Draft 15 December 2008

Sage-grouse habitat objectives for the Brothers Planning Area of Central Oregon's High Desert

Prepared by wildlife biologists associated with the planning area.
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Purpose

The purpose of this document is to define habitat objectives for greater sage-grouse in the Brothers Planning Area of central Oregon (Figure 1 & 2). Objectives were developed based upon known habitat requirements for the species, existing information on habitat conditions, historic and present use by sage grouse, and consensus among biologists from ODFW, BLM, USFWS, and NRCS about measures needed to maintain/improve the grouse population in the planning area. This document does not prescribe site specific treatments or management direction for achieving habitat objectives, as those decisions should be made by the respective land owners and managers.

Definitions

For the purpose of this paper, the following definitions are used to describe the scale and habitat conditions for sage grouse:

- *Broad scale* = state level
- *Mid scale* = Prineville BLM District Boundary and population management units therein
- *Fine scale* = Pasture level, ecological site
- *Site/project scale* = Assessment points, vegetation community
- *Primary habitat indicators* = Key vegetation variables used to indicate sage-grouse habitat suitability. Benchmarks include: sagebrush canopy cover between 15-25%, grass canopy cover ≥15%, forb canopy cover ≥10%
- *Optimal habitat* = Habitat meets all of benchmarks for primary habitat indicators
- *Suitable habitat* = Habitat meets most of benchmarks for primary habitat indicators
- *Unsuitable habitat* = Habitat fails to meet benchmarks for the primary habitat indicators
- *Leks* = breeding display site for sage-grouse; other breeding activities like nesting and brood-rearing often occur near these sites

Current Sage-Grouse Habitat Use

The planning area is located on the northwest fringe of the species range in Oregon. Forest and juniper woodland communities are found at the higher elevations to the north, which limits the amount of available habitat. Data from active lek sites and radio-marked sage grouse indicate that most of the year-round habitat use occurs within 4 miles of leks in the planning area. This appears to be a non-migratory population that occupies lower elevation habitats around leks most of the year. Three dominant Ecological Sites (Pumice 10-12" precip zone, Pumice Flat 10-12" precip zone, Pumic Claypan 10-12" precip zone), encompassing approximately 140,000 acres of the area, appear to be especially important as sage-grouse breeding habitat. Most hens likely nest within 4 miles of a lek on these sites and utilize surrounding habitats during the early brood-rearing period. Depending upon forb and insect availability, hens and broods may either stay in these areas all summer or may follow the "green-line" up in elevation later as summer progresses. Some grouse have been observed using meadows in the summer/fall on higher elevation private lands. Most birds likely return to the lower elevation sagebrush areas during the fall and winter. Birds have been documented using other portions of the planning area, however, the majority of grouse in this population are thought to follow the habitat use patterns described above.

Existing Habitat Conditions

In 2006, the BLM-Idaho's Habitat Assessment Framework (May 2000) was used to inventory BLM-administered lands within 43 pastures, 8 allotments and across 6 delineated lek areas for their suitability for sage-grouse life history needs (Figure 1 & 2). In addition, Oregon Department of State Lands evaluated conditions at Todd and Marion pastures as they pertain to sage-grouse. ODFW and NRCS staff conducted a rapid assessment of ~34,000 private land acres within the project area. Because grouse use the planning area year-round, the breeding habitat criteria from the Framework were used to assess conditions. These criteria were selected because they also captured the needs of other seasonal habitats. The habitat assessment process was a rapid assessment to indicate (at a landscape perspective) areas which were lacking in habitat quality for sage-grouse during the breeding period. Primary habitat indicators of the Habitat Assessment Framework were used to identify management actions necessary to meet the habitat needs of sage-grouse. These indicators focus on sagebrush, grass, and forb canopy which are important factors for recognizing limitations for sage-grouse breeding habitat. Further, secondary indicators were used, along with ecological site descriptions, to further define management opportunities to improve sage-grouse habitat.

Assessment Findings

Sagebrush canopy cover was generally found to be adequate throughout the region with a few areas having more than 25% sagebrush canopy cover and some areas having less than 15% sagebrush canopy cover. There is decadence (i.e., when >50% of a shrub is dead) and columnar growth form in parts of the sagebrush community. There is an overarching need for maintaining sagebrush canopy and height while sustaining the highly palatable early-flowering and low sagebrush, and mountain big sagebrush.

Forb canopy cover was considered to be marginal and should be increased throughout the region.

Grass cover was adequate in most areas however the combination of grass and forb height was marginal and could be improved.

Habitat assessments documented a large component of rabbitbrush in the overall shrub canopy (Appendices 1-3) . Rabbitbrush cover accounted for approximately 25% of the total shrub component which, according to ecological site data, should range from a trace to 1 or 2%, adding a significant proportion to the overall shrub component in these ecological sites. Opportunities to reduce rabbitbrush and replace decadent sagebrush in some communities along with an overall increase in grass and forb cover should be sought. Habitat assessments also documented encroachment of juniper in two of the three ecological sites and work has been ongoing for its removal.

Some additional field validation maybe necessary to determine ecological site limitations, appropriate treatments, or habitat alteration for each pasture to increase the likelihood of reaching optimal conditions for sage-grouse habitat.

Current proportions of habitat rankings for assessed lands are: 23% optimal (31,947 acres), 52% suitable (71,723 acres), and 25% unsuitable (33,957 acres). The majority of these assessments occurred within three dominant ecological sites that accounted for 140,953 acres.

Approximately, 34,000 acres of private land are within these three dominant ecological sites and have been rapidly assessed to provide a starting point for this planning effort. Private lands in the

planning area, especially at lower elevations, are a critical component of the landscape that sage-grouse use and future more extensive habitat assessments of these lands are vital to obtaining a complete picture of the habitat conditions in the area.

State land assessments conducted in 2007 for Todd and Marion pastures indicated that these areas had adequate sagebrush (>15%) and grass canopy cover (>20%), but were relatively poor in forb canopy cover (<5%). Note that 2007 was a poor forb production year and may not be representative of the average conditions. Rabbitbrush cover in these pastures was <5%, and decadence was low <12%. Thus these pastures ~~were~~ overall were suitable for sage-grouse year-round use.

Private land assessments were conducted late Nov 2008 and consisted of a rapid assessment from the view of a vehicle. Because of the time of year the ability to assess forb cover and species diversity was extremely limited. Generally the assessments revealed that grass cover was adequate in these areas sagebrush was variable with only a few large areas with inadequate canopy cover. The stature and growth form of sagebrush was adequate in all areas and had and low decadence. Aroga moth was noted in a few areas along Merril Road. Rabbitbrush was present throughout the area but never more than 15% canopy cover.

The assessment included lands from the NE end of Camp Creek SW towards King's Well. Much of the landscape north of Pringle Flat along the Bear Creek – Fife Rd is inundated with juniper and not likely to provide habitat for sage-grouse without intensive and extensive efforts. However, the lands south of the Bear Creek Rd through the foothills there are opportunities to provide late summer habitat and potentially nesting cover. Juniper removal is paramount in much of this area. Such treatments would immediately provide improvement in the uplands but may also improve water table and the quality of the wet meadows scattered along Camp Creek. Increasing forb cover and diversity (again based on November) may be important in the uplands.

From the junction of Merrill Rd and Pringle Flat Rd heading west: rangeland on south of road dominated by rabbitbrush out to ~ 0.5 mile scattered young juniper in various densities prevalent until approximately mile marker 4 where juniper starts to dominate; to the north adequate sagebrush cover young juniper prevalent.

Future Landscape Portrait for Sage-Grouse Habitat

The overarching strategy for maintaining and increasing the sage-grouse population in the Brothers Planning Area is to ensure a landscape that is compatible with all aspects of sage-grouse life history. This includes providing adequate cover and food for each season of use. Thus, the proposed landscape portrait for sage-grouse habitat would include managing for optimal habitat conditions adjacent to the leks in the dominating ecological sites, while seeking to provide some proportion of late-summer and winter habitat needs in these areas and working to improve some of the late-summer and winter habitat conditions further away from lek areas (generally higher elevations to the north and south of Highway 20).

Goals

In 2007, the sage-grouse working group established three goals as guides to restoring sage-grouse populations in the area. These include:

1) Healthy/sustainable sage-grouse populations

-"maintain what we have and fix what is broken"
2) Healthy/functioning ranches (culturally, economically, and ecologically)
3) and healthy/functioning rangelands.

In the spirit of these three overarching goals, we recommend achievement of the following sage-grouse habitat goal: Increase optimal habitat to 40% (56,000 acres) of the total (140,000 acres) over the next 20 years, with established benchmarks reviewed every 5-years. More detailed assessments will allow for these acreages to change, but a target of 40% of the total area in optimal habitat conditions is expected to be maintained.

Three lek areas have been targeted as "places to start" to enhance habitat conditions: Whiskey, South Well, and Todd Well (Grassy Butte), and Kotzman would be used as a control.

Objectives

Mid Scale

To achieve the habitat goal described above, a 4 mile buffer around active leks was established and targeted for optimal habitat management, since 80% of year-round activity occurs within those areas (Figure 3). Mid-scale resource management considerations within the buffers include:

a. Increase forb canopy
b. Increase forb and grass height
c. Improve sagebrush vigor and palatability
d. Remove encroaching juniper
e. Reduce/eradicate undesirable weeds
f. Apply grazing strategies that yield appropriate vegetation requirements (e.g., reference plant community conditions in the ecological site description).
g. Avoid sagebrush eradication
h. Restore playa habitats
i. Install perch deterrents for raptors and corvid along power lines
j. Mark "problem" fences with anti-strike devices
k. Avoid construction of tall features

Sagebrush habitats outside of these buffers were also identified as important areas to improve for late summer and winter use (Figure 3). Mid-scale resource management considerations for these areas include:

1) Increasing herbaceous component in the uplands
2) Restoring meadows and playas
3) Removing encroaching juniper from ridge tops, upper slopes and low lying areas

Fine scale

1) Generally, priorities will link habitat suitability and population trends and prioritize in the following order: declining, stable, and inactive leks. This prioritization is based on the fundamental goals of the State Plan as well as the primary objective of this group to "maintain what we have." Spatial location of pastures should be considered as well. For example, if a pasture is in close proximity to a power line, highway or other human created structure it may not be effective to invest in habitat improvements for sage-grouse.

2) When and where key winter habitat has been documented, prioritize based on habitat assessment and ecological site information that has further described the specific sagebrush species and its limited availability in this landscape.

3) Increase optimal habitat such that increases in sage-grouse production and ultimately overall population size are realized. In particular, ensuring adequate

   a. residual grass cover to hide nests,
   b. forb cover to provide forage for chicks, and
   c. representation of diverse seral stages of shrub communities (focusing on mid to late stages).

4) Conduct fine and project level inventories and monitoring that will include a variety of vegetation measurements to track trends as well as vegetation characteristics important to sage-grouse. Exclosures, of at least an acre in size, should be used to better understand changes in vegetation over time. Smaller cages may be used to examine utilization levels on an annual basis.

5) Improve conditions from unsuitable or suitable to optimal in pastures adjacent to or inclusive of declining leks to optimal conditions over next 20 years.
   a. If improvements focused only on unsuitable pastures within the 3 target areas it would increase optimal habitat by ~27,000 acres for a total of 52,000 acres just shy of the goal.

   b. If improvements focused only on suitable pastures within the 3 target areas it would increase optimal habitat ~48,000 acres for a total of 73,600 acres exceeding the goal by 17,600 acres.

   c. The habitat assessments indicated that all three dominant ecological sites in this region were capable of producing optimal sage-grouse breeding habitat. Additional habitat considerations and objectives for other wildlife species may limit land management for sage-grouse.

Summary by lek areas:

Area 1–Kotzman Basin: Manage for current conditions- **Area 2–Whiskey:** Increase height of herbaceous cover Remove juniper Evaluate areas of dense sagebrush for possible thinning Evaluate areas to increase grass canopy Reduce rabbitbrush **Area 3–South Well:** Increase forb cover	**Area 5–Brothers:** Increase forb cover Remove juniper Increase grass and forb height Decrease sagebrush decadence Increase forb canopy Reduce rabbitbrush **Area 6–Moffit:** Increase forb canopy Decrease sagebrush decadence Reduce rabbitbrush

Remove juniper Reduce rabbitbrush **Area 4–Todd Well:** Increase forb cover Remove juniper Increase grass canopy Improve sagebrush growth form Decrease sagebrush decadence Reduce rabbitbrush	

Pasture management opportunities:
Based on assessment of BLM lands, specific pasture recommendations are available for the planning area as well (Figure 4). Using these recommendations, along with ecological site guidance, management direction can be more specifically designed to meet grouse habitat requirements (See Appendix).

Rationale/limitations
Recognizing not every acre of land can not be expected to meet "optimal habitat" criteria every year, it is paramount that on an annual basis, a high percentage (~70%) of the region is managed to meet the sage-grouse habitat goals. All management activities that have the potential to effect sage grouse habitat such as prescribed burning, juniper removal, livestock grazing, or brush beating should be designed with this goal in mind.

Monitoring
At least three levels of monitoring are needed in this landscape approach to sage-grouse habitat management. 1) Annual trends in plant community utilization 2) long-term trends in plant community composition and structure, and 3) birds response to changes in vegetation. There is a potential need to track the effects on the livestock operation (e.g., weight gains, calf weights, others) to better understand how such a plan impacts a ranch operation. Short-term monitoring of plant community utilization should include small exclosure cages to estimate utilization levels in a given pasture. This level of monitoring ensures that treatments are occurring consistently from year to year. Long-term monitoring using techniques described in the Assessment Framework at set locations will assist in determining if the treatments are trending in the direction of the stated goals. Lastly, the response of bird numbers (lek counts) to these treatments is critical to understanding the biological outcomes of the actions.

References:

BLM Idaho. 2000. A Framework to Assist in Making Sensitive Species Habitat Assessments for BLM-Administered Public Lands in Idaho: Sage Grouse.

Appendix 1. Summary statistics from Framework Assessments of Sage Grouse Habitats near Brothers Oregon. Data summarized at the landscape level by 3 ecological sites Pumice (P), Pumice Claypan (PC), and Pumice Flat (PF). Data reported are: canopy cover (%) for sagebrush, grass and forb, herbaceous height (G/F Ht), % decedance, total shrub (TS), % of total shrub that is rabbitbrush, sagebrush growth form, sagebrush height (in), forb richness, and management direction. DATA ARE DRAFT 12/2008

Ecosite	Total	BLM %	Private %	Sage %	Grass %	Forb %	G/F Ht (in)	Dec	TS	% CHVI	Growth Form	Sage Ht	Forb Rich	Management Direction
P	55162	64%	36%	22	22	9	8	40	33	26	2	19	2	< CHVI, > Forbs, < Dec
PC	31466	78%	22%	23	19	9	7	33	33	27	2	18	1	< CHVI, >G/F Ht
PF	54086	87%	13%	27	15	13	7	25	38	19	2	17	1	< CHVI, >G/F Ht, < Sage

Appendix 2. Summary statistics from Framework Assessments of Sage Grouse Habitats near Brothers Oregon. Data summarized at the lek area unit. DATA ARE DRAFT 12/2008

	Ecosite	**Total Ac**	**BLM%**	**PV%**	**Sage**	**Grass %**	**Forbs %**	**%CHVIofTS**	**G/F HT**	**Dec**	**Management Direction**
AREA 1	P	2146	73%	27%	21	30	11	10	9	14	Control-Maintain
Kotzman	PF	2571	94%	6%	25	16	13	13	6	17	Control-Maintain
AREA 2	P	13954	84%	16%	29	20	15	20	7	15	< CHVI, >G/F Ht, <Sage
Whiskey	PC	6440	88%	12%	24	19	13	34	5	36	< CHVI, > G/F Ht, JUOC Encroaching
	PF	16064	97%	3%	32	9	14	11	6	17	> Grass, > G/F Ht, < Sage?
AREA 3	P	5235	33%	67%	17	19	6	31	9	39	< CHVI, > Forbs, JUOC Encroaching
S Well	PC	9069	92%	8%	23	19	7	31	7	25	< CHVI, > Forbs, > G/F Ht, JUOC Encr.
	PF	20751	89%	11%	23	18	14	27	8	31	<CHVI
AREA4	P	14081	48%	52%	21	24	7	26	8	28	< CHVI, > Forbs, JUOC(FEW PTS)
Todd Well	PC	3542	46%	54%	22	20	10	20	9	35	<CHVI
	PF	14700	71	29	25	18	9	21	8	31	< CHVI, >Forbs
AREA5	P	10635	76%	24%	21	24	9	21	7	48	< CHVI, > Forbs, > G/F Ht
Brothers	PC	12415	72%	28%	22	19	9	25	8	34	< CHVI, > Forbs, JUOC(FEW PTS)
AREA 6	P	9111	62%	38	20	23	7	37	9	68	< CHVI, > Forbs, < Decadence
Moffit											

Appendix 3. Pasture summary of framework assessment results. Data DRAFT Dec 2008

Area	Allot	Past.	Ecosite	% Past	Total Ac	BLM%	PV %	Pv acres	Sage %	Grass %	Forb %	% CHVl	G/F HT	Dec	Management Direction
A 1	Moffit	N Kotz	P	39	745	63	37	276	12	20	8	7	7	5	Control-maintain
A 1	Moffit	N Kotz	PF	10	183	100	0	0	25	28	14	10	7	11	Control-maintain
A 1	Moffit	N Kotz	Other	51	965	.									
A 1	Moffit	S Kotz	P	19	1406	78	22	309	24	32	12	10	10	16	Control-maintain
A 1	Moffit	S Kotz	PF	33	2405	93	6	144	26	12	13	16	7	18	Control-maintain
A 1	Moffit	S Kotz	Other	48	3531										
A 2	Moffit	Pine Flat	PF	78	8689	100	0	0	31	9	12	12	6	19	< Sage, > Grass, > G/F Ht
A 2	Moffit	Pine Flat	Other	22	2403										
A 2	Haughton	SWhisky	PF	52	2345	100	0	0	27	11	18	11	5	21	>Grass, > G/F Ht
A 2	Haughton	SWhisky	Other	48	2166										
A 2	ZX	KO Butte	P	58	8595	81	18	1547	32	20	12	16	7	15	< CHVI, < Sage, > G/F Ht
A 2	ZX	KO Butte	PF	11	1580	68	31	490	34	8	15	6	7	7	> Grass, G/F Ht
A 2	ZX	KO Butte	Other	32	4726										
A 2	ZX	N4 Cornr	P	37	4041	85	15	606	27	15	20	28	6	19	< CHVI, > G/F Ht
A 2	ZX	N4 Cornr	PF	32	3512	99	1	35	46	6	19	10	6	15	> G/F Ht, Grass
A 2	ZX	N4 Cornr	Other	30	3288										
A 2	ZX	S4 Cornr	P	9	1421	100	0	0	21	27	20	27	8	8	< CHVI, >G/F Ht
A 2	ZX	S4 Cornr	PC	43	6441	88	12	773	24	20	13	36	5	37	< CHVI, > G/F Ht, JUOC encr
A 2	ZX	S4 Cornr	Other	48	7140										
A 3	B Junct	Homestd	PF	93	5224	92	8	418	25	19	21	19	8	28	< CHVI
A 3	B Junct	Homestd	Other	7	366										
A 3	B Junct	S Well	PF	100	5780	98	2	116	23	21	13	26	10	30	<CHVI
A 3	Haughton	E TPine	PF	96	3226	75	25	807	23	22	23	32	9	19	<CHVI
A 3	Haughton	E TPine	Other	4	142										
A 3	Haughton	N Spray	PF	63	3512	100	0	0	23	13	16	23	7	26	< CHVI, > G/F Ht & Canopy
A 3	Haughton	N Spray	Other	37	2030										
A 3	ZX	Dominik	PC	38	4050	97	3	122	25	12	6	41	5	35	< CHVI, >Grass, >Forb, >G/F Ht, JUOC
A 3	ZX	Dominik	PF	23	2423	83	17	412	20	18	6	30	6	52	< CHVI, > Forb, > G/F Ht, < Dec
A 3	ZX	Dominik	Other	39	4104										
A 3	ZX	Imperial	P	90	5236	33	67	3508	13	20	5	14	11	52	>Forb, JUOC encr, < Dec
A 3	ZX	Imperial	PF	10	592	7	93	551	23	17	6	48	8	33	< CHVI, >Forb
A 3	ZX	Fredrick	PC	27	5021	89	11	552	22	21	7	27	8	22	<CHVI, >Forb, JUOC encr
A 3	ZX	Fredrick	Other	73	13287										

A 4	B Junct	Gr. Butte	P	66	2724	99	1	27	24	29	4	21	10	39	< CHVI, > Forb
A 4	B Junct	Gr. Butte	PF	33	1374	100	0	0	20	15	8	21	9	23	< CHVI > Forb
A 4	B Junct	Gr. Butte	Other	1	42										
A 4	B Junct	Holding	PF	100	1022	95	5	51	37	14	9	17	7	13	<CHVI, > Grass, >Forb, > G/F H~
A 4	B Junct	Marion	P	52	1950	3	97	1892	19	30	3	0	6	10	> Forb
A 4	B Junct	Marion	PF	20	743	1	99	736	23	24	4	1	6	16	> Forb
A 4	B Junct	Marion	Other	28	1032										
A 4	B Junct	S Butte	PF	95	3827	83	17	651	23	13	10	18	6	40	< CHVI, > Grass, JUOC encr
A 4	B Junct	S Butte	Other	5	194										
A 4	B Junct	Todd	P	43	2417	1	99	2393	25	45	3	6	3	9	> Forb
A 4	B Junct	Todd	PC	14	795	0	100	795	25	23	3	19	8	6	> Forb, < CHVI
A 4	B Junct	Todd	PF	17	991	0	100	991							
A 4	B Junct	Todd	Other	26	1483										
A 4	B Junct	Vargo	P	27	1356	86	14	190	21	22	4	25	10	13	< CHVI, > Forb
A 4	B Junct	Vargo	PF	73	3684	80	20	737	26	17	10	21	8	33	<CHVI
A 4	Bright	Barbwire	P	52	1921	5	95	1825							
A 4	Bright	Barbwire	PC	6	213	6	94	200							
A 4	Bright	Barbwire	PF	30	1115	1	99	1104	22	26	7	30	7	50	< CHVI, < Dec
A 4	Bright	Barbwire	Other	12	448										
A 4	Bright	Bright	P	52	1161	92	8	93	18	21	8	31	5	28	< CHVI, JUOC encr, > Forb, > G/F Ht
A 4	Bright	Bright	PC	26	570	95	5	29	21	23	11	23	8	52	< CHVI, < Dec
A 4	Bright	Bright	PF	10	218	96	4	9	22	30	8	8	5	23	> Forb, > G/F Ht
A 4	Bright	Bright	Other	12	278										
A 4	Bright	L.Nasty	P	90	761	85	15	114	14	27	12	27	12	11	<CHVI
A 4	Bright	L.Nasty	PC	4	37	100	0	0							
A 4	Bright	L.Nasty	PF	6	48	100	0	0							
A 4	Brothers	St.Bottm	P	15	116	83	17	20							
A 4	Brothers	St. Bottm	PF	85	675	96	4	27	14	8	14	42	7	70	< CHVI, > Grass, > G/F Ht, < Dec
A 4	Fehren.	Gr.Butte	P	32	1684	53	47	791	24	19	10	14	12	10	Improve sage growth form
A 4	Fehren.	Gr. Butte	PC	37	1932	53	47	908	23	16	9	15	11	10	> Forb, Improve sage growth form
A 4	Fehren.	Gr.Butte	PF	19	1014	97	3	30	22	15	9	17	13	15	< CHVI, > Forb, Improve sage growth form,
A 4	Fehren.	Gr.Butte	Other	12	631										
A 5	Brothers N	Big West	P	57	1859	55	45	837	13	22	8	32	10	66	< CHVI, > Sage, > Forb, JUOC encr
A 5	Brothers N	Big West	PC	40	1313	76	24	315	19	19	7	20	9	54	< CHVI, > Forb, > Sage Ht, < Dec
A 5	Brothers N	Big West	Other	3	89										
A 5	Fehren.	Cody	P	20	380	68	32	122	3	30	12	73	10	50	<CHVI, > Sage, Imp Sage grwth form, JUOC

A 5	Fehren.	Cody	PC	80	1543	45	55	849	24	20	9	8	11	32	> Forb, JUOC encr
A 5	Fehren.	Pucket	P	47	1550	29	71	1101	18	14	6	14	7	73	
A 5	Fehren.	Pucket	PC	50	1639	53	47	770	22	16	7	18	7	26	> Forb, < Dec, JUOC encr
A 5	Fehren.	Pucket	Other	3	85										
A 5	Haughton	E Gov	P	20	558	100	0	0	21	24	10	30	8	37	< CHVI, JUOC encr
A 5	Haughton	E Gov	PC	65	1765	100	0	0	23	24	10	20	8	19	< CHVI, JUOC encr
A 5	Haughton	E Gov	Other	15	400										
A 5	Haughton	Gov Wll	P	35	1706	95	5	85	19	24	9	21	7	37	< CHVI, > Forb, > G/F Ht, JUOC encr
A 5	Haughton	Gov Wll	PC	60	2928	79	21	615	24	19	10	27	8	39	< CHVI, JUOC encr
A 5	Haughton	Gov Wll	Other	4	208										
A 5	Haughton	Isreal	P	18	752	48	52	391	16	12	4	0	9	25	< ERNA, > Forb, JUOC encr
A 5	Haughton	Isreal	PC	77	3233	72	28	905	21	16	9	33	7	44	< Dec, > Forb, > G/F Ht
A 5	Haughton	Isreal	Other	5	214										
A 5	Haughton	N Sage	P	84	3837	99	1	38	25	26	9	18	6	50	< CHVI, > Forb, > G/F Ht, JUOC encr, < Dec
A 5	Haughton	N Sage	Other	16	724										
A 6	Haughton	Highway	P	95	2528	42	58	1466	16	45	6	37	10	71	< CHVI, > Forb, < Dec
A 6	Haughton	Highway	Other	5	146										
A 6	Haughton	King Wl	P	17	356	17	83	295	10	10	3	40	7	30	< ERNA/CHVI,>Grass,>Forb,>Sage,>G/F Ht
A 6	Haughton	King Wl	Other	83	1706										
A 6	Haughton	N TPine	P	48	1951	61	39	761	24	14	7	38	7	32	< CHVI, > Grass, > Forb, > G/F Ht
A 6	Haughton	N TPine	Other	52	2114										
A 6	Moffit	North	P	88	4280	78	22	942	21	19	8	36	9	76	< CHVI, > Forb, < Dec
A 6	Moffit	North	Other	12	558										

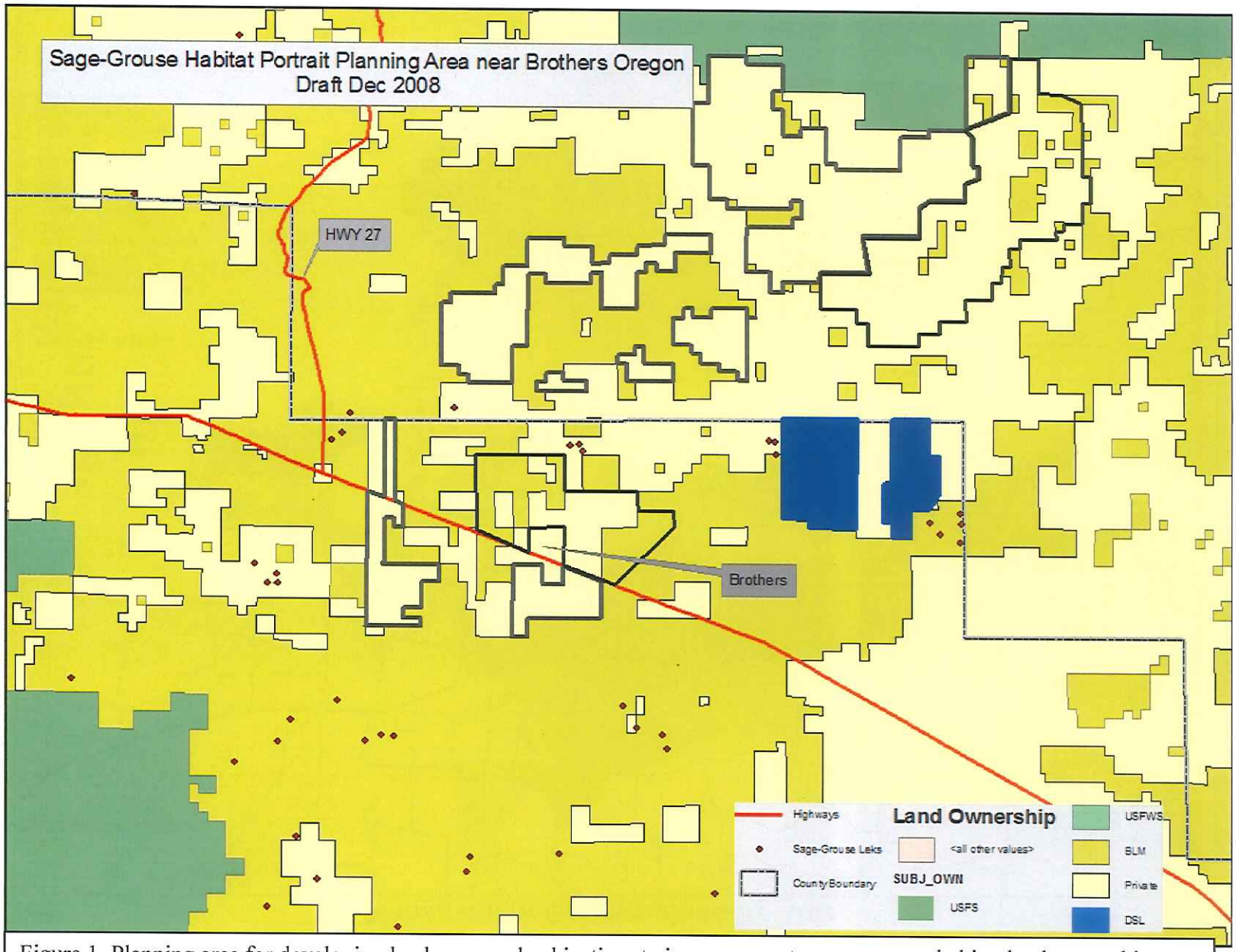

Figure 1. Planning area for developing landscape scale objectives to improve greater sage-grouse habitat land ownerships depicted near Brothers, OR.

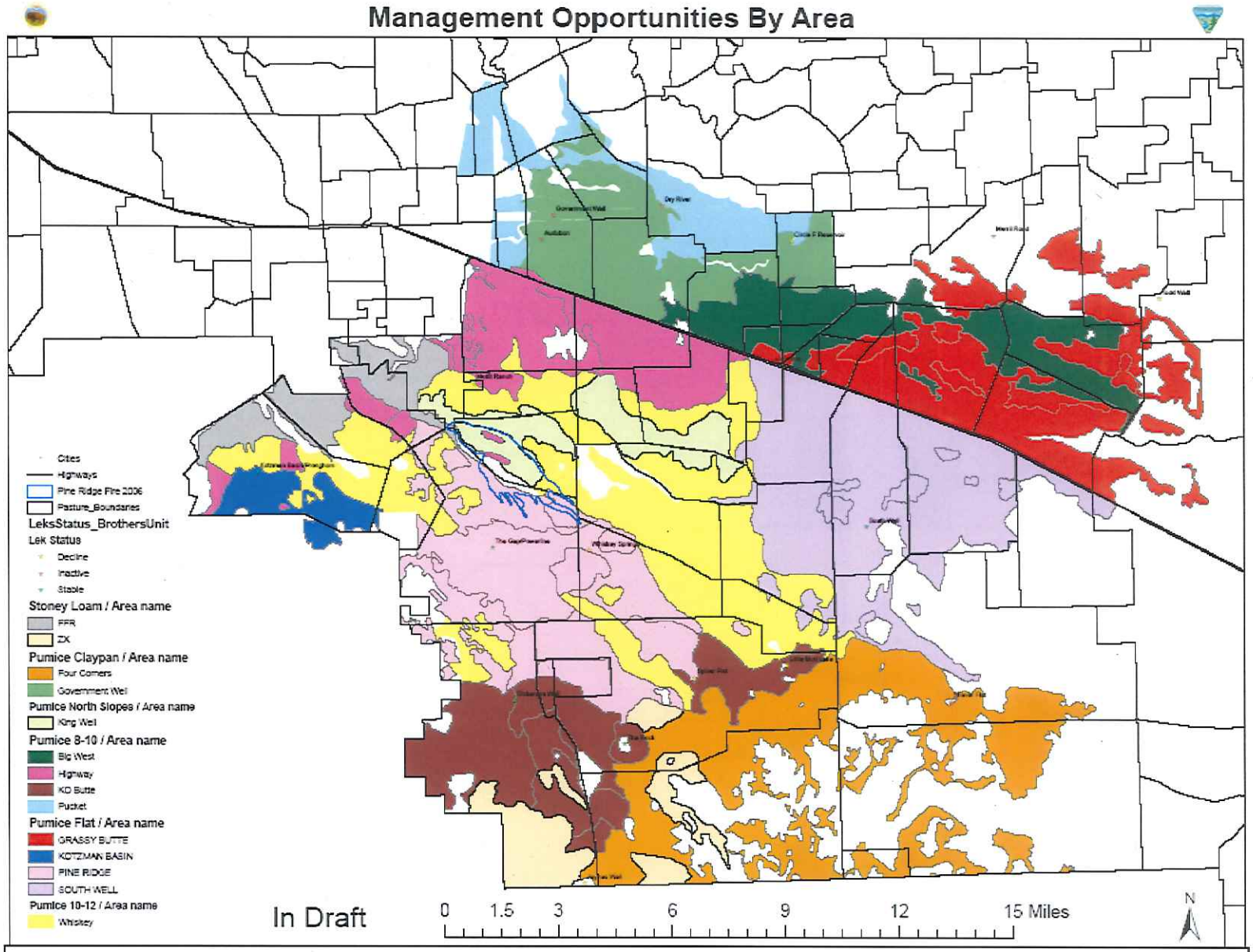

Figure 2. Planning area for developing landscape scale objectives to improve greater sage-grouse habitat ecological sites depicted near Brothers, OR. The 3 most used ecological sites by sage-grouse are Pumice Flat, Pumice Claypan, and Pumice 10-12.

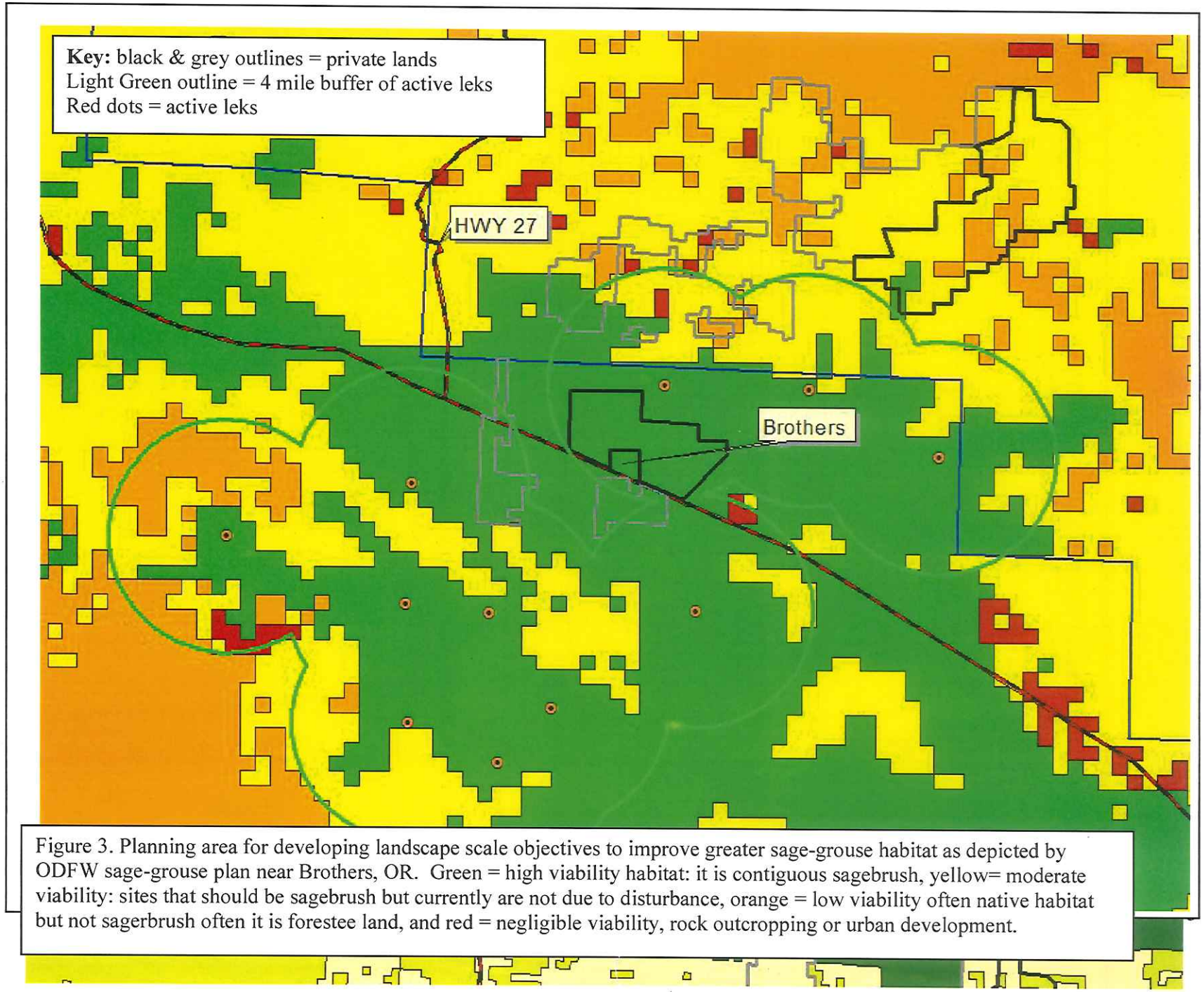

Figure 3. Planning area for developing landscape scale objectives to improve greater sage-grouse habitat as depicted by ODFW sage-grouse plan near Brothers, OR. Green = high viability habitat: it is contiguous sagebrush, yellow= moderate viability: sites that should be sagebrush but currently are not due to disturbance, orange = low viability often native habitat but not sagerbrush often it is forestee land, and red = negligible viability, rock outcropping or urban development.

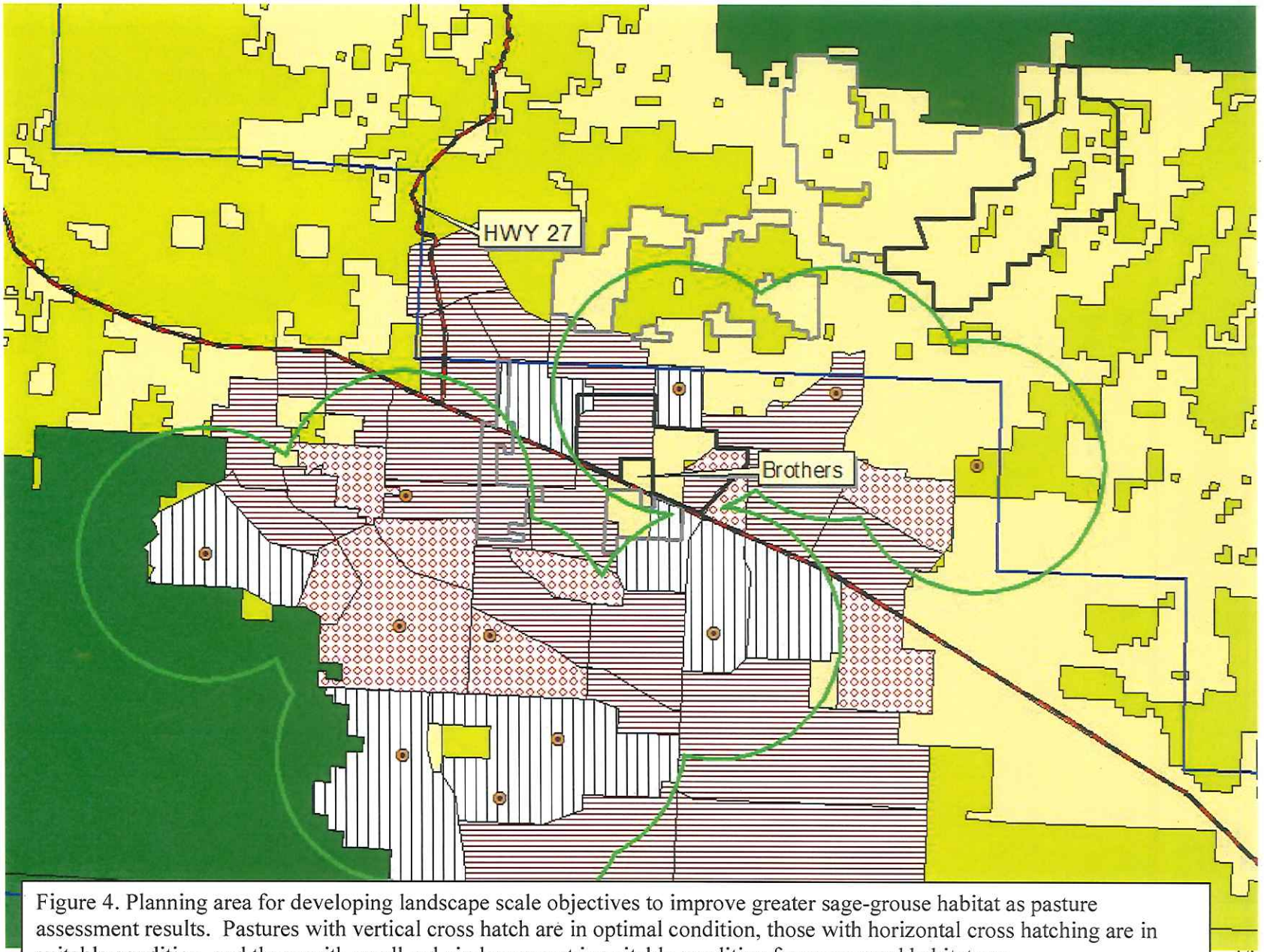

Figure 4. Planning area for developing landscape scale objectives to improve greater sage-grouse habitat as pasture assessment results. Pastures with vertical cross hatch are in optimal condition, those with horizontal cross hatching are in suitable condition, and those with small red circles are not in suitable condition for year round habitat use.