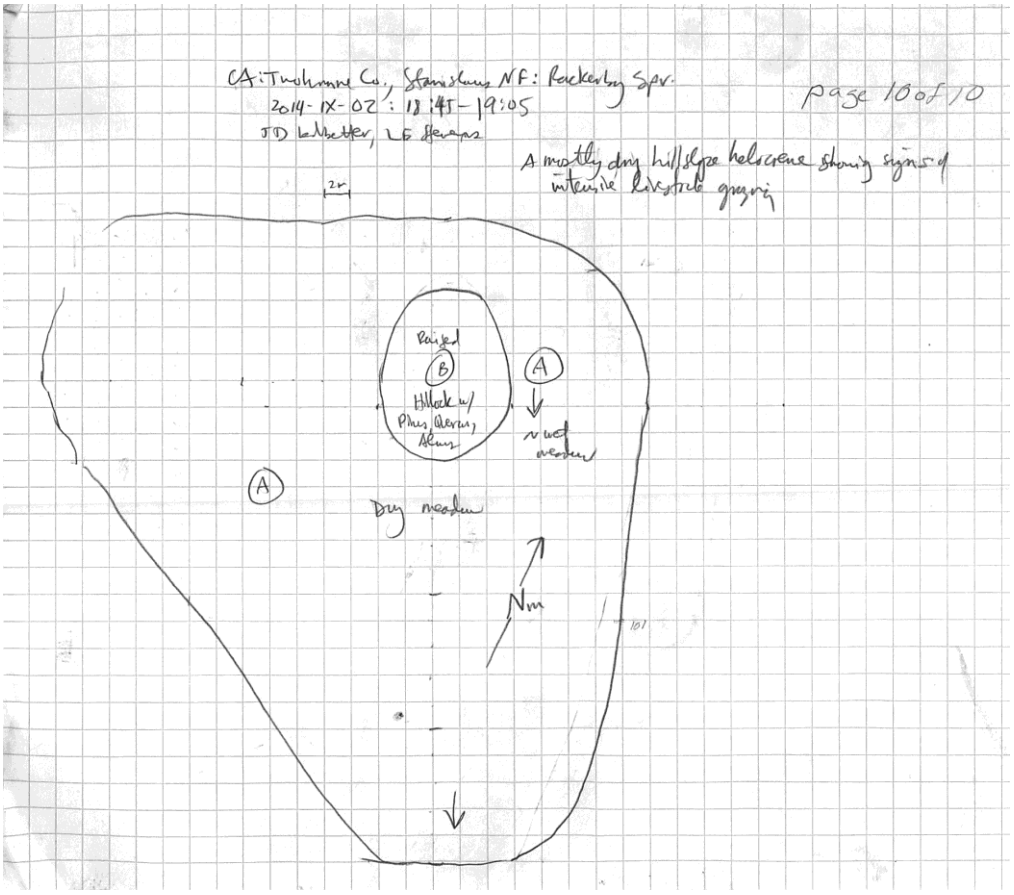
It was too late in day for viewing invert taxon, and benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Rackerby Jack Spring (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Trampling (by ungulates, native or nonnative);
Soil alteration: Erosion (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Rackerby Jack Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Evidence of reduced flow
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Trampling/fire effects
Geomorphology and Soils		
4) Landform stability not altered	False	Fire effects
5) Runout channel functioning naturally	UA	No runout channel
6) Soil integrity not altered	False	Very little flow
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Meadow is dry
9) TES, SOI/SOC flora as anticipated	False	Little moss, little surviving Mimulus which was formerly abundant
10) Faunal species as anticipated	False	Surrounding landscape altered and the site did not support species
11) TES, SOI/SOC fauna as anticipated	False	Surrounding landscape does not appear to support T& E birds
12) Invasive species not established	False	Cirsium vulgare, Taraxacum officinale, Trifolium etc.
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Slies adjacent to road and likely receives dust and runoff
15) Fencing functions properly	False	No fencing - heavily trampled
16) Herbivory not adversely affecting site	False	Heavily trampled
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Roadcut Springs ID# 159440

Survey Date:	9/5/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hillslope
Aspect (TN):	188
Elevation (m):	1390
Coordinates	37 57 27.2 Latitude -120 1 5.7 Longitude
Area:	610 square meters
Surrounding Vegetation:	No dominant life form
Surficia Material:	Alluvium, Human cause/constructed
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Salix lasiolepis
Graminoid	2	Juncus effusus
Forb	1	Hosackia oblongifolia
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

There are high burn intensity effects from the 2013 Rim Fire at this spring. The source is 100 m upslope from where it is marked in the NHD. The surrounding landscape has been plowed for logging purposes. An old road cut goes through the site and the flow runs down tire ruts for approximately 60 m, then downslope to a wet meadow. The area was estimated using the sketchmap.

Hydrology, Geology, and Soil Notes

This is an anthropogenic hillslope spring ecosystem. No soil pits were indicated, as the site was heavily disturbed.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	0
Flow estimate (L/sec)	0.028

Water Quality (Single Location)

pH	6.64
Specific conductance (uS/cm)	149.0
Dissolved oxygen (mg/L)	1.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	16.6

Roadcut Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Salix, SALIX	
Aster, ASTER	
moss, 2MOSS	
Cercocarpus, CERCO	
Polypogon australis, POAU3	
Juncus bufonius var. occidentalis, JUBUO	
Lotus oblongifolius, LOOB2	Acmispon americanus
Prunella vulgaris, PRVU	
unknown Graminoid (grass or grasslike), 2GRAM	grass 3
Conyza canadensis, COCA5	
Mimulus moschatus, MIMO3	
Holcus lanatus, HOLA	* brush top
Chenopodium, CHENO	cf. missouriense
Polygonum aviculare ssp. Buxiforme,	* red stem/skinny
Pseudognaphalium, PSEUD43	
Plantago lanceolata, PLLA	
Perideridia parishii, PEPA21	
Salix scouleriana, SASC	
Leptochloa fusca ssp. fascicularis, LEFUF	
Persicaria lapathifolia,	
Juncus effusus, JUEF	
Hypericum anagalloides, HYAN2	
unknown Forb, dicot, 2FD	cf. bidens
Taraxacum, TARAX	
Lactuca serriola, LASE	
Anaphalis margaritacea, ANMA	
Cyperus difformis, CYDI4	
Poa, POA	cf pratensis
Agrostis idahoensis, AGID	
Pseudoroegneria, PSEUD22	
Trifolium wormskioldii, TRWO	
Hosackia oblongifolia, LOOBO2	
Carex, CAREX	cf alma
Pinus lambertiana, PILA	
Epilobium brachycarpum, EPBR3	cf ciliatum
Salix lasiolepis, SALA6	cf.
Eleocharis, ELEOC	cf bella
Cirsium vulgare, CIVU	
Viola, VIOLA	
unknown Forb (herbaceous, not grass nor grasslike), 2FORB	small rosette

Roadcut Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
domestic cow, Bos taurus	sign	tracks/scat

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae	obs	Adult	many

Fauna Notes

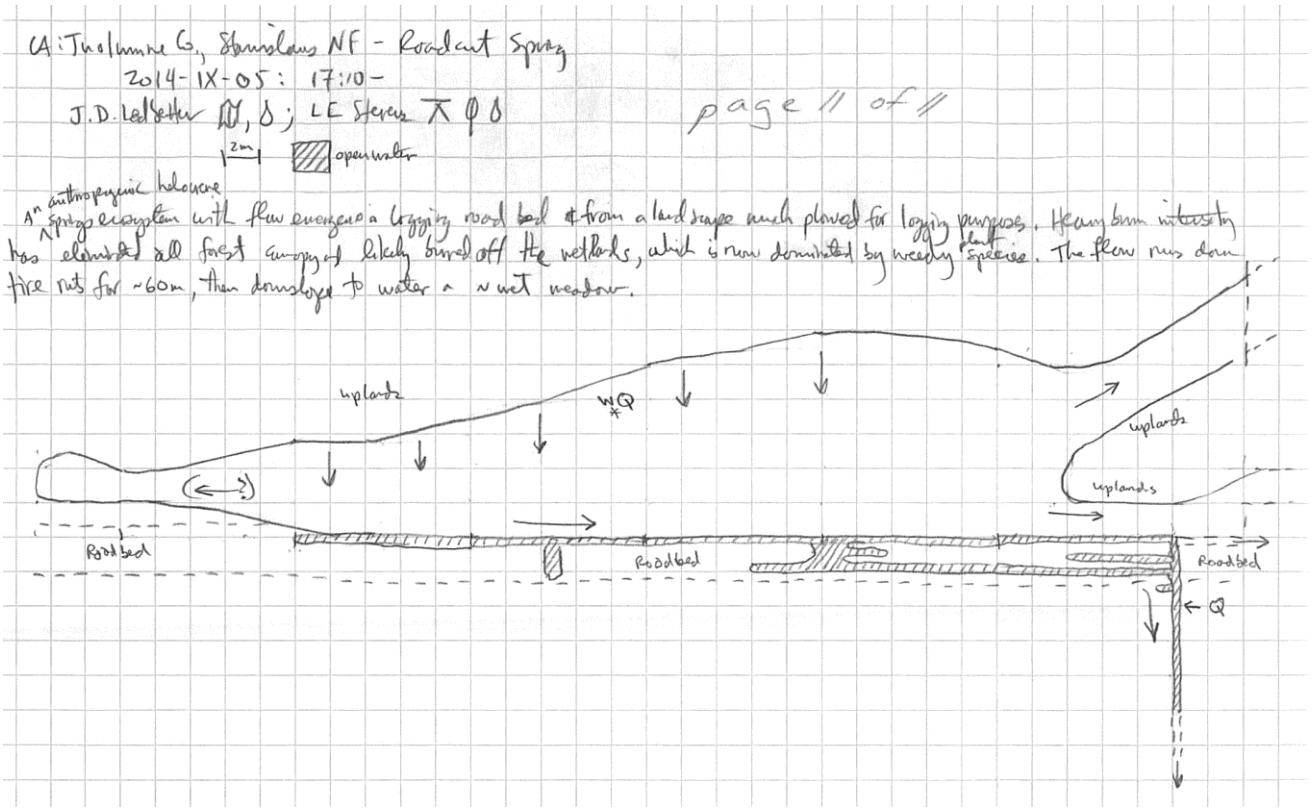
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Roadcut Springs (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: Tracks or trails by vehicles (ATV, 4WD, etc);
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Erosion (general); Excavation; Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Roadcut Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Trampled, road through site
Geomorphology and Soils		
4) Landform stability not altered	False	Trampled, road through site
5) Runout channel functioning naturally	False	Trampled, road through site
6) Soil integrity not altered	False	Trampled, road through site
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	No TES or SOI/SOC plants
10) Faunal species as anticipated	False	No AQ intertebrates, except Culicidae
11) TES, SOI/SOC fauna as anticipated	False	Habitat does not support TES fauna
12) Invasive species not established	False	Many non-native spp.
Disturbances		
13) Flow reg. not adversely affecting site	False	Road cut
14) Construction, Roads not affecting	False	Road cut
15) Fencing functions properly	False	No fencing present
16) Herbivory not adversely affecting site	False	Trampled
17) Recreation not adversely affecting	False	Road cut
18) Other dist. not adversely affecting	False	No live trees
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Rockwall Springs ID# 159361

Survey Date:	8/20/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene, rheocrene
Aspect (TN):	183
Elevation (m):	1643
Coordinates	37 58 50 Latitude -119 57 32.3 Longitude
Area:	188 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Other (explain in "Notes on Geology")
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree		
Shrub	2	Salix scouleriana
Graminoid	1	Poa pratensis
Forb	3	Melilotus
Aquatic		
Bryophyte		
Unknown		

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This spring is located within the 2013 Rim Fire perimeter, but had little impact. The site has been heavily manipulated, bermed, trenched, and excavated. The spring was dry at the time of the survey, and heavily trampled and grazed by cattle.

Hydrology, Geology, and Soil Notes

The surficial material was soil. Extensive excavation indicates previous reliable flow in the past, although the site was dry. No water quality or flow measurements were possible as the site was dry. The soil pit location selected as it was one of the few places that was undisturbed. There was root mat to 6 cm depth, and gravelly-sandy loam to 39 cm.

Rockwall Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Agrostis exarata, AGEX	
Fragaria, FRAGA	
Melilotus, MELIL	
Dactylis glomerata, DAGL	
Ceanothus cordulatus, CECO	whitethorn
unknown Forb (herbaceous, not grass nor grasslike), 2FORB	fabaceae annual
Epilobium glaberrimum, EPGL	
Sidalcea oregana, SIOR	
Bromus tectorum, BRTE	
Trisetum spicatum, TRSP2	yellow
unknown Graminoid (grass or grasslike), 2GRAM	
Lotus oblongifolius, LOOB2	
Aquilegia formosa, AQFO	
Achillea millefolium, ACMI2	
Gnaphalium, GNAPH	
Poa pratensis, POPR	cf.
Verbascum thapsus, VETH	
Salix scouleriana, SASC	
Agrostis variabilis, AGVA	
Potentilla gracilis, POGR9	
Cirsium vulgare, CIVU	
Pseudoroegneria spicata, PSSPS	
Festuca idahoensis, FEID	
Carex alma, CAAL7	
Juncus effusus, JUEF	red top
Verbascum, VERBA	
Taraxacum officinale ssp. officinale, TAOF	
Ribes roezlii, RIRO	var. roezlii

Rockwall Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
American Robin, Turdus migratorius	obs	
Broad-tailed Hummingbird, Selasphorus platyce	obs	
California ground squirrel, Spermophilus beeche	obs	
domestic cow, Bos taurus	sign	tracks and scat
hummingbird, Archilochus fam	obs	
Mountain Chickadee, Poecile gambeli	call	
Northern Flicker, Colaptes auratus	obs	
Townsend's Solitaire, Myadestes townsendi	obs	
White-breasted Nuthatch, Sitta carolinensis	obs	
woodpecker, picidae fam	call	

Invertebrate Species	Detection	Stage	Comments
HYM Formicidae	obs	Adult	
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	

Fauna Notes

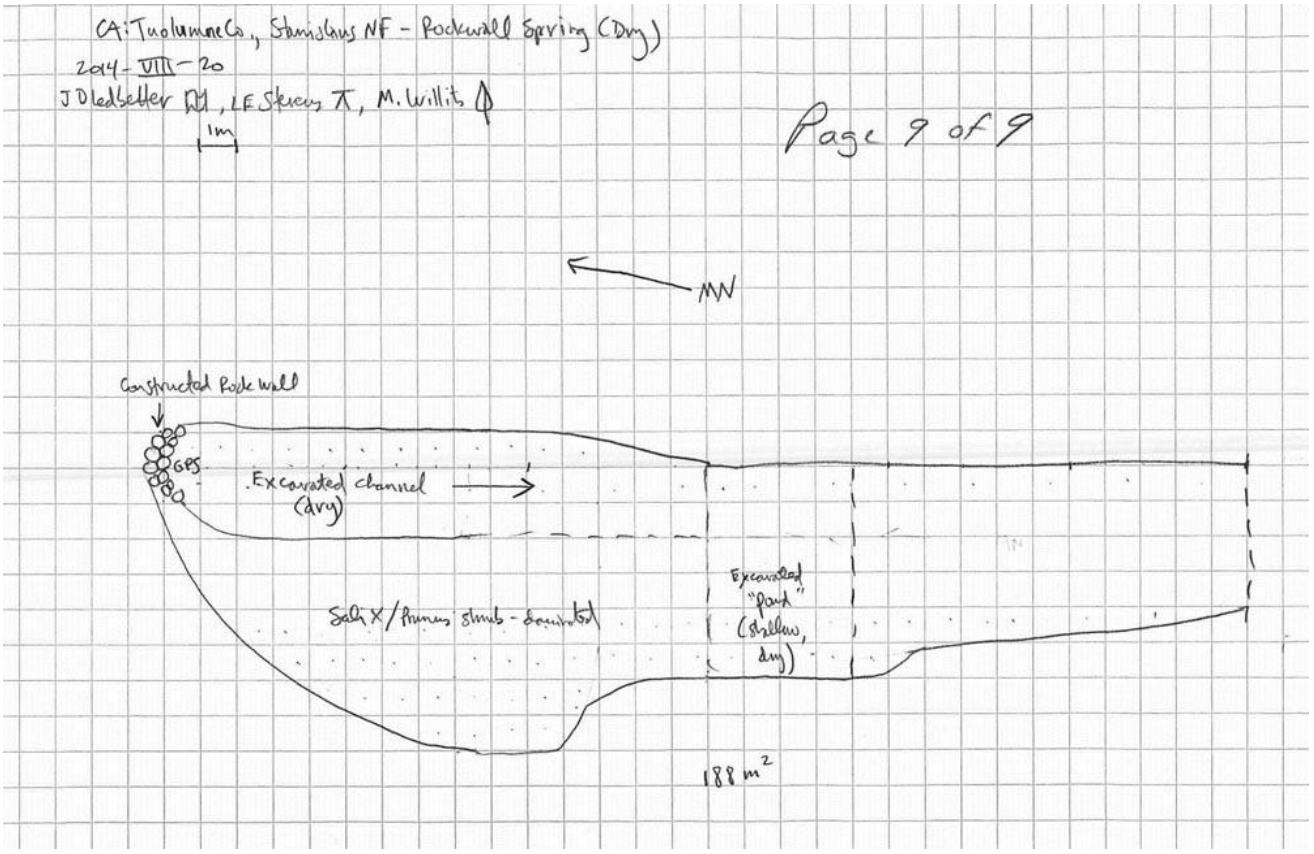
Surveyors were unable to conduct benthic sampling as there was no water. There were 15-20 domestic cattle at Cowbell Springs just downslope.

Inverts Collected ☐

Number of Reps:

Rockwall Springs (continued)

Sketchmap



Disturbance

Hydrology: Downgradient capture of surface water or groundwater (post-spring emergence); Other hydrologic alteration observed--see Disturbance notes	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Compaction; Ground disturbance (general); Gully erosion; Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Rockwall Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Site is dry
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	NA	No water
Geomorphology and Soils		
4) Landform stability not altered	False	Excavation, manipulation, berms, trenching
5) Runout channel functioning naturally	False	Excavated, trenched
6) Soil integrity not altered	False	Site is dry
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavily grazed
9) TES, SOI/SOC flora as anticipated	False	Mimulus pulchellus not present
10) Faunal species as anticipated	False	No aquatic species
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Pseudoroegneria spicata, Cirsium vulgare
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	True	
16) Herbivory not adversely affecting site	False	Heavily grazed and trampled
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	True	
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Salvage Meadow ID# 159427

Survey Date:	8/23/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	130
Elevation (m):	1187
Coordinates	37 55 6.2 Latitude -119 58 45.3 Longitude
Area:	350 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Other (explain in "Notes on Geology")
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub		
Graminoid	2	Polypogon australis
Forb	1	Trifolium repens
Aquatic		
Bryophyte	5	
Unknown		

Survey Notes

The area surrounding this site was heavily influenced by the 2013 Rim Fire.

Hydrologic Attribute	Results
Water table type	Unknown
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0

Water Quality (Single Location)

pH	
Specific conductance (uS/cm)	
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	

Hydrology, Geology, and Soil Notes

This appears to be a seepage/filtration spring. The Surficial Materialis sandy loam over silt. The secondary lithology is likely tonalite, which is not on the USFS list. Surveyors were unable to measure flow or water chemistry as there was no water or flow at the site. The soil pit was dry. Surveyors dug a 20 cm soil pit at the center of the site. There was no peat or muck. Depth to the mineral layer was 10 cm; the texture was sandy loam over clay, color 10YR-4/3 and 10YR-3/2. There were no redox concentrations, depletions, reduced matrices, Hydrogen sulfide odor, or reaction to HCl.

Salvage Meadow (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Trifolium repens, TRRE3	*
Polypogon australis, POAU3	"Trisetum"
Conyza canadensis, COCA5	
Briza minor, BRMI2	
Carex echinata, CAEC	collected
Lactuca saligna, LASA	*
Perideridia parishii, PEPA21	
Muhlenbergia, MUHLE	cf. richardsonii
Calystegia malacophylla, CAMA38	
Carex, CAREX	cf. alma
Lotus oblongifolius, LOOB2	
Epilobium, EPILO	cf ciliatum
erythranthe guttata,	
Acmispon nevadensis var. nevadensis,	
Juncus effusus, JUEF	
Taraxacum officinale ssp. officinale, TAOF	
Cyperus eragrostis, CYER	
Pinus lambertiana, PILA	seedling
Bromus sterilis, BRST2	
Cirsium vulgare, CIVU	
Hypochaeris radicata, HYRA3	
Tragopogon, TRAGO	* sp
Prunella vulgaris, PRVU	
Pseudognaphalium, PSEUD43	*

Salvage Meadow (continued)

Fauna

Vertebrate Species	Detection	Comments
Acorn Woodpecker, Melanerpes formicivorus	call	
domestic cow, Bos taurus	sign	tracks/scat

Invertebrate Species	Detection	Stage	Comments
LEP Hesperiidae Erynnis	obs	Adult	
LEP Lycaenidae Plebejus	obs	Adult	
LEP Nymphalidae Danaus plexippus	obs	Adult	Monarch
LEP Nymphalidae Junonia coenia	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	
LEP Nymphalidae Vanessa cardui	obs	Adult	

Fauna Notes

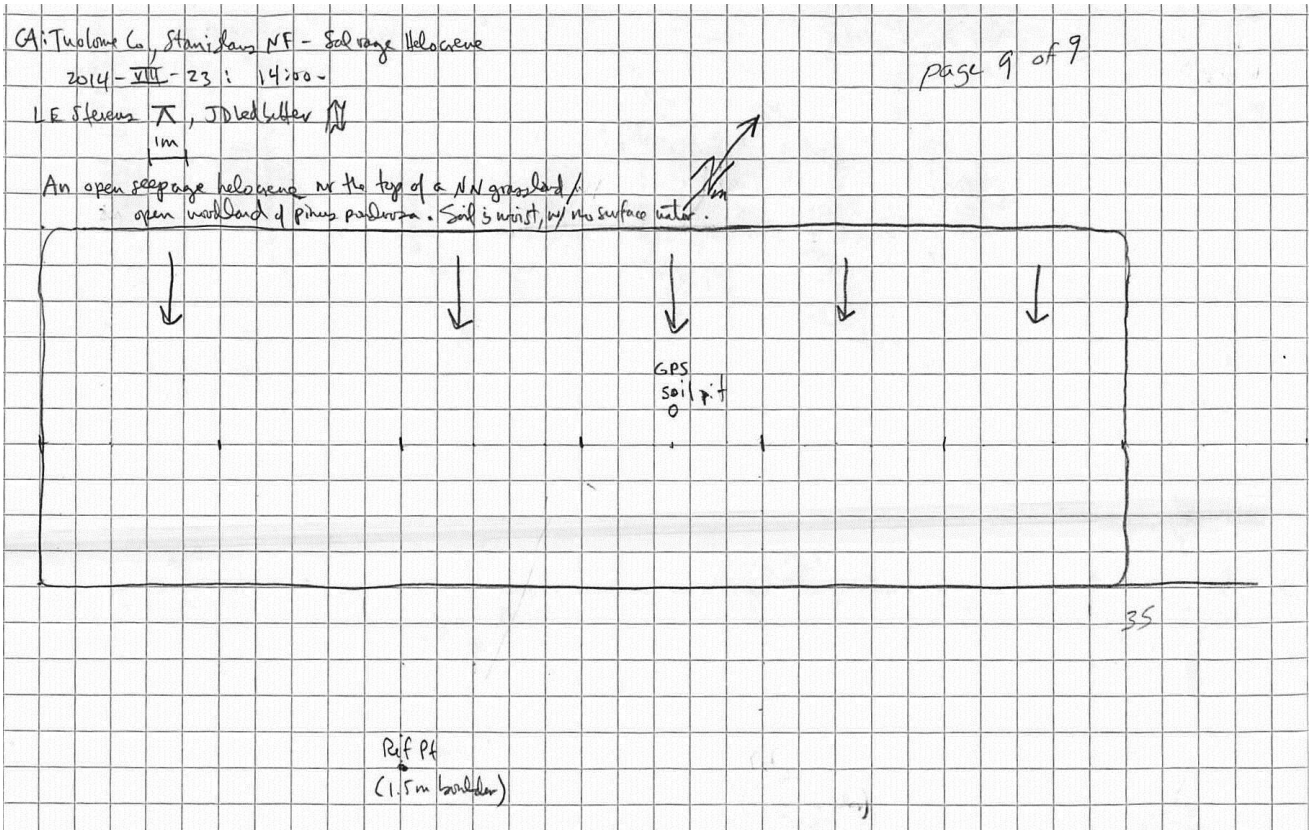
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Salvage Meadow (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: Tracks or trails by vehicles (ATV, 4WD, etc);
	Animal effects: Livestock; Trampling (by ungulates, native or nonnative);
Soil alteration: No soil disturbance noted;	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Salvage Meadow (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Heavy Fire/Road Influence
5) Runout channel functioning naturally	NA	Not applicable
6) Soil integrity not altered	False	Trampled, Fire & Road
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Many NN spp, no unusual native spp
10) Faunal species as anticipated	False	No AQ spp
11) TES, SOI/SOC fauna as anticipated	False	No AQ spp
12) Invasive species not established	False	Many NN spp, especially Taraxacum, Cirsium vulgare
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road within 50m
15) Fencing functions properly	NA	No fencing present
16) Herbivory not adversely affecting site	False	Heavily trampled
17) Recreation not adversely affecting	False	Road nearby, salvage logging
18) Other dist. not adversely affecting	False	Rim fire, salvage logging
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Sawmill Pilot Springs ID# 159377

Survey Date:	9/25/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hillslope
Aspect (TN):	317
Elevation (m):	1319
Coordinates	37 50 16.4 Latitude -119 57 6.1 Longitude
Area:	85 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	1	Pinus ponderosa
Shrub	4	Alnus tenuifolia
Graminoid	3	Deschampsia
Forb	2	Cirsium vulgare
Aquatic		
Bryophyte	5	
Unknown		

Survey Notes

This hillslope spring emerges near the dirt road and is diverted into the roadside ditch. The soil near the source is moist. The only standing water is in the ditch and there is no discernable flow. The area was moderately affected by the 2013 Rim Fire.

Hydrology, Geology, and Soil Notes

Flow measurements were not possible as there was no flow. Water chemistry measurements were not taken, as there was so little seepage. No soil pit was indicated as there was no wetland, and this is a heavily disturbed site.

Hydrologic Attribute	Results
Water table type	
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined
Water Quality (Single Location)	
pH	
Specific conductance (uS/cm)	
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	

Sawmill Pilot Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Cirsium vulgare, CIVU	
Potentilla, POTEN	prostrate
Pinus ponderosa, PIPO	
Arnica, ARNIC	
Lotus oblongifolius, LOOB2	
Agrostis stolonifera, AGST2	
Anaphalis margaritacea, ANMA	
Agrostis exarata, AGEX	yellow grass
Ribes, RIBES	Roundleaf
Pseudognaphalium thermale,	
Nasturtium officinale, NAOF	
Cerastium fontanum, CEFO2	
Pseudoroegneria, PSEUD22	
Bromus tectorum, BRTE	
Arctostaphylos, ARCTO3	
Hieracium argutum, HIAR2	diffuse aster
Salix scouleriana, SASC	
Conyza canadensis, COCA5	
Tragopogon, TRAGO	cf. dubius
Mimulus floribundus, MIFL2	
Deschampsia, DESCH	cf. danthonioides
Juncus, JUNCU	
Calocedrus decurrens, CADE27	
Alnus incana ssp. tenuifolia, ALINT	
Pteridium aquilinum, PTAQ	
Carex, CAREX	no heads
Pinus lambertiana, PILA	seedling
Galium triflorum, GATR3	
unknown shrub, 2SHRUB	Scotch Broom?, Sent to MW for ID
Epilobium ciliatum, EPCI	
Taraxacum officinale ssp. officinale, TAOF	
Cephalanthus occidentalis, CEOC2	large leaf chaparral, sent to MW for ID
unknown shrub, 2SHRUB	cf Prunus subcordatus

Sawmill Pilot Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
domestic cow, Bos taurus	sign	tracks & scat
hummingbird, Archilochus fam	call	
Northern Flicker, Colaptes auratus	call	
Pacific tree frog, Hyla regilla	obs	
Steller's Jay, Cyanocitta stelleri	call	

Fauna Notes

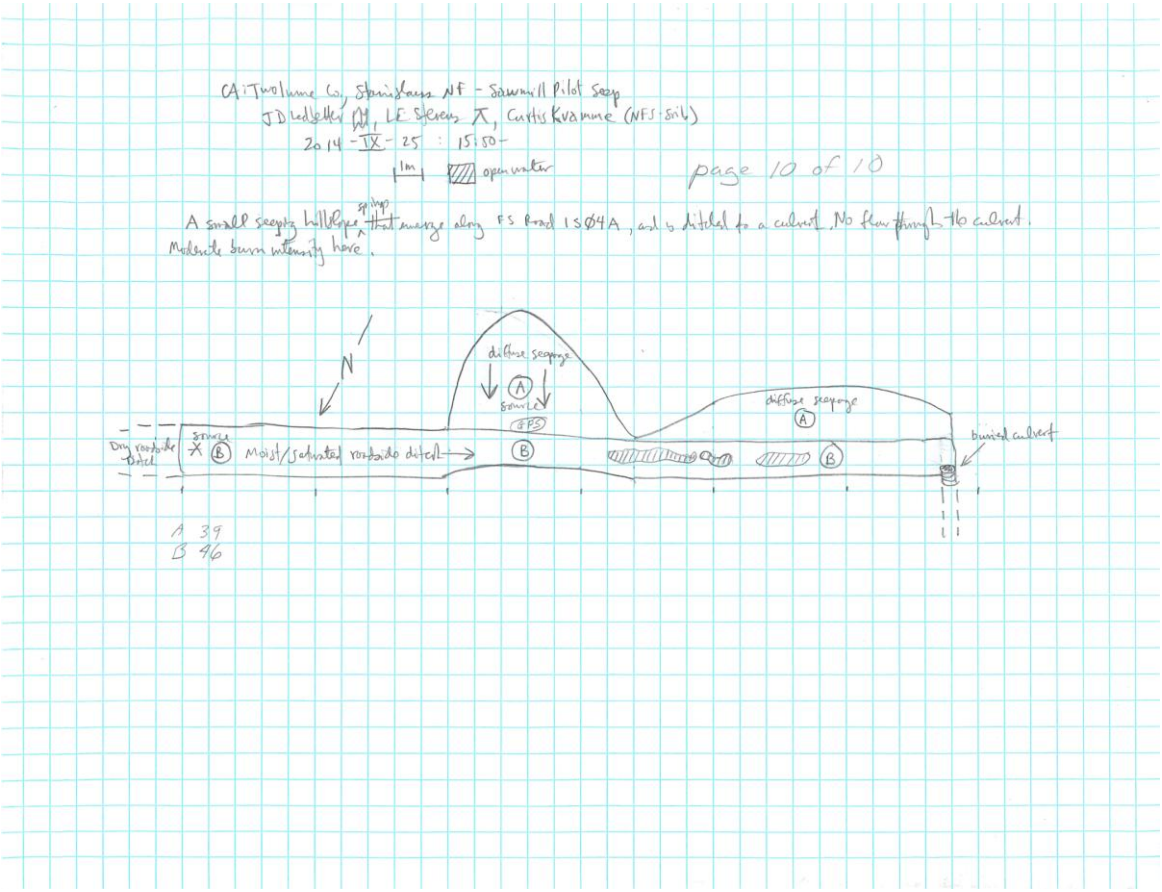
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Sawmill Pilot Springs (continued)

Sketchmap



Disturbance

Hydrology: Water diversion (permanently diverted);	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Displacement of soil; Excavation; Pedestals or hummocks (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Sawmill Pilot Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Effects from fire and road - dust
Geomorphology and Soils		
4) Landform stability not altered	False	Fire and road
5) Runout channel functioning naturally	False	Diverted into roads and ditch
6) Soil integrity not altered	False	Diverted into roads and ditch
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Fire impacts
9) TES, SOI/SOC flora as anticipated	False	Road, fire, and granzaing
10) Faunal species as anticipated	False	Ash and road debris reduce aquatic habitat, but frogs present
11) TES, SOI/SOC fauna as anticipated	False	Habitat does not support SOC, especially due to fire and road
12) Invasive species not established	False	Many non-native grasses and weeds, for example Cirsium
Disturbances		
13) Flow reg. not adversely affecting site	False	Diverted to ditch
14) Construction, Roads not affecting	False	Flow diverted to ditch
15) Fencing functions properly	False	No fencing present
16) Herbivory not adversely affecting site	False	Heavily browsed and trampled
17) Recreation not adversely affecting	False	Roadside
18) Other dist. not adversely affecting	False	Moderate effects from Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Scoit Springs ID# 159337

Survey Date:	9/22/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Mariposa

GDE Type(s):	rheocrene
Aspect (TN):	200
Elevation (m):	1092
Coordinates	37 45 28.4 Latitude -119 58 38 Longitude
Area:	210 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Alluvium, Colluvium
Lithology:	Sedimentary , Chert
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	1	Alnus incana ssp. tenuifolia
Shrub	2	Acer macrophyllum
Graminoid		
Forb	3	Rubus armeniacus
Aquatic	5	algae sp
Bryophyte	4	
Unknown		

Survey Notes

This spring emerges in a channel at the junction of two roads. There were no effects from the 2013 Rim Fire. The site supports a very rich canopy diversity.

Hydrology, Geology, and Soil Notes

No soil pits were indicated, as this is a rheocrene spring in a rocky, disturbed channel.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Mixed groundwater and surface inflow
Outflow pattern	Surface water outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.2

Water Quality (Single Location)

pH	6.36
Specific conductance (uS/cm)	178.0
Dissolved oxygen (mg/L)	3.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	13.7

Scoit Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
moss, 2MOSS	
Acer macrophyllum, ACMA3	
Epilobium ciliatum, EPCI	
Veronica, VERON	
Calocedrus decurrens, CADE27	
Maianthemum stellatum, MAST4	
Rubus armeniacus, RUAR9	
Pseudotsuga menziesii, PSME	
Agrostis exarata, AGEX	
Alnus incana ssp. tenuifolia, ALINT	
algae sp, 2ALGA	
Lilium, LILIU	cf. parvum
Cornus stolonifera, COSES	
Viola, VIOLA	
Abies concolor, ABCO	
Toxicodendron diversilobum, TODI	
Cirsium vulgare, CIVU	
Aquilegia formosa, AQFO	
Clematis, CLEMA	Sent to MW for ID
Mimulus cardinalis, MICA3	
Quercus kelloggii, QUKE	
Juncus balticus, JUBA	cf b
unknown Forb, dicot, 2FD	cf Arnica
Pteridium aquilinum, PTAQ	

Scoit Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Northern Flicker, Colaptes auratus	call	
Scrub Jay, Aphelocoma californica	call	
Steller's Jay, Cyanocitta stelleri	sign	feather
woodpecker, picidae fam	call	pecking

Invertebrate Species	Detection	Stage	Comments
DIP Chloropidae	obs	Adult	face flies - many
DIP Culicidae	obs	Adult	
HEM Gerridae Aquarius remigis	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	
MEG	obs		suspected/not obs
ODO Aeshnidae	obs	Adult	
PLE Perlidae	obs	Larvae	
TRI	obs	Larvae	sp 1
TRI	obs	Larvae	sp2
TURB	obs	Larvae	

Fauna Notes

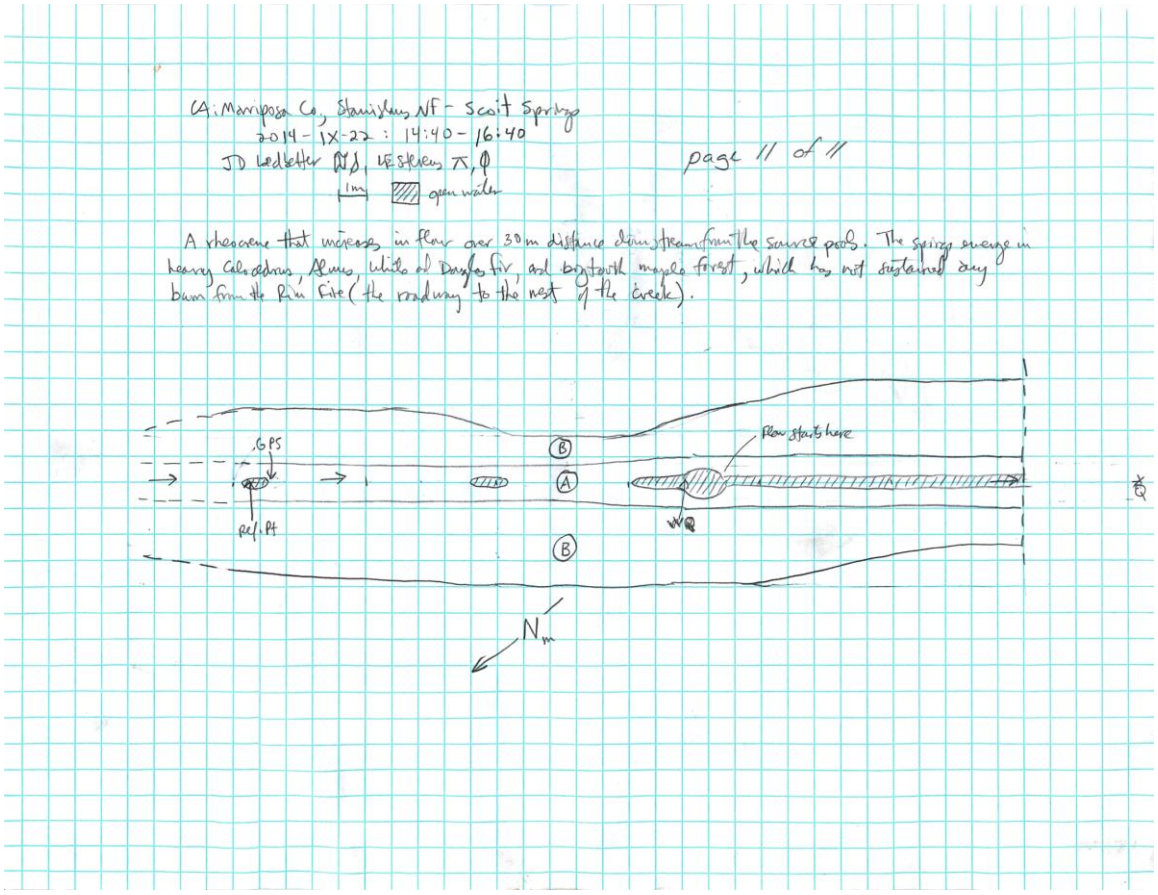
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Scoit Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: No soil disturbance noted;	Miscellaneous effects: No miscellaneous effects noted
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Scoit Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Road adjacent, gravel runoff, dust
Geomorphology and Soils		
4) Landform stability not altered	False	Road bed, gravel runoff
5) Runout channel functioning naturally	False	Road bed, gravel runoff
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	False	Proximity to road likely limits ES & SOC vertebrate habitat use
12) Invasive species not established	True	Little non-native vegetation cover at the site
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road adjacent
15) Fencing functions properly	UA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	some debris, trash
18) Other dist. not adversely affecting	True	
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Scoulers Willow Springs ID# 159391

Survey Date:	8/21/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s): helocrene, rheocrene

Aspect (TN): 84

Elevation (m): 1835

Coordinates 37 59 46 Latitude
-119 57 10.2 Longitude

Area: 93 square meters

Surrounding Vegetation: Tree dominated

Surficia Material:

Lithology: Igneous intrusive , Granite

Bryophyte Abundance: Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Prunus emarginata
Graminoid	1	Juncus balticus
Forb	2	Achillea millefolium
Aquatic		
Bryophyte	5	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	0
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This site was within the 2013 Rim Fire perimeter; effects were significant. Many trees in the surrounding area were burned and were dead.

Hydrology, Geology, and Soil Notes

This is a seepage/filtration spring; the surficial material is entirely soil. Flow measurement was not possible as there was no standing or flowing water at thesite. A soil pit dug at m 12.2 on the transect line from source. The hole depth was 40 cm, with silty-sandy loam and some gravel; mineral depth was not reached.

Scoulers Willow Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Salix scouleriana, SASC	
Madia glomerata, MAGL2	
Potentilla glandulosa, POGL9	collected *
Rumex acetosella, RUAC3	
Juncus covillei var. obtusatus, JUCOO	
Epilobium, EPILO	cf.
Epilobium angustifolium ssp.circumvagum,	cf angustifolium - collected *
Gayophytum diffusum ssp. parviflorum, GADIP	
Poa, POA	cf compressa (collected *) Alopecurus?
Carex alma, CAAL7	
Ceanothus cordulatus, CECO	
Juncus balticus var. montanus,	spp. Montanus
Achillea millefolium, ACMI2	
Ribes roezlii, RIRO	
Prunus emarginata, PREM	"cf emarginata"
Pinus lambertiana, PILA	seedlign - cf?
Allophyllum integrifolium, ALIN3	
Agrostis, AGROS2	cf. Idahoensis
Juncus balticus var. mexicanus,	spp. Mexicanus
Anaphalis margaritacea, ANMA	
Pseudoroegneria spicata, PSSPS	
Aquilegia formosa, AQFO	
Carex, CAREX	2 - broad leaf/no inflorescence
unknown Graminoid (grass or grasslike), 2GRAM	Muhlenbergia? Grass 1
Trifolium monanthum ssp. parvum, TRMOP	collected *

Scoulers Willow Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
American Robin, Turdus migratorius	call	
bobcat, Lynx rufus	sign	scat
chickadee, Poecile	call	
Common Raven, Corvus corax	call	
deer, Odocoileus	sign	tracks and scat
Red-breasted Nuthatch, Sitta canadensis	obs	
Red-tailed Hawk, Buteo jamaicensis	call	
Steller's Jay, Cyanocitta stelleri	obs	

Invertebrate Species	Detection	Stage	Comments
LEP	obs	Adult	comma
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
LEP Nymphalidae Speyeria	obs	Adult	
LEP Pieridae Pontia protodice	obs	Adult	?
ODO Aeshnidae	obs	Adult	

Fauna Notes

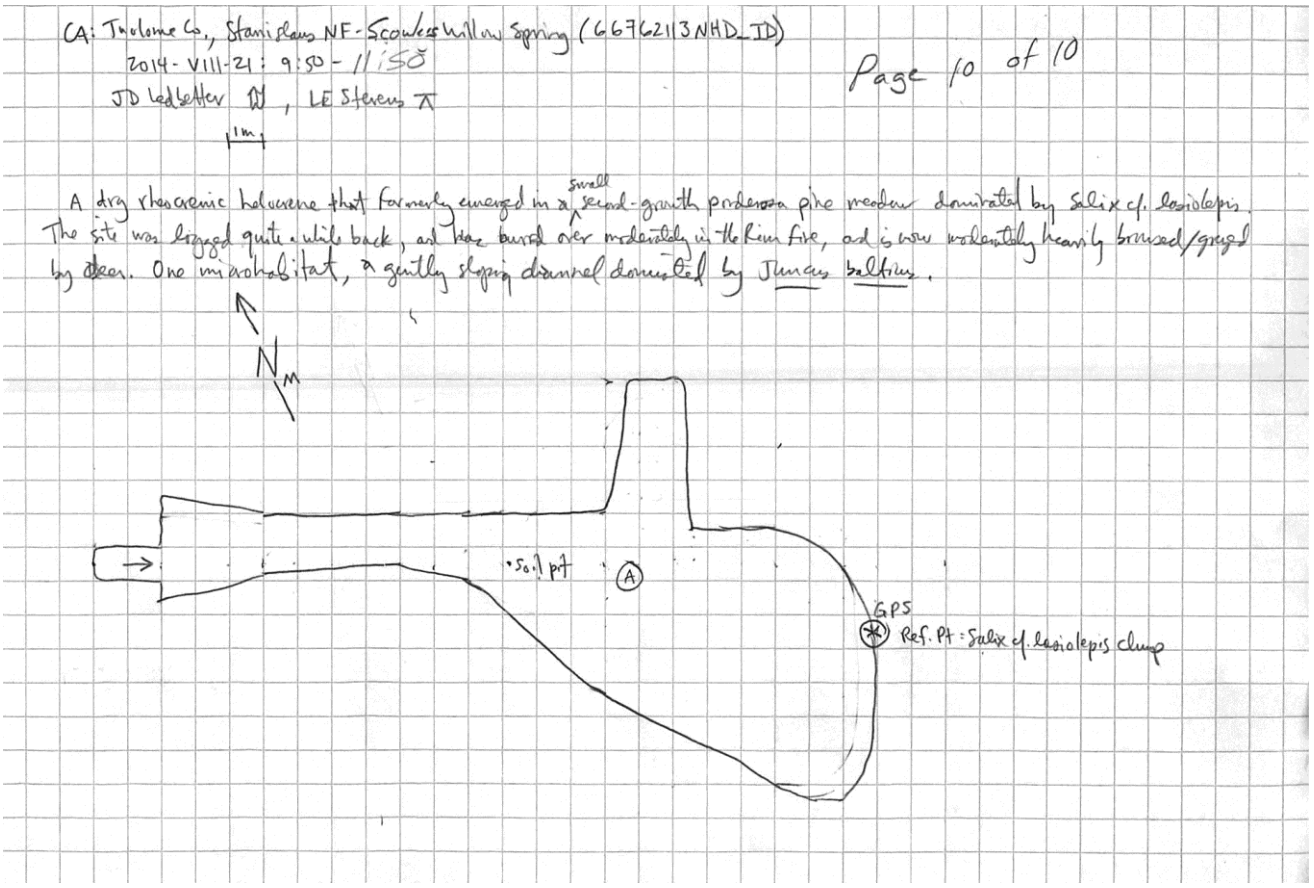
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Scoulers Willow Springs (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Wild animals; Trampling (by ungulates, native or nonnative);
Soil alteration: Excavation; Ground disturbance (general); Pipes; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Other structures observed--see disturbance notes;	Rubber piping within 75 m of site, cut/torn; fencing remnants at site

Scoulers Willow Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	Site is dry
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	NA	No water at the site
Geomorphology and Soils		
4) Landform stability not altered	False	Excavated; fire impacts
5) Runout channel functioning naturally	False	Channel excavated
6) Soil integrity not altered	False	Site is dry
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	heavily grazed/browsed by deer
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	True	Check to det. TES in area
12) Invasive species not established	True	
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	Nearby road has been closed
15) Fencing functions properly	True	
16) Herbivory not adversely affecting site	False	Deer browsing significant
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Area burned
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Shingle Spring ID# 159457

Survey Date:	8/24/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	205
Elevation (m):	1810
Coordinates	38 0 45.7 Latitude -119 52 58.1 Longitude
Area:	292 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Alluvium
Lithology:	Unconsolidated , Glacial Deposit
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	1	Pinus lambertiana
Shrub	2	Alnus incana ssp. tenuifolia
Graminoid	4	Agrostis exarata
Forb	3	Mimulus moschatus
Aquatic		
Bryophyte	5	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Extensive standing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.73

Water Quality (Single Location)

pH	6.11
Specific conductance (uS/cm)	65.7
Dissolved oxygen (mg/L)	6.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	11.5

Survey Notes

The actual source location is 150m up the drainage from where it is mapped on the DRG and reported in the NHD database. This site is moderately influenced by the 2013 Rim Fire, with dead standing and fallen trees, and some huge ones that have fallen in the drainage upslope of the current source. This likely shifted the emergence point.The fire intensity at this site is moderate.

Hydrology, Geology, and Soil Notes

Surveyors measured flow 16 m below the source as well as where the outflow crossed the trail. As the flow increases due to multiple sources, the measurement was significantly higher at the trail crossing. No soil pit was indicated, as this is a rheocrene spring with a rocky substrate in a heavily burned forest.

Shingle Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Mimulus moschatus, MIMO3	collected
unknown Graminoid (grass or grasslike), 2GRAM	perennial - collected grass 1
Anaphalis margaritacea, ANMA	
unknown Fungus, 2FUNGI	Mushroom
Pseudotsuga menziesii, PSME	
liverwort fam,	Sent to MW for ID
Epilobium ciliatum, EPCI	ssp. Ciliatum
Trifolium monanthum ssp. monanthum, TRMOM	
Pteridium aquilinum, PTAQ	
Glyceria, GLYCE	collected
Carex, CAREX	Carex 1
Ribes nevadense, RINE	
moss, 2MOSS	
Agrostis exarata, AGEX	"cf stolonifera" - collected
Alnus incana ssp. tenuifolia, ALINT	collected
Carex praegracilis, CAPR5	cf; "cf alma"
Calocedrus decurrens, CADE27	
Deschampsia danthonioides, DEDA	U Grass 2 tiny
Clarkia purpurea ssp. purpurea, CLPUP	collected
Gayophytum heterozygum, GAHE3	
Pinus lambertiana, PILA	
Juncus orthophyllus, JUOR	collected
Carex, CAREX	Carex 1
Ceanothus integerrimus, CEIN3	seedling

Shingle Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
Black-backed Woodpecker, Picoides arcticus	obs	
chipmunk, Eutamias sp	obs	
Dark-eyed Junco, Junco hyemalis	call	
frog, Bufo sp.	obs	see notes
Mountain Chickadee, Poecile gambeli	call	
Red-breasted Nuthatch, Sitta canadensis	call	
Red-tailed Hawk, Buteo jamaicensis	call	
Steller's Jay, Cyanocitta stelleri	call	
woodpecker, picidae fam	obs	black backed

Invertebrate Species	Detection	Stage	Comments
DIP	obs	Adult	
HEM Gerridae Aquarius remigis	obs	Adult	many

Fauna Notes

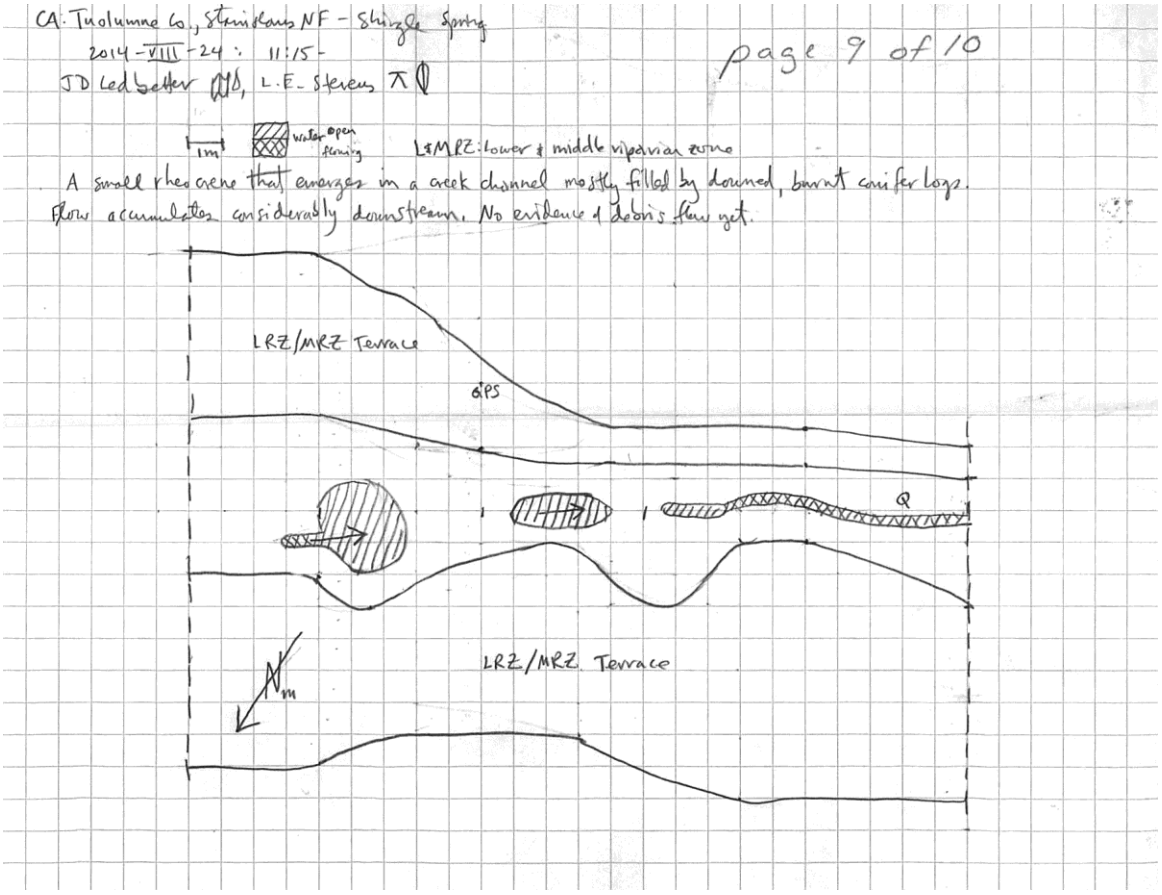
The frog may have been Hyla regilla? It was uniformly gold with black upper lip stripe.

Inverts Collected ☐

Number of Reps:

Shingle Spring (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Wild animals;
Soil alteration: Channel erosion;	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

Shingle Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Fire and down debris
Geomorphology and Soils		
4) Landform stability not altered	True	
5) Runout channel functioning naturally	False	Incised due to fire effects
6) Soil integrity not altered	False	Channel incised
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	False	Severe burn impacts on riparian vegetation
9) TES, SOI/SOC flora as anticipated	False	Heavy erosion and cutbank limits habitat availability
10) Faunal species as anticipated	False	Heavy erosion and cutbank limits habitat availability
11) TES, SOI/SOC fauna as anticipated	False	Heavy erosion and cutbank limits habitat availability
12) Invasive species not established	False	Agrostis and likely epilobium are NN
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	No fencing present or indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Heavy impact from Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Soldier Sunset Springs ID# 159424

Survey Date:	9/19/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene, hillslope
Aspect (TN):	295
Elevation (m):	1360
Coordinates	37 48 17.3 Latitude -119 53 41.5 Longitude
Area:	175.5 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	1	Pinus ponderosa
Shrub		
Graminoid	3	Holcus lanatus
Forb	2	Mimulus moschatus
Aquatic		
Bryophyte	5	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.021

Water Quality (Single Location)

pH	6.23
Specific conductance (uS/cm)	133.0
Dissolved oxygen (mg/L)	2.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	11.0

Survey Notes

This spring emerges from an incised channel, as well as from additional hillslope sources in the area. Flow increases downstream and is captured in a pond at a bed and breakfast on private land. Effects from the 2013 Rim Fire were moderate. The source is upslope from where it is marked on the DRG. There was an excavated area and old spring box at that location.

Hydrology, Geology, and Soil Notes

Private landowner claims the spring has never gone dry in 37 years. No soil pits were indicated as this site is in a heavily disturbed, incised channel.

Soldier Sunset Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Galium triflorum, GATR3	
Lupinus, LUPIN	
Lichen, 2LICHN	
unknown Forb, dicot, 2FD	cf. Arnica
Aquilegia, AQUIL	cf robusta
Cirsium vulgare, CIVU	
Rubus armeniacus, RUAR9	himalayan blackberry?
Lilium, LILIU	5-star pod, cf. parvum
Asarum caudatum, ASCA2	unveined ginger
Ribes, RIBES	cf. inerme, sent to MW for ID
Madia glomerata, MAGL2	dry, diffuse aster
algae sp, 2ALGA	
Trifolium breweri, TRBR3	Astragalus
Dieteria canescens,	var. canescens; purple, clonal
unknown Graminoid (grass or grasslike), 2GRAM	diffuse barley Grass 1
Quercus kelloggii, QUKE	
Deschampsia danthonioides, DEDA	
Rubus parviflorus, RUPA	
Spiranthes, SPIRA2	
Cornus stolonifera, COSES	
Lotus oblongifolius, LOOB2	
Veratrum, VERAT	californicum ?
Ceanothus, CEANO	
Juncus effusus, JUEF	
Holcus lanatus, HOLA	12 cm-long dense/compact yellow infl.
Equisetum arvense, EQAR	
Hypericum perforatum, HYPE	St.Johns wort
Acer macrophyllum, ACMA3	dead
Hypochaeris radicata, HYRA3	yellow
Epilobium ciliatum, EPCI	
Agrostis stolonifera, AGST2	
Carex, CAREX	cf alma
moss, 2MOSS	
Quercus kelloggii, QUKE	
Mimulus moschatus, MIMO3	
Pinus ponderosa, PIPO	
Rumex crispus, RUCR	
Pseudoroegneria, PSEUD22	
Asarum lemmonii, ASLE	wild ginger - unveined
unknown Forb, dicot, 2FD	Dicot 3 oblong leaf seedling

Soldier Sunset Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Alligator lizard, Elgaria	obs	
Common Raven, Corvus corax	call	
Dark-eyed Junco, Junco hyemalis	obs	
gopher, Thomomys sp	sign	holes
Northern Flicker, Colaptes auratus	call	
Red-breasted Nuthatch, Sitta canadensis	obs	
Sierran treefrog, Pseudacris sierra	obs	
Steller's Jay, Cyanocitta stelleri	sign	feather
woodpecker, picidae fam	other	pecking

Invertebrate Species	Detection	Stage	Comments
DIP Chloropidae	obs	Adult	too many
DIP Culicidae	obs	Adult	many
HEM Gerridae Aquarius remigis	obs	Adult	

Fauna Notes

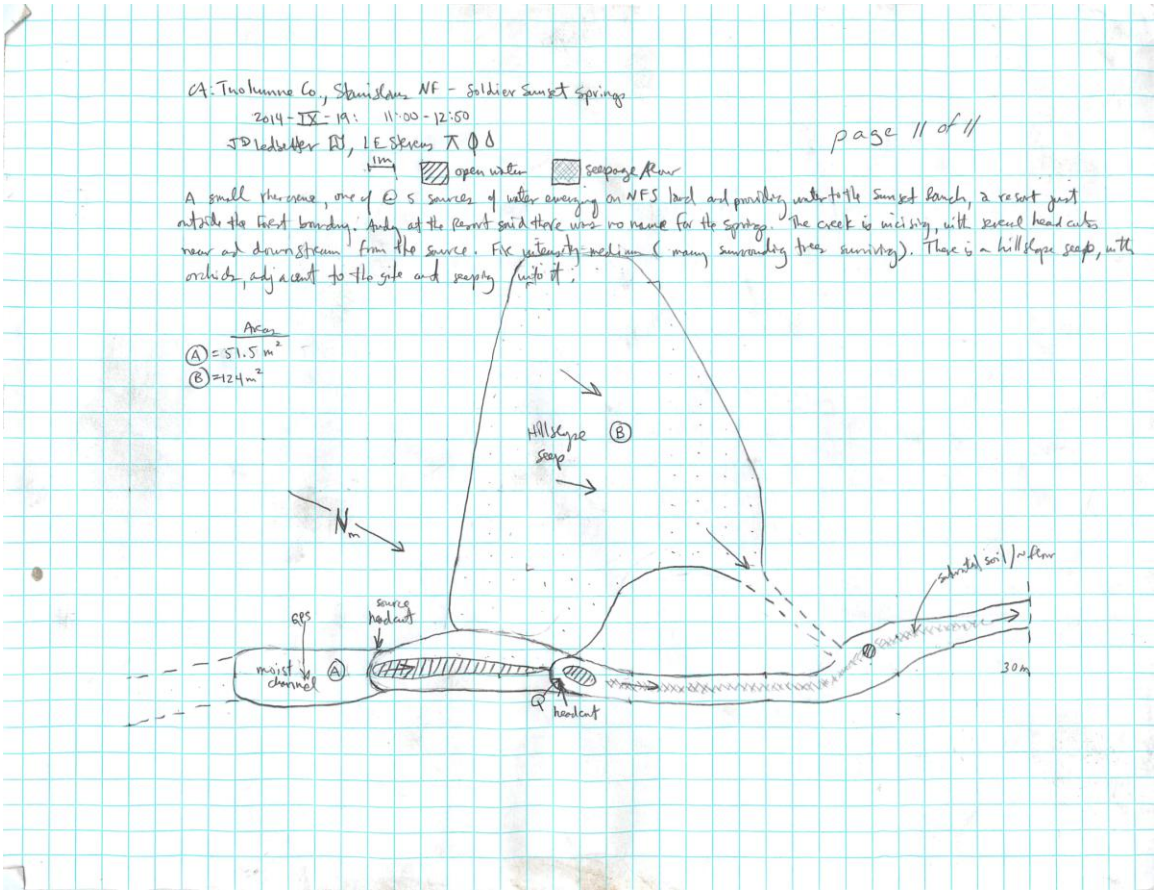
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Soldier Sunset Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Erosion (general); Excavation; Ground disturbance (general);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

Soldier Sunset Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Road just upslope. Fire effects/channel incised
Geomorphology and Soils		
4) Landform stability not altered	False	Road just upslope. Fire effects/channel incised
5) Runout channel functioning naturally	False	Road just upslope. Fire effects/channel incised
6) Soil integrity not altered	False	Road just upslope. Fire effects/channel incised
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Shrubs still recovering from fire effects
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	Stream heavily in-filled with sediment
11) TES, SOI/SOC fauna as anticipated	False	Site does not provide sufficient food/habitat to support TE or SOC spp
12) Invasive species not established	False	Non-natives, include Cirsium and Agrostis
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road just upslope
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Moderate effects from the 2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Spiranthes Seep ID# 164143

Survey Date:	8/24/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	hypocrene
Aspect (TN):	204
Elevation (m):	1377
Coordinates	37 58 4.7 Latitude -119 54 31.8 Longitude
Area:	344 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Other (explain in "Notes on Geology")
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	5	Pinus lambertiana
Shrub	3	Calocedrus decurrens
Graminoid	1	Juncus covillei
Forb	2	Spiranthes romanzoffiana
Aquatic		
Bryophyte	4	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This site is within the 2013 Rim Fire perimeter, on the edge of an area where the burn intensity was low. Although surveyors found no standing or flowing water, the soil was moist and supports an impressive stand of orchids. This seep is not included on the NHD database, nor is it marked on the DRG.

Hydrology, Geology, and Soil Notes

The soils at this site were heavily affected by the road, which was adjacent. The soils at this site were heavily affected by the road. At the soil pit, the upper 2 cm were roots, with sandy loam to 32 cm.There was moderate reduction/gley.

Spiranthes Seep (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Fragaria, FRAGA	cf. virginiana
erythranthe guttata,	sp. Collected
Cirsium vulgare, CIVU	
Verbascum thapsus, VETH	
Conyza canadensis, COCA5	
Bromus tectorum, BRTE	
Prunella vulgaris, PRVU	
Juncus articulatus ssp. Articulatus,	
Ribes nevadense, RINE	
Calamagrostis purpurascens, CAPU	
moss, 2MOSS	
Pinus lambertiana, PILA	
Rubus parviflorus, RUPA	
Viola, VIOLA	
Lotus, LOTUS	cf obtusifolia
Carex, CAREX	cf alma
Spiranthes romanzoffiana, SPRO	
Cerastium fontanum ssp. vulgare, CEFOV2	
Cornus stolonifera, COSES	
Juncus covillei, JUCO5	
Calocedrus decurrens, CADE27	
Galium, GALIU	
Pseudotsuga menziesii, PSME	
Epilobium, EPILO	cf ciliatum
Hieracium albiflorum, HIAL2	?
Pseudoroegneria spicata, PSSPS	
Lilium, LILIU	Sent to MW for ID
Lactuca serriola, LASE	
Tragopogon dubius, TRDU	
Agrostis stolonifera, AGST2	
Madia glomerata, MAGL2	

Spiranthes Seep (continued)

Fauna

Vertebrate Species	Detection	Comments
Band-tailed Pigeon, Columba fasciata	obs	
California Quail, Callipepla californica	obs	
Cedar Waxwing, Bombycilla cedrorum	call	
Northern Flicker, Colaptes auratus	obs	
Steller's Jay, Cyanocitta stelleri	call	
Steller's Jay, Cyanocitta stelleri	obs	
woodpecker, picidae fam	obs	

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae	obs	Adult	Mosquitos

Fauna Notes

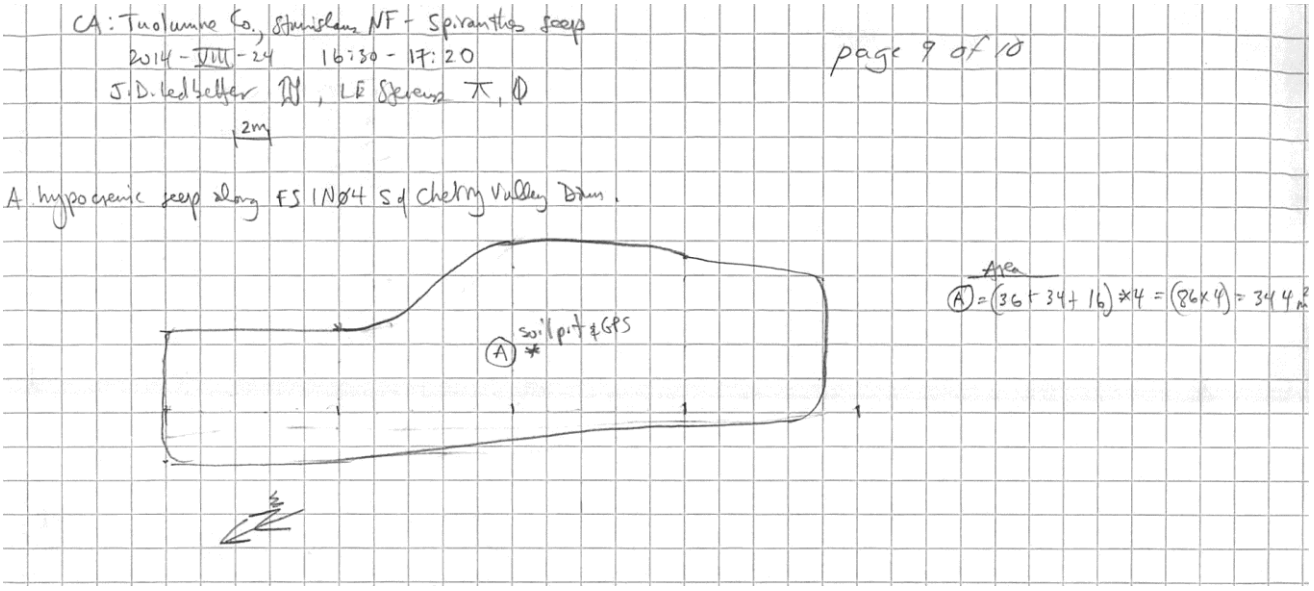
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Spiranthes Seep (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Compaction; Excavation; Ground disturbance (general);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance; Other structures observed--see disturbance notes;	Road adjacent to site.

Spiranthes Seep (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Road adjacent and slash pile at upper end
5) Runout channel functioning naturally	False	Runs into culvert, modified by road
6) Soil integrity not altered	False	Road adjacent
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	No AQ inverts
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	False	Many NN species
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Road adjacent
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	False	Road adjacent
18) Other dist. not adversely affecting	False	Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Sweetwater Springs ID# 159397

Survey Date:	9/25/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	294
Elevation (m):	958
Coordinates	37 49 21.6 Latitude -119 59 49.8 Longitude
Area:	7.8 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	1	Alnus tenuifolia
Shrub	3	Ribes nevadense
Graminoid	5	Pseudoroegneria
Forb	2	Aquilegia formosa
Aquatic		
Bryophyte	4	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Mixed groundwater and surface inflow
Outflow pattern	Surface water outflow dominated
Surface water	
Water table depth single location (cm)	0.8299999833106
Flow estimate (L/sec)	0.59

Water Quality (Single Location)

pH	6.52
Specific conductance (uS/cm)	294.0
Dissolved oxygen (mg/L)	5.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	11.9

Survey Notes

This rheocrene emerges near a road east of the sweetwater campground off Highway 120. The site has been extensively manipulated with a 36" diameter spring tank that has .6 m of standing water. There is another tank across the channel and downslope. There is a lot of old piping in the channel. Effects from the 2013 Rim Fire were limited in this area.

Hydrology, Geology, and Soil Notes

The water table was measured at 1 m on tape (see sketchmap). A second set of water flow measurements taken to determine diversions between Q1 and Q2 for the campground. Flow measurement was 0.043 l/sec at Q2 (see sketchmap). A soil pit was not indicated as the area is heavily disturbed, with no wetland and no soils.

Sweetwater Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Rubus armeniacus, RUAR9	
Alnus incana ssp. tenuifolia, ALINT	
Pseudoroegneria, PSEUD22	
Aquilegia formosa, AQFO	
Abies concolor, ABCO	
unknown Graminoid (grass or grasslike), 2GRAM	grass 1 no heads
Acer macrophyllum, ACMA3	
Pteridium aquilinum, PTAQ	
unknown Forb, dicot, 2FD	twinflower
Toxicodendron diversilobum, TODI	
Quercus kelloggii, QUKE	
Calocedrus decurrens, CADE27	

Sweetwater Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Northern Flicker, Colaptes auratus	call	

Invertebrate Species	Detection	Stage	Comments
DIP Chironomidae	benth	Larvae	
DIP Chloropidae	obs	Adult	face flies
DIP Culicidae Culiseta	obs	Adult	
MEG Corydalidae	spot	Larvae	
NEMA	benth		
ODO Aeshnidae Anax junius	obs	Adult	female and male
PLE	benth		
PLE Capniidae	benth		
PLE Nemouridae	benth		
TRI	benth		

Fauna Notes

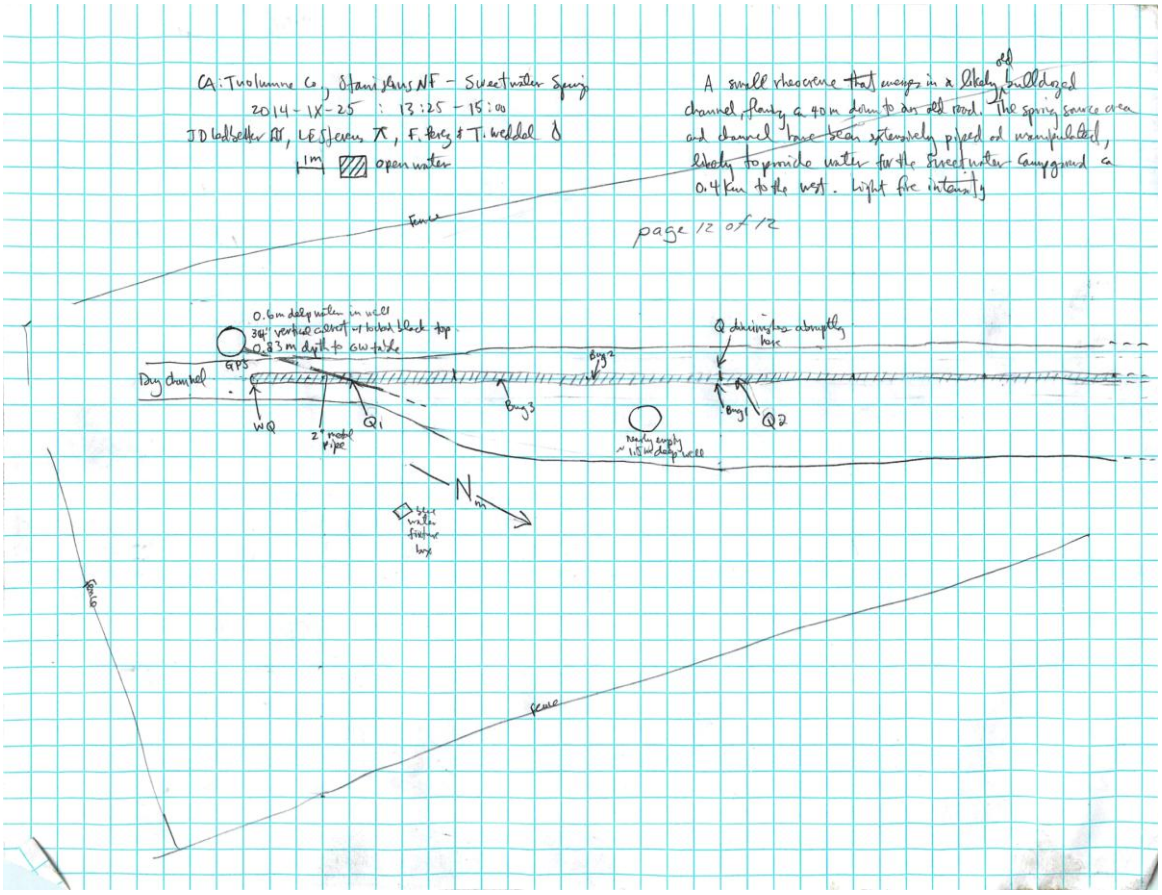
Three benthic samples were taken at 19.9m, 15.1m and 11.7 m. No species were collected at location 1, a low velocity sandbed. Location 2 was at a higher velocity gravel bed riffle. Location 3 was at a higher velocity sand bed riffle.

Inverts Collected ☑

Number of Reps: 3

Sweetwater Springs (continued)

Sketchmap



Disturbance

Hydrology: Water diversion (permanently diverted); Upgradient extraction of surface water or groundwater (prespring emergence); Downgradient capture of surface water or groundwater (post-spring emergence); Flooding;	Recreational effects: No recreational effects noted
	Animal effects: Trails by animals and people;
Soil alteration: Channel erosion; Excavation; Ground disturbance (general); Pipes; Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Enclosure (such as spring house, spring box, or concrete enclosure; Road (includes construction and maintenance;	

Sweetwater Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Fire effects
Geomorphology and Soils		
4) Landform stability not altered	False	Fire, road, excavation, diversion
5) Runout channel functioning naturally	False	Incised, excavated
6) Soil integrity not altered	False	Heavily manipulated & excavated. Fire, roads above and below.
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Site altered and partially dewatered; no orchids or rare spp.
10) Faunal species as anticipated	False	Flow alteration & fire impacts reduced the AQ invert assemblage
11) TES, SOI/SOC fauna as anticipated	False	Proximity to roads and campground not conducive to T&E & SOC spp
12) Invasive species not established	True	But much NN ground cover & grasses in adjacent uplands.
Disturbances		
13) Flow reg. not adversely affecting site	False	Water is being diverted likely to campground
14) Construction, Roads not affecting	False	Road above and below site
15) Fencing functions properly	False	Fencing down in sections
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Tecnu Springs ID# 159375

Survey Date:	9/2/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	235
Elevation (m):	893
Coordinates	37 53 42.1 Latitude -119 56 25.1 Longitude
Area:	47.5 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	1	Quercus kelloggii
Shrub	3	Acer macrophyllum
Graminoid		
Forb	2	Pteridium aquilinum
Aquatic		
Bryophyte	5	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.1

Water Quality (Single Location)

pH	7.42
Specific conductance (uS/cm)	178.0
Dissolved oxygen (mg/L)	6.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	15.1

Survey Notes

The 2013 Rim Fire burn intensity was low in this area. The seep emerges as rheocrene/hillslope in a steep, densely vegetated drainage with a lot of poison oak. Due to the conditions, surveyors were unable to set out a measuring tape, and the survey was somewhat less complete.

Hydrology, Geology, and Soil Notes

Flowcould not be measured, but was estimated. No soil pit was indicated, as this was a heavily disturbed rheocrene.

Tecnu Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Ceanothus integerrimus, CEIN3	
Datisca glomerata, DAGL2	
Artemisia douglasiana, ARDO3	
Mimulus moschatus, MIMO3	
Quercus kelloggii, QUKE	black
Amaranthus, AMARA	
moss, 2MOSS	
unknown Graminoid (grass or grasslike), 2GRAM	Grass 1
Rubus parviflorus, RUPA	
Asarum lemmonii, ASLE	
Agrostis stolonifera, AGST2	
Toxicodendron diversilobum, TODI	
Pteridium aquilinum, PTAQ	
Carex, CAREX	cf alma
Lamiaceae fam,	White mint, same as at Liverwort Spr.
Acer macrophyllum, ACMA3	
Vitis californica, VICA5	
Lupinus, LUPIN	
unknown Forb (herbaceous, not grass nor grasslike), 2FORB	like Lycopus, Sent to MW for ID

Tecnu Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
deer, Odocoileus	sign	tracks

Invertebrate Species	Detection	Stage	Comments
DIP Chloropidae	obs	Adult	many
DIP Culicidae	obs	Adult	many
HYM Apidae Apis mellifera	obs	Adult	many

Fauna Notes

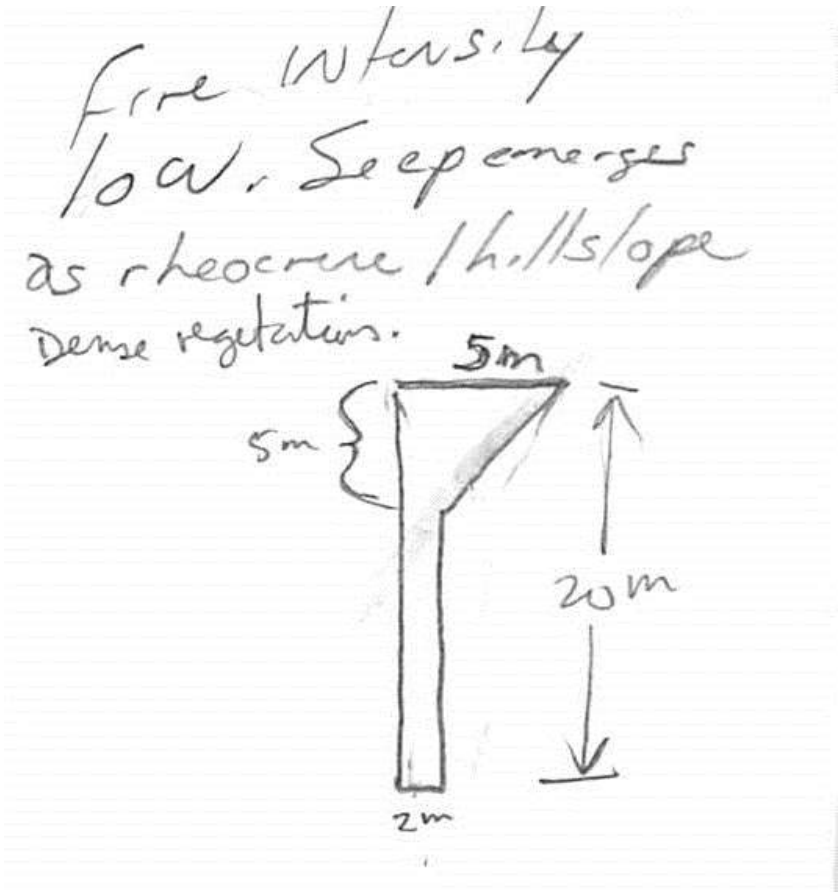
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Tecnu Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Trails by animals and people;
Soil alteration: Channel erosion; Erosion (general); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

Tecnu Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Incision, erosion
5) Runout channel functioning naturally	False	Incision, erosion
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	None expected in this steep channel
10) Faunal species as anticipated	True	Steep drainage - not expected
11) TES, SOI/SOC fauna as anticipated	False	Surrounding landscape does not appear adequate to support TES bird
12) Invasive species not established	True	
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Rim Fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Towhee Springs ID# 159380

Survey Date:	8/24/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	235
Elevation (m):	1362
Coordinates	37 57 22.9 Latitude -119 55 4.7 Longitude
Area:	378 square meters
Surrounding Vegetation:	Shrub dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	2	Salix scouleriana
Graminoid	4	Carex
Forb	1	Rubus parviflorus
Aquatic		
Bryophyte	5	
Unknown		

Survey Notes

There was evidence of past fire, prior to 2013 Rim fire. The road leads to the spring. There was a lot of trash and trailing nearby, but not at the site. Berming, excavation, and incision at the spring outflow suggests that it was dammed in the past.

Hydrology, Geology, and Soil Notes

The geologic structure type may have been seepage. The surveyors did not dig soil pits as this was a rocky channel.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Extensive standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.37

Water Quality (Single Location)	
pH	6.11
Specific conductance (uS/cm)	83.8
Dissolved oxygen (mg/L)	5.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	12.6

Towhee Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Anaphalis margaritacea, ANMA	
Lotus, LOTUS	Acmispon americanus var. nevadensis
Rumex acetosella, RUAC3	
Fragaria, FRAGA	
Juncus effusus, JUEF	
Asarum lemmonii var. nevadensis,	var.nevadensis
Conyza canadensis, COCA5	
Cirsium vulgare, CIVU	
Pseudoroegneria spicata, PSSPS	
Verbascum thapsus, VETH	
Pinus lambertiana, PILA	
Aquilegia formosa, AQFO	
Mimulus cardinalis, MICA3	
Mimulus floribundus, MIFL2	cf; small yellow flower
Rubus parviflorus, RUPA	
Actaea rubra, ACRU2	large leaf - collected
Fabaceae,	Astragalus-like bushy herb, sent to MW fo
Tragopogon dubius, TRDU	
unknown Forb, dicot, 2FD	erect aster w/expanded inflorescence/las
Bromus tectorum, BRTE	
Symphoricarpos, SYMPH	?
erythranthe guttata,	large yellow flower
Veronica catenata, VECA7	sp
Hypericum perforatum, HYPE	
Carex, CAREX	cf alma collected
Salix scouleriana, SASC	
Lessingia, LESSI	
Potentilla, POTEN	
Ceanothus integerrimus, CEIN3	
Agrostis stolonifera, AGST2	
Lepidium virginicum, LEVI3	
Epilobium, EPILO	ciliatum

Towhee Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Band-tailed Pigeon, Columba fasciata	obs	
deer, Odocoileus	sign	tracks
Lesser Goldfinch, Carduelis psaltria	obs	
Northern Flicker, Colaptes auratus	call	
Red-tailed Hawk, Buteo jamaicensis	call	
Spotted Towhee, Pipilo maculatus	obs	

Invertebrate Species	Detection	Stage	Comments
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	

Fauna Notes

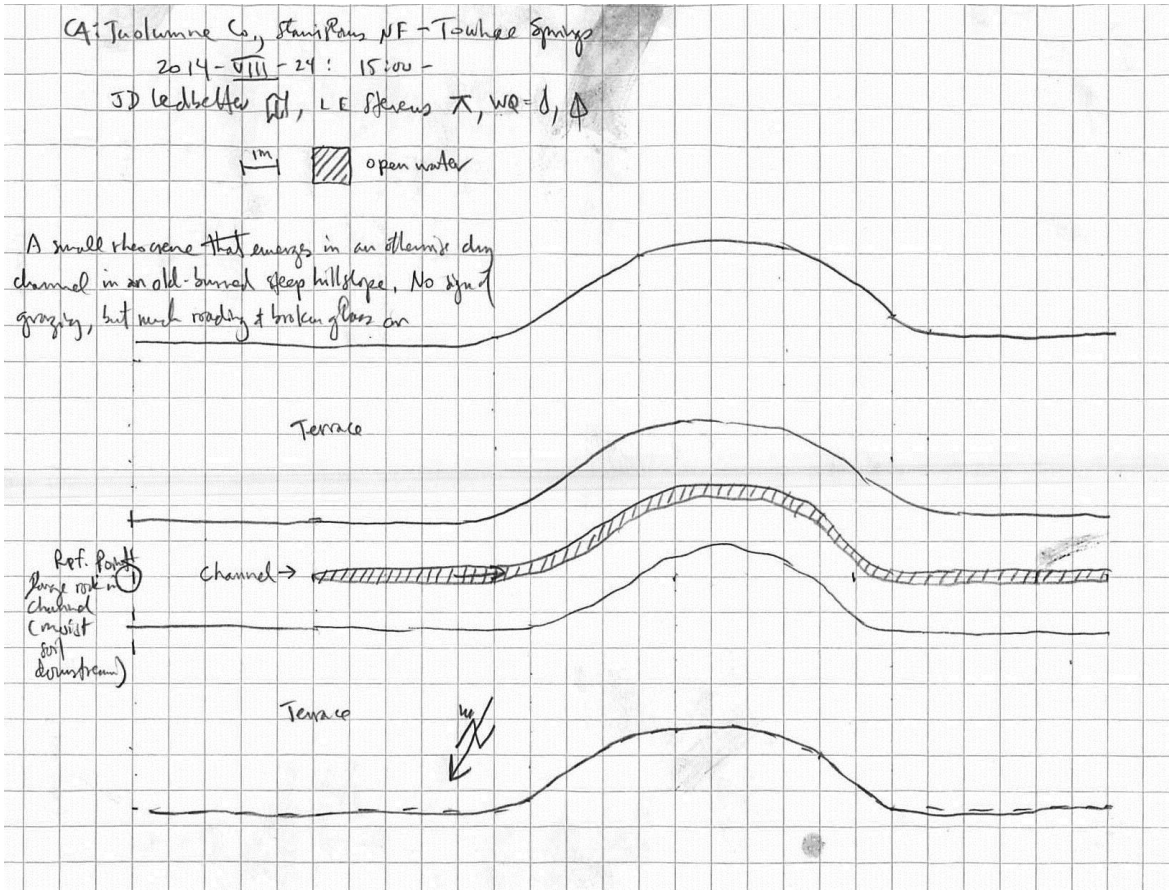
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Towhee Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: Camp sites; Tracks or trails by vehicles (ATV, 4WD, etc); Other recreational effects observed--see disturbance notes;
	Animal effects: Wild animals;
Soil alteration: Channel erosion;	Miscellaneous effects: Fire;
	Disturbance Notes
	Trash, tracks/trails nearby
Structures: Road (includes construction and maintenance; Other structures observed--see disturbance notes;	

Towhee Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	True	
5) Runout channel functioning naturally	True	
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	False	Paucity of aquatic insects
11) TES, SOI/SOC fauna as anticipated	False	Paucity of aquatic insects
12) Invasive species not established	False	NN spp are abundant
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	True	
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Treed Cubs Springs ID# 164150

Survey Date:	9/4/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	helocrene
Aspect (TN):	145
Elevation (m):	1588
Coordinates	38 2 37.6 Latitude -120 4 19.6 Longitude
Area:	500 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	5	Calocedrus
Shrub	4	Calocedrus
Graminoid	2	Eleocharis
Forb	1	Hypericum
Aquatic		
Bryophyte	3	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

This helocrene has been heavily grazed by cattle, resulting in pedestals, trampling, grazing, and browsing. Small cedars and other conifers are conolizing, in part because the site has apparently been drying out. Management recommendation: fencing to exclude livestock. The survey was concluded prematurely due to the approach of two bear cubs. Aspect, area, and slope were estimated, and there was no sketchmap.

Hydrology, Geology, and Soil Notes

Flow and water quality measurements were not possible due to no outflow. The soil pit was 35 cm, and depth to mineral layer was 30 cm. Texture was clay, dark gray 2.5Y N4/4 with a rich organic horizon, saturated with abundant roots.

Treed Cubs Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Calocedrus, CALOC2	
Juncus, JUNCU	
Ribes nevadense, RINE	?
Viola, VIOLA	
Eleocharis, ELEOC	
Asarum lemmonii, ASLE	
Carex, CAREX	
Mimulus, MIMUL	m
Hypericum, HYPER	
Ribes, RIBES	small-leaf
Juncus, JUNCU	lily-like
Juncus effusus, JUEF	
Cirsium vulgare, CIVU	
unknown Graminoid (grass or grasslike), 2GRAM	poa?
Epilobium, EPILO	cf ciliatum

Treed Cubs Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
American black bear, Ursus americanus	obs	2 cubs
American black bear, Ursus americanus	other	adult
coyote, Canis latrans	sign	tracks and scat
deer, Odocoileus	sign	scat
domestic cow, Bos taurus	sign	tracks, scat, pedistals
Red-breasted Nuthatch, Sitta canadensis	obs	
Steller's Jay, Cyanocitta stelleri	obs	

Fauna Notes

Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Treed Cubs Springs (continued)

Sketchmap

Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Compaction; Ground disturbance (general); Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Treed Cubs Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	False	dry but formerly wet meadow
2) Watershed (surface water) not altered	False	heavy burn
3) WQ changes not affecting site	False	No surface water
Geomorphology and Soils		
4) Landform stability not altered	False	Heavy cattle impacts
5) Runout channel functioning naturally	False	Entrenched
6) Soil integrity not altered	False	heavy cattle impacts on soils
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavy cattle impacts
9) TES, SOI/SOC flora as anticipated	False	Heavy cattle impacts
10) Faunal species as anticipated	False	Despite presence of bear, coyote & deer, site does not support prey
11) TES, SOI/SOC fauna as anticipated	False	The site does not support prey for T & E birds
12) Invasive species not established	False	Taraxicum & cirsium are abundant
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	obstruction of lateral flow due to roads
15) Fencing functions properly	True	
16) Herbivory not adversely affecting site	False	heavy cattle impacts
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	low-medium burn intensity from 2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Twomile Bridge Springs ID# 164151

Survey Date:	9/4/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	hillslope, unknown
Aspect (TN):	None
Elevation (m):	1535
Coordinates	38 2 28.9 Latitude -120 3 38.7 Longitude
Area:	287 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	4	Calocedrus decurrens
Shrub	5	Pseudotsuga menziesii
Graminoid	3	Juncus effusus
Forb	1	Pteridium aquilinum
Aquatic		
Bryophyte	2	
Unknown		

Survey Notes

The spring emerges above a trail near an old RR bridge over Twomile Creek. There are four sources. Based on water chemistry, surveyors suspect that this may be a diversion from Brushy Creek. There was moderate burn intensity from 2013 Rim Fire in this area. There were significant impacts to the runout from the trail and fallen trees.The area was determined by the sketchmap.

Hydrology, Geology, and Soil Notes

The secondary GDE type is anthropogenic. No soil pits were indicated, as the site is located on rocky colluvium on a steep hillslope.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.42

Water Quality (Single Location)

pH	
Specific conductance (uS/cm)	80.5
Dissolved oxygen (mg/L)	7.92
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	7.0

Twomile Bridge Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
unknown Forb (herbaceous, not grass nor grasslike), 2FORB	fern, not bracken; Sent MW for ID
Fragaria, FRAGA	
Pteridium aquilinum, PTAQ	
Carex, CAREX	cf alma
Mimulus cardinalis, MICA3	
Carex, CAREX	sp 2 *
Calocedrus decurrens, CADE27	
Ribes nevadense, RINE	Sent to MW for ID
unknown Forb, dicot, 2FD	6 leaf, cf Cornus canadensis; Sent MW for
Quercus kelloggii, QUKE	black
liverwort fam,	liverwort, sent to MW for ID
Mimulus moschatus, MIMO3	
moss, 2MOSS	
Hypericum anagalloides, HYAN2	
Monilophyta fam,	
Cirsium vulgare, CIVU	
Juncus effusus, JUEF	
unknown Graminoid (grass or grasslike), 2GRAM	Agrostis stolonifera? Grass 1
Pseudotsuga menziesii, PSME	
Epilobium ciliatum, EPCI	cf ciliatum
Carex, CAREX	Carex 1

Twomile Bridge Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
American black bear, Ursus americanus	sign	tracks nearby
Common Raven, Corvus corax	call	
domestic cow, Bos taurus	sign	tracks and scat
Northern Flicker, Colaptes auratus	call	
Red-breasted Nuthatch, Sitta canadensis	obs	
Steller's Jay, Cyanocitta stelleri	call	

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae	obs	Adult	mosquitoes

Fauna Notes

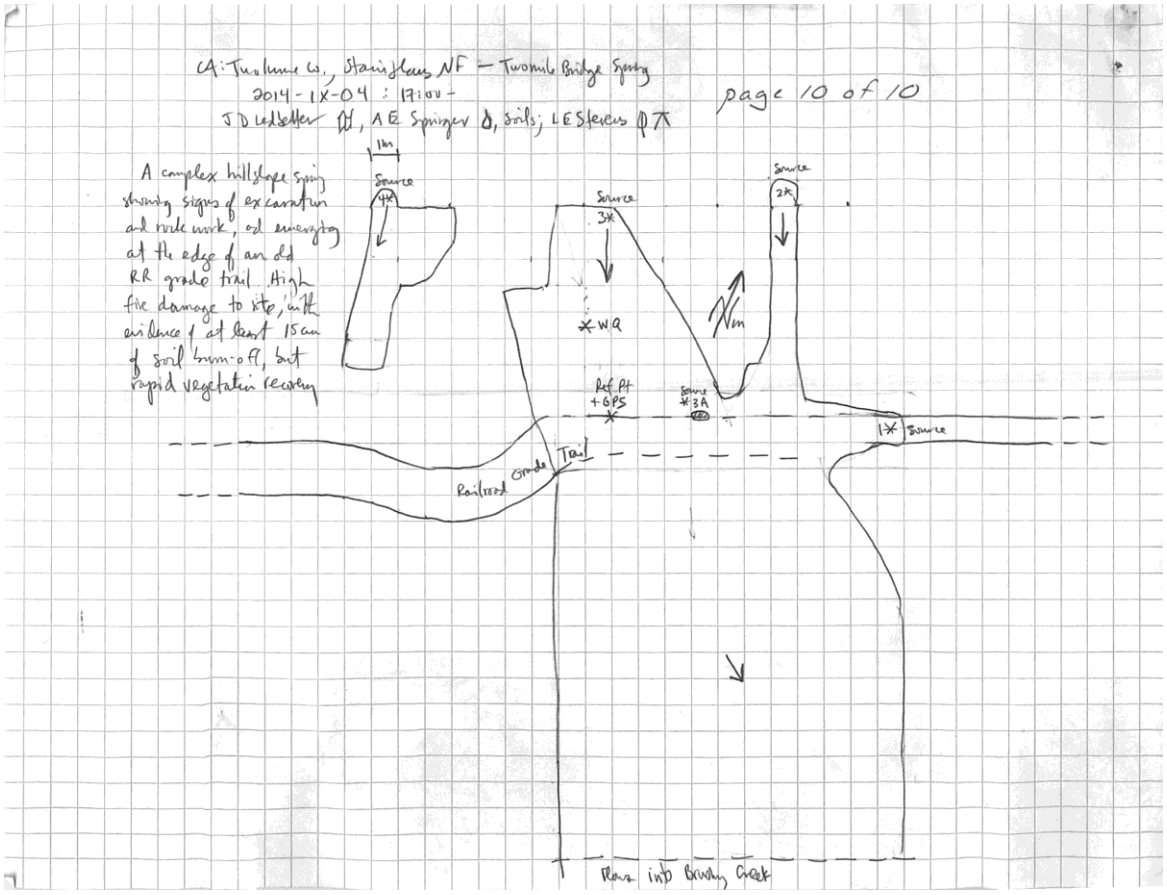
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Twomile Bridge Springs (continued)

Sketchmap



Disturbance

Hydrology: Other hydrologic alteration observed--see Disturbance notes	Recreational effects: Tracks or trails by vehicles (ATV, 4WD, etc); Other recreational effects observed--see disturbance notes;
	Animal effects: Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Excavation; Ground disturbance (general); Pipes; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Road (includes construction and maintenance;	Excavation upslope

Twomile Bridge Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Trail across runout is heavily trampled
Geomorphology and Soils		
4) Landform stability not altered	False	Source excavated/Trail across runout is heavily trampled
5) Runout channel functioning naturally	False	Source excavated/Trail across runout is heavily trampled
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Much sign of disturbance & monoculture of mimulus
10) Faunal species as anticipated	False	Few aquatic invertebrates
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	True	
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Trail crosses runout, old road
15) Fencing functions properly	False	Fencing not present
16) Herbivory not adversely affecting site	False	Heavily trampled, runout
17) Recreation not adversely affecting	False	Heavily trampled, runout
18) Other dist. not adversely affecting	False	Fire effects, mostly runout
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Vista Seep ID# 159413

Survey Date:	9/6/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	25
Elevation (m):	974
Coordinates	37 49 17.1 Latitude -120 2 12.8 Longitude
Area:	8 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Quercus
Graminoid	2	Carex
Forb	1	Mimulus cardinalis
Aquatic		
Bryophyte		
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	No standing or flowing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH

Specific conductance (uS/cm)

Dissolved oxygen (mg/L)

Dissolved oxygen saturation (%)

Oxygen-reduction potential (ORP)

Temperature (C)

Survey Notes

The burn intesity from the 2013 Rim Fire was moderate at this site. It is located on a steep colluvial slope that has been heavily manipulated for construction and maintenance of power lines.

Hydrology, Geology, and Soil Notes

Spring emerges beneath large powerline system Surveyors were unable to measure flow or water chemistry, as the small amount of flow was too diffuse. No soil pit was indicated, as this issite is on a steep, rocky, highly manipulated slope.

Vista Seep (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Rosa, ROSA5	cf woodsii
Carex, CAREX	cf alma
Cercocarpus, CERCO	long stem
Quercus kelloggii, QUKE	
Lactuca, LACTU	cf seriola
Quercus, QUERC	scrub oak nr Q. wislizenia
Mimulus cardinalis, MICA3	
unknown Forb, dicot, 2FD	powder pea
Rubus armeniacus, RUAR9	
Lupinus, LUPIN	tall

Vista Seep (continued)

Fauna

None

Fauna Notes

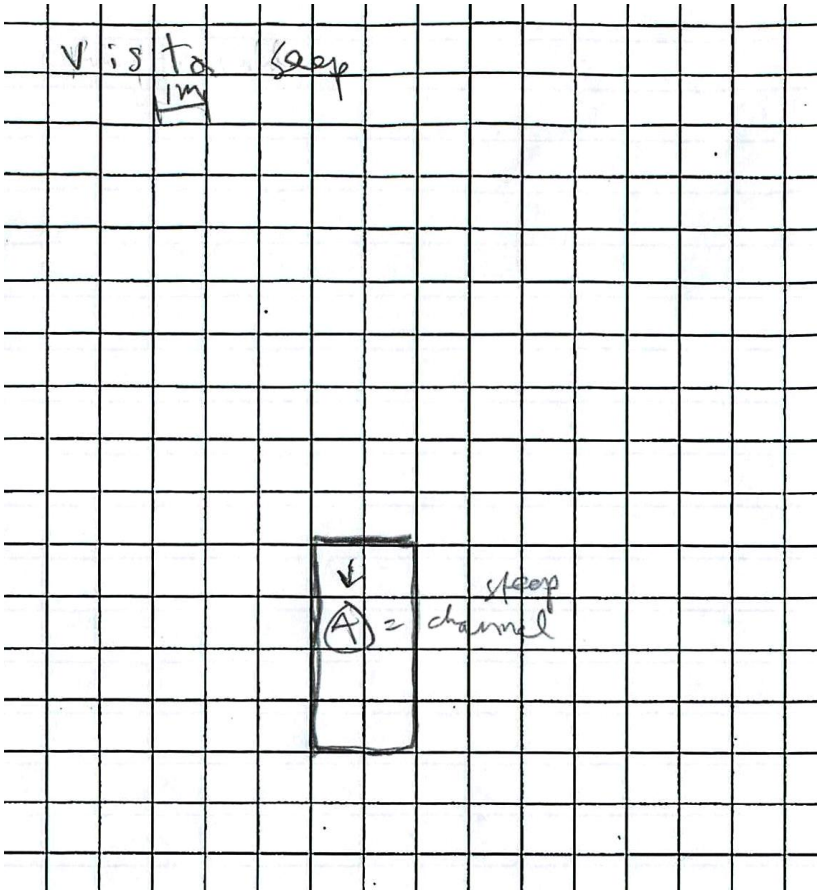
No benthic sampling was possible due to diffuse flow. There was no evidence of faunal species.

Inverts Collected ☐

Number of Reps:

Vista Seep (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Ground disturbance (general);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Power lines; Road (includes construction and maintenance;	

Vista Seep (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	UA	unable to measure water chemistry - moist soil only
Geomorphology and Soils		
4) Landform stability not altered	False	Power line area, bull dozer cut above
5) Runout channel functioning naturally	False	Power line area, bull dozer cut above, channel incised
6) Soil integrity not altered	False	channel incised
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Habitat altered by powerline construction and fire
10) Faunal species as anticipated	False	Insufficient water and associated habitat
11) TES, SOI/SOC fauna as anticipated	False	No habitat or resource for T&E species
12) Invasive species not established	False	Many non-native weeds
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	False	Bulldozer upslope
15) Fencing functions properly	NA	Neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Significant fire effects
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Walton Lower Spring ID# 159406

Survey Date:	9/27/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	None
Elevation (m):	741
Coordinates	37 52 37.3 Latitude -120 5 52.2 Longitude
Area:	354 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Alluvium
Lithology:	Metamorphic , Metavolvanic Rocks
Bryophyte Abundance:	None

Lifeform	Rank	Dominant Species
Tree		
Shrub	4	Acer macrophyllum
Graminoid	2	Cyperus eragrostis
Forb	1	Lotus oblongifolius
Aquatic	5	algae sp
Bryophyte		
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.065

Water Quality (Single Location)

pH	6.36
Specific conductance (uS/cm)	190.5
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	17.0

Survey Notes

This spring emerges 20 m upslope from the NHD point where there is a large stand of typha, but no flow. Flow only continues for about 20 m, then soaks into the ground. The entire area was severely burned during the 2013 Rim Fire. No trees remain alive, and the soil is burned off.

Hydrology, Geology, and Soil Notes

No soil pit was indicated, as this site is a heavily disturbed rheocrene.

Walton Lower Spring (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Pteridium aquilinum, PTAQ	
Acer macrophyllum, ACMA3	
Pseudoroegneria spicata, PSSPS	
Oxytenia acerosa, OXAC4	?
Salix scouleriana, SASC	
Hypericum anagalloides, HYAN2	
Polypogon australis, POAU3	yellow grass
Cyperus eragrostis, CYER	
Mimulus cardinalis, MICA3	
Agrostis, AGROS2	U Grass 2 - cf stolonifera ?
Conyza, CONYZ	cf canadensis
Calystegia malacophylla, CAMA38	
Verbascum thapsus, VETH	
Ceanothus integerrimus, CEIN3	var macrothyrsus
Lotus oblongifolius, LOOB2	
Lactuca, LACTU	cf seriola
Typha latifolia, TYLA	
Carex, CAREX	cf alma
Eriodictyon californicum, ERCA6	Yerba buena
Epilobium ciliatum, EPCI	
Salix lutea, SALU2	
Cirsium vulgare, CIVU	
Dieteria canescens,	diffuse aster cf subulatus
algae sp, 2ALGA	
Juncus, JUNCU	cf saximontanus

Walton Lower Spring (continued)

Fauna

Vertebrate Species	Detection	Comments
Common Raven, Corvus corax	call	
deer, Odocoileus	sign	scat
hummingbird, Archilochus fam	obs	juvenile female
Northern Flicker, Colaptes auratus	obs	
Steller's Jay, Cyanocitta stelleri	obs	
warbler, Parulidae	obs	
White-crowned Sparrow, Zonotrichia leucophry	obs	

Invertebrate Species	Detection	Stage	Comments
COL	spot	Adult	on burned log
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	dead
LEP Nymphalidae Phyciodes	obs	Adult	dead

Fauna Notes

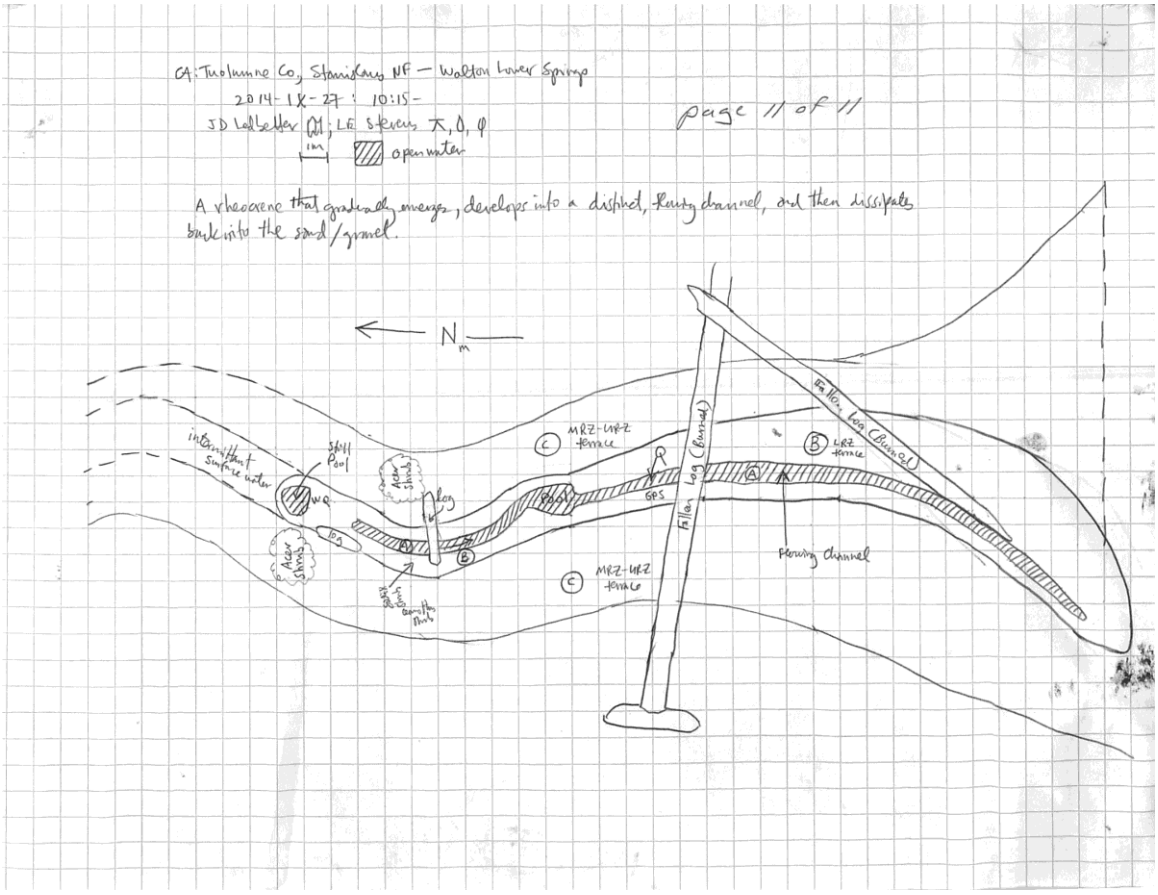
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Walton Lower Spring (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Erosion (general); Excavation; Ground disturbance (general); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

Walton Lower Spring (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Heavily burned, excavated and highly manipulated
Geomorphology and Soils		
4) Landform stability not altered	False	Highly manipulated, incised channel
5) Runout channel functioning naturally	False	Incised, excavated
6) Soil integrity not altered	False	Area highly manipulated and altered by fire, soils burned off
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Site has been heavily disturbed by past land use,fire, and flooding
10) Faunal species as anticipated	False	Surface water quality suports mostly ooze-dwelling spp.
11) TES, SOI/SOC fauna as anticipated	False	Site has been so heavily altered and burned that no SOC habitat exists
12) Invasive species not established	False	Cirsium, Agrostis, Lactuca are dominant NN plants.
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	UA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	Severe wildfire effects over time, including 2013 Rim Fire.
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Water Springs ID# 159363

Survey Date:	9/21/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene, hillslope
Aspect (TN):	48
Elevation (m):	1114
Coordinates	37 52 9.8 Latitude -119 57 59.5 Longitude
Area:	unknown
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Acer macrophyllum
Graminoid	1	unknown Graminoid (grass or grasslike)
Forb	2	Datisca glomerata
Aquatic	4	algae sp
Bryophyte	5	
Unknown		

Survey Notes

These springs emerge from 2 sources. One source is a seepage in a steep, rocky/bedrock channel that is diverted after 3m into a culvert. The other is a seepage into a roadside ditch that flows about 20 m and is then diverted into a culvert that passes under the road and is collected in a vertical pipe. There is a "water" sign pointing to this pipe. The 2013 Rim Fire effects are heavy and there are no live trees.

Hydrology, Geology, and Soil Notes

The secondary lithology is tonalite. Algae in pipe would affect water chemistry. Surveyors did not measure Dissolved Oxygen, and they were unable to measure flow accurately. They measured water chemistry at the vertical collection pipe, where the standing water was 60cm deep. No soil pit is indicated, as the site is in a steep, rocky channel and roadside ditch.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Groundwater outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)

pH	6.21
Specific conductance (uS/cm)	262.0
Dissolved oxygen (mg/L)	
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	17.0

Water Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Ribes nevadense, RINE	
Lotus oblongifolius, LOOB2	
Elymus, ELYMU	barley
Salix scouleriana, SASC	
Trifolium repens, TRRE3	
Juncus, JUNCU	cf bufonius
Acer, ACER	cf. Macrophyllum
Ceanothus integerrimus, CEIN3	
algae sp, 2ALGA	
Toxicodendron diversilobum, TODI	
Heuchera rubescens, HERU	cf.
Mimulus, MIMUL	
Plantago ovata, PLOV	
Deschampsia danthonioides, DEDA	cf.
unknown Graminoid (grass or grasslike), 2GRAM	
Lupinus latifolius var. columbianus,	
Veronica, VERON	
Rumex crispus, RUCR	
Datisca glomerata, DAGL2	
Trifolium wormskioldii, TRWO	red "clover"
Epilobium ciliatum, EPCI	
Cornus stolonifera, COSES	
Agrostis exarata, AGEX	"cf stolonifera" - collected

Water Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Northern Flicker, Colaptes auratus	obs	
Steller's Jay, Cyanocitta stelleri	obs	
warbler, Parulidae	obs	
Western Bluebird, Sialia mexicana	obs	
woodpecker, picidae fam	obs	black backed or hairy

Invertebrate Species	Detection	Stage	Comments
DIP Culicidae Culiseta	obs	Larvae	many
HYM Apidae Apis mellifera	obs	Adult	many
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Nymphalidae Phyciodes	obs	Adult	
LEP Pieridae Colias	obs	Adult	
LEP Pieridae Pieris rapae	obs	Adult	
ODO Coenagrionidae	obs	Adult	

Fauna Notes

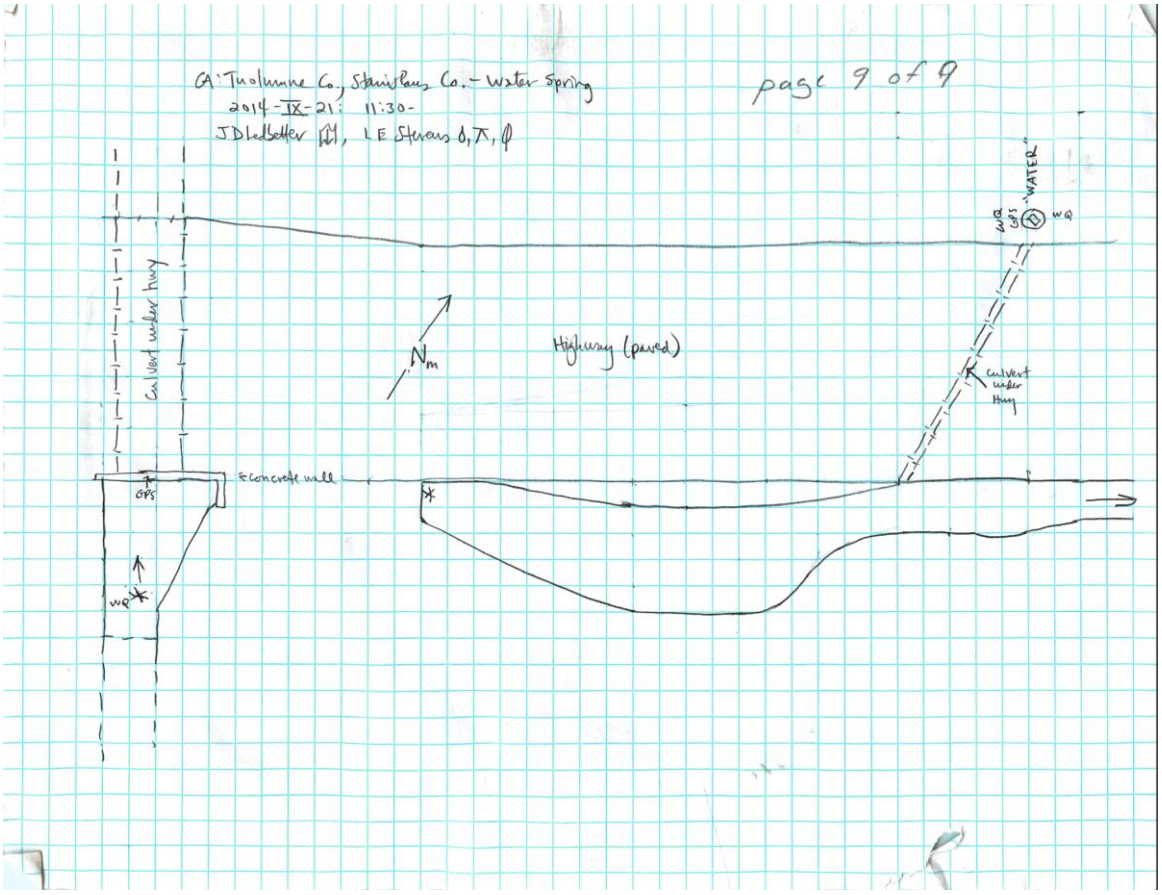
Benthic sampling was not possible due to no accessible flow.

Inverts Collected ☐

Number of Reps:

Water Springs (continued)

Sketchmap



Disturbance

Hydrology: Water diversion (permanently diverted); Flooding;	Recreational effects: No recreational effects noted
	Animal effects: No animal effects noted
Soil alteration: Channel erosion; Excavation; Ground disturbance (general);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: Enclosure (such as spring house, spring box, or concrete enclosure; Erosion control structure; Road (includes construction and maintenance; Other structures observed--see disturbance notes:	

Water Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Effects from fire, road built over source
Geomorphology and Soils		
4) Landform stability not altered	False	Effects from fire, road built over source
5) Runout channel functioning naturally	False	Effects from fire, road built over source
6) Soil integrity not altered	False	Effects from fire, road built over source
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	No suitable habitat for TES/SOC flora
10) Faunal species as anticipated	False	Highly disturbed site
11) TES, SOI/SOC fauna as anticipated	False	No habitat for T&E/SOC species
12) Invasive species not established	False	Non-native Agrostis, Veronica, and other weeds
Disturbances		
13) Flow reg. not adversely affecting site	False	Flow diverts to culverts
14) Construction, Roads not affecting	False	Road over source and runout
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	False	Road over source
18) Other dist. not adversely affecting	False	Heavy impacts from 2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Wet Meadows ID# 159460

Survey Date:	9/3/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	helocrene, rheocrene
Aspect (TN):	201
Elevation (m):	1611
Coordinates	38 2 29 Latitude -120 4 55.1 Longitude
Area:	688 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Colluvium
Lithology:	Igneous intrusive , Diorite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	3	Lonicera
Graminoid	1	Juncus
Forb	2	Taraxacum
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

The source has shifted downslope. There is an incised channel and the site is heavily trampled and grazed. Fire effects are light. A forest surrounds the site and there is very little biological diversity in the meadow, with many of the plant species (carex, juncus,herbs, and grasses) chewed to the ground. The area of the site was determined by the sketch map.

Hydrology, Geology, and Soil Notes

A 10 cm soil pit at the center of the site had silty sand, dark brown 7.5 YR 3/2 throughout. There were no redox concentrations, depletions, reduced matrices, Hydrogen Sulfide odor, and no reaction to HCl.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Some developing channels;
Water table depth single location (cm)	0
Flow estimate (L/sec)	0.037

Water Quality (Single Location)	
pH	6.00
Specific conductance (uS/cm)	82.0
Dissolved oxygen (mg/L)	0.18
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	20.7

Wet Meadows (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Verbascum thapsus, VETH	
Carex nebrascensis, CANE2	
Epilobium, EPILO	sp
moss, 2MOSS	
Hypericum, HYPER	
Pinus ponderosa, PIPO	
Juncus effusus, JUEF	
Taraxacum, TARAX	
Lilium, LILIU	cf. Parvum
Salix scouleriana, SASC	
Fragaria, FRAGA	
Cirsium vulgare, CIVU	
Lonicera, LONIC	
Trifolium, TRIFO	
Juncus, JUNCU	lily-like; cf. saximontanus

Wet Meadows (continued)

Fauna

Vertebrate Species	Detection	Comments
domestic cow, Bos taurus	obs	trampling/scat
gopher, Thomomys sp	sign	holes
Red-tailed Hawk, Buteo jamaicensis	obs	hunting

Invertebrate Species	Detection	Stage	Comments
LEP Nymphalidae Limenitidinae Adelpha californica	obs	Adult	
ODO Aeshnidae Anax junius	obs	Adult	

Fauna Notes

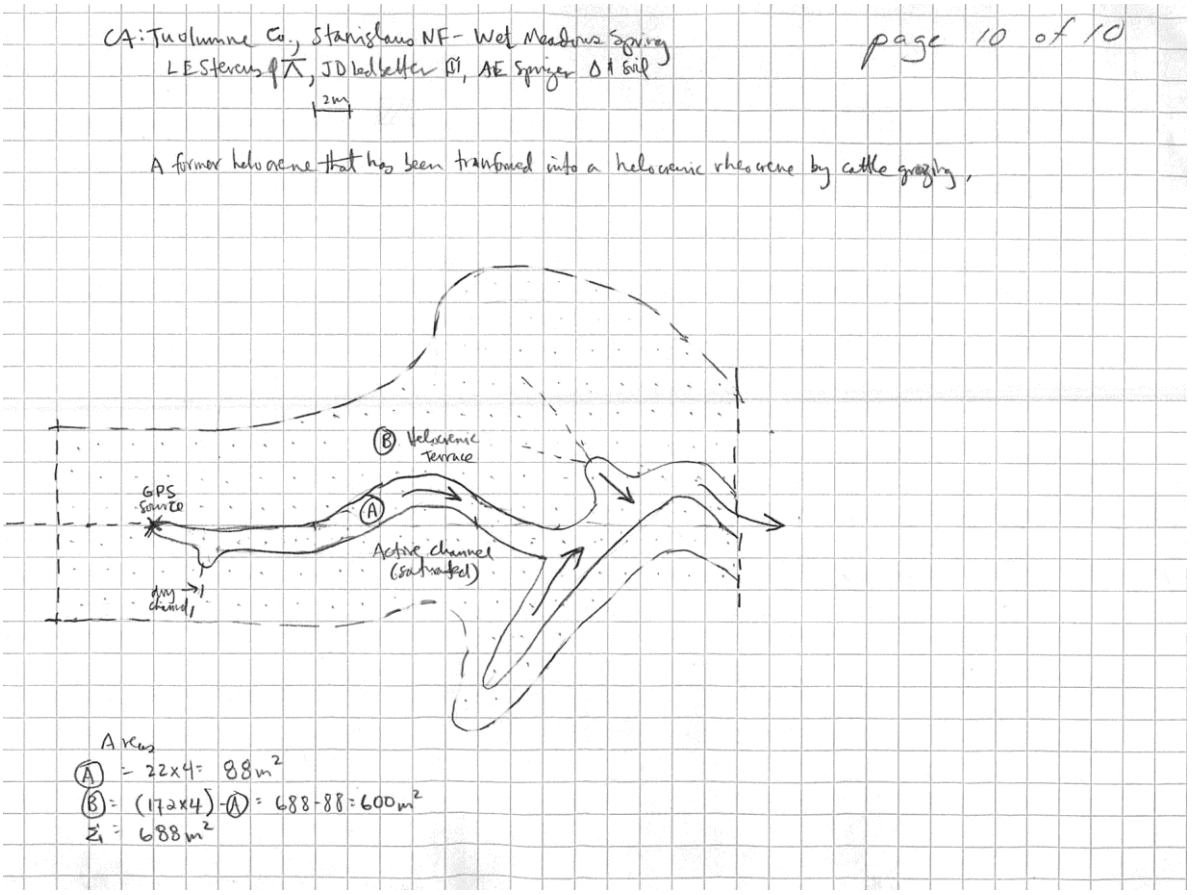
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

Wet Meadows (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Livestock; Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Compaction; Erosion (general); Gully erosion; Pedestals or hummocks (by people or animals); Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
Structures: No structures noted	

Wet Meadows (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	False	Heavily trampled and grazed
Geomorphology and Soils		
4) Landform stability not altered	False	Heavily trampled and grazed
5) Runout channel functioning naturally	False	Heavily trampled and grazed
6) Soil integrity not altered	False	Channel incised by trampling
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Heavily grazed down
9) TES, SOI/SOC flora as anticipated	False	If any focal spp exist they are not presently detectable
10) Faunal species as anticipated	False	No voles or AQ insects
11) TES, SOI/SOC fauna as anticipated	False	This site is unlikely to support T&E birds or their prey
12) Invasive species not established	False	Taraxacum, Poa, Cirsium vulgare present
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	No fencing present; could be helpful
16) Herbivory not adversely affecting site	False	heavily trampled and grazed
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	heavily trampled and grazed
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

White Lupine Springs ID# 159378

Survey Date:	9/23/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene, hillslope
Aspect (TN):	318
Elevation (m):	1494
Coordinates	37 46 53.4 Latitude -119 57 23.3 Longitude
Area:	100 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Colluvium
Lithology:	Metamorphic , Schist
Bryophyte Abundance:	Common component

Lifeform	Rank	Dominant Species
Tree	1	Abies concolor
Shrub	3	Cornus stolonifera
Graminoid		
Forb	2	Lupinus
Aquatic		
Bryophyte	4	
Unknown		

Survey Notes

This rheocrene hillslope emerges in a steep avalanche chute and on the hillslope above it. The area was moderately affected by the 2013 Rim Fire. The flow crosses an abandoned road below, with some passing through a culvert. Some of that flow is piped to a constructed pond above Packard Canyon Rd.

Hydrology, Geology, and Soil Notes

Water quality sample was taken at the uppermost seepage. No soil pit was indicated, as the site is in an avalanche chute that is heavily disturbed.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.072

Water Quality (Single Location)	
pH	6.19
Specific conductance (uS/cm)	53.0
Dissolved oxygen (mg/L)	6.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	14.6

White Lupine Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Cornus stolonifera, COSES	
moss, 2MOSS	
Maianthemum stellatum, MAST4	False Soloman's seal
Calocedrus decurrens, CADE27	
Nasturtium, NASTU2	
Pseudotsuga menziesii, PSME	sapling
Quercus kelloggii, QUKE	
Dicentra formosa, DIFO	* leaves only
Mimulus cardinalis, MICA3	
Pteridium aquilinum, PTAQ	
Heuchera rubescens, HERU	*
Lupinus, LUPIN	L. latifolia var. columbiana
Abies concolor, ABCO	
Galium triflorum, GATR3	
Epilobium ciliatum, EPCI	
Ceanothus integerrimus, CEIN3	seedling
Salix scouleriana, SASC	
Boraginaceae,	Goodyeara-like basal rosette, no white ve
Aquilegia formosa, AQFO	
Rubus parviflorus, RUPA	
Ribes nevadense, RINE	
Spiranthes romanzoffiana, SPRO	
Asyneuma prenanthoides, ASPR10	

White Lupine Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Northern Flicker, Colaptes auratus	obs	
passerine,	obs	dead-eaten
Steller's Jay, Cyanocitta stelleri	obs	
warbler, Parulidae	obs	yellow

Invertebrate Species	Detection	Stage	Comments
DIP Tipulidae	obs	Larvae	
DIPL	spot	Adult	millepede
EPH	spot		
MEG Corydalidae	spot	Larvae	
MOLL	spot	Adult	large landsnail

Fauna Notes

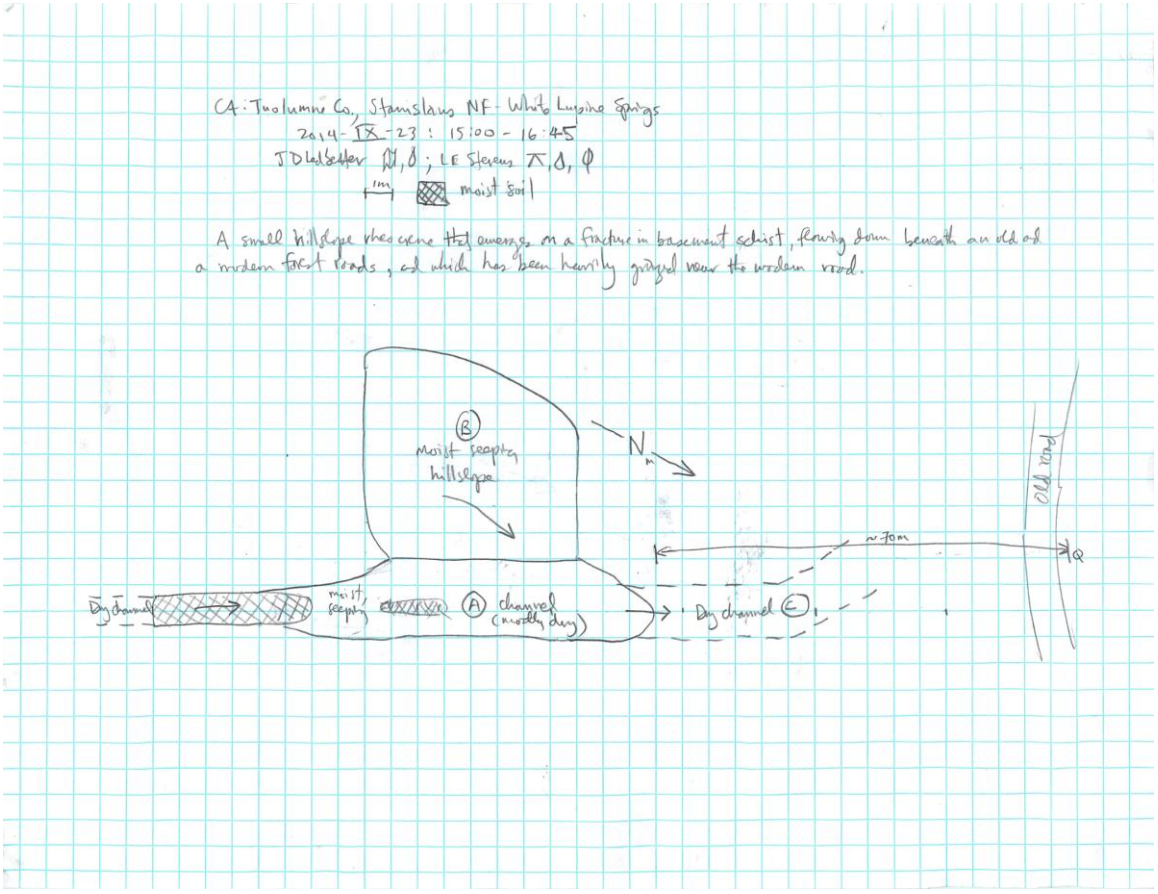
Benthic sampling was not possible due to insufficient flow.

Inverts Collected ☐

Number of Reps:

White Lupine Springs (continued)

Sketchmap



Disturbance

Hydrology: Downgradient capture of surface water or groundwater (post-spring emergence);	Recreational effects: Tracks or trails by vehicles (ATV, 4WD, etc);
	Animal effects: Trails by animals and people;
Soil alteration: Channel erosion; Debris flow; Erosion (general); Ground disturbance (general); Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: Road (includes construction and maintenance;	

White Lupine Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Some channel incision due to fire, but mostly natural.
5) Runout channel functioning naturally	False	Crosses old road, through culverts and pipes.
6) Soil integrity not altered	True	
Biology		
7) Vegetation composition as anticipated	False	False
8) Vegetation condition is healthy	False	Somewhat reduced cover and vigor from expected condition
9) TES, SOI/SOC flora as anticipated	False	Habitat only marginally adequate to support T&E and SOC plants.
10) Faunal species as anticipated	False	Some wetland and AQ insects, but little flow/highly disturbed channel
11) TES, SOI/SOC fauna as anticipated	False	Habitat insufficient to provide resources for T&E and SOC spp.
12) Invasive species not established	False	Nasturtium officinale in channel.
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Wild Ginger Springs ID# 164147

Survey Date:	9/4/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Mi-Wok
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	33
Elevation (m):	1506
Coordinates	38 1 37.3 Latitude -120 4 15 Longitude
Area:	37 square meters
Surrounding Vegetation:	Tree dominated
Surficia Material:	Alluvium
Lithology:	Igneous extrusive , Andesite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree	1	Calocedrus decurrens
Shrub	2	Ribes nevadense
Graminoid	4	Carex
Forb	3	Asarum lemmonii
Aquatic		
Bryophyte	5	
Unknown		

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Groundwater inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water; Some developing channels;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	0.21

Water Quality (Single Location)

pH	6.24
Specific conductance (uS/cm)	140.5
Dissolved oxygen (mg/L)	5.00
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	8.4

Survey Notes

The fire intensity was low at this site, but severe in surrounding forest and a short distance downstream. This would be an excellent long-term monitoring site should an exclosure be installed to protect it from grazing domestic cattle.

Hydrology, Geology, and Soil Notes

No soil pits were indicated as this was a rheocrene in a rocky channel with no soil. No soil pits were indicated, as this was a rocky, heavily disturbed channel.

Wild Ginger Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
moss, 2MOSS	
unknown Forb, dicot, 2FD	tiny white sprayflower
Ribes nevadense, RINE	
Agrostis scabra, AGSC5	1 - nr Agrostis stolonifera
Fragaria, FRAGA	
Pinus lambertiana, PILA	
Carex, CAREX	cf alma
unknown Forb, dicot, 2FD	celery-like = Berula?
Asarum lemmonii, ASLE	
Ribes, RIBES	cf. roezlii, small leaf, sent to MW for ID
Asarum lemmonii, ASLE	
Calamagrostis purpurascens, CAPU	
Alnus incana ssp. tenuifolia, ALINT	
unknown Graminoid (grass or grasslike), 2GRAM	
Epilobium ciliatum, EPCI	ssp. Ciliatum
Lupinus, LUPIN	
Goodyera, GOODY	
Ceanothus integerrimus, CEIN3	long stem
Arnica, ARNIC	
Galium triflorum, GATR3	large
Ranunculus, RANUN	
Quercus kelloggii, QUKE	
Humulus lupulus, HULU	
Calocedrus decurrens, CADE27	
Pseudotsuga menziesii, PSME	
Juncus effusus, JUEF	
frangula parshiana,	

Wild Ginger Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Blue-gray Gnatcatcher, Polioptila caerulea	obs	
domestic cow, Bos taurus	sign	tracks and scat
hawk, Buteo	obs	
Mountain Chickadee, Poecile gambeli	obs	
red squirrel, Tamiasciurus hudsonicus	obs	
sparrow, Passer sp	call	
Steller's Jay, Cyanocitta stelleri	obs	

Invertebrate Species	Detection	Stage	Comments
ANNE	benth	Other	rep 3 eggs
DIP	benth	Larvae	rep 1
DIP Chironomidae Chironomus	benth	Larvae	rep 2
EPH	benth	Larvae	rep 1
EPH	benth	Larvae	rep 3
MOLL Physidae	benth	Adult	rep 3
PLE	benth	Larvae	rep 1
PLE	benth	Larvae	rep 3
TURB	benth	Adult	rep 3

Fauna Notes

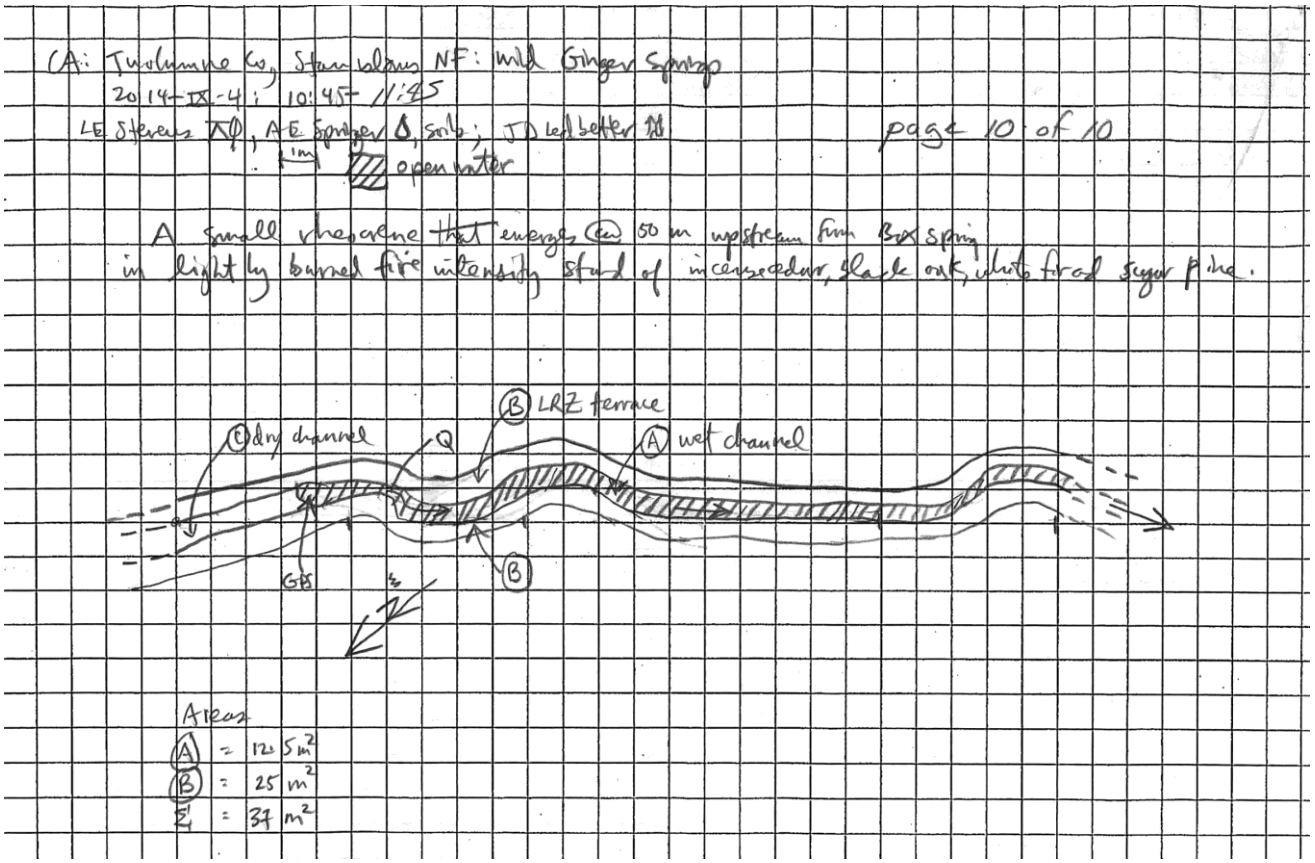
Surveyors completed 3 sampling reps: 1) meter 20, .02 sq m, gravel & mud woody debris, 3 cm deep, vel 0.05 m/sec; 2) meter 15, mod leaf litter, 0.02 sq m, vel 0, 10 cm deep; 3) gravel floor & moc, 0.02 sq m, vel 0.1 m/sec, 2 cm deep

Inverts Collected ☑

Number of Reps: 3

Wild Ginger Springs (continued)

Sketchmap



Disturbance

Hydrology: No hydrologic disturbance noted	Recreational effects: No recreational effects noted
	Animal effects: Grazing or browsing (by ungulates); Trails by animals and people; Trampling (by ungulates, native or nonnative);
Soil alteration: Channel erosion; Ground disturbance (general); Pedestals or hummocks (by people or animals); Pipes; Trails (by people or animals);	Miscellaneous effects: Fire;
	Disturbance Notes
Structures: No structures noted	

Wild Ginger Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	heavily grazed and trampled by cattle
5) Runout channel functioning naturally	False	Heavily grazed and trampled by cattle
6) Soil integrity not altered	False	heavily grazed and trampled by cattle
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	True	
10) Faunal species as anticipated	True	
11) TES, SOI/SOC fauna as anticipated	True	
12) Invasive species not established	True	
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	
15) Fencing functions properly	False	Fencing not present; would be appropriate
16) Herbivory not adversely affecting site	False	heavily grazed and trampled by cattle
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	True	
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

Plant codes and native status are from the USDA PLANTS database web page: http://plants.usda.gov

Winding Springs ID# 159356

Survey Date:	9/24/2014
Ownership:	USFS
Region, Forest:	5, Stanislaus
District:	Groveland
State, County:	CA, Tuolumne

GDE Type(s):	rheocrene
Aspect (TN):	145
Elevation (m):	1280
Coordinates	37 49 55.3 Latitude -119 53 31.4 Longitude
Area:	372 square meters
Surrounding Vegetation:	Herbaceous/nonvascular dominated
Surficia Material:	Alluvium
Lithology:	Igneous intrusive , Granite
Bryophyte Abundance:	Minor component

Lifeform	Rank	Dominant Species
Tree		
Shrub	2	Salix scouleriana
Graminoid	3	Agrostis exarata
Forb	1	Rubus parviflorus
Aquatic	5	algae sp
Bryophyte	4	
Unknown		

Survey Notes

This spring emerges in an incised channel in a heavily forested area that suffered severe effects from the 2013 Rim Fire. No large trees remain alive. There were several pools in the channel, the lowest being about 0.5m deep. The area was calculated from the sketchmap.

Hydrology, Geology, and Soil Notes

Surveyors were unable to measure flow due to no outflow; there were a series of pools, so they measured water chemistry in the standing water. Only alluvial sediments were present; no soil pit was indicated.

Hydrologic Attribute	Results
Water table type	Apparent
Inflow pattern	Surface water inflow dominated
Outflow pattern	Surface water outflow dominated
Surface water	Patches of standing water;
Water table depth single location (cm)	Undetermined
Flow estimate (L/sec)	Undetermined

Water Quality (Single Location)	
pH	6.63
Specific conductance (uS/cm)	206.0
Dissolved oxygen (mg/L)	4.50
Dissolved oxygen saturation (%)	
Oxygen-reduction potential (ORP)	
Temperature (C)	17.7

Winding Springs (continued)

Plant Species of Interest

Species, USDA Symbol	Comments
Trifolium repens, TRRE3	
Calystegia malacophylla, CAMA38	cream-flowered morning glory
algae sp, 2ALGA	
Juncus saximontanus, JUSA	iris-like
Galium, GALIU	
Pteridium aquilinum, PTAQ	
Rumex acetosella, RUAC3	Dicot 3 buckwehat - samll with narrow inf
Aquilegia formosa, AQFO	
Salix scouleriana, SASC	
Mimulus moschatus, MIMO3	
Lilium, LILIU	12-leaf radiating leaves, cf parvum
Mimulus cardinalis, MICA3	
Aster, ASTER	canescens, purple clump forming
Ceanothus integerrimus, CEIN3	long stem
Salix lasiandra var. lasiandra,	* ?
Pinus lambertiana, PILA	seedling
Astragalus, ASTRA	?
Lupinus, LUPIN	tall purple
Gastridium phleoides, GAPH2	
Anaphalis margaritacea, ANMA	
Equisetum arvense, EQAR	
Rubus parviflorus, RUPA	
Pseudognaphalium stramineum, PSST7	*
Carex, CAREX	cf alma
Agrostis exarata, AGEX	yellow grass
moss, 2MOSS	

Winding Springs (continued)

Fauna

Vertebrate Species	Detection	Comments
Common Raven, Corvus corax	call	
Northern Flicker, Colaptes auratus	call	

Invertebrate Species	Detection	Stage	Comments
DIP Chloropidae	obs	Adult	face flies
LEP Lycaenidae Polyommatinae Plebejus lupini	obs	Adult	
LEP Nymphalidae Adelpha californica	obs	Adult	
LEP Pieridae Pieris rapae	obs	Adult	
ODO Aeshnidae Rhionaeschna	obs	Adult	female

Fauna Notes

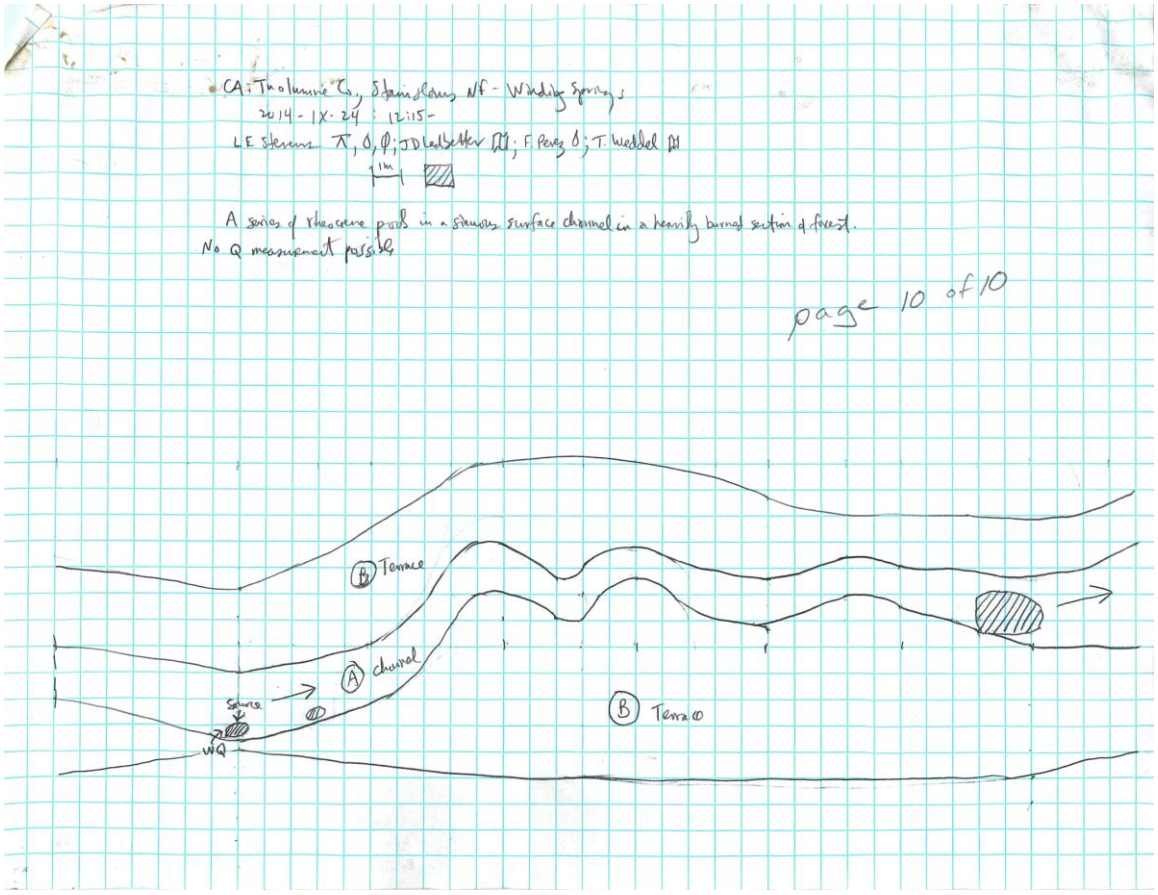
Surveyors were unable to conduct benthic sampling as there was no flowing water.

Inverts Collected ☐

Number of Reps:

Winding Springs (continued)

Sketchmap



Disturbance

Hydrology: Flooding;	Recreational effects: Other recreational effects observed--see disturbance notes;
	Animal effects: Trails by animals and people;
Soil alteration: Channel erosion; Erosion (general); Rill erosion; Trails (by people or animals);	Miscellaneous effects: Fire; Tree cutting (timber harvest or other);
	Disturbance Notes
	Recreational effects include miscellaneous trash at the site.
Structures: Road (includes construction and maintenance;	

Winding Springs (continued)

Management Indicators

1) Aquifer (groundwater) not altered	True	
2) Watershed (surface water) not altered	True	
3) WQ changes not affecting site	True	
Geomorphology and Soils		
4) Landform stability not altered	False	Heavy impacts from 2013 Rim Fire
5) Runout channel functioning naturally	False	Incised
6) Soil integrity not altered	False	Channel incised
Biology		
7) Vegetation composition as anticipated	True	True
8) Vegetation condition is healthy	True	
9) TES, SOI/SOC flora as anticipated	False	Adjacent uplands are severely burned, affecting tree demography
10) Faunal species as anticipated	False	Ash and sediment loading in channel limit aquatic invertebrate life
11) TES, SOI/SOC fauna as anticipated	False	Stream and adjacent habitats are insufficient to support SOC fauna
12) Invasive species not established		Phleum, Trifolium, and Convolvulus are NN plants present
Disturbances		
13) Flow reg. not adversely affecting site	True	
14) Construction, Roads not affecting	True	Monitor fugitive dust
15) Fencing functions properly	NA	Fencing neither present nor indicated
16) Herbivory not adversely affecting site	True	
17) Recreation not adversely affecting	True	
18) Other dist. not adversely affecting	False	2013 Rim Fire
Administrative Context		
19) Cultural values don't affect mgmt		
20) Land ownership is FS around site		
21) Other landowners not affecting site		
22) Land Mgmt Plan provides protection		
23) Env. compliance occurring		
24) Water use not affecting site		
25) Water rights filed, not outstanding		

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