

Appendix A – Site Ratings and Justifications

Lower Joseph Creek Watershed Assessment Interpreting Indicators for Rangeland Health

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
4	<p>Cow Creek – Special use</p> <p>Subwatershed: Lower Swamp Creek</p> <p>Open ridge top at 4099ft, on 6-7% south facing slope.</p>	<p>Slight to moderate departure (4.3). Bare soil higher than expected and biotic crusts less than expected for site. Surface soil loss or movement associated with bare soil, annual vegetation, and/or gopher activity. Soil resistance on the lower side of the expected range for the site. Intermound soils are most degraded. Pedestals most common in intermounds where soil is shallower and flow patterns most extensive. Mosses</p>	<p>Slight to moderate departure (4.2). Water-flow patterns slightly greater than expected for site and (rills) are associated with bare ground. Flow patterns are stable and short given high bare ground percent – this is due to patchiness of bare ground and low slope angle.</p>	<p>Moderate to extreme departure (3.5). Annual grasses dominate the site. Low site production due to high annual grass population. Historic seeding of mounds with THIN. Native plants account for only 20% of current vegetation.</p>	<p>Slight to moderate departure from expected (3.9). Litter cover is slightly greater expected. All samples taken from bare exposed soils.</p>	<p>Mound intermound soil complex</p> <p>Ecosite: Mountain Loamy (18) for mounds – Parsnip soil.</p> <p>Mountain very shallow (27) for intermound - Bocker soil</p> <p>Soil: Parsnip-Bocker Complex 0-15% slopes.</p> <p><i>Parsnip</i> is predominately associated with mounds; moderately deep (20 – 25”) silty loam over silty clay loam.</p> <p><i>Bocker</i> is predominately associated with intermounds; very shallow (less than 10 inches), silt loam to very cobbly loam to clay loam. Surface basalt rock moderate</p>	<p>FEID-KOMA (mounds) – early seral due to annual invasion, planted non-native perennials, loss of FEID and KOMA and an increase in POSA12.</p>

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		associated with areas of high surface rock.				to high cover.	
7	Davis Creek/ Davis South Subwatershed: Lower Swamp Creek Open meadow on upper shoulder of plateau top at 4430ft on 18% southeast facing slope.	Moderate Departure (3.7). Soils are very loose and exposed. The rating is due to historic soil loss by erosion and degradation. Bare soils are greater than expected for the site, rill slightly more, flow patterns show instability and pedestalling is greater than expected for the site. There is no soil compaction.	Moderate Departure (3.5). Rating due to number and length of flow patterns being what is expected but with some instability and deposition. Pedestalling much greater than expected – up to 3 inches height. Soil is moving downslope to bench below	Moderate Departure (4.2). Due to increase in bare ground and subsequent decrease in perennial density. Dominant species expected for the site are moderately reduced - loss of annual production. Weeds/invasive species are scattered throughout the site. PSSP6 and POSA12 perennials are reproducing well.	Slight to moderate departure from expected for soils under litter (3.6). Loose and exposed soils with less litter than expected for this site. There is a great amount of gopher activity on this site. This may account for some of the site stability and hydrologic conditions of concern.	Ecosite: Mountain Shallow (22) Current management does not appear to be exacerbating the soil erosion Soil: Bocker-Anatone complex 15-30% slope <i>Anatone</i> is the dominant soil type for the analysis area; Shallow, silt loam to very cobbly loam to very cobbly clay loam. Surface rock moderate to high cover. <i>Bocker</i> is the less dominant soil; very shallow, very cobbly silt loam over cobbly clay loam.	FEID-PSSP6/ BASA – mid seral. Increase in PSSP6, SYAL, ROSA which are a sign of disturbance. Decrease in FEID, all species within plant association present.
8	Davis/ Davis West Subwatershed: Lower Swamp Creek	None to slight departure (4.9). Soil and site stability appear to be in very good condition. Only bare	None to slight departure (4.9). Site shows signs of stability and – erosion and water flow patterns match	None to slight departure (4.6). Composition of invasive species is slightly greater than expected for the site.	None to slight departure from expected (5.7). Soil and site stability appear to be in very	Ecosite: Mountain Shallow South (36) Soil: Anatone-Bocker – Fivebeaver complex 15-30% slopes	FEID-KOMA (Ridgetop) with associated POSA12 and DAUN – early

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	Plateau/ridge-upper shoulder (<i>Anatone-Bocker soils</i>) at 4793ft on 16% southeast facing slope and open forested meadow (<i>Fivebeaver Soil</i>) adjacent to site.	ground was noted as slightly greater than expected for the site. This may be associated with high gopher activity and recent prescription burn. Biological crusts exist where site has not been disturbed by gophers	what is expected for the site. Minimal evidence of past or current soil deposition or erosion.	Bromes are present primarily in disturbed areas; areas that have been burned, and below the road. Functional groups have been slightly reduced from expected due to invasion of annual grasses and MAGR.	good condition. No evidence of historic surface soil loss, no evidence of accelerated erosion and deposition, and litter amount matches what is expected for the site.	<i>Anatone</i> is the dominant soil type for the analysis area; Shallow, silt loam to very cobbly loam. Surface rock moderate to high cover. <i>Bocker</i> is the less dominant soil; very shallow, very cobbly silt loam over cobbly clay loam. Surface rock is moderate to high.	seral due to decrease in FEID, increase in DAUN and POSA12, gopher activity, and increase in invasive annuals.
9	Swamp Creek/ Little Elk Subwatershed: Lower Swamp Creek Forested hillslope, at 4466ft on 5-8% southwest facing slope.	No departure (5.0) from expected conditions. Site does not deviate from expected conditions. Bare soil is low, vegetative ground cover is high, surface soil resistance is high.	None to Slight Departure (5.0). Low gradient and good soil resistance to erosion, no water flow patterns, good ground cover. Litter is primarily composed of PIPO needles and CARU leaves. Good infiltration. Soil compaction limited to areas with skid trails.	None to Slight Departure (5.0). Site does not deviate from what is expected for the site. Functional groups have high vigor and good, diverse composition. Annual vegetation production and invasive plant matches what expected for site. BRTE primarily associated with skid trails.	None to Slight Departure (6.0). Low gradient, minimal surface soil loss or degradation (except on skid trails within analysis area). Bare soil is low, vegetative ground cover is high,	Ecosite: MLRA009 – Loamy Dry pine (ABGR/CARU and PIPO/ CARU) Soil: Syrupcreek-Lowerbluff complex 2-15% slopes <i>Lowerbluff</i> is the dominant soil type for the analysis area; well drained, shallow ashly loamy skeletal soil associated with PSME/PIPO mixed conifer open forested sites. Surface soil typically has 0-1 inch of slightly decomposed needles and twigs.	PIPO/SYAL – mid to late seral. Plant association species present and at expected levels. Site compaction is limiting some vegetation growth.

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						<p><i>Syrupcreek</i> is the less dominant soil type for the analysis area; a well drained moderately deep ashy silt loam over very cobbly loam, over basalt.</p>	
10	<p>Swamp Creek/Miller</p> <p>Subwatershed: Joseph Creek/ Sumac Creek</p> <p>Open meadow on ridge shoulder top at 4531ft on 17% south/southeast facing slope.</p>	<p>Moderate Departure (3.7). Due to historic soil loss and degradation. Bare soil is greater than expected (15-40%). Mosaic pattern of bare ground tends to correspond with soil depth. As depth decreases – bare soil increases. Surface soil is missing on the majority of bare soil areas; surface gravel content increased. Pedestals are associated with flow patterns, and are slightly active. Some surface sealing from rain splash impact. Minimal biotic crust anchored to plant bases and rocks.</p>	<p>Sight to moderate departure (4.5). Number and length of water flow patterns slightly greater than expected for site. Erosion is primarily in the form of sheet erosion with some instability and deposition in areas were slope and surface texture change. Surface litter is less than what is expected (5% cover) and generally associated with BRTE. Surface soil resistance slightly less than expected for site.</p>	<p>Slight to moderate departure (4.4). Number of functional and structural groups of grasses and forbs are slightly to moderately less than what is expected for site, but in a mosaic pattern that tends to correspond with soil depth and bare soil patterns. Annual grasses are common throughout the site, primarily on shallow, bare soils. Patches of annuals are up to 100-200’ in square area. Annual production is slightly to moderately reduced from what is expected for the site. The reproductive capacity of perennial plants is not reduced.</p>	<p>Slight to moderate departure from that expected for surface soils under litter (4.1). Litter cover is less than expected for the site; only 5%. Where not historically eroded, surface soil retains fine granular structure and good infiltration.</p> <p>Slight to moderate departure from expected for subsoil at 1.5” depth (2.8). Historic loss of</p>	<p>Ecosite: Mountain Shallow South (36)</p> <p>Soil: Anatone-Bocker – Fivebeaver complex 15-30% slopes</p> <p><i>Anatone</i> is the dominant soil type for the analysis area; shallow 10-15” deep), silt loam to very cobbly loam to very cobbly clay loam. Surface rock moderate to high cover.</p> <p><i>Bocker</i> is less dominant soil type; very shallow, very cobbly silt loam over cobbly clay loam. Surface soil typically has 0-1 inch of slightly decomposed needles and twigs.</p>	<p>FEID-PSSP6/LUSE – early seral. All plant association species present, but at a decrease percentage than expected as a result of invasion of annual grasses.</p>

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					surface soil associated with bare soils, soil erosion hazard has increased over natural conditions – predominant soil erosion is sheet erosion.		
11	<p>Swamp Creek/ Starvation Ridge</p> <p>Subwatershed: Lower Swamp Creek</p> <p>Open meadow on ridge shoulder to mid slope at 4380ft on 20-30% south west facing slopes</p>	<p>None to slight departure (5.0). Very little ground disturbance. Rills, water flow patterns, pedestals, and bare ground all within the range of expected values for this ecosite. Moderate amounts of soil biotic crusts – but expected to be within normal range for the site and slope steepness. No compaction or evidence of soil degradation.</p>	<p>None to slight departure (5.0). Rills, water flow patterns, pedestals, and bare ground all within the range of expected values for this ecosite. Under current conditions the ground cover is high, and litter what is expected for the site.</p>	<p>None to slight departure (5.0). Number and composition of structural and functional groups closely match that expected for the site. Only LUPIN and POTEN is missing from expected plants. Very few annual grasses (expected amount for site). Not expected to increase.</p>	<p>No departure (6.0) for surface soils under plant or litter cover.</p> <p>Only soil disturbance is slight pedestalling associated with elk hoof trailing and shearing.</p> <p>This site has a high erosion hazard potential when soils are exposed. Under current conditions soils are stable and not moving</p>	<p>Ecosite: Mountain Shallow South (36)</p> <p>This site was noted to be a good future reference site</p> <p>Soil: Anatone-Bocker Rock Outcrop Complex, 15-30% slopes.</p> <p><i>Bocker</i> is the dominant soil type for the analysis area; very shallow, very cobbly silt loam over cobbly clay loam.</p> <p><i>Anatone</i> is the less dominant soil; Shallow, silt loam to very cobbly loam to very cobbly clay loam. Surface rock cover is moderate to high.</p>	<p>FEID-PSSP6/ BASA – later seral. Reference condition site. Small amount of invasive annual grasses present.</p>

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					down slope.		
12	<p>Swamp Creek/ Miller Unit</p> <p>Subwatershed: Joseph Creek/ Sumac Creek</p> <p>Located on the nose of dividing ridge between - Joseph Creek/ Sumac Creek SWS and Joseph Creek/ Cougar Creek SWA. Actual location is on the Joseph Creek/ Sumac Creek SWS</p> <p>Open meadow ridge shoulder at 4468ft on 60% southeast facing slope.</p>	Slight departure (4.7) predominately due to bare ground being slightly higher than expected for the site. Bare areas are small and rarely connected. Soil resistance to erosion is slightly lower than expected for the site. No surface soil compaction noted. Biological crusts and moss cover is fair to good.	Slight departure (4.7). Litter cover match that expected for the site. Bare ground is slightly greater than expected for the site. Rills, water flow patterns and pedestals match that expected for the site. Soil resistance of bare soils slightly reduced from that expected for the site	Slight departure (4.2). Number and composition of structural and functional groups slightly reduced from that expected for the site. There is greater amount of POSA12 than FEID. Annual grasses primarily in disturbed areas within the site.	<p>Slight to moderate departure from expected for bare/exposed soil at 0.5 inch depth (3.9).</p> <p>Historic loss of surface soil and exposure of subsoil may account for lowered soil stability rating.</p>	<p>Ecosite: Mountain Shallow South (36)</p> <p>Soil: Bocker-Imnaha Rock Outcrop Complex, 30-60% slopes</p> <p><i>Bocker</i> is the dominant soil type for the analysis area; very shallow, very cobbly silt loam over cobbly clay loam. Surface rock cover is high.</p> <p><i>Imnaha</i> soil is less dominant; shallow to moderately deep gravelly silt loam over very gravelly silt loam to very gravelly loam over unweathered bedrock.</p>	FEID-PSSP6/ BASA – mid to late seral. Can see soil movement. Potentially causing a decrease in native grass establishment. Some invasive annual grasses are present.
13	<p>Al Cunningham/ Shoot Canyon</p> <p>Subwatershed: Joseph Creek/ Sumac Creek</p>	Moderate Departure (4.1). Due to historic soil loss and degradation. Bare soil is greater than expected (20-35%).	Moderate Departure (3.8). Water flow patterns and pedestalling matches that expected for site, but some evidence of	Moderate to extreme departure from that expected for the site (3.2). Number and diversity of functional and structural groups	<p>Slight to moderate departure from that expected the site (3.4).</p> <p>Due to soil</p>	Ecosite: Due to the site’s plant functional structural group deterioration; the site appears to fit into both:	ERST2/POSA 12 – early seral. Few PSSP6 and POSA12. High

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	Open meadow on upper shoulder of plateau top at 4322ft elevation on 5-10% south facing slope.	Historic surface soil loss is evident in bare soil areas by increase in surface soil sheet wash and gravel exposure. Soil compaction in surface 1-2 inches is moderately widespread. Signs of surface soil sealing and compaction appears to be moderately restricting infiltration.	minor active erosion. Infiltration is greatly reduced due to lack of deep rooted perennial plant roots, lack of surface litter, and associated surface soil sealing. Even with high annual grass composition; litter cover is low.	is dramatically reduced from what is expected for the site. Invasive plants dominate the site. Site productivity has been reduced to 20-40% of that expected for the site. Only two POSA12 plants observed.	degradation, soil stability has been compromised. Samples taken from bare/ exposed sites at 0.5 inch depth.	Mountain Shallow South (36) and Mountain Loamy (18) Soil: Bocker-Anatone Complex, 0-15% slopes. <i>Anatone</i> is the predominant soil for the analysis area; Shallow, fine gravelly to gravelly silt loam to very cobbly clay loam. Surface rock cover is moderate. <i>Fivebeaver</i> is the predominant soil in open forested areas; shallow to moderately deep silt loam to gravelly silt loam.	percentage of invasive annual grasses, erosion is contributing to decline in rangeland health.
15	Chico Administrative Use Site #1/ Horse Pasture Subwatershed: Joseph Creek/ Sumac Creek Site is on the divide of Upper Joseph Creek Watershed and Chesnimnus Creek Watershed – but site	Slight to moderate departure (4.6). Due to evidence of some historic soil surface loss and degradation. Pedestals are 1-2” in height with minor active erosion. Shallow soils tend to be sensitive to hoof shearing when moist or wet. Soil resistance of bare soils was less than expected. Deeper	Slight to moderate departure (4.3). Shallow soils display a greater number and length of water flow patterns and are larger and more connected than expected with some instability and deposition, hoof shear impact, and a greater amount of bare ground than expected. Gopher activity is moderate.	Moderate departure (3.9). On the deeper soils the number and structural groups are moderately to extremely reduced from that expected for the site with annual grasses common throughout in large patches. Shallower soils have slightly to moderately reduced functional and structural groups from what is expected for	No departure from expected for soils under litter (6.0). Surface litter cover is above what is expected for the site due to presence of annuals. Moderate departure from expected for soils without litter cover	Ecosite: Shallow South (31) and South (30) Site is composed of a mosaic of shallow and moderately deep soils Soil: Gwinly-Mallory-Kettenback complex, 15-30% slopes. <i>Kettenback</i> is the dominant soil type for the analysis area; Moderately deep stoney silt loam over gravelly silt loam, with distinct clay films.	PSSP6-POSA12 (Basalt) – early seral with a decrease in PSSP6, and an increase in invasive annual grasses, LASE. Seral state appears stable. Increase in ACMI was also noted.

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	<p>characterizes the immediate vicinity of Joseph Creek/ Sumac Creek</p> <p>Open meadow on mid slope of plateau breakland, at 4078ft elevation on 25-30% south facing slopes.</p>	soils have good soil resistance, and an abundance of litter due to annual grasses.		the site, with annual grasses present only in disturbed areas.	(2.3). Most likely due to a lack of litter cover and potentially due to historic loss of surface soil.	<i>Gwinly</i> is the less dominant soil type; Shallow, very cobbly silt loam over very cobbly silty clay loam.	
16	<p>Fine/ Peavine #4</p> <p>Subwatershed: Joseph Creek/ Peavine Creek</p> <p>Site is on the divide of Upper Joseph Creek Watershed and Chesnimnus Creek Watershed – but site characterizes the immediate vicinity of Joseph Creek/ Sumac Creek</p>	<p>Moderate Departure (4.1). Due to historic soil loss and degradation. Bare soil is greater than expected (25%) and in larger, more continuous patches than expected. Soil compaction in surface 1.5 inches is moderately widespread. Signs of surface soil sealing on bare soils and compaction appears to be moderately restricting</p>	<p>Moderate Departure (4.1). Water flow patterns are match what is expected for the site, but some evidence of minor, active erosion. Pedestals are up to 1-2” in height, in patches up to 4” diameter and concentrated in flow paths. Predominant soil erosion is rainsplash and sheet erosion. Soil is not moving off site, but being caught in litter, change in micro-topography, rocks</p>	<p>Slight to moderate departure (4.1). Due primarily to functional and structural groups being moderately reduced from what is expected for this site, slightly greater plant decadence, reduced annual production, and presence of annual grasses and invasive annual grasses being present primarily within disturbed sites which are scattered throughout the site. Perennials grasses on site appear to be reproducing at</p>	<p>None to slight departure from expected for soils without litter cover (4.1). Soil samples were taken from both mound and intermound soil types. Most likely due to more bare soil than expected for the site, and potentially due to historic loss of surface soil.</p>	<p>Ecosite: Mountain Very Shallow (27)</p> <p>Mound/intermound plant and soil complex</p> <p>Adjacent to site is a Loamy skeletal dry pine ecosite on <i>Fivebeaver</i> soil type</p> <p>Soil: Bocker-Anatone-Rock Outcrop Complex, 2-15% slopes.</p> <p><i>Bocker</i> is the predominant soil for intermounds areas. Soil is very shallow (less than 10 inches), very gravely to very cobbly silt loam to silty clay to very cobbly loam to</p>	<p>PSSP6 – POSA12 (Scabland) with weak FEID/KOMA (Mounds). The mounds are short in stature and a small percentage of the area. Mounds are very early seral with a loss of soil, native plant communities, and increase in invasive</p>

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	Open ridgetop meadow at 4402ft elevation on a 5% south facing slope.	infiltration. Good moss/biotic cover in areas not exposed and with high rock content.	and plant bases due to low slope angle.	expected levels.		clay loam. Surface basalt rock is moderate to high cover. <i>Anatone</i> is the predominant soil on the mounds; shallow, fine gravelly silt loam to very cobbly clay loam. Surface rock cover is low to moderate.	annual grasses, Scablands and in mid seral condition. Some invasive annual grasses noted and loss of surface soil.
17	Cougar Creek/ Muddy Creek Subwatershed: Joseph Creek/ Sumac Creek Site is on the divide of Upper Joseph Creek Watershed and Chesnimnus Creek Watershed – but site characterizes the immediate vicinity of Joseph Creek/ Sumac Creek Actual location is on the Lower Crow Creek SWS	None to slight departure (4.7). Soil and site stability appear to be in very good condition. Only compaction from historic and past ground based logging was noted as being moderately greater than expected for the site. Aerial extent of detrimental compaction was estimated at less than 20%. Soil compaction is recovering naturally through root penetration and freeze thaw activity. Compaction was noted.	None to slight departure (4.7). Low gradient and good infiltration and soil resistance to erosion. No water flow patterns, good ground cover. Litter amount is what is expected for the site. It is a mosaic of slightly decomposed grasses and PIPO needles and twigs. Soil compaction limited to areas with skid trails. Canopy cover helps alleviate rain splash impact and surface erosion.	None to slight departure (4.7). Number and composition of structural and functional groups closely match that expected for the site. Very few annual grasses (expected amount for site). Bromes are present under pine trees used for bedding. Plant mortality, decadence and reproductive capability match that expected for the site.	No departure from that expected for the site (6.0). Stability samples taken under litter. Bare ground cover averaged 0-5% (primarily needle drop). It was higher on <i>Anatone</i> and <i>Bocker</i> open meadow soils (5-10%), but within the expected range for the site.	Two ecosites are represented on this site: Ecosite: Forested Loamy Skeletal Dry Pine – associated with open forested areas with <i>Fivebeaver</i> soil and PIPO/ CARU plant association. Ecosite: Mountain Shallow (27) – associated with open meadow areas with <i>Anatone</i> soil. Soil: <i>Anatone</i> - <i>Bocker</i> - <i>Fivebeaver</i> Complex, 0-15% slopes. <i>Bocker</i> is the predominant soil for open meadow areas. Soil is very shallow (less than 10 inches), very gravelly to very cobbly silt loam to silty clay to very cobbly loam to clay loam. Surface rock cover is	PSME/SPBE – mid seral. Forest is more open than expected, mostly likely from past timber harvests. Openness has allowed PSSP6, FEID, and POSA12 to increase on the site. Also an increase in invasive annual grasses.

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	Open meadow and open forested ridgetop at 4861ft elevation on a 5% north facing slope.					low to moderate. <i>Fivebeaver</i> is predominately associated with open forested areas; Shallow gravelly ashy silty loam to cobbly ashy silty loam over bedrock. Surface soil typically has 0-1 inch of slightly decomposed needles and twigs.	
18	Cougar Creek/ Peavine Subwatershed: Lower Swamp Creek Open forested (25% canopy closure) on upper 1/3 to middle slope of plateau at 5036ft elevation on 5% north/ northwest facing slope.	None to slight departure (5.0) from expected conditions. Site does not deviate from expected conditions. Bare soil is low, vegetative ground cover is high, surface soil resistance is high. Only compaction from historic and past ground based logging was noted as being moderately greater than expected for the site. Aerial extent of detrimental compaction was estimated at less than 20%. Soil	None to slight departure (5.0) from expected conditions. Low gradient and good infiltration and soil resistance to erosion. No water flow patterns, good ground cover. Litter cover and amount is what is expected for the site. Litter is composed of slightly decomposed, grass, tree needles and twigs. Soil compaction limited to areas with skid trails. Canopy cover helps alleviate rain splash impact and surface erosion.	None to slight departure (5.0) from expected conditions. Number and composition of structural and functional groups plant mortality, vigor, decadence and reproductive capability match that expected for the site. Annual grasses and invasive annual grasses are few, and match that expected for the site.	None to slight departure from that expected for the site (5.6). Stability samples taken under litter. Bare ground cover averaged 0-5% (primarily needle drop).	Ecosite: Loamy Skeletal Dry Pine Plant association: ABGR-PIPO/CARU Soil: Syrupcreek ashy silt loam, 0-15% slopes. <i>Syrupcreek</i> soil is a moderately deep ashy silt loam over a very cobbly loam with distinct clay films, over basalt bedrock. Surface 1-2 inches of soil is composed of partially decomposed needles, grass, and some surface moss. Surface 0-2 inches is composed of partially decomposed needles and twigs.	PSME/CARU – early to mid seral, mostly likely from past logging. Increase in LUPIN. Good herbaceous cover was noted.

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		compaction is recovering naturally through root penetration and freeze thaw activity. No cattle related compaction was noted.					
19	<p>Cougar Creek/ Cougar</p> <p>Subwatershed: Joseph Creek /Cougar Creek</p> <p>Site is on the divide of Upper Joseph Creek Watershed and Chesnimnus Creek Watershed – but site characterizes the immediate vicinity of Joseph Creek/ Sumac Creek</p> <p>Open meadow on upper 1/3 to mid slope of ridge at 4865ft elevation on 15-20% south facing slope.</p>	Slight to moderate departure (4.4). Due to evidence of some historic soil surface loss and degradation. Pedestals are slightly more common in water flow patterns with minor active erosion. Bare soil was moderately greater than expected for the site (25-35% as opposed to 10-15%) due to reduced plant canopy cover and microbiotic crusts. Soil resistance of bare soils was less than expected. Soil with cover, (generally on deeper	Slight to moderate Departure (4.4). Water flow patterns and pedestalling are slightly more common than expected for site, with some evidence of active erosion – predominantly in the form of sheet erosion. Flow patterns and soil movement decrease with increase in slope and increase in vegetation or soil cover. Infiltration is slightly reduced due to change in plant composition, decrease in surface litter between perennial grasses, and	Slight to moderate/moderate departure (4.2). Due to the slight reduction in the number of functional and structural groups, (FEID and PSSP6), expected for the site <p>Invasive annual grasses scattered throughout in large patches. Annual production was estimated to be 40-60% of the potential for the site based on recent weather.</p>	None to slight departure from expected for soils under cover (5.6). Surface litter is slightly above what is expected for the site. Moderate departure from expected for soils without cover (2.6). Samples taken in plant interspaces. Reduced stability likely due to lack of organic cover and to historic loss of surface soil.	<p>Ecosite: Mountain Very Shallow (27)</p> <p>Soil: Bocker-Anatone complex, 15 -30% slopes.</p> <p><i>Anatone</i> is the dominant soil type for the analysis area; shallow, very gravelly to cobbly silt loam to very cobbly silty clay loam. Surface rock cover is moderate to high</p> <p><i>Bocker</i> is the less dominant soil; very shallow (less than 10 inches), very gravelly to very cobbly silt loam to silty clay to very cobbly loam to clay loam. Surface basalt rock is moderate to high cover.</p>	PSSP6-POSA12 (Scabland) – early seral due to increase in invasive annual grasses. Slight soil movement and a decrease in PSSP6 noted.

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		soils), have good soil resistance, and an abundance of litter due to annual grasses.	associated surface soil sealing. Infiltration matches that expected for the site in areas with increased litter associated with annual grasses.				
20	Swamp Creek/ Lower Swamp Subwatershed: Joseph Creek/ Cougar Creek Open meadow on ridge shoulder, upper slope and nose ridge at 4262ft elevation on 30% north facing slope.	None to slight departure (4.8). Site soil and stability indicators match what is expected for the site except pedestals/ terracettes and amount of bare ground. Amount and number of terracettes are greater than expected for the site with minor active erosion. Bare soil was slightly greater than expected, and associated with terracettes. Bare soils has good soil resistance.	None to slight departure (4.8) from expected conditions. Infiltration is not affected by changes in plant community composition and distribution. No water flow patterns, and good ground cover except in areas associated with terracettes. Litter cover and amount is what is expected for the site. Good soil resistance to erosion.	No departure (5.0) from expected conditions. Number and composition of structural and functional groups plant mortality, vigor, decadence and reproductive capability match that expected for the site. Invasive annual grasses are few, and match that expected for the site.	None to slight departure from expected for site (5.3). Samples taken at 1” depth from bare soils adjacent to or within small terracettes. Little to no surface soil degradation or loss was noted. Surface litter cover is amount expected for the site. There	Ecosite: Shallow South (31) and South (30) Site is composed of a mosaic of shallow and moderately deep soils. Soil: Gwinly-Mallory-Kettenback complex, 15-30% slopes. <i>Gwinly</i> is the dominant soil type for the analysis area; Shallow, very cobbly silt loam over very cobbly silty clay loam associated with Shallow South (31) <i>Kettenback</i> is the less dominant soil; moderately deep stony silt loam over gravelly silt loam, with distinct clay films, associated with Shallow South (30).	FEIS-PSSP6/ BASA – late seral. Plant community present with all species and at expected levels. Slightly more ERHE than expected.
22	Table Mountain/	Slight to moderate/	Slight to moderate/	Slight to moderate/	None to slight	Ecosite: Mountain Shallow	FEID-PSSP/

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	<p>Thorn Hollow</p> <p>Subwatershed: Joseph Creek/ Cougar Creek</p> <p>Open meadow on ridge shoulder at 3433ft elevation on 60% south facing slope.</p>	<p>moderate departure (4.1) due to historic soil surface loss and degradation. Bare ground is moderately greater than expected for the site and generally associated with terracettes, perennial plant interspaces and shallow soil. Surface soil loss is associated with terracettes (approximately 0.5 to 1.5 inches of soil loss)</p>	<p>moderate departure (4.1). Terracettes are common in flow paths and associated with bare/exposed soils. Uphill portions/ walls of terracettes are slumping onto treads. There are more rills than expected for the site. Some active minor rill formation and some inactive, old rills with blunted features. Evidence of minor erosion in water flow patterns, especially on exposed soils. Predominant soil erosion is sheet erosion concentrated on bare soils associated with terracettes.</p>	<p>moderate departure (4.3). Due to the slight to moderate reduction in PSSP6 expected for the site and annual grasses (BRTE) scattered throughout, particularly in concave or moist areas and in very shallow soils between perennial grass interspaces. POSA12 appears to be dying out. Annual production was estimated to exceed 80% of the potential for the site.</p>	<p>departure from expected for soils under cover (5.0). Surface litter is slightly less than what is expected for the site. None to slight departure from expected for soils without cover (5.4). Samples taken in plant interspaces. Good stability likely due to presence of fine roots in the soil up to 2” depth.</p>	<p>South (36)</p> <p>Soil: Soil: Bocker-Imnaha Rock outcrop complex, 30-60% slopes</p> <p><i>Bocker</i> is the dominant soil type for the analysis area; very shallow (less than 10 inches), very gravely to very cobbly silt loam to silty clay to very cobbly loam to clay loam. Surface basalt rock is moderate to high cover.</p> <p><i>Anatone</i> the less dominant soil; shallow, very gravely to cobbly silt loam to very cobbly silty clay loam. Surface rock cover is moderate to high.</p>	<p>BASA – mid seral. Very steep site, has lead to increase in soil movement, which may be inhibiting native vegetation establishment. All species expected for the plant association are present; FEID is at a reduced rate. Invasive annual grasses present throughout the site.</p>
25	<p>Table Mountain/ Kirkland</p> <p>Subwatershed: Joseph Creek/ Peavine Creek</p> <p>Plateau top draw</p>	<p>Slight departure (4.7) due to an increase in bare ground and surface soil degradation over what is expected for the site. Bare soil is 5-</p>	<p>Slight departure (4.7) due to bare ground surface soil degradation and soil compaction layer being greater than expected for the site. Current and past rill</p>	<p>Slight departure (4.1) due to slight change in functional and structural groups expected for the site. Some species not native to the site have been introduced/</p>	<p>None to slight departure from expected for soils under cover (5.6). The site predominately has good</p>	<p>Ecosite: Warm-dry forest, loamy soil.</p> <p>Soil: Limberjim-Syrupcreek complex, 0-15% slopes</p> <p><i>Syrupcreek</i> is the dominant soil type for the analysis area;</p>	<p>PICO(ABLA2)/VASC/POPU – early seral due to past timber harvests and grazing practices. Site</p>

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	at 4999ft elevation on a 0-5% northwest facing slope.	15% as opposed to 0-5% and generally associated with past logging activities; compacted skid trails and landings, and burned areas. Gopher activity tends to be concentrated on skid trails. Compaction layer on skid trails (platy soil structure) is 4-5 inches deep. Soil compaction is recovering naturally through root penetration and freeze-thaw activity.	formation, water flow patterns, and pedestals match that expected for the site. Infiltration and runoff are not affected by changes in plant community composition and distribution. Some surface soil sealing and sheet erosion was noted on bare soils in skid trails. Soil is not eroding or being transported off site.	planted during post timber harvest activities (clover, timothy orchard grass). ACMI has increased due to ground disturbance. Annual production is slightly reduced from expected production rates due to increase in bare soils and change in plant composition.	vegetation and litter cover except on skid trails and pocket of sterile/ exposed soil due to burning.	moderately deep ashy silt loam over a very cobbly loam with distinct clay films, over basalt bedrock. Surface 1-2 inches of soil is composed of partially decomposed needles, grass, and some surface moss. Surface 0-2 inches is composed of partially decomposed needles and twigs. <i>Limberjim</i> is the less dominant soil; deep, ashy silt loam over a silt loam and very gravely silt loam subsoil. The surface 0-2 inches is composed of partially decomposed needles and twigs.	is in a transition as plant community is healing from past activities.
26	Hunting Camp/ Tamarack Subwatershed: Joseph Creek/ Rush Creek Plateau top at 4596ft elevation on a 5-10% southwest facing slope.	None to slight departure (5.0). Bare soil, surface soil structure and organic matter content, rills, pedestals, water flow patterns, and soil surface resistance to erosion match what is expected for the site.	None to slight departure (5.0) from expected conditions. Infiltration is not affected by changes in plant community composition and distribution. No water flow patterns, and good ground cover except in areas associated with terraces. Litter	None to slight (5.0) from expected conditions. Number and composition of structural and functional groups plant mortality, vigor, decadence and reproductive capability match that expected for the site. There is no presence of BASA	None to slight departure from that expected for the site (5.6). Stability samples taken from bare soil areas. Amount of bare ground match that expected for the site. Surface rock content is	Ecosite: Mountain Shallow South (36) Soil: Soil: Bocker-Anatone Rock outcrop complex, 2-15% slopes <i>Anatone</i> is the dominant soil type for the analysis area; shallow to moderately deep silt loam to silty clay loam. Rock fragment by volume is less than expected for an	FEID-PSSP6/ LUSE – early to mid seral. Stand appears healthy. Increase in POSA12, and a decrease in KOMA. Few invasive annual grasses throughout site.

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			cover and amount is slightly greater than what is expected for the site. Good soil resistance to erosion.	or DAUN. Annual grasses and invasives are few, and match that expected for the site. Litter amount is slightly more than expected due to small patches of annual grasses.	lower than expected for Anatone soil, but vegetation cover, litter cover, and soil microbiotic crust cover are good.	<i>Anatone</i> soil (only approximately 15%) Surface rock cover is low to moderate. <i>Bocker</i> is the less dominant soil; very shallow (less than 10 inches), very gravely to very cobbly silt loam to silty clay to cobbly loam to clay loam.	
27	Teepee Elk/ Elk Subwatershed: Broady Creek Site is on the divide of Upper Joseph Creek Watershed and Chesnimnus Creek Watershed – The site is actually on the Chesnimnus Creek Watershed side of the divide – but the site characterizes well the immediate vicinity of Broady Creek Plateau top at 4922ft elevation	None to slight departure (5.0) for both mound and intermounds areas. Bare soil, surface soil structure and organic matter content, rills, pedestals, water flow patterns and soil surface resistance to erosion match what is expected for the site.	None to slight departure (5.0) from expected conditions. Plant community and distribution on mounds has shifted, with reduced numbers of deep rooted perennial grasses, and increased number of shallow rooted annual grasses. Due to the low slope angle, infiltration is good, and appears not to be affected by plant composition. There are not any water flow patterns, rilling or pedestalling. Ground cover is within the expected levels.	Slight departure (4.6) primarily due to the shift in plant community on the mounds and associated reduced annual production. The number and structural groups are moderately reduced from that expected for the site with annual grasses scattered throughout the mounds. The biotic integrity of intermound/scab areas have a slight departure from what is expected for the site.	None to slight departure (5.2) from that expected for mound sites. Samples taken from bare soil areas. Bare ground match that expected for the site. Vegetation cover, litter cover is what is expected for the site, but composed predominately of annual grasses. Slight departure (4.0) from that expected for intermounds/	Ecosite: Mountain Shallow (27) Mound intermound plant/soil complex Soil: Anatone-Bocker-Fivebeaver Complex, 0-15% slopes. <i>Bocker</i> is the predominant soil associated with intermounds areas. Soil is very shallow (less than 10 inches), very gravely to very cobbly silt loam to silty clay to very cobbly loam to clay loam. Surface rock cover is high. <i>Anatone</i> the predominant soil associated with the mound areas; shallow, very gravelly silt loam to very gravelly loam/ clay loam. Surface rock cover is moderate.	ARRI/POSA1 2– early to mid seral. Decrease in ARRI and POSA12, increase in invasive annual grasses. FEID-KOMA (Mounds) – POPR disclimax seral state.

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	on a 0 - 5% northwest to southwest facing slope		Good soil resistance to erosion. Soil stability for mound and intermound areas is good.		scab sites. High surface rock content and good micro-biotic crusts associated with rock.		
28	Cougar Creek/ Baldwin Subwatershed: Broady Creek Site is on the divide of Upper Joseph Creek Watershed and Chesnimnus Creek Watershed – but site characterizes the immediate vicinity of Broady Creek Ridge top at 5100ft elevation on a 0 - 5% southwest facing slope.	None to slight departure (4.6). Site soil and stability indicators closely match what is expected for the site. Departure is primarily due to slight increase amount of bare soil, shallow and slight compaction layer, and slight decrease in soil stability to erosion than that expected for the site.	None to slight departure (4.6). Current and past rill formation, water flow patterns, pedestals match that expected for the site. Departure is due to slight evidence of minor erosion in water flow patterns, slightly more bare ground than expected for the site. A shallow, slight compaction layer was found at 1.5 inches deep. Infiltration and runoff are slightly affected by reduction in plant density and distribution and presence of annual grasses in disturbed areas. Soils or sediment are not moving off site.	Slight to moderate departure (4.3) primarily due to slight to moderate change in functional and structural groups. Annual production is slightly reduced from expected rates due to increase in size of plant interspaces, amount of bare soils, and presence of BFRTE in disturbed areas.	Slight departure (4.5) from that expected samples taken from unprotected/ bare soil areas. Bare ground is slightly higher than expected for the site. Vegetation cover, litter cover is slightly lower than what is expected for the site. Very little to no active erosion was noted on site (with the exception of soil movement off of gopher mounds on to adjacent	Ecosite: Mountain Shallow (27) Mound intermound plant/ soil complex Soil: Anatone-Bocker-Fivebeaver Complex, 0-15% slopes. <i>Bocker</i> is the predominant soil associated with intermounds areas. Soil is very shallow (less than 10 inches), very gravelly to very cobbly silt loam to silty clay to very cobbly loam to clay loam. Surface rock cover is high. <i>Anatone</i> the predominant soil associated with the mound areas; shallow, very gravelly silt loam to very gravelly loam/clay loam. Surface rock cover is moderate. <i>Fivebeaver</i> is predominately associated with pines	FEID-KOMA (Ridgetops) – Mid seral with an increase in POPR, and a decrease in PSSP6, FEID and KOMA. Invasive annual grasses present.

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					protected sites.	dispersed throughout the site, and open forested areas adjacent to the analysis area; shallow gravelly ashy silty loam to cobbly ashy silty loam over bedrock.	
29	<p>Teepee Elk/ Rock Creek</p> <p>Subwatershed: Broady Creek</p> <p>Steep side slope of plateau at 3696ft elevation on a 60% southwest facing slope.</p>	<p>Slight to moderate departure (4.4) due to historic soil surface loss and degradation. Bare ground is slightly greater than expected for the site and generally associated water flow patterns. Rock cover acts as surface cover where fines have been historically washed away. Soil stability closely matches that expected for the site.</p>	<p>Slight to moderate departure (4.4). Number and length of water flow patterns are slightly greater than that expected for the site with evidence of minor erosion. In the absence of vegetation, water flow is contributing to pedestal formation and litter movement. Pedestals are approximately 2-4” in height, and show minor erosion-primary in the form of sheet erosion. Amount of bare ground closely matches that expected for the site. Soil is slumping off terracette walls due to animal trailing. Soil stability closely</p>	<p>Slight departure (4.7). Number and composition of structural and functional groups plant mortality, vigor, decadence, and reproductive capability match that expected for the site. Departure is primarily due to slight historic surface soil loss and presence of BRTE and TRDU in disturbed areas – particularly associated with soil slumping off terracettes.</p>	<p>None to slight departure from expected for protected surface soils under litter or plant cover (5.5). Good stability likely due to adequate soil organic matter content and presence of fine roots in the soil surface. Slight departure from expected for unprotected surface soils (4.0). Due to historic surface soil loss.</p>	<p>Ecosite: Mountain Shallow South (36)</p> <p>Soil: Bocker-Clearline-Rock outcrop complex, 60-90% slopes</p> <p><i>Bocker</i> is the predominant soil associated with intermounds areas. Soil is very shallow (less than 10 inches), very gravelly to very cobbly silt loam to silty clay to very cobbly loam to clay loam. Surface rock cover is high.</p> <p><i>Clearline</i> is the less dominant soil located across the side slope in slight concave areas; deep to very deep well drained very gravelly silt loam over very gravelly fine sandy loam, over very cobbly loam over basalt bedrock.</p>	<p>FEID-PSSP6/LUSE – late seral. Some invasive annual grasses and planted perennials (THIN6) present.</p>

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			matches that expected for the site.				
30	<p>Cold Springs/ Lost Cow</p> <p>Subwatershed: Horse Creek</p> <p>Steep side slope of plateau at 2907ft elevation on a 60% northwest facing slope</p>	<p>None to slight departure (5.0). Bare soil, surface soil structure and organic matter content, rills, pedestals, water flow patterns and soil surface resistance to erosion match what is expected for the site.</p>	<p>None to slight departure (5.0) from expected conditions. Infiltration is not affected by changes in plant community composition and distribution. Water flow patterns match that expected for the site. Litter cover and amount is slightly greater than what is expected for the site due to BRTE in perennial plant interspaces. Good soil resistance to erosion.</p>	<p>None to slight departure (4.7). Departure is primarily due to the number and composition of structural and functional groups being slightly to moderately altered. FEID appears to be absent from the site – but there is a seed source above the site. Historic, heavy sheep and cattle grazing has potentially been the cause of a shift from FEID-KOMA plant community in which PSSP6, SYAL, and ROSA species dominate. Plant mortality, vigor, decadence and reproductive capability match that expected for the site. BRTE is primarily present only in perennial grass interspaces and appears not be</p>	<p>None to slight departure from expected for unprotected surface soils (5.5). Good stability most likely due to adequate soil organic matter content, and litter cover.</p>	<p>Ecosites: Shrubby North (60) and North (40)</p> <p>Ecosites are associated, and because they form a mosaic across the analysis area. The Shrubby north (60) ecosite may be more strongly represented currently due to historic heavy sheep and cattle grazing and a shift in plant communities.</p> <p>Soil: Rock outcrop-Imnaha-Cherrycreek complex, 60-90% north slopes</p> <p>On this site the two soils form a mosaic and neither one is dominant.</p> <p><i>Imnaha</i> soil is moderately deep, well drained gravely ashy silt loam over very gravely ashy silt loam over basalt bedrock. <i>Imnaha</i> soil tends to be more closely associated with deep rooted perennials.</p> <p><i>Cherrycreek</i> soil is a deep,</p>	<p>SYAL-ROSA – transitioning plant associations. Site appears to be shifting from one dominated by PSSP6 and FEID to one dominated by SYAL and ROSA. No seral state identified.</p>

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				increasing.		well drained very cobbly ashly silt loam over extremely cobbly silt loam over basalt bedrock. <i>Cherrycreek</i> soil tends to be more closely associated with shrubs.	
31	Cold Springs/ North Wildhorse Subwatershed: Upper Cottonwood Creek Top of Wildhorse Ridge at 5222ft elevation on a 10-15% Northwest facing slope.	Moderate departure (4.1) due to historic soil surface loss and degradation in the intermound areas. Bare ground is slightly greater than expected for the site and generally associated with loss of soil biotic crust component, reduced litter and increase in water flow pattern activity in perennial plant interspaces and intermound areas. Surface soil loss is evident with pedestal formation up to 1” high. Surface soil resistance to erosion has been slightly to moderately reduced in intermounds areas.	Moderate departure (3.9). Number and length of water flow patterns are slightly greater than that expected for the site with evidence of minor erosion, instability and deposition – specifically in the intermounds where there is an absence of vegetation. Water flow is contributing to pedestal formation and litter movement within intermounds sites. Pedestals are approximately 0.5 to 1” in height, associated with water flow patterns and show minor erosion-primarily in the form of sheet erosion. Amount of bare	Moderate departure (4.3) primarily due to the shift in plant community on the intermounds and associated slightly reduced annual production. There has been a loss of native perennial plants on intermound sites. Presence of PSSP6 has been reduced and replaced by POPR and seeded, non-native grasses. The functional and structural groups on the mounds have only slightly departed from that expected for the site. Invasive plants are present in amount expected for the site.	Slight to moderate departure from that expected for unprotected surface soils in intermound sites (4.0). Reduced soil stability is most likely due to historic surface soil loss, degradation and increase in bare soil.	Ecosite: Mountain Very Shallow (27) and Mountain Shallow (22) mound intermounds complex. Soil: Anatone-Bocker-Fivebeaver complex, 2-15% slopes <i>Bocker</i> is the predominant soil associated with intermound areas. Soil is very shallow (less than 10 inches), very gravelly to very cobbly silt loam to silty clay to very cobbly loam to clay loam. Surface rock cover is high. <i>Anatone</i> the predominant soil associated with the mound areas; shallow, very gravelly silt loam to very gravelly loam/ clay loam. Surface rock cover is moderate. <i>Fivebeaver</i> is predominately associated with conifers in	FEID-KOMA (Mounds) – late seral. Within the intermounds, POPR is filling the role of other species (disclimax to POPR). Slightly less vegetation than expected.

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			ground is greater than that expected for the site. Bare areas are more connected and larger – potentially due to gopher activity and not livestock management. Mound areas do not have water flow patterns above that expected for the site.			draws and steeper north slopes adjacent to the analysis area; Shallow gravelly ashy silty loam to cobbly ashy silty loam over bedrock.	
32	Cold Springs/ Cottonwood Subwatershed: Upper Cottonwood Creek Plateau top at 5152ft elevation on a 2-10% southwest facing slope.	Slight departure (4.8). Site soil and stability indicators closely match what is expected for the site. Departure is due to the moderate increase in the amount of bare soil and less soil biotic crust than that expected for the site.	Slight departure (4.6). Due the moderate increase in the amount of bare soil and less soil biotic crust than expected for the site. A slight change in structural/ functional groups has decreased canopy cover and ground cover, but does not appear to be affecting water infiltration rates. Rills, water flow patterns and pedestals match that expected for the site. Terracettes are slightly greater than	Slight departure (4.6). Departure is primarily due to slight change in the number and composition of structural and functional groups. Amount of PSSP6 appears to have increased, and FEID/KOMA reduced. Overall, there are less perennial plants than would be expected for the site. However, plant mortality, vigor, decadence and reproductive capability match that expected for the site. There are few invasive annual	None to Slight departure from that expected for bare/ unprotected surface soils (4.4). Slight increase in bare/ exposed soils and loss of biotic crust overall on site.	Ecosite: Mountain Shallow South (36) used for analysis but also fits Mountain Very Shallow (27) Soil: Albee-Bocker Complex, 2-15% slopes. <i>Bocker</i> is the dominant soil type for the analysis area; very shallow (less than 10 inches), silt loam to very cobbly loam to clay loam. Surface rock is less than expected low moderate in cover. <i>Albee</i> soil is the less dominant soil; moderately deep (20 – 25”) ashy silty loam over silt loam.	FEID-PSSP6 (Ridgetop) – mid seral. Decrease in FEID and KOMA. Increase in PSSP6 and POSA12.

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
			expected for the site, and appear to be caused by wildlife trailing.	grasses on site.			
33	Cold Springs/ North Cold Springs Subwatershed: Horse Creek Plateau top at 5050ft elevation on a 0-5% north to northwest facing slope.	Slight to moderate departure (4.6). Due the moderate increase in the amount of bare soil and less soil biotic crust than expected for the site. Rills and water flow patterns match that expected for the site. Soils on mounds have good soil structure and good resistance to erosion. Soils on intermound sites have slight surfaces soil sealing and evidence of historic soil degradation and surface soil loss.	Slight to moderate departure (4.5). Due the slight reduction in liter cover on mound as a result of grazing, and an increase in the amount of bare soil on intermounds. A slight change in structural/functional groups on intermounds has decreased canopy cover and ground cover. Water flow patterns have little evidence of active erosion. Pedestals are greater in number than expected and range from 1-2 inches in height. Only some evidence of active erosion is evident. Sediment is not moving off site (low slope angle, adequate infiltration and low runoff potential.	Slight departure (4.7). Departure is primarily due to slight decrease in soil resistance to erosion, slight soil degradation or loss of surface soil and slightly less litter than that expected for intermounds areas. Historic grazing has potentially changed the plant community from a FEID-KOMA to a later seral FEID-PSSP6 plant community. Plant vigor, annual production, and reproductive capability matches that expected for the site. There are few invasive plants on the site.	None to slight departure (5.6) from that expected for mound sites. Samples taken from bare soil areas. Bare ground match that expected for the site. Vegetation cover, litter cover is what is expected for the site. Slight to moderate departure (3.3) from that expected for intermound/ scabsites. Bare ground is higher than expected for the site, but there is a high surface rock content and	Ecosite: Mountain Loamy (18) associated with <i>Albee</i> soils and Very Shallow (27) associated with <i>Bocker</i> soils. Mound-intermound plant/soil community. Soil: Albee-Bocker Complex, 2-15% slopes. <i>Bocker</i> soil is the predominant soil associated with intermounds; very shallow (less than 10 inches), silt loam to very cobbly loam to clay loam. Surface rock is less than expected, and is low to moderate in cover. <i>Albee</i> soil is the dominant associated with mounds; moderately deep (20 – 25”) ashy silty loam over silt loam.	FEID-PSSP6 (Ridgetop) – late seral. All species present and at expected levels.

VI – Rangeland Condition Assessment

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
					good moss and microbiotic crust in inter-mound areas.		
34	<p>Cold Springs/ South Cold Springs</p> <p>Subwatershed: Upper Cottonwood Creek</p> <p>Plateau top at 5294ft elevation on a 0-5% north facing slope.</p>	<p>Slight to moderate departure (4.5). Due primarily to soil degradation from logging activities. Bare ground is higher than expected due to past logging activities, burning and current grazing of understory forbs and grasses. Use by cattle is low to moderate; trailing on skid trails. Detrimental soil compaction is evident on skid trails and landings. Aerial extent of DSC is unknown but expected to be at minimum 20% of the area.</p>	<p>Slight to moderate departure (4.5). Due to the reduction in vegetation cover, ground cover and detrimental soil compaction associated with skid trails. Infiltration and runoff do not seem to be affected by changes in plant community. Due to low slope angle, and adequate canopy cover and understory rills, water flow patterns and pedestals match that expected for the site.</p>	<p>Slight to moderate/moderate departure (4.2). Due primarily to surface soil degradation associated with compaction on skid trails and landings. Plant association appears to have been converted to an early seral stage ABGR/LIBO2 from commercial logging activities. Skid trails and landings have been seeded to non-native grasses. Moss cover common in areas initially denuded from prescription burning. Number and composition of invasive annual grasses match that expected for the site.</p>	<p>None to Slight departure from that expected for protected surface soils (6.0). Bare soil is greater than expected and soil compaction associated with skid trails is common throughout site.</p>	<p>Ecosite: Warm-dry forest, loamy soil. Under current conditions this site appears to be in an early seral stage of ABGR/LIBO2; with a mixed conifer/PIPO/PSME plant group dominating.</p> <p>Soil: Limberjim-Syrupcreek complex, 0-15% slopes</p> <p><i>Syrupcreek</i> is the dominant soil type for the analysis area; a well drained moderately deep ashy silt loam over very cobbly loam, over basalt.</p> <p><i>Limberjim</i> is the less dominant soil; a well drained deep, ashy silt loam, over silt loam, over gravelly silt loam, over basalt on stable mountain slopes.</p>	<p>ABGR/LIBO2 – early seral, as a result of past timber harvests.</p>
35	<p>Cold Springs/ South Cold Springs</p>	<p>Slight to moderate departure (4.5). Due primarily to soil degradation and</p>	<p>Slight to moderate departure (4.4). Due to an slight to moderate change in 6</p>	<p>Slight to moderate departure (4.6) primarily due to historic soil loss and</p>	<p>Slight to moderate departure from that expected</p>	<p>Ecosite: Mountain Very Shallow (27) and Mountain Shallow (22)</p>	<p>PSSP6-POSA12 – late seral. Site is very steep and</p>

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
	<p>Subwatershed: Upper Cottonwood Creek</p> <p>Plateau steep side slope at 5450ft elevation on a 60 – 70% east to southeast facing slope.</p>	<p>loss of soil cover. Amount of bare ground is slightly more than expected due to loss of perennial plants, biotic crusts and slightly active terraces. Effects to soil do not appear to be related to current grazing management. But to historic over grazing of steep, unstable slopes, and potentially due to past fire effects.</p>	<p>of the 10 hydrologic indicators. Flow patterns primarily associated with terraces, and are slightly more numerous than expected with some minor erosion and deposition. Terraces tend to be associated with both animal trailing, and freeze thaw activity and soil sloughing/ movement downhill. Distribution and amount of deep rooted perennials are less than expected but infiltration is good due to high rock cover.</p>	<p>degradation, loss of soil biotic crusts, and a slight change in functional structural groups. Due to steep slope and ease of soil sloughing/ movement down slope, vegetation appears to be sensitive to disturbance by trampling/hoof impact. There has been a decrease/loss of deep rooted perennial plants (PSSP6 – POSA12).</p>	<p>for unprotected surface soils (4.0). Reduced soil stability is most likely due to historic surface soil loss, degradation and increase in bare soil.</p>	<p>Soil: Bocker-Anatone Rock outcrop complex, 2-15% slopes</p> <p><i>Anatone</i> is the dominant soil type for the analysis area; shallow gravely silt loam to very cobbly silty clay loam. Surface rock cover is moderate.</p> <p><i>Bocker</i> is the less dominant soil; very shallow (less than 10 inches), very gravely to very cobbly silt loam to silty clay to cobbly loam to clay loam. Surface rock cover is moderate to high.</p>	<p>high elevation, hard to identify site potential.</p>
P1	<p>Private 1</p> <p>Subwatershed: Upper Swamp Creek</p> <p>Plateau shoulder to midslope at 4613ft elevation on a 15 – 20 %</p>	<p>None to slight departure (5.0). Bare soil, surface soil structure and organic matter content, rills, pedestals, water flow patterns and soil surface resistance to erosion</p>	<p>None to slight departure (5.0) from expected conditions. Infiltration not affected by changes in plant community composition and distribution. Litter cover and amount of bare soil matches that</p>	<p>None to slight (5.0) from expected conditions. Number and composition of structural and functional groups plant mortality, vigor, decadence and reproductive capability</p>	<p>None to Slight departure from that expected for unprotected surface soils (6.0). Ground cover, bare ground and soil quality indicators</p>	<p>Ecosite: Mountain Loamy – silt loam without rock fragments (17) associated a smooth and linear landform.</p> <p>Wallowa-Bocker complex 2-15% slopes</p> <p><i>Wallowa</i> is the dominant soil type for the analysis area; a</p>	<p>FEID-KOMA (High Elevation) – late seral as species and amount of species are at expected amounts. Invasive</p>

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
	east to north to northeast facing slope.	match what is expected for the deeper <i>Wallowa</i> soils. Bare soils, litter cover and terracettes are slightly higher than expected for the shallower, <i>Bocker</i> soils. Terrecettes show only minor evidence of active erosion, predominately from freeze thaw activity.	expected for the site. Good soil resistance to erosion. No water flow patterns, and good ground cover except in areas associated with terracettes on the shallower <i>Bocker</i> soils. Also associated with shallower <i>Bocker</i> soils is higher than expected bare soil (up to 40% as opposed to 20%). Bare soil associated with gophers, ground squirrels and terracettes.	match that expected for the site. Soil surface stability, health and integrity all match that expected for the site.	match that expected for the site.	well drained, moderately deep to deep ashy silt to silt loam over gravely silt loam over basalt bedrock. <i>Bocker</i> is the less dominant soil; a very shallow (less than 10 inches), very gravely to very cobbly silt loam to silty clay to cobbly loam to clay loam. Surface rock cover is moderate.	annual grasses are on site.
P2	Private 2 Subwatershed: Lower Swamp Creek On the divide between Lower and Upper Swamp Creek Plateau top to shoulder at 4268ft elevation	Slight to moderate/ Moderate departure (4.0). Due primarily to historic surface soil loss, soil cover loss and soil degradation. Amount of bare ground is more than expected due to slight loss of perennial plants, biotic crusts and slightly active,	Slight to moderate/ Moderate departure (4.0). Number and length and connectivity of water flow patterns are slightly greater than that expected for the site with evidence of minor erosion, instability and deposition. Active pedestalling is more common than	Slight to moderate departure (4.3) primarily due to historic soil loss and degradation, loss of soil biotic crusts, moderate to slight change in functional structural groups (less PSSP6 and FEID than expected) and change in plant community composition resulting in slight decrease in	Slight to moderate departure from that expected for unprotected surface soils (3.0). Reduced soil stability is most likely due to historic surface soil loss, degradation and increase in bare	Ecosite: Mountain Very Shallow (27) and Mountain Shallow South (36) Soil: Harlow- Bocker complex 2-15% slope <i>Bocker</i> is the dominant soil type for the analysis area; a very shallow (less than 10 inches),and very to extremely cobbly silt loam to silty clay to cobbly loam to cobbly clay loam over basalt bedrock.	FEID-PSSP6/ BASA – early to mid seral. Site is scabby, and therefore potential is not as great as expected.

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
	on a 5-10 % north to northwest facing slope.	connected water flow patterns and pedestals.	expected for the site and strongly associated with flow patterns, bare soil and plant interspaces. Active erosion is primarily in the form of sheet erosion – few rills present. Bare ground is greater than that expected for the site. Bare areas are more connected and larger and show signs of active sheet erosion.	infiltration rates. Invasive annual grasses are primarily present in disturbed areas within the site.	soil.	Surface rock cover is moderate to extreme. <i>Harlow</i> is the less dominant soil; well drained shallow very stony clay loam over very gravelly clay loam to extremely cobbly clay loam over basalt bedrock.	
P3	Private 3 Subwatershed: Joseph Creek/ Green Gulch On the divide between Deer Creek SWS of Snack River/ Captain John Watershed and Joseph Creek/ Green Gulch SWS of Lower Joseph Creek Watershed. Site	None to slight/ Slight departure (4.7). Bare soil is slightly greater than expected for the site due to a decrease in native annuals in perennial plant interspaces. Surface soil structure and organic matter content match that expected for the site. Rills and soil surface resistance to erosion match what is expected for the	None to slight/Slight departure (4.7) from expected conditions. Infiltration is good, and is only slightly decreased by decrease in native annual forbs within perennial plant interspaces. Water flow patterns and pedestals closely match that expected for the site but show evidence of minor erosion and deposition on	None to slight (4.9) from expected conditions. Site is dominated by perennial bunch grasses. Number and composition of structural and functional groups plant mortality, plant vigor, decadence and reproductive capability closely match that expected for the site. Slight decrease in native annuals and soil biotic crusts and	None to Slight departure from that expected for unprotected surface soils (5.2). Ground cover is slightly less than expected in perennial plant interspaces due to reduced number of native annual forbs, bare ground is slightly higher.	Ecosite: Mountain Loamy (18) associated with <i>Snell</i> soils and Mountain Shallow (22) associated with <i>Harlow</i> soils. Soil: Harlow-Snell- Imnaha complex, moist, 15-30% slopes <i>Imnaha</i> soil is the dominant soil type for the analysis area; well drained shallow to moderately deep gravelly silt loam over very gravelly silt loam to very gravelly loam over unweathered bedrock.	FEID-PSSP6 (Ridgetop) – mid to late seral. Plant community consist of vigorous and expected species and specie levels. Invasive annual grasses on site.

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
	<p>is actually on the side of the Snake River Watershed. However, the site characterizes the immediate vicinity of Joseph Creek/ Green Gulch SWS</p> <p>Upper plateau slope at 4100ft elevation on a 20% north facing slope</p>	<p>site.</p>	<p>exposed soils. Some rain splash impact and minor sheet erosion. Soil is not leaving site, but being deposited in micro topographic positions and vegetation. Good soil resistance to erosion.</p>	<p>mosses. Soil surface stability, health and integrity match closely that expected for the site. Invasives are predominately in small patches in disturbed areas.</p>	<p>Soil stability indicators slightly depart from that that expected for the site.</p>	<p>The less dominant soils are <i>Snell</i> and <i>Harlow</i>.</p> <p><i>Snell</i>; a well drained moderately deep very stony loam to very stony clay loam over bedrock.</p> <p><i>Harlow</i>; well drained shallow very stony clay loam , very gravelly clay loam to extremely cobbly clay loam over bedrock.</p>	
P4	<p>Private 4</p> <p>Subwatershed: Joseph Creek/ Green Gulch</p> <p>On the divide between Deer Creek SWS of Snack River/ Captain John Watershed and Joseph Creek/ Green Gulch SWS of Lower Joseph Creek Watershed. Site is on the Joseph</p>	<p>Moderate departure (4.0). Active pedestals and terracettes are more common than expected for the site and strongly associated with flow patterns, animal trailing, bare soil, and plant interspaces. Bare areas are more common, connected and larger than expected for the site. There is little vegetation cover in perennial</p>	<p>Slight to moderate/ Moderate departure (4.0). Number, length and connectivity of rills and water flow patterns are slightly greater than that expected for the site with evidence of minor erosion, instability and deposition. Active pedestalling and terracettes are more common than expected for the site and strongly</p>	<p>None to slight departure (4.8). In general the site vegetation is dominated by perennial bunch-grasses. Composition of structural and functional groups plant mortality, plant vigor, decadence and reproductive capability closely match that expected for the site. There has been a slight to moderate decrease in vegetation cover and loss of soil biotic</p>	<p>None to Slight departure from that expected for unprotected surface soils (4.6). Bare soil is moderately greater than expected and ground cover is moderately less than expected in perennial plant interspaces due to reduced number of native annuals, and loss of soil</p>	<p>Ecosite: Shallow South (30)</p> <p>Soil: Gwin-Kettenback- Rock outcrop complex, 60-90% slopes.</p> <p><i>Gwinly</i> is dominant soil within the analysis area; well drained shallow very gravelly silt loam to very cobbly silt loam over very cobbly silty clay loam.</p> <p><i>Kettenback</i> is the less dominant soil; moderately deep stony silt loam over gravelly silt loam, with distinct clay films. Surface rock cover is moderate.</p>	<p>PSPP6- POSA12 (Basalt) – mid to late seral. Some invasive annual grasses present. Site mostly late seral with expected species and specie levels.</p>

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
	<p>Creek/ Green Gulch side of the divide</p> <p>Plateau mid slope at 4089ft elevation on a 70% Southeast facing slope</p>	<p>plant interspaces and little to no soil biotic crusts. There is evidence of rain splash impact and surface soil sealing.</p>	<p>associated with flow patterns, bare soil and plant interspaces. Bare areas are more common, more connected, larger and show signs of active sheet erosion. Site conditions indicate that the silt loam soils have low cohesiveness due to high slope angle and resultant water runoff/flow. However, soil stability test showed high stability rating.</p>	<p>crusts and mosses in perennial plant interspaces and terracettes. Terracettes are more numerous than expected and show signs of active erosion/ sloughing down slope due to animal trailing and freeze thaw action. Perennial plants on terrace walls have exposed roots and are at risk of early drying. Soil resistance to erosion is good. Invasive annual grasses are primarily in disturbed areas.</p>	<p>microbiotic crusts. Other soil stability indicators moderately depart from that that expected for the site.</p>	<p>Rock outcrops tend to occur on topographic breaks immediately adjacent to analysis area. Surface stones and rock cover is moderate.</p>	
P5	<p>Private 5</p> <p>Subwatershed: Joseph Creek/ Rush Creek</p> <p>On the divide between Joseph Lower Joseph Creek Watershed and Snack River/ Captain John Watershed. Site</p>	<p>Slight to moderate/ Moderate departure (4.1). Due primarily to historic surface soil loss, soil cover loss and soil degradation. Amount of bare ground is more than expected due to loss of native annuals, biotic crusts and mosses in perennial</p>	<p>Slight to moderate/ Moderate departure (4.0). Steep slopes have a high to soil erosion hazard and are unstable when disturbed. Departure is primarily due to historic surface soil loss, soil cover loss and soil degradation. The current number and patterns of rills,</p>	<p>Slight to moderate/ moderate departure (4.4) primarily due to historic soil loss and degradation, loss of soil biotic crusts. A moderate change in functional structural groups (less FEID and native annual in perennial plant interspaces). Invasive annuals are primarily</p>	<p>None to Slight departure from that expected for unprotected surface soils (4.6). Bare soil is moderately greater than expected and ground cover is moderately less than expected in perennial plant</p>	<p>Ecosite: Mountain Shallow (22).</p> <p>Soil: Gwinly-Kettenback-Rock outcrop complex, 60-90% slopes.</p> <p><i>Gwinly</i> is dominant soil within the analysis area; well drained shallow very gravelly silt loam to very cobbly silt loam over very cobbly silty clay loam. Surface stones and rock cover</p>	<p>FEID-PSSP6/ BASA – mid to early seral, decrease in FEID. Invasive annual grasses and non-native perennials throughout site. Invasive annuals in monoculture</p>

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
	<p>is on the Joseph Creek/ Rush Creek side of the divide.</p> <p>Plateau shoulder at 4259ft elevation on a 55-70% South facing slope</p>	<p>plant interspaces. Evidence of old rills, water flow patterns and pedestals with blunted or muted erosion features are common. The current number and patterns of rills, water flow patterns and pedestals match that expected for the site, but show signs of minor active erosion. Soil degradation is slowly recovering in the form of increased litter cover and soil organic matter.</p>	<p>water flow patterns and pedestals match that expected for the site, but show signs of minor active erosion. Surface rock cover is very high and helps to reduce water runoff and erosion effects.</p>	<p>composed of CECY2 and are scattered to common throughout the site. Invasive annual grasses form a mosaic across the landscape and are concentrated in disturbed areas within the site.</p>	<p>interspaces due to reduced number of native annuals, and loss of soil micro biotic crusts. Other soil stability indicators moderately depart from that that expected for the site.</p>	<p>is very high.</p> <p><i>Kettenback</i> is the less dominant soil; moderately deep stony silt loam over gravelly silt loam, with distinct clay films. Surface stones and rock cover is very high.</p> <p>Rock outcrops tend to occur on topographic breaks immediately adjacent to analysis area.</p>	<p>pockets.</p>
P6	<p>Private 6</p> <p>Subwatershed: Joseph Creek/ Rush Creek</p> <p>Plateau shoulder at 4029ft elevation on a 60-70%</p>	<p>Slight departure (4.6). Bare ground is slightly greater than expected for the site and is primarily due to past management. Slight evidence of minor erosion associated with rills and pedestals within</p>	<p>Slight departure (4.6). Soil quality indicators closely match that expected for the site. Bare ground is slightly greater than expected for the site and is primarily due to past management. Slight evidence of minor</p>	<p>Slight departure (4.9) primarily due to historic soil surface loss and degradation. Composition of structural and functional groups plant mortality, plant vigor, decadence and reproductive capability closely match that</p>	<p>None to Slight departure from that expected (5.7). Ground cover, bare ground and soil quality indicators closely match that expected for the site.</p>	<p>Eocsite: Shrubby North (60)</p> <p>Soil: Anatone- Cherrycreek Innaha complex, 30 – 60% north slopes</p> <p><i>Anatone</i> is the dominant soil type for the analysis area; shallow gravelly silt loam to very cobbly silty clay loam. Restrictive rock feature is</p>	<p>FEID-PSSP6/ BASA – mid seral. This site is adjacent to an old homestead and received extensive historic use. Currently, FEID is less</p>

Site #	Allotment, Pasture, Subwatershed, Site Landform, Topographic Position, Aspect and Slope	Soil and Site Stability Attributes	Hydrology Function Attributes	Biotic Integrity Attributes	Soil Stability Test	NRCS Ecological Site Soil Map Unit Name/ Predominant and Subdominant Series and Representative Soil Features	Plant Association and Seral Status
	Northeast facing slope	flow patterns. These are associated with historic soil loss and bare ground. Infiltration and runoff is not affected by changes in plant community. Litter amount is what is expected for the site and soil biotic crust and moss cover is recovering from historic loss.	erosion associated with rills, and pedestals within flow patterns. Infiltration and runoff is not affected by changes in plant community. Litter amount is what is expected for the site and soil biotic crust and moss cover is recovering from historic loss. Soil is not moving off site but accumulating in micro depressions and vegetation.	expected for the site. There has been a slight decrease in FEID component and loss of soil biotic crusts and mosses in perennial plant interspaces and terracettes. Site appears to be on an upward trend. Soil stability to erosion is high.	Slight evidence of minor erosion associated with rills, pedestals within flow patterns. Litter amount is what is expected for the site.	<p>within 10 to 20 inches soil depth. Surface rock cover is high.</p> <p>The less dominant soils are <i>Cherrycreek</i> and <i>Imnaha</i>.</p> <p><i>Cherryreek</i>; well drained shallow, very stony silt loam to very cobbly silty clay loam over bedrock.</p> <p><i>Imnaha</i>; well drained shallow to moderately deep gravelly silt loam over very gravelly silt loam to very gravelly loam over unweathered bedrock.</p>	than expected and invasive annual grasses are on site.

1. Soil and Site Stability, Hydrologic Function and Biotic Integrity are rated as degree of departure from the expected condition as referenced for a specific ecological site. A value of 5 is the highest rangeland health rating. A value of 1 is the lowest rangeland health rating.
2. Soil map units for each IIRH site were identified using NRCS websurvey generated soil map for each site. Note that websurvey map is not a large enough scale to adequately identify soil types for each site. Predominant soil type was more accurately identified using field soil descriptions conducted during IIRH survey, ecological site descriptions and professional judgment. Detailed soil description can be found in the NRCS websurvey.

Appendix B – Summary of Sites

Lower Joseph Creek Watershed Assessment Interpreting Indicators for Rangeland Health

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
1	Elk Mountain/ Emmons	FIED, PSSP6, POSA12, BRAR5, KOMA, CAREX, LUPIN, POTEN, LOMAT, VEDU	High to moderate elk/deer use and cattle use. Spring/fall rotation. Current grass condition good. Hoof shearing on moist soils	Rock outcrop/ridge top results in higher overland flow/runoff and less infiltration. Evidence of heavy past livestock use Concern of future weed invasion	Soil: Albee-Bocker Complex, 2-15% slopes Ecosite: Mountain Loamy (18) Ecosite 18 does not have reference sheet. Used reference (22)
2	Dobbins/ Dobbins	POSA12, PSSP6, BRTE, BRAR5, VEDU, BRBR, ACMI, GRSQ, SYAL, AGOSE, BASA	Moderate elk/deer and livestock use.	No off site influences noted. Weedy area with MAGR, VEDU, BRTE and BRAR5. Few perennial grasses present, but what is present are vigorous and reproducing. SYAL is present, not listed for (36).	Soil: Anatone-Bocker Complex, 2-15% slopes. Ecosite: Mountain Shallow South (36) best fit; but site has
4	Cow Creek – special use	BRBR, PODO, PSSP6, POSA12,	Historic grazing pressure/use was heavy. Current use is none to slight. Moderate	Past heavy grazing pressure.	Soil: Parsnip-Bocker Complex 0-15% slopes.

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		LEPID, LOMAT, ACMI, BRAR5, TRMA, VEDU, ERHE, ANMA, LASE	elk/deer.	Potential seeding of mounds? Moved site from original location in a wooded draw to open ridge top.	<i>Parsnip</i> (mounds) <i>Bocker</i> (intermounds) Ecosite: Mountain Loamy (18) for <i>Parsnip</i> and Mountain very shallow (27) for <i>Bocker</i> soil Ecosite 18 does not have reference sheet. Used reference (22)
5	Swamp Creek/ Catch Fly	PSSP6, FIED, POSA12, VEDU, BRAR5, BRTE	Wild and domestic ungulate use. Choose site because south facing with low slope angle.	Used as training site for FS and NRCS employees, and contractors. Surface soil compaction noted.	Soil: Parsnip-Bocker Complex 0-15% slopes. Soils: <i>Parsnip</i> (mounds) <i>Bocker</i> (intermounds) Ecosite: Mountain shallow (22) for Parsnip Mountain very shallow (27) for <i>Bocker</i> soil
6	Davis Creek/ Elk Creek	VEDU, KOMA, BRAR5, BRTE, PSSP6, POSA12, FEID, POPR, CAGE, ERHE, ACMI, GRSQ, Perennial grasses subdominant to annuals.	Moderate to high elk/deer use/pressure. Green up of KOMA grazed within 1 ½" height. Historic grazing appears to have been heavy due to presence of VEDU over entire site.	No off site influences noted	Soil: Klicker - Fivebeaver-Anatone Complex, 0-15% slopes. Ecosite: Mountain Loamy (18) Ecosite 18 does not have reference sheet. Used reference (22)

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
7	Davis Creek/ Davis South	PSSP6, FEID, BASA, BRTE, BRBR, BRCA, SYAL, ROSA,GRSQ, PHMA, ERHE, CLPU,	No sign of elk or deer activity. High gopher activity	Current management is not exacerbating erosion. Site selected to represent an east – southeast aspect.	Soil: Bocker - Anatone complex 15-30% slope Ecosite: Mountain Shallow(22)
8	Davis Creek/ Davis West	FEID, PSSP6, KOMA, ACMI, PIPO, BRTE, BRAR5	Moderate elk use in spring and winter. Grazing in a rotational schedule – with light use. Gopher activity is extensive.	A roadbed is located just above the site/analysis area. A fall prescription burn occurred in 2001-2002.	Soil: Anatone-Bocker – Fivebeaver complex 15- 30% slopes Ecosite: Mountain South (35) and Mountain Shallow South (36). (35) does not have a reference sheet - used Mountain Shallow South (36) for reference sheet
9	Swamp Creek/ Little Elk	SYAL, VAME, ROSE, THMO, SPBE, ARCO, LUPIN, FRVI, ANTEN, CALOC, BRCA, CARU, CAGE, BRTE, KOMA, STOC	Obvious deer activity/beds. No elk sign. Gopher activity. Site was commercially thinned and prescription burned approximately 5 to 10 years ago (2003). Duff layer, soil cover and understory plant growth has re-established.	Canopy closure is approximately 28%. exposed soil is generally associated with logging activities and gopher activity. Moss cover has established on skid trails to create effective ground cover on those disturbed sites.	Soil: Syrupcreek – Lowerbluff complex 2-15% slopes Ecosite: MLRA009 – Loamy Dry pine
10	Swamp Creek/ Miller	PSSP6, FEID, POSA, BRTE, ACLA, LUPIN, BASA, LOMAT,	Moderate to low elk use (less than expected). Low deer use. Historic- season long cattle use was heavy. Current cattle	Surrounding ridges have experienced logging and potentially wildfire and prescribed burning.	Soil: Anatone-Bocker – Fivebeaver complex 15- 30% slopes

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		PHVI3, ERHE, TRDU, LITHO3, BASA, WYAM	spring use is moderate. Site potentially burned with adjacent ridges.		Ecosite: Mountain Shallow South (36)
11	Swamp Creek/ Starvation Ridge	FEID, PSSP6, BRAR5, BRBR, BRTE, PHVI3, KOMA, LOMAT, COLLO, BASA, EPILO, TRDU, ERHE, POSA12	Good winter and spring elk range. Little to no past or current livestock use. Moderate amount of gopher activity.	No off site influences noted	Soil: Anatone-Bocker Rock Outcrop Complex, 15-30% slopes. Ecosite: Mountain Shallow South (36) This site was noted as being a good site to be used as a Reference site for Ecological site Mountain Shallow South (36).
12	Swamp Creek/ Miller Unit	PSSP6, BRBR, POSA12, FEID, CYNA, BRTE, RIBES, PODO, PENST, LOMAT, WYAM, mosses.	Elk and deer use noted. Cattle graze yearly. Some gopher activity noted	CEDI3 site noted: Past erosion noted from historic heavy sheep or cattle grazing	Soil: Bocker-Imnaha Rock Outcrop Complex, 30-60% slopes Ecosite: Mountain Shallow South (36)
13	Al Cunningham/ Shoot Canyon	Number and diversity of functional and structural groups is significantly to dramatically reduced from what is expected for the site.	Evidence of elk and deer use. Cattle and wild ungulate use evident during times when soils are wet or moist. Site conditions appear to be static or slowly reverting from historic over grazing effects and associated soil degradation.	Timber harvest occurred on areas adjacent to site/ridge. Site is located just below a fence line, and just above steep slope break area with evidence of terracette formation.	Soil: Bocker-Anatone Complex, 0-15% slopes. Ecosite: Mountain Shallow South (36)

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		Invasive plants dominate the site. Plant list includes: BRTE, POSA12, VEDU, PSSP6, BRAR5, CYNA, BRASS2, LEPID, PODO, LITHO3			
15	Chico Administrative Use Site #1/ Horse Pasture	Number and diversity of functional and structural groups is moderately reduced from what is expected for the site. Invasive plants are common throughout the site. Plant list includes: BRTE, PSSP6, VEDU, POSA12, BRRA, LUPIN, ACMI, LASE, TRDU, LOMAT.	Used as an administrative horse pasture. Use by horses, elk and deer when soils are moist/wet is evident. Gopher activity moderate.	Rock outcrop above site approximately 50 ft. Flatter areas above site in ridge top and ridge shoulder are comPOSA12d of 80-90% annual grasses. Both of these factors may contribute to increased runoff onto evaluation area/ site	Soil: Gwinly-Mallory-Kettenback complex, 15-30% slopes. Ecosite: Shallow South (31) and South (30) Soil is a mosaic of shallow and moderately deep soils.
16	Fine/ Peavine #4	POSA12, PSSP6, BRTE,	Moderate high use by elk and deer. All plant species	This site is a scabby, mound intermounds	Soil: Bocker-Anatone-Rock outcrop, 2-15% slopes

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		BRAR5, POA, KOMA, VEDU, ACMI, GRSQ, MADIA, ALLIU, ERHE, LOMAT, PODO, BRAR5, MAGR.	browsed by wild ungulate, including buckwheat. Moderate use by cattle, spring, summer, fall rotation. Good biotic/moss crust on intermound soils. Mounds missing biotic/moss crust.	topography. It is difficult to evaluate a site with a mosaic of two different soils types with different inherent soil productivity. The site was moved from the original selected location to avoid a forested drainage.	Ecosite: Mountain Very Shallow (27) Mound/intermounds plant/soil complex.
17	Cougar Creek/ Muddy Creek	CARU, FEID, KOMA, BRTE, BRMO, PSSP6, PSME, PIPO, POSA12, ROSA, GRSQ, SYAL, ANMA, LUPIN, FRVI, PERID, SPIRA, POTEN, LITHO, DIAR.	Light to moderate elk and deer use. Light to moderate cattle use in mid summer. Cattle use in open meadow, and lounging sites under trees. Site and surrounding area has been tractor logged more than once within the past 40 years.	Skid trails are evident within site and adjacent area.	Soil: Anatone-Bocker-Fivebeaver Complex, 2-15% slopes Ecosite: Loamy Skeletal Dry Pine – associated with open forested areas with <i>Fivebeaver</i> soil and Mountain Shallow – associated with open meadow areas with <i>Anatone</i> soil.
18	Cougar Creek/ Peavine	CARU, CAGE, BRMO, STIPA, ARCO, AMLY, THFE2, TRIFO, SYAL, SPBE, VAME, PIPO, PSME, ABGR, LACO, LUPIN, PERID, SEDUM, FRVI, CASTI	Moderate elk and deer summer use. Light fall domestic livestock grazing. Canopy closure approximately 25%. Timber harvest activities occurred within and adjacent to evaluation site. Non-native grasses seeded during post-	Because there were only low growing shrubs on site (one foot height or less) HODI was not observed on site the Loamy Skeletal Dry Pine ecosite was chosen.	Soil: Syrupcreek ashy silt loam, 0-15% slopes. Ecosite: Loamy Skeletal Dry Pine

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
			harvest timber restoration activities.		
19	Cougar Creek/ Courgar	FIED, PSSP6, POSA, POPR, BRAR5, KOMA, BRTE, VEDU, BRBR, LOMAT, ALLIU, PODO, EPLIO, MAGR, ACMI, ERHE, LASE, TRDU, CALCO, PENST.	Moderate to high spring elk use. Some deer use. Moderate fall cattle use (rotates from between early fall to late fall use). Little gopher activity compared to other sites with similar soil and ecosite characteristics.	Original site location was further to south. Because there was no access, the original site was move to the north ridge, at the same location as C& T plot. This site fits into the Mountain Shallow (22) ecosite description with the exception of slope. Slope is slightly greater (15-20% as opposed to 0-15%).	Soil: Bocker-Anatone complex, 15-30% slopes. Ecosite: Mountain Very Shallow (27)
20	Swamp Creek/ Lower Swamp	KOMA, PSSP, SYAL, POSA, FEID, PSSP6, POSA12, BASA, ERHE, WYAM, ACMI, PENST, LEPID, SPIRA, LITHO, ALLIU, CALCO	Wildlife; elk, deer, grouse. Cattle use in spring – not grazed in 2008.	Field survey identified Shallow Mountain South (36) as the ecological site description. Soils and aspect did not properly match this ecosite. Soils did not have as high rock content, nor profile development and clay content. Office review of field data and NRCS web survey verified soil type and ecotype.	Soil: Gwinly-Kettenback-Mallory complex, 15-30% slopes Ecosite: Shallow South (31) associated with Gwinly soil Ecosite: South (30) associated with Kettenback soil
22	Table Mountain/ Thorn Hollow	FEID, PSSP6, POSA12, PHMA, SYAL,	Hoof shear and trailing from wildlife evident. Signs of grouse, and other birds.	Soil biocrusts observed only in protected sites. In areas of deeper soil there	Soil: Bocker-Imnaha Rock outcrop complex, 30-60% slopes

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		ROSA.	Steep slopes appear to be used minimally by domestic cattle.	is evidence of shallow and minor soil slumping/creeping downhill – most likely natural or caused by past heavy grazing. It is evident in places without current heavy livestock use. Perennial vegetation is catching soil. 70% of site is in climax plant community. In areas with shallow rocky soil POSA12 has been replaced by annual grasses. Particularly pockets of concave soils.	Ecosite: Mountain Shallow South (36)
25	Table Mountain/ Kirkland	PICO, ABLA2, JUNCU, FRVI, ACME, THFE2, RUPA, ROSA, TRIFO, POTEN, PIMA	This site has had historic logging. Cattle are grazing open areas including skid trails and moist areas or areas of water accumulation on site. Skid trails show evidence of detrimental soil compaction (platy structure)	Mosses and quick growing biological soil crusts are present on otherwise bare/exposed soil sites resulting from skid logging and prescription burning.	Soil: Limberjim-Syrupcreek complex, 0-15% slopes Ecosite: Warm-dry forest, loamy soil.
26	Hunting Camp/ Tamarack	PSSP6, POSA12, BRTE, BRAR5, FEID, ACMI, TRDU, LUPIN, LASE, PERID, DAUN, BASA,	Moderate to high elk use. Early to mid summer cattle grazing. Slight to moderate gopher activity.	Water development/pond located on top of hill ¼ mile above evaluation site. Salting site located ¼ mile below evaluation site. Selected low slope angle	Soil: Bocker-Anatone Rock outcrop complex, 2-15% slopes Ecosite: Mountain Shallow South (36)

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		ERHE, are expected on this site, but are missing		site at time of evaluation, as all other sites in the vicinity had been located on steep slopes.	Soils are less rocky and slightly deeper than typical Anatone soils previously evaluated. May be due to low slope angle.
27	Teepee Elk/ Elk	PSSP6, POSA12, DAUN, BRCA, ARRI, ACMA, POPR, ACMA, TRDU, SYAL, ERHE, KOMA, BRAR5, BRCA, ANTEN, MADIA, PODO, ALLIU, LOMAT, EPLIO, FRVI, CAREX/JUNC	Low to moderate use by elk and deer. Domestic livestock use currently low, but in past more intensive.	Adjacent to analysis area is open forested (PIPO) area. Dispersed recreational area adjacent to site – but no obvious off road ATV use.	Ecosite: Mountain Very Shallow (27) Mound intermound plant/soil complex Soil: Anatone-Bocker-Fivebeaver Complex, 0-15% slopes.
28	Cougar Creek/ Baldwin	PSSP6, FEID, KOMA, CARU, POSA, POPR, BRAR5, BASA, ACLA, TRMA, SYAL, GETR, BRODIA, PHLOX, LUPINE, PERID, DELPH, EPLIO, WYAM, ALLIU, TRDU, SEDUM	Wild ungulate use in fall and spring. Cattle use in fall. Moderate gopher activity – observed new tunnels on greater than 5% site area, apparently constructed under snow pack.	Timber harvest activities adjacent to site – but not directly impacting the site/evaluation area. Skid trails and landings associated with timber harvest activities have been seeded to intermediate wheat and Timothy grass. A pond is located just south of the analysis area.	Soil: Anatone-Bocker-Fivebeaver complex, 2-15% slopes Ecosite: Mountain Very Shallow (27)
29	Teepee Elk/ Rock Creek	PSSP6, FEID, POSA12, BRTE, BRAR5, BASA,	Winter use by elk and deer.	BRTE and TRDU exist in small patches and in shape of contour bands	Soil: Bocker-Clearline-Rock outcrop complex, 60-90% slopes

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		TRDU, ROSA, ACLA		throughout site. Soils tend to be easily displaced down slope/sloughed with hoof impact.	Ecosite: Mountain Shallow South (36)
30	Cold Springs/ Lost Cow	BRTE, PSSP6, ACGL, ROSA, SYAL, HODI, TRDU, LUPIN, PHMA, BASA, LOMAT, PIPO.	Winter use by elk and deer. Mountain sheep range area. Light use in winter by cattle. Historic heavy sheep and cattle grazing has potentially been the cause of a shift in plant community from FEID/KOMA to one dominated by PSSP6, SYAL, and ROSA.	This site is located on the most northern section of the WW –NRA. This is canyon/ canyon breakland topography at lower elevation than the other sites.	Soil: Rock outcrop-Imnaha-Cherrycreek complex, 60-90% north slopes Ecosites: Shrubby North (60) and North (40) Ecosites are associated and because they form a mosaic across the analysis area it is hard to tease them apart.
31	Cold Springs/ North Wildhorse	FEID, KOMA, ACMI, PSSP6, BRCA, POPR, MAGR,	Sign of elk and grouse use on mounds. Sign of cattle use from previous years – not currently. Predominant use appears to be trailing – moving through to areas with better forage and lounging sites. Mound – intermound soil and plant community complex. This type of topography makes it more challenging to analyze the site. Attributes are primarily evaluated for both mounds and intermounds	The vicinity of the analysis area has been moderately to intensively burned in the past by wildfire. There are no obvious burn affects currently on the site –but the timbered ridges and north slopes of draws adjacent to the site appear to have experience a stand replacement fire. Trees, shrubs, understory vegetation and ground cover are regenerating. The site and vicinity has	Soil: Anatone-Bocker-Fivebeaver complex, 2-15% slopes Ecosite: Mountain Very Shallow (27) and Mountain Shallow (22)

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
			separately.	been seeded with brome – potentially a post fire activity. A road is located directly above the site. Also, a rock outcrop is located directly above adjacent to the site. These two features with low infiltration rates and high runoff potential most likely are impacting the sites hydrologic and soil stability functions.	
32	Cold Springs/ Lower Cottenwood	POSA12, FEID, PSSP6, ASTRA, LUPIN,	High amount of elk use. Moderate amount of cattle use. Heavy cattle use to south of site and adjacent to access road and salting site, and very heavy use associated with holding site and main road further south of analysis area.	Holding site, salting sites and road used for trailing and moving cattle are in close proximity to site.	Soil: Albee-Bocker Complex, 2-15% slopes. Ecosite: Mountain Shallow South (36) used for analysis but also fits Mountain Very Shallow (27). Very faint mound-intermound plant/soil community.
33	Cold Springs/ North Cold Springs	FEID, PSSP6, POSA12, ERHE, LUPIN, PHLOX	Light winter elk and deer use. Light cattle use – predominately grazing FEID species.	Mound – intermound community with good ground cover and good soil biotic crust cover.	Soil: Albee-Bocker Complex, 2-15% slopes. Ecosite: Mountain Loamy (18) associated with <i>Albee</i> soils and Very Shallow (27) associated with <i>Bocker</i> soils.

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
					Mound-intermound plant/soil community.
34	Cold Springs/ South Cold Springs	PIPO, PSME, ABGR, LAOC, SASC, CAGE, ARUV, ROSA, VIOLA, LIBO2, CARU.	Area is used lightly to moderately by domestic livestock. Some browsing by cattle was observed particularly on skid trails and areas opened up through commercial logging activities. The area is recovering from heavy past disturbance including commercial timber harvest, post-harvest prescribed burning, commercial grazing and dispersed camping and hunting activities.	Area is not suited for IIRH. Forest canopy cover too dense. Forested area is approximately 200 acres in size. Because signs of cattle use were observed, an IIRH was conducted to get a general idea of resource conditions.	Soil: Syrupcreek- Limberjim complex, 0-15% slopes Ecosite: Warm-dry forest, loamy soil.
35	Cold Springs/ South Cold Springs	PSSP6, POSA12, PHLOX, ERHE, LOMAT, ALLIU, PENST, BERE	Very light use by both wild ungulate and domestic. Site appears to be used just for passing through – it is very steep.	Area is very steep (60- 70%). This area may not be considered to be 'suitable grazing'.	Soil: Bocker-Anatone Rock outcrop complex, 2-15% slopes Ecosite: Mountain Very Shallow (27) and Mountain Shallow (22)
P1	Private 1	FEID, PSSP6, KOMA, BRBR, BRTE, ERHE, GETR, ACMI, ZIPA2, SYAL, ROSA, STIPA,	Deer browse on shrubs restricting growth, badger holes, ground squirrels,	Slump 200 yards above site. Determined site to be a Mountain Loamy (17) ecosite due to moderately	Wallowa-Bocker complex 2- 15% slopes Ecosite: Mountain Loamy – silt loam without rock fragments (17) associated a

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		LUPIN, ANTEN, LOMAT, POTEN, TRIFO.		deep silt soils without rock fragment and smooth, linear topo-graphy. Used Reference Sheet (22) Mountain shallow because no reference sheet for (18).	smooth and linear landform.
P2	Private 2	POSA12, BRTE, ELEL5, FEID, KOMA, ACMI, BASA, CRNA, PHLOX, ERIGE, ANTEN, LUPIN	Deer and livestock use; grazing on PSSP6 use of KOMA green-up. Adjacent south slope has significant patches of TACA8 and ELYMU.	Soil and aspect match (27), but structural and composition of vegetation matches (36). Both ecosites descriptions are similar in regards to amount of bare soil and vegetated ground cover.	Soil: Harlow- Bocker complex 2-15% slope Ecosite: Mountain Very Shallow (27) and Mountain Shallow South (36)
P3	Private 3	PSSP6, FEID, , CAMAS, ACMI, LUPIN, GETR, PHLOX, ERHE, LOMAT, BRASS2, ASTRA, BRTE, BRAR5, LEPID, SOLID, PODO, ANTEN,	Commercial cattle use in June and July, low horse use. Signs of elk.	No reference sheet for ecosite (18). Instead used reference sheet (22). Soils have a silty clay loam to clay loam horizon at approximately 8-9 inch depth that may moderately restrict capacity to transmit water.	Soil: Harlow-Snell- Imnaha comolex, moist, 15-30% slopes Ecosite: Mountain Loamy (18) associated with <i>Snell</i> soils and Mountain Shallow (22) associated with <i>Harlow</i> soils.
P4	Private 4	ERHE, BRTE, BASA, PSSP, FEID, POSA12, COLLO, ACMI, LOMAT, ERHE,	Yearly use by cattle in July. Signs of elk use. Gophers present and associated with BRTE.	No Reference sheet for Shallow South (30). Used Mountain Shallow South (36) Reference sheet.	Soil: Gwin-Kettenback- Rock outcrop complex, 60- 90% slopes. Ecosite: Shallow South (30)

Site #	Allotment/ Pasture	Summary of Predominant vegetation on site	Wildlife and Livestock Use and Recent Disturbances	Off-site Influences and Comments	Soil Type and Ecological Site Name
		LEPID.		Road above site. Elk trailing prevalent in area.	
P5	Private 5	PSSP6, FEID, POSA12, KOMA, DAUN, ACMI, ERHE, BASA, BRAR5, GILIA, LEPID, PENST, ASTRA, CECY2, CALCO, LUPIN,	No domestic grazing within the past ten years. Signs of deer, elk and bear use. Signs of past/ historic soil high soil degradation and surface soil loss.	Skid road below analysis area was used heavily in past. Not currently used.	Soil: Gwin-Kettenback-Rock outcrop complex, 60-90% slopes. Ecosite: Mountain Shallow (22). This site does not accurately fit this ecosite due to steep slope (55- 70% slope) and associated high soil erosion potential.
P6	Private 6	PSSP6, POSA12, FIED, BASA, ROSE, BRAR5, BRTE, SYAL, PHMA, ASTRA, LOMAT, PHLOX, PENST, CALCO, CAMAS, AGUR, HIERA	No domestic grazing within the past ten years. Old homestead above the site. Trail to Joseph Creek within site. Signs of deer, elk and bear use. Signs of past/historic soil degradation and surface soil loss.	Surface soil rock and soil rock content by volume is very high for the analysis area and the surrounding areas.	Soil: Anatone- Cherrycreek Imnaha complex, 30 – 60% north slopes Eocsite: Shrubby North (60)

Appendix C

Species Code, Latin Name, Common Name

Species Code	Latin Name	Common Name
Grasses and grass-like		
BRAR5	<i>Bromus arvensis</i>	Field brome, Japanese brome
BRBR	<i>Bromus briziformus</i>	rattlesnake brome
BRCA	<i>Bromus carinatus</i>	mountain brome
BRMO	<i>Bromus mollis</i>	soft chess
BRTE	<i>Bromus tectorum</i>	cheatgrass
CAGE	<i>Carex geyeri</i>	elk sedge
CAREX	<i>Carex species</i>	sedge species
CARU	<i>Calamagrostis rubescens</i>	pinegrass
DAUN	Danthonia unispicata	one spike oatgrass
ELEL5	Elymus elymoides	bottlebrush squirreltail
FEID	<i>Festuca Idahoensis</i>	Idaho fescue
JUNCU	<i>Juncus species</i>	rush species
KOMA	<i>Koeleria macratha</i>	prairie junegrass
POA	<i>Poa species</i>	bluegrass species
POPR	<i>Poa pratensis</i>	Kentucky bluegrass
POSA12	<i>Poa secunda</i>	Sandberg bluegrass
PSSP6	<i>Pesudoragneria spicata</i>	bluebunch wheatgrass
STIPA	<i>Stipa species</i>	needlegrass species
STOC	<i>Stipa occidentalis</i>	western needlegrass
TACA8	Taeniatherum caput-medusae	Medusa head
THIN6	Thinopyrum intermedium	intermediate wheatgrass
VEDU	<i>Ventenata dubia</i>	ventenata
Shrubs		
ACGL	<i>Acer glabrum</i>	Rocky mountain maple
ABLA2	<i>Abies lasiocarpa</i>	subalpine fir
ARRI	<i>Artemisia rigida</i>	stiff sagebrush
ARUV	Arctostaphylos uva-ursi	kinnikinnick
BERE	<i>Berberis repens</i>	creeping Oregon grape
CRNA	<i>Crysothamnus nauseosus</i>	grey rabbitbrush
HODI	<i>Holodiscus discolor</i>	ocean-spray
PHMA	<i>Physocarpus malvaceus</i>	mallow ninebark
ROSA	<i>Rosa species</i>	rose species
SASC	<i>Salix scouleriana</i>	scouler willow
SPBE	<i>Spirea betulifolia</i>	birchleaf spirea
SPIRA	<i>Spirea species</i>	spirea species
SYAL	<i>Symphocarpos albus</i>	common snowberry
VASC	<i>Vaccinium scoparium</i>	grouse huckleberry
Trees		

ABGR	<i>Abies grandis</i>	Grand fir
LAOC	<i>Larix occidentalis</i>	western larch
PICO	<i>Pinus contorta</i>	lodgepole
PIPO	<i>Pinus ponderosa</i>	ponderosa pine
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
Forbs		
ACMI	<i>Achillea millefolium</i>	yarrow
AGOSE	<i>Agoseris species</i>	false dandelion, agoseris
AGUR	Agastache urticifolia	nettleleaf horse mint
ALLIU	<i>Allium species</i>	wild onion species
AMLY	<i>Amsinkia lycopsoides</i>	tarweed fiddleneck
ANMA	Anaphalis margaritacea	pearly everlasting
ANTEN	<i>Antennaria speceis</i>	pussy toes species
ASTRA	<i>Astragalus species</i>	locoweed, milkvetch
ARCO	<i>Arnica cordifolia</i>	heartleaf arnica
BASA	<i>Balamorhiza sagitata</i>	arrowleaf balsamroot
BRASS2	Brassica species	mustard species
CALOC	Calochortus <i>species</i>	mariposa lily
CAMAS	Camassia species	camas species
CASTI	<i>Castilleja species</i>	paintbrush species
CECY2	Centaurea cyanus	bachelor's button
CEDI3	Centaurea diffusa	diffuse knapweed
CLPU	<i>Clarkia pulchelia</i>	clarkia, deer horn
COLLO	<i>Collomia species</i>	collomia species
DELPH	<i>Delphinium species</i>	larkspur species
EPILO	<i>Epilobium species</i>	willow-weed
ERIGE	<i>Erigeron species</i>	daisy, fleabane
ERHE	<i>Eriogonum heracleoides</i>	wyeth's buckwheat
ERST2	<i>Eriogonum strictum</i>	strict buckwheat
FRVI	<i>Fragaria virginana</i>	blueleaf strawberry
GETR	<i>Geum trifolium</i>	old man's whiskers, prairie smoke
GILIA	<i>Gilia species</i>	gilia species
GRSQ	Grindelia squarrosa	curlcup gumweed
HIERA	Hieracium <i>species</i>	hawkweed species
LASE	<i>Lactuca serriola</i>	prickly lettuce
LEPID	Lepidium <i>species</i>	pepperweed
LIBO2	Linnaea borealis	twinline
LINAN	<i>Linanthuis species</i>	linanthuis species
LITHO3	Lithospermum <i>species</i>	stoneseed
LOMAT	<i>Lomatium species</i>	biscuit root, desert parsley
LUPIN	<i>Lupinus species</i>	lupine species
MADIA	<i>Madia species</i>	tarweed
MAGR3	<i>Madia gracilis</i>	Grassy tarweed
PENST	<i>Penstemon species</i>	penstemon, beardtongue
PERID	Perideridia <i>species</i>	yampah

PHLOX	<i>Phlox species</i>	phlox, wild sweet William
PHVI3	<i>Phlox viscida</i>	sticky phlox
PIMA	<i>Plantago patagonica</i>	common plantain
POTEN	<i>Potentilla species</i>	cinquefoil
PODO	<i>Polygonum douglasii</i>	Douglas' knotweed
POPU	<i>Polemonium pulcherrimum</i>	Jacob's ladder
RIBES	<i>Ribes species</i>	current, gooseberry
RUPA	Rubus parviflorus	thimbleberry
SEDUM	<i>Sedum species</i>	stonecrop species
SOLID	Solidago species	goldenrod
THFE2	<i>Thalictrum fendleri</i>	Fendler's meadowrue
TRDU	<i>Tragopogon dubius</i>	yellow salsify
TRMA	<i>Trifolium macrocephalum</i>	big head clover
TRIFO	<i>Trifolium species</i>	clover
VAME	Vaccinium membranaceum	thin leaf huckleberry
VIOLA	<i>Viola species</i>	violet
WYAM	<i>Wyethia Amplexicaulis</i>	northern mule's ear
ZIPA2	Zigadenus paniculatus	meadow death camas

Appendix D

Lower Jo Plant association list/general management recommendations

Black thorn/mesic forbs/alder

- Riparian area management should focus on the terrace utilization, greenline and shrub utilization
- Encourage shrub/sedge growth to aid in channel stabilization where appropriate
- Black hawthorn foliage is readily eaten by livestock and is a source of food and cover for wildlife
- Common snowberry is browsed by deer, elk, and cattle. It is a nutritious species for cattle late in the season

Blue Bunch wheatgrass/sandberg bluegrass

- Bluebunch Wheatgrass-Sandberg's Bluegrass (basalt)
 - Management of the community should focus on proper grazing to sustain Bluebunch Wheatgrass. Spring grazing of large herbivores should end before boot stage, summer grazing should begin after flowering or deferred or rest rotational grazing can be utilized to mitigate these concerns
- Bluebunch Wheatgrass-Sandberg's Bluegrass (scabland)
 - Manage as a community associated with Idaho Fescue-Prairie Junegrass communities, especially the mound community.
 - Grazing of the mound-intermound complex by large herbivores should occur only after scabland soils are dry and flowering of bunchgrasses on both mounds and intermounds has occurred.

Bluebunch wheatgrass/ Idaho fescue

- Management of the community should focus on proper grazing to sustain Bluebunch Wheatgrass. Spring grazing of large herbivores should end before boot stage, summer grazing should begin after flowering. Deferred or rest rotational grazing can be utilized to mitigate these concerns

Bluebunch wheatgrass/Arrowleaf balsamroot

- Management of the community should focus on proper grazing to sustain Bluebunch Wheatgrass. Spring grazing of large herbivores should end before boot stage, summer grazing should begin after flowering. Deferred or rest rotational grazing can be utilized to mitigate these concerns

Bluebunch wheatgrass/Sandberg bluegrass/scabs

- Maintenance of Bluebunch wheatgrass is important
- Trampling may reduce moss-plant ratio causing compaction, surface water movement and wind erosion
- Soil loss in deep soiled high elevation sites can be reduced by grazing following seed set. Frequency of animal traffic is an issue

Douglas buckwheat/sandberg bluegrass

- Sites to rocky and too severe for consideration in revegetation efforts.
- Avoid impacting these communities when soils are saturated with water in late spring and early summer. Season of domestic livestock use should be after early July when the

higher elevation ridges are open and range vegetation is phonologically ready.

Douglas fir/snowberry

- Primary management should be for timber production
- Control of shrubs may be necessary
- Primary value is in variety of plant species offering diverse habitat

Douglas fir/Snowberry/Stiff sage

- Livestock use these stands for shading, bedding and some foraging
- These sites are usually managed for timber production

Grand fir/ twinflower

- Late seral stands do not provide desirable forage for domestic livestock or big game, but animals are attracted to these stands for shading and bedding in the hot summer months.
- Seeding grasses will provide interim forage on silviculturally modified sites. Orchardgrass, timothy, and hard fescue are especially suited.

Idaho fescue/ Blue bunch wheatgrass /arrowleaf balsam root

- Idaho Fescue maintenance is key
- A potential conflict may develop from early season wild ungulates and domestic livestock
- Grazing after seed set preferred, rotational grazing will aid it maintaining desirable species

Idaho fescue/ Blue bunch wheatgrass /lupine

Idaho Fescue-Bluebunch Wheatgrass/Silky Lupine

- Community is suitable for livestock use but best for domestic sheep use.
- Winter grazing by multiple large herbivores can damage plant community and promote weedy forbs.
- Fire can damage perennial bunchgrasses and promote weedy forbs.

Idaho fescue/ bluebunch wheatgrass/Sandberg bluegrass

- Idaho Fescue maintenance is key, presence of sandberg's bluegrass draws more early season use
- A potential conflict may develop from early season wild ungulates and domestic livestock
- Grazing after seed set preferred, rotational grazing will aid it maintaining desirable species

Idaho fescue/Blue Bunch wheatgrass

Idaho Fescue-Bluebunch Wheatgrass (ridgetop)

- Early season use by large herbivores should be avoided.
- The community can be easily degraded by overgrazing.
- Difficult to use fire in this community because of low vegetation cover.

Idaho fescue/June prairie grass

Idaho Fescue-Prairie Junegrass (ridgetop)

- Plant communities in very early and early seral stages unless dominated by Kentucky bluegrass should be considered for mechanical seeding of native bunchgrass plants.
- As part of an UJCW management plan, deferment of livestock grazing to fall season grazing in alternate years should be considered.

- Degraded sites should be identified and treated through grazing modification and seeding.
- Idaho Fescue-Prairie Junegrass (mounds-Kentucky Bluegrass disclimax)
 - Manage with other communities forming the Mound-Intermound complex.
 - Mounds dominated by Kentucky bluegrass can be grazed heavier than mounds dominated by native perennial grasses.
- Idaho Fescue-Prairie Junegrass (mounds-Wyeth's Buckwheat disclimax)
 - Manage with other communities forming the Mound-Intermound complex.
- Idaho Fescue-Prairie Junegrass (high elevation)
 - Manage this community similar to and with other steep sloped Idaho Fescue communities.

Idaho fescue/June prairie grass Mounds

- Grazing mound communities before soil stabilizes should be avoided because of unstable soil stability characteristics.
- Mounds are highly susceptible to churning caused by frost heaving and hoof action and grazing should be avoided during this period.

Idaho fescue/Sandberg bluegrass/stiff sage

- **Community is suitable for livestock use but best for domestic sheep use.**
- **Idaho Fescue maintenance is key**
 - **Fire can damage perennial bunchgrasses and promote weedy forbs.**
- **A potential conflict may develop from early season wild ungulates and domestic livestock**
- **Grazing after seed set preferred, rotational grazing will aid it maintaining desirable species**

Mountain sage/Mt snowberry/Mt Brome

- Site is many times overgrazed as it is preferred by both livestock and big game as it is on the edge for wildlife and near shade for livestock.
- Management should focus on wildlife value for the diversity it offers between the forests and the grasslands

Ponderosa pine /Idaho fescue

- Manage for maintenance of Idaho fescue
- Sites historically degraded, can successfully be revegetated using intermediate wheatgrass, hardfescue or big bluegrass
- Grazing occurs early due to snow melt patterns, manage livestock grazing after soil saturation has passed

Ponderosa pine/Idaho fescue /pinegrass

- Site is on moist end of Ponderosa pine/Idaho fescue, sites very limited in watershed
- Manage as other pinegrass sites

Ponderosa pine/snowberry

- Considerable use by all ungulates due to proximity to desirable bunchgrass sites
- Manage to control rhizomatous shrubs to allow bunch grasses to grow. Reseed with Dry-site species

Sandberg bluegrass /onespike oatgrass /Idaho fescue

- Revegetation should not be attempted as frost heaving of disturbed soil is certain. Soils are too shallow and rocky for equipment
- Sandberg's bluegrass is available in the early spring and again when rains come in late summer or fall
- Spring use may cause trampling due to wet soil conditions, rotational grazing should be considered to mitigate
- Wild ungulates will often graze Sandberg bluegrass in the early spring

Sandberg bluegrass/onespike oatgrass

Sandberg's Bluegrass-Onespike Oatgrass (scabland)

- Manage as a community associated with Idaho Fescue-Prairie Junegrass communities, especially the Mound and Ridgetop communities.
- Grazing of the mound-intermound complex by large herbivores should occur only after scabland soils are dry and flowering of bunchgrasses on both mounds and intermounds has occurred.
- Wild ungulates will often graze Sandberg bluegrass in the early spring

Twinflower/common snowberry

- These areas are not utilized a great deal by ungulates for grazing. They are usually found in conjunction with a dense overstory and therefore livestock utilization is generally found in conjunction with bedding and shading

Appendix E

Range list of Identified Needs

Type	Label_ID	Location	Ownership	Description
Fence	1	Swamp Cr,	USFS	Rebuild
	2	Swamp Cr.	USFS	Rebuild
		Starvation		
	3	Ridge	USFS	Rebuild
	4	Swamp Cr.	USFS	Riparian Fence needs repair
	5	Swamp Cr.	USFS	Rebuild
	6	Swamp Cr.	USFS	Rebuild
	7	Miller Ridge	USFS	Rebuild
	8	Swamp Cr.	USFS	Rebuild
		Telephone		Water gap to form new
		9	Ridge	USFS
	10	Peavine Cr.	USFS	Peavine
	11	Swamp Cr.	USFS	Remove enclosure
	12	Cottonwood		
		Cr	NPT	Repair
Roads	1	Davis Cr. rd		Spot rocking, rolling dips, -
		#4602000	USFS	DO NOT CLOSE
	2	Swamp Cr.		
		rd# 460050	USFS	Spot rocking
		Cottonwood		
	3	Cr.	NPT	Road sluff- Gravel
		Long Ridge		
		rd #		Leave open to 4 wheeler
	4	4600560	USFS	access Leave open to 4 wheeler
	5	Broady Cr.	USFS	access Cattle trail maintenance to
Trail				access water
Maintenance	1	Tepee Ridge	USFS	
Water	1	Swamp Cr.	USFS	Rocking Water Gap
	2	Miller Ridge	USFS	Water Development
		Hunting		
		Camp Ridge		
		rd#		
	3	4655200	USFS	Rebuild Spring
		Hunting		
		Camp Ridge		
		rd#		
	4	4655150	USFS	Clean Pond
		Hunting		
	5	Camp Ridge	USFS	Rebuild Spring

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		rd#		
		4655150		
	6	Bull Canyon	USFS	Clean Pond
	7	Bull Canyon	USFS	Clean Pond
	8	Bull Canyon	USFS	Clean Pond
	9	Rock Creek	USFS	Spring repair, needs trough
		Long Ridge		
		rd#		
	10	4600570	USFS	Spring Development- Trough
	11	Rock Cr.	USFS	Spring Development in draw
		Cold Springs		
	12	Cr.	USFS	Pond Maintenance
		Cold Springs		
	13	Cr.	USFS	Pond Maintenance
		Cold Springs		
	14	Cr.	USFS	Pond Maintenance
		Cold Springs		
	15	Cr.	USFS	Pond Maintenance
		Cold Springs		
	16	Cr.	USFS	Pond Maintenance
		Cold Springs		
	17	Cr.	USFS	Pond Maintenance
		Trail Cr. rd #		
	18	4680212	NPT	Pond Maintenance
		Frog Pond		
	19	rd # 4680	USFS	Pond Maintenance
		Cold Springs		
	20	Ridge	USFS	Pond Maintenance
	21	Road Gulch	NPT	Pond Maintenance
	22	Horse Cr.	NPT	Pond Maintenance
	23	Horse Cr.	NPT	Pond Maintenance
		Chesnimnus		Degradation; needs
	24	Creek	Private	improvements
		Crow Cr.		
		Johnson		
		Canyon		
	24	Area	Private	Water Development and
		Davis Cr. rd		Maintenance
		# 4602000		
Weeds	1	(DKW)	USFS	Knappweed
		Chesnimnus		
	2	Cr	USFS	Scotch Thistle
		Chesnimnus		
	3	Cr.	USFS	Scotch Thistle
		Thorn		
	4	Hollow	USFS	Scotch Thistle

Appendix F

Interpreting Indicators of Rangeland Health Site Selection

The Lower Joseph Creek Watershed Range Sub-group identified Protocols to use for identification of the locations of the Interpreting Indicators of Rangeland Health sites. To best represent the larger watershed and understand the various management from private to public land, both ecological and social attributes were used in developing the appropriate sites. Consultation with Pat Shaver, NRCS aided in the stratification criteria.

The attributes included were:

Broad Based Criteria:

- Non-forested areas (less than 40%)
- Areas of Use by Cattle
- Some crossover of locations of Condition and Trend Plots
- Random locations based on stratification accounted for the diversity of the watershed
- Sites must be more than 1/8th mile from roads, water, salting areas and other known disturbance sites.

Ecological Criteria

- Slope
- Aspect
- Vegetation category

Social Criteria

- Landownership (public/private)
- 1 site per allotment
 - If additional sites available allocate 1 additional site per 85 head
- Areas of concern or question in previous assessments or management actions
- Areas identified as special (RNA's, Listed Plant Species locations)

Description and detail of site selection:

All sites were located in non-forested areas or areas of less than 40% cover. They were also more than 1/8th mile from significant roads, water, salting areas and other known

disturbance sites unless land form required less. If this occurred the team made sure the assessment area was not being directly affected by that attribute. All of the sites were located where cattle have access. Also some of the locations were placed in relative proximity with the Condition and Trend plots to allow for crossover between these two methodologies.

A list of the all the combinations of Aspect, Slope and major vegetation categories was developed allowing for coverage of basic land form and vegetation sites. All of these attributes were limited to minimal options to keep the combinations within usable numbers. Aspect was divided into north and south. Slope was broken into 0 to 5% slope, 5 to 15% slope and over 15% slope. Vegetation categories were taken from the previous experience of mapping the vegetation in the Upper Joseph Creek Watershed Assessment. Therefore we used Idaho Fescue, Bluebunch Wheatgrass or Scabland. Land ownership of the open grassland was estimated to be $\frac{3}{4}$ public and $\frac{1}{4}$ private. Therefore, the same ratio of public and private sites per ownership was used as criteria for site selection. A request to participate was sent out to the qualifying landowners in the watershed. To qualify, only landowners with 240 acres or more were considered for site selection. This was to attempt to keep the private representation in lands that are less likely be converted into small ranchettes and to have enough land in one ownership to offer a viable unit of grazing. These lands must also be currently grazed or has had past grazing and are proposed to be grazed in the future. Those who signed up to participate were then assessed for the ecological site and to represent the various areas of the watershed. The private land sites in the end represented approximately 15%.

To prepare to select the sites an slope/aspect map was generated, a random number list was created and compared to our slope/aspect/vegetation combinations. A potential list of the various sites was generated. Using the potential list the sites that represent necessary sites were selected. This included a site in a Research Natural Area and sites representing the listed species, Spalding catchfly. Then one site per allotment was identified working down the random list generated. Finally, additional sites were allocated to locations in the larger allotments. The allocation used 85 head of allowed livestock per site. They were placed in separate pastures or areas to fill out the best representation of the watershed.

Once the sites were selected on the map it was understood that the evaluation team would have to interpret the map site and make appropriate on the ground decisions once at the location. The following was given as a guideline.

Criteria for selecting Ecological sites when on the ground: Choose an ecological site description within 250 feet from the center of the designated site location. The team will then use appropriate area from that whole site description area, not just those within the radius. If appropriate conditions were not present on the ground the team had the latitude to adjust the site to get an appropriate area to represent the actual area.

Lower Joseph Creek C&T Location and Establishment

Allotment: Cluster Number: Date:

Pasture: Names of Identifiers:

General Description of the Area:

GPS Location of Witness Pole:

Declination/Datum:

Location of Pole in Reference to C&T (feet and azimuth to T1-0):

Legal Description:

Transect	Distance from previous Transect	Azimuth of Transect	T-0 Northing	T-0 Westing	T-100 Northing	T-100 Westing
T1-0						
T1-100						
T2-0						
T2-100						
T3-0						
T3-100						

T1-0 to T2-0 Azimuth:

T2-0 to T3-0 Azimuth:

COVER-FREQUENCY FORM

General Information

Site ID _____[®]
DATE (MMDDYYYY) _____[®]
EXAMINER LAST _____[®] **FIRST** _____[®] **Middle Initial** _____
Current Transect ____ **Date Entry Mode** _____

Plot Design

Frame Info

Microplot Lenth _____	UOM _____	Microplot Width _____	UOM _____
Frame Orientation _____			

Transect Info for # _____

Transect Length _____	UOM _____	Number of Frames _____	Transect Bearing _____
1 st Microplot Location _____	UOM _____	Microplot Interval _____	UOM _____

Baseline Info

Species List Complete _____	Cover Level % _____	Baseline Bearing _____	Baseline Length _____
Number of Transects _____	1 st Transect Location _____	UOM _____	
Transect Interval _____		UOM _____	

