Appendix 2: Supplemental Tables

Table A-1: Summary of Transect Sites

Transect Number	Pasture	Biotype	Ecological Site
CII1	Camp II	Cheatgrass	Shallow Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
CII2	Camp II	Sage/Crested Wheatgrass	Shallow Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
CII3	Camp II	Cheatgrass	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
EB1	East Bull	NA	Loamy 8-12" (basin big sagebrush/bluebunch wheatgrass)
EB2	East Bull	NA	Sandy 8-12" (basin big sagebrush/ Indian ricegrass/needle and thread)
EC1	East Cinder Butte	Seeding	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
ESL1	East Star Lake	Cheatgrass	Shallow Fractured 8-12"(basin big sagebrush/bluebunch wheatgrass)
ESL2	East Star Lake	Sage/Crested Wheatgrass	Shallow Fractured 8-12"(basin big sagebrush/bluebunch wheatgrass)
ESL3	East Star Lake	Sage/Crested Wheatgrass	Loamy 8-12" (basin big sagebrush/bluebunch wheatgrass)
M1	Mallard	NA	Loamy 8-10" (Wyoming big sagebrush/Thurber's needlegrass)
M2	Mallard	NA	Loamy 8-10" (Wyoming big sagebrush/Thurber's needlegrass)
NW1	North Wilson	Seeding	Loamy 8-12" (basin big sagebrush/bluebunch wheatgrass)
NW2	North Wilson	Cheatgrass	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
OB1	Owinza Butte	NA	Loamy 8-12" (basin big sagebrush/bluebunch wheatgrass)
OB2	Owinza Butte	NA	Clay Pan 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
SB1	Stagebarn	Crested Wheatgrass	Loamy 8-12" (basin big sagebrush/bluebunch wheatgrass)
SB2	Stagebarn	Seeding	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
SW1	South Wilson	Seeding	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
SW2	South Wilson	Cheatgrass	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)
SW3	South Wilson	Sagebrush	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass)

Transect Number	Pasture	Biotype	Ecological Site
WB1	West Bull	NA	Sandy 8-12” (basin big sagebrush/ Indian ricegrass/needle and thread)
WC1	West Cinder Butte	Cheatgrass	Loamy 8-12” (Wyoming big sagebrush/bluebunch wheatgrass)
WC2	West Cinder Butte	Sagebrush	Loamy 8-12” (Wyoming big sagebrush/bluebunch wheatgrass)
WSL1	West Star Lake	Sage/Crested Wheatgrass	Shallow Fractured 8-12”(basin big sagebrush/bluebunch wheatgrass)
WSL2	West Star Lake	Sage/Crested Wheatgrass	Shallow Fractured 8-12”(basin big sagebrush/bluebunch wheatgrass)
WSL3	West Star Lake	Cheatgrass	Loamy Bottom 8-14” (basin big sagebrush/basin wildrye)

Table A-2: Fires within the Star Lake Allotment

Year	Fire Name	Pasture(s) Burned	Allotment Acres Burned	% of Allotment Burned
1957		Camp II	44	<1%
1958		West Bull	70	<1%
1958		Camp II	4,691	5%
1959		Heifer, West Bull	456	<1%
1960		West Bull	4	<1%
1960		East Bull, West Bull	113	<1%
1960		Heifer	2	<1%
1962		Camp II	597	1%
1962		Camp II	64	<1%
1962		West Star Lake	4	<1%
1963		Mallard, Sands, West Bull	633	1%
1965		Camp II	3,140	3%
1965		West Bull	6	<1%
1965		West Cinder Butte	41	<1%
1967		East Star Lake, Mallard, North Wilson, Owinza	4,314	4%
1970	Eden North 6	West Cinder Butte	1	<1%
1971	Russian Lake	Owinza	589	1%
1971	Notch Butte South	Camp II, East Star Lake, Mallard, North Wilson, Owinza, Stagebarn, West Star Lake	21,844	22%
1973	Stagebarn SE 5	Stagebarn	9	<1%
1973	Hidden Valley	Owinza	2	<1%
1973	Star Lake	East Star Lake, Mallard, North Wilson	2,906	3%
1973	Whittaker	West Star Lake	2	<1%
1974	Owinza 1	Owinza	355	<1%
1975	Owinza 1	East Bull	31	<1%

Year	Fire Name	Pasture(s) Burned	Allotment Acres Burned	% of Allotment Burned
1976	Ice	Stagebarn	184	<1%
1977	Owinza 1	West Bull	186	<1%
1977	Weiss 2	Sands	13	<1%
1977	Star North	Camp II, West Star Lake	638	1%
1977	Camp Two	Camp II	11	<1%
1979	Hi Point	West Cinder Butte	3,987	4%
1981	RR MP304	Camp II, East Bull, East Star Lake, Mallard, North Wilson, Owinza, Sands, South Wilson, Stagebarn, West Bull, West Cinder Butte	44,336	45%
1981	Whittaker	West Star Lake	<1	<1
1981	Twenty Six	Camp II	2,089	2%
1982	Cinder Butte	South Wilson, West Cinder Butte	3,497	4%
1983	Rock Well	West Bull	1,511	2%
1983	Star Lake	Camp II, East Star Lake, West Star Lake	1,097	1%
1983	Wilson Butte	Camp II	62	<1%
1983	Camp Three	West Cinder Butte	<1	<1%
1983	Eagle	East Cinder Butte	416	<1%
1985	Hidden Valley West	Stagebarn	161	<1%
1986	Big Brush	East Cinder Butte	3	<1%
1987	Owinza 5S	North Wilson, Stagebarn	358	<1%
1987	VanTassel	North Wilson	58	<1%
1989	Kimama 9SW	East Cinder Butte	63	<1%
1990	RR MP306.3E	West Bull	14	<1%
1995	Star Lake	West Star Lake	72	<1%
1995	Camp One	Camp II, West Star Lake	1,302	1%
1995	Schodde North	East Cinder Butte	275	<1%
1996	Camp 2	Camp II	879	1%
1996	Star Lake	Mallard, West Star Lake	340	<1%
1998	High Point	South Wilson	785	1%
1998	High Point 2	West Cinder Butte	1,030	1%
1998	Camp III	West Cinder Butte	290	<1%
1999	Hwy24MP48	East Bull	13	<1%
1999	Wilson Butte	Camp II, South Wilson	1,685	2%
1999	Mallard Lake	East Star Lake, Mallard, North Wilson, Sands	4,891	5%
2000	High Point	East Cinder Butte, North Wilson, South Wilson, Stagebarn	17,210	18%
2000	West High Point	West Cinder Butte	45	<1%
2001	Wilson Butte	Camp II	160	<1%
2001	Hidden	Owinza	88	<1%
2005	East Star Lake	Camp II, North Wilson, South Wilson	7,284	7%

Year	Fire Name	Pasture(s) Burned	Allotment Acres Burned	% of Allotment Burned
2005	Star Lake	Camp II	<1	<1%
2006	Cinder	Stagebarn	1,465	1%
2007	Red Bridge (not included on map)	West Star Lake, Camp II	7,416	8%
		Total	**136,419**	**147%**

Table A-3: Field Assessment Sites Percent Ground Cover

Transect Number	Vascular Plants	Bare Ground	Rock	Ground Litter	Standing Litter	Biotic Crust
CII1	92	0	6	2	0	0
CII2	81	3	4	8	0	4
CII3	90	0	2	2	6	0
EB1	68	8	8	8	6	2
EB2	70	16	4	6	3	1
EC1	71	13	0	6	9	1
ESL1	73	9	5	6	5	2
ESL2	56	19	10	8	2	5
ESL3	68	20	2	9	0	1
M1	56	13	3	15	13	0
M2	59	15	0	14	6	6
NW1	73	11	1	15	0	0
NW2	89	2	3	4	2	0
OB1	82	10	0	8	0	0
OB2	76	10	2	8	2	2
SB1	91	2	1	5	0	1
SB2	74	10	2	12	1	1
SW1	83	7	4	4	2	0
SW2	94	2	4	0	0	0
SW3	83	7	0	4	3	3
WB1	46	23	2	24	4	1
WC1	75	2	2	2	17	2
WC2	73	10	1	4	5	7
WSL1	64	23	3	7	3	0
WSL2	60	21	1	12	1	5
WSL3	62	5	3	15	11	4
Average	**73**	**10**	**3**	**8**	**4**	**2**

Table A-4: Star Lake Production Study Summary

Pasture Name	Vegetation Type	Acres	(n)	Mean lbs/ac Perrenial Herbaceous	Total Perennial Production (pounds)	Mean lbs/ac Annual Herbaceous	Total Annual Production (pounds)	Mean lbs/ac Shrub	Total Shrub Production (pounds)
Camp II	Sage-Crested	4,555	6	98	446,390	77	350,735	36	163,980

Pasture Name	Vegetation Type	Acres	(n)	Mean lbs/ac Perrenial Herbaceous	Total Perennial Production (pounds)	Mean lbs/ac Annual Herbaceous	Total Annual Production (pounds)	Mean lbs/ac Shrub	Total Shrub Production (pounds)
	Cheatgrass	3,355	3	120	402,600	318	1,066,890	3	10,065
	Seedings	882	2	928	818,496	117	103,194	-	-
	Crested wheatgrass	28		506	14,168	21	588	51	1,428
	Sagebrush	59		117	6,903	108	6,372	32	1,888
	Total	**18,712**			**1,688,557**		**1,527,779**		**177,361**
Cinder Butte	Crested wheatgrass	864	2	124	107,136	149	128,736	-	-
	Sage-Crested	2,258	5	52	117,416	139	313,862	73	164,834
	Sagebrush	2,096	5	57	119,472	55	115,280	141	295,536
	Cheatgrass	5,800	6	29	168,200	786	4,558,800	4	23,200
	Total	**11,018**			**512,224**		**5,116,678**		**483,570**
Cinder Butte East	Seeding	4,151	6	532	2,208,332	133	552,083	-	-
	Cheatgrass	3,200	3	109	348,800	1,680	5,376,000	-	-
	Total	**7,351**			**2,557,132**		**5,928,083**		**-**
East Bull	Sagebrush	155		235	36,425	1	155	1	155
	Sage-Crested	1,278	1	945	1,207,710	3	3,834	30	38,340
	Crested wheatgrass	57		947	53,979	8	456	3	171
	Total	**1,490**			**1,298,114**		**4,445**		**38,666**
Mallard	Crested wheatgrass	1,525	2	390	594,750	60	91,500	0	76
	Sage-Crested	1,489	2	188	279,932	90	134,010	73	108,697
	Sagebrush	1,954	2	30	58,620	185	361,490	59	115,286
	Cheatgrass	811	1	71	57,581	506	410,366	-	-
	Total	**5,779**			**990,883**		**997,366**		**224,059**
Owinza	Crested wheatgrass	2,404	1	43	103,372	104	250,016	97	233,188
	Sage-Crested	2,694	3	477	1,285,038	155	417,570	33	88,902
	Sagebrush	585	1	235	137,475	1	585	1	585
	Total	**5,683**			**1,525,885**		**668,171**		**322,675**
Sand Blow	Crested wheatgrass	688	1	795	546,960	3	2,064	4	2,752
	Sage-Crested	655	1	724	474,220	83	54,365	11	7,205
	Sagebrush	23		30	690	185	4,255	59	1,357
	Total	**1,366**			**1,021,870**		**60,684**		**11,314**
Stagebarn	Crested wheatgrass	2,992	3	375	1,122,000	132	394,944	51	152,592
	Cheatgrass	637	1	439	279,643	25	15,925	-	-
	Seeding	10,212	15	610	6,229,320	192	1,960,704	1	10,212
	Total	**13,841**			**7,630,963**		**2,371,573**		**162,804**
StarLake (East and West Star Lake Pastures)	Sage-Crested	8,510	13	304	2,587,040	65	553,150	48	408,480
	Cheatgrass	1,806	2	417	753,102	154	278,124	-	-
	Total	**10,316**			**3,340,142**		**831,274**		**408,480**
West Bull	Crested wheatgrass	1,115	1	947	1,055,905	8	8,920	3	3,345
	Sagebrush	910	1	0	-	125	113,750	104	94,640

Pasture Name	Vegetation Type	Acres	(n)	Mean lbs/ac Perrenial Herbaceous	Total Perennial Production (pounds)	Mean lbs/ac Annual Herbaceous	Total Annual Production (pounds)	Mean lbs/ac Shrub	Total Shrub Production (pounds)
	Sage-Crested	320		477	152,640	155	49,600	33	10,560
	Total	**2,345**			**1,208,545**		**172,270**		**108,545**
Wilson Ridge (North and South Wilson Pastures)	Crested wheatgrass	1,252	2	506	633,512	21	26,292	51	63,852
	Sage-Crested	1,518	3	314	476,652	38	57,684	25	37,950
	Sagebrush	1,168	2	117	136,656	108	126,144	32	37,376
	Cheatgrass	2,792	2	167	466,264	434	1,211,728	-	-
	Seeding	10,069	15	469	4,722,361	170	1,711,730	4	40,276
	Total	**18,435**			**6,435,445**		**3,133,578**		**179,454**
Allotment	TOTAL PRODUCTION				28,209,760		20,811,901		2,116,928
					Total Production (all vegetation)	51,138,589			

Appendix 3-1 *May, 2000*

Qualitative Assessment Worksheet: Indicators of Rangeland Health

Degree of Departure from Ecological Site Description and/or Ecological Reference Area(s)					
Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills	Rill formation is severe and well defined throughout most of the area.	Rill formation is moderately active and well defined throughout most of the area.	Active rill formation is slight at infrequent intervals, mostly in exposed areas.	No recent formation of rills; old rill have blunted or muted features.	Current or past formation of rills as expected for the site.
2. Water Flow Patterns	Extensive and numerous; unstable with active erosion; usually connected.	More numerous than expected; deposition and cut areas common; occasionally connected.	Nearly matches what is expected for the site; erosion is minor with some instability and deposition.	Matches what is expected for the site; some evidence of minor erosion. Flow patterns are stable and short.	Matches what is expected for the site; minimal evidence of past or current soil deposition or erosion.
3. Pedestals and/or Terracettes (Wind and Water)	Abundant active pedestalling and numerous terracettes. Many rocks and plants are pedestalled; exposed plant roots are common.	Moderate active pedestalling; terracettes common. Some rocks and plants are pedestalled with occasional exposed roots.	Slight active pedestalling; most pedestals are in flow paths and interspaces and/or on exposed slopes. Occasional terracettes present.	Active pedestalling or terracette formation is rare; some evidence of past pedestal formation, especially in water flow patterns and on exposed slopes.	Current or past evidence of pedestalled plants or rocks as expected for the site. Terracettes absent or uncommon.
4. Bare Ground	Much higher than expected for the site. Bare areas are large and generally connected.	Moderately to much higher than expected for the site. Bare areas are large and occasionally connected.	Moderately higher than expected for the site. Bare areas are of moderate size and sporadically connected.	Slightly to moderately higher than expected for the site. Bare areas are small and rarely connected.	Amount and size of bare areas nearly to totally match that expected for the site.
5. Gullies	Common with indications of active erosion and downcutting; vegetation is infrequent on slopes and/or bed. Nickpoints and headcuts are numerous and active.	Moderate to common with indications of active erosion; vegetation is intermittent on slopes and/or bed. Headcuts are active; downcutting is not apparent.	Moderate in number with indications of active erosion; vegetation is intermittent on slopes and/or bed. Occasional headcuts may be present.	Uncommon with vegetation stabilizing the bed and slopes; no signs of active headcuts, nickpoints, or bed erosion.	Drainages are represented as natural stable channels; no signs of erosion with vegetation common.
6. Wind-Scoured, Blowout, and/or Depositional Areas	Extensive	Common	Occasionally present	Infrequent and few	Matches what is expected for the site
7. Litter Movement (wind or water)	Extreme; concentrated around obstructions. Most size classes of litter have been displaced.	Moderate to extreme; loosely concentrated near obstructions. Moderate to small size classes of litter have been displaced.	Moderate movement of smaller size classes in scattered concentration around obstructions and in depressions.	Slightly to moderately more than expected for the site with only small size classes of litter being displaced.	Matches that expected for the site with a fairly uniform distribution of litter.
8. Soil Surface Resistance to Erosion	Resistance of soil surface to erosion extremely reduced throughout the site. Biological stabilization agents including organic matter and biological crusts virtually absent.	Resistance of soil surface to erosion significantly reduced in most plant canopy interspaces and moderately reduced beneath plant canopies. Stabilizing agents present only in isolated patches.	Resistance of soil surface to erosion significantly reduced in at least half of the plant canopy interspaces, or moderately reduced throughout the site.	Some reduction in soil surface stability in plant interspaces or slight reduction throughout the site. Stabilizing agents reduced below expected.	Resistance of soil surface to erosion matches that expected for the site. Surface soil is stabilized by organic matter decomposition products or a biological crust.

Appendix 3-1 continued *May, 2000*

Qualitative Assessment Worksheet: Indicators of Rangeland Health

Degree of Departure from Ecological Site Description and/or Ecological Reference Area(s)					
Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
9. Soil Surface Loss or Degradation	Soil surface horizon absent. Soil structure near surface is similar to, or more degraded, than that in subsurface horizons. No distinguishable difference in subsurface organic matter content.	Soil loss or degradation severe throughout site. Minimal differences in soil organic matter content and structure of surface and subsurface layer.	Moderate soil loss or degradation in interspaces with some degradation beneath plant canopies. Soil structure is degraded and soil organic matter content is significantly reduced.	Some soil loss has occurred and/or soil structure shows signs of degradation, especially in plant interspaces.	Soil surface horizon intact. Soil structure and organic matter content match that expected for site.
10. Plant Community Composition & Distribution Relative to Infiltration & Runoff	Infiltration is severely decreased due to adverse changes in plant community composition and/or distribution. Adverse plant cover changes have occurred.	Infiltration is greatly decreased due to adverse changes in plant community composition and/or distribution. Detrimental plant cover changes have occurred.	Infiltration is moderately reduced due to adverse changes in plant community composition and/or distribution. Plant cover changes negatively affect infiltration.	Infiltration is slightly to moderately affected by minor changes in plant community composition and/or distribution. Plant cover changes have only a minor effect on infiltration.	Infiltration and runoff are equal to that expected for the site. Plant cover (distribution and amount) adequate for site protection.
11. Compaction Layer	Extensive; severely restricts water movement and root penetration.	Widespread; greatly restricts water movement and root penetration	Moderately wide-spread, moderately restricts water movement and root penetration.	Rarely present or is thin and weakly restrictive to water movement and root penetration.	None to minimal, not restrictive to water movement and root penetration.
12. Functional/Structural Groups	Number of F/S groups greatly reduced. AND/OR Relative dominance of F/S groups has been dramatically altered. AND/OR Number of species within F/S groups dramatically reduced.	Number of F/S groups reduced AND/OR one dominant group and/or one or more sub-dominant group replaced by F/S groups not expected for the site AND/OR Number of species within F/S groups significantly reduced.	Number of F/S groups moderately reduced. AND/OR One or more subdominant F/S groups replaced by F/S groups not expected for the site. AND/OR Number of species within F/S groups moderately reduced.	Number of F/S groups slightly reduced. AND/OR Relative dominance of F/S groups has been modified from that expected for the site. AND/OR number of species within F/S slightly reduced.	F/S groups and number of species in each group closely match that expected for the site.
13. Plant Mortality/Decadence	Dead and/or decadent plants are common.	Dead plants and/or decadent plants are somewhat common.	Some dead and/or decadent plants are present.	Slight plant mortality and/or decadence.	Plant mortality and decadence matches that expected for the site.
14. Litter Amount	Largely absent or dominant relative to site potential and weather.	Greatly reduced or increased relative to site potential and weather.	Moderately more or less relative to site potential and weather.	Slightly more or less relative to site potential and weather.	Amount is what is expected for the site potential and weather.
15. Annual Production	Less than 20% of potential production.	20-40% of potential production.	40-60% of potential production.	60-80% of potential production.	Exceeds 80% of potential production.
16. Invasive Plants	Dominate the site.	Common throughout the site.	Scattered throughout the site.	Occasionally present on the site.	Rarely present on the site.
17. Reproductive Capability of Perennial Plants	Capability to produce seed or vegetative tillers is severely reduced relative to recent climatic conditions.	Capability to produce seed or vegetative tillers is greatly reduced relative to recent climatic conditions.	Capability to produce seed or vegetative tillers is somewhat limited relative to recent climatic conditions.	Capability to produce seed or vegetative tillers is only slightly limited relative to recent climatic conditions.	Capability to produce seed or vegetative tillers is not limited relative to recent climatic conditions.

Appendix 3-2 Standard Checklist For Lotic Riparian

Yes	No	N/A	Hydrologic		Yes	No	N/A	Vegetative		Yes	No	N/A	Soils-Erosion Deposition

			1. Floodplain above bankfull inundated in "relatively frequent" events					6. There is diverse age-class distribution of riparian wetland vegetation (recruitment for maintenance/recovery)					13. Flood plain and channel characteristics (i.e., rocks overflow channel, coarse and/or large woody material) are adequate to dissipate energy
			2. Where beaver dams are present they are active and stable					7. There is diverse composition of riparian-wetland vegetation (for maintenance/recovery)					14. Point bars are revegetating with riparian-wetland vegetation
			3. Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (I.e., landform, geology, and bioclimatic region)					8. Species present indicate maintenance of riparian soil moisture characteristics					15. Lateral stream movement is associated with natural sinuosity
			4. Riparian-wetland area is widening or has achieved potential extent					9. Streambank vegetation is comprised of those plant or plant communities that have root masses capable of withstanding high streamflow events					16. System is vertically stable
			5. Upland watershed is not contributing to riparian degradation					10. Riparian-wetland plants exhibit high vigor					17. Stream is in balance with the water and sediment being supplied by the watershed (i.e. no excessive erosion or deposition)
								11. Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows					
								12. Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery)					

Standard Checklist for Lentic Riparian

Yes	No	N/A	**Hydrologic**	Yes	No	N/A	**Vegetative**	Yes	No	N/A	**Soils-Erosion Deposition**
			1. Riparian-wetland area is saturated at or near the surface or inundated in "relatively frequent" events				8. Diverse age-class distribution (recruitment for maintenance or recovery)				16. Accumulation of chemicals affecting plant productivity/composition is not apparent
			2 Fluctuation of water levels is not excessive				9. Diverse composition of vegetation (for maintenance/recovery)				17. Saturation of soils (i.e., ponding, flooding frequency and duration) is sufficient to compose and maintain hydric soils
			3. Riparian-wetland zone is enlarging or has achieved potential extent				10. Species present indicate maintenance of riparian-wetland soil moisture characteristics				18. Underlying geologic structure/soil material/permafrost is capable of restricting water percolation
			4. Upland watershed is not contributing to riparian-wetland degradation				11. Vegetation is comprised of those plants or plant communities that have root masses capable of withstanding wind events, wave flow events, or overland flows(e.g., storm events, snowmelt)				19. Riparian-wetland is in balance with water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition
			5. Water quality is sufficient to support riparian-wetland degradation				12. Riparian-wetland plants exhibit high vigor				20. Islands and shoreline characteristics (i.e., rocks, course and/or large woody debris) adequate to dissipate wind and wave event energies
			6. Natural surface or subsurface flow patterns are not altered by disturbance (i.e., hoof action, dam, dikes, trails, roads, rills, gullies, drilling activities)				13. Adequate vegetative cover present to protect shorelines/soil surface and dissipate energy during high wind and wave events or overland flows				
			7. Structure accommodates safe passage of flows (e.g., no headcut affecting dam or spillway)				14. Frost or abnormal hydrologic heaving is not present				
							15. Favorable microsite conditions (i.e., woody debris, water temperature, etc.) is maintained by adjacent site characteristics				

Standard 8 Sage Grouse Habitat Assessment Worksheet - Breeding Habitat

Habitat Feature	Indicator	Suitable Habitat	Marginal Habitat	Unsuitable Habitat
Nesting Cover	Big sagebrush canopy cover	≥ 15% but ≤ 25%	10-14% or 26-35%	<10% or >35%
Nesting Cover	Big sagebrush height	15-30 inches	10-14 inches or 31-40 inches	<10 inches or > 40 inches
Nesting Cover	Big sagebrush growth form	Spreading form, few if any dead branches		Tall, columnar growth form with dead branches
Nesting Cover	Herbaceous perennial grass and forb height	≥ 7 inches	5 - <7 inches	< 5 inches
Nesting Cover & Food	Perennial grass canopy cover	≥ 15%	5 - 14%	<5%
Nesting Cover & Food	Forb canopy cover	≥ 10%	5 - <10%	<5%
Food	Forb richness (relative to ecological site descriptions)	High	Low	Very low

Standard 8 Sage Grouse Habitat Assessment Worksheet - Late Brood-rearing

Habitat Feature	Indicator	Suitable Habitat	Marginal	Unsuitable Habitat
Food	Riparian and wet meadow plant community	Mesic or wetland plant species dominate wet meadow or riparian area	Xeric plant species invading wet meadow or riparian area	Xeric plant species along water's edge or near center of wet meadow
Cover and Food	Riparian and wet meadow stability	No erosion evident; some bare ground may be evident but vegetative cover dominates the site	Minor erosion occurring and bare ground may be evident but vegetative cover dominates the site	Major erosion evident; large patches of bare ground
Food	Forb availability in uplands and wetland areas	Succulent forbs are readily available in terms of distribution and plant structure	Succulent forbs are available though distribution is spotty or plant structure limits effective use	Succulent forbs are not available due to site condition or plant structure
Cover	Proximity of sagebrush cover	Sagebrush cover is adjacent (< 100 yards) to brood-rearing area	Sagebrush cover is in close proximity (100 - 300 yards) of brood-rearing areas	Sagebrush cover is unavailable (> 300 yards).

Standard 8 Sage Grouse Habitat Assessment Worksheet - Winter Habitat

Habitat Feature	Indicator	Suitable Habitat	Marginal Habitat	Unsuitable Habitat
Cover and Food	Sagebrush canopy cover	10-30%	5- 9% or >30%	< 5%
Cover and Food	Sagebrush height	Normal height relative to site potential	Hedged shrubs, slightly shorter relative to site potential	Severely hedged shrubs and short relative to site potential

Appendix 3-3 - continued

Site Forb Abundance Form for Sage Grouse Evaluations

Species	Rare	Sparse	Common
Sage Grouse Preferred Forbs:			
Broomrape (*Orobanche* spp.)			
Composites			
Daisies (*Erigeron* and *Aster* spp.)			
Dandelion, C.(*Taraxacum officinale*)			
Dandelion, Mt. (Agoseris spp.)			
Hawksbeard (*Crepis* spp.)			
Microsteris (*Microseris* spp.)			
Prickly lettuce (*Lactuca serriola*)			
Salsify (*Tragopogan dubius*)			
Desert-parsley (*Lomatium* and *Cymopterus* spp.)			
Everlasting (*Antennaria* spp.)			
Groundsmoke (*Gayophytum* spp.)			
Knotweed (*Polygonum* spp.)			
Legumes (other than *Lupinus* spp.)			
Alfalfa (*Medicago* spp.)			
Bird's foot tre-foil *(Lotus* spp.)			
Clover (*Trifolium* spp.)			
Sweet clover (*Melilotus* spp.)			
Sweet vetch (*Hedysarum* spp.)			
Vetch (*Vicia* spp.)			
Milkvetch (*Astragalus* spp.)			
Peppergrass (*Lepidium* spp.)			
Phlox (*Phlox* spp.)			
Prairie star flower (*Lithophragura* spp.)			
Yarrow (*Achillea millifolium*)			
Other Forbs:			

Directions:

1. Walk around an area generally the size of a 100-foot radius circle and observe the relative abundance of forbs based on the following ratings:

Rare:	Less than 5 plants
Sparse:	5-25 plants
Common:	26+ plants