Standards for Rangeland Health
and
Guidelines for Livestock Grazing Management
for
Public Lands in Oregon and Washington

for

Willow Creek Allotment #00404

8 October 2015

Background

The Willow Creek Allotment is located approximately 25 miles north of Lakeview, Oregon. Land status within the allotment is 11,996 acres of public land and 9,219 acres of privately owned land. There are nine pastures in this allotment where livestock grazing is on a rotational schedule in the spring and summer. Much of the perennial Willow Creek was excluded from livestock grazing in the 1980s. These pastures are grazed by three permittees with a total of 565 AUMs (Table 1). There are 195 AUMs allotted for deer and pronghorn antelope.

Historical fires and brush control occurred in the Willow Creek allotment in the 1970s followed by seeding of crested wheatgrass in some areas. These seeding continue to persist today with maintenance occurring as recently as 2003 and 2004.

Table 1. Summary of the Rangeland Health Assessments for the Willow Creek Allotment

Standard	Standards 2014	Current Assessment 2014	Standards 2004	Comments 2004
1. Watershed Function – Uplands	Met	The allotment exhibits infiltration and permeability rates, moisture storage, and stability appropriate to soil, climate, and landform based on allotment utilization, observed apparent trend, and basal cover assessed in 2014.	Met	Plant composition and community structure were stable and provided root system and cover holding soil in place. The perennial vegetation provided protective cover to reduce soil movement, decrease compaction and thus, increased infiltration.
2. Watershed Function Riparian/ Wetland Areas	Met	All 60 acres of lentic habitat and 2.65 miles of lotic habitats recently inventoried are at PFC.	Not Met	Several reaches of Willow Creek were Functional At Risk with an upward trend. One reach of Willow Creek and an unnamed spring were assessed to be as Non-functional.
3. Ecological Processes	Not Met	This standard is being met for wildlife habitat. Annual invasive grasses are compromising ecological processes in portions of this allotment and therefore, this standard is not being met. Livestock grazing is NOT a causal factor.	Met	This standard was met for wildlife habitat. Ecological processes were at risk due to the increasing annual invasive grasses. Standard 3 was not met in those areas invaded by medusahead rye.
4. Water Quality	Not met	Willow Creek does not meet state temperature standards, but livestock grazing is not a significant causal factor.	Not Met	Willow Creek did not meet state temperature standards
5. Native, T/E, and Locally Important Species	Met	No known special status plant species occur within the allotment. Wildlife species with high public interest and special status species occur within the allotment and are healthy and diverse for the habitat provided. Invasive species have impacted the habitat available for Greater Sage-Grouse.	Met	No known special status plants were known to occur within the allotment. Special status wildlife species or their habitats are present in the allotment. Wildlife species are appropriate for the current potential of the landscape.

STANDARD 1 - Upland Watershed -Upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform.

The Willow Creek allotment has a variety of vegetation communities including mountain big sagebrush/grass, low sagebrush/grass, bitterbrush, crested wheatgrass, greasewood, juniper woodlands, ponderosa pine, and riparian communities including willows and aspen. The variation in the herbaceous understory indicates that native vegetation communities are stable. Invasive annual grass stands are present within the allotment and continue to provide some soil stability. There are 9 long term trend plots on the allotment recording observed apparent trend and photo trend to be stable. Invasive annual grasses in long term trend plots WC-01, WC-02, and WC-03 create susceptible conditions for a deteriorating trend. Overall, vegetation communities are stable and livestock grazing is maintaining site productivity and potential. . Throughout the allotment cover and abundance indicate infiltration, moisture storage, and soil stability are appropriate for the soils found in this landform and climate regime. Based on these findings, this standard is being met.

STANDARD 2 -Riparian/Wetland-Riparian-wetland areas are in properly functioning physical (PFC) condition appropriate to soil, climate, and landform.

Willow Creek Stream Reaches (see Map 1)

Reach 0.0-0.8 PFC
Reach 0.8-1.1 PFC
Reach 1.1-2.0 PFC
Reach 2.0-2.3 PFC
Reach 2.3-2.6 PFC

Reach numbers on Willow Creek are from downstream up, beginning at the lower BLM boundary. These stream reaches have generally been excluded from grazing since the early 1980s and have largely recovered from previous disturbances. All reaches were determined to be in proper functioning condition in 2012. Stream reach 2.0-2.65 continues to be impacted by the adjacent county road; however, it is properly functioning, and able to process the sediment being supplied.

The 2004 health assessment discussed an unnamed drainage in T35S, R20E, Section 18 containing a spring that was non-functional. In 2007, the spring was found to be functional due to a change in grazing management. The spring continues to be in good condition and continues to be in proper functioning condition.

There are 60 acres of lentic wetland habitat on BLM-administered lands within the allotment (Map 2). All acres were assessed in 2014-2015 and determined to be properly functioning.

Based on these findings, standard 2 is being met.

STANDARD 3 -Ecological Processes-Healthy, productive, and diverse plant and animal populations and communities appropriate to soil, climate, and landform are supported by ecological processes of nutrient cycling, energy flow, and hydrologic cycle.

Wildlife

The majority of wildlife habitats within the allotment are in functional condition and support natural ecological processes. Drought, climate change, wildfire, weed and juniper expansion, habitat fragmentation, predation, competition, disease, heavy grazing, hunting, and other anthropogenic activities are factors that individually or collectively may have negative impacts on habitats and/or wildlife populations. Habitat quality and population levels fluctuate in response to these factors over time, and generally represent natural trends in the ecosystem; however, some species may show erratic or negative trends. These trends are determined through monitoring of habitat and animal composition and community structure. This area currently supports diverse wildlife populations that are appropriate for the types of habitats available within the allotment. This standard is currently being met from the aspect of natural wildlife populations, diversity, and sustainability with current environmental conditions. Based on these findings this standard is being met for wildlife habitats on the allotment.

Vegetation

The Willow Creek Allotment has multiple plant community types. Low sagebrush and tall sagebrush are predominant in the uplands with willows and aspen dominating the riparian areas. Subdominant plant communities include juniper and ponderosa pine. Secondary shrub communities include current, greasewood, bitterbrush, and rabbitbrush. The forbs are diverse with abundant native grasses including Sandberg's bluegrass, squirreltail, Indian rice grass, Great Basin wild rye and needlegrass. The grasses are in good condition with no sign of over-utilization by livestock. Some areas of the allotment are being encroached by juniper.

Noxious weeds and other non-native invasive annual grass species are widespread and are aggressively competing with the native species across the entire allotment. The known noxious weed species within the allotment consist of Canada thistle *(Cirsium arvense),* bull thistle *(Cirsium vulgare),* musk thistle *(Carduus nutans), and* Medusahead rye *(Taeniatherum caput-medusae).* Other problematic weed species within the allotment are rough cocklebur *(Xanthium strumarium L.),* North African grass *(Vetenata dubia)* and Cheatgrass *(Bromus tectorum).*

Medusahead rye has been known as the biggest ecological risk to the allotment for the last twenty (20) years. Medusahead rye is an aggressive non-native annual grass, which germinates in the fall, develops a vigorous root system through the winter, then resumes active growth in the early spring. By establishing a strong root system, medusahead is able to rob soil moisture from other later-growing perennial grasses. As a result, many areas lose their biodiversity and result in monotypic stands of medusahead. The high silica content delay plant decomposition and allows medusahead to build up a deep thatch layer. The thatch layer also prevents other plant seeds from germinating or growing.

To date, within the Willow Creek allotment there are over 346 documented sites of medusahead rye with the total recorded acreage being about 5,637 acres (Map 3). The medusahead rye sites range in size from small isolated infestations to larger areas consisting of 995 acres. Previous treatments of medusahead on private and public lands took place within the allotment from 2002

through 2009. The treatments consisted of burning, chemical application, and re-seeding efforts. The chemical treatments were ineffective due to the limitations within a court injunction that only allowed four herbicides to be used to control noxious weeds, none of which were effective on annual grass species. In 2015, the Lakeview Resource Area completed a new Integrated Weed and Invasive Species Management Plan that allows for more effective herbicides to be used for invasive plant management.

The other non-native winter annual grass species are also degrading the health of the Willow Creek Allotment. North African grass has been recently identified as a large threat to rangelands in the Lakeview Resource Area. Site visits and invasive plant surveys have shown this species to be wide spread across the allotment (Map 3). Additional survey will need to be completed to accurately record all of the North African grass infestation; this species can out-compete perennial bunchgrasses, but the mechanism for this ability is not clear. It is high in silica making it poorly palatable to grazing animals-but not as high as medusahead. Litter can build up on the soil surface, likely because of the higher silica content. Plants dry early in the season, similar to downy brome, and should pose similar risks. Cheatgrass is also abundant within the allotment.

Mediterranean sage continues to invade the Willow Creek Allotment and surrounding areas. Within the allotment there are 116 documented sites of Mediterranean sage with a total of about 335 acres (Map 3). The species has the ability to spread rapidly in degraded sagebrush communities.

The Willow Creek Allotment contains a total of about 6,012 acres of non-native invasive species (including noxious weeds) that are degrading the rangeland heath of the allotment (Map 3). Ecological processes are at risk within the Willow Creek Allotment due to the increasing size of the medusahead rye populations and other noxious and non-native species. All of these species could threaten both nutrient cycling and energy flow if left untreated.

Based on these findings, Standard 3 is not being met throughout the allotment due to the heavy infestations of annual grass species and noxious weeds. Current livestock grazing is not a significant factor contributing to Standard 3 not being met.

STANDARD 4: Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

Based on the State of Oregon's 303(d) stream listing information, Willow Creek, from the mouth to the headwaters, does not meet state standards for temperature. Within the #00404 allotment, current livestock management is not a significant reason for Standard 4 not being met.

STANDARD 5: Native, T&E, and Locally Important Species. Habitats support healthy, productive and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate and landform.

Vegetation

Standard 5 is being met for native, T&E, and locally important plant species in the allotment. The essential habitat elements for species populations and communities are present and available within the big and low sagebrush and riparian communities, and are consistent with the potential for the landscape. The plant communities include plant species diversity, adequate age distribution, and adequate production for site potential. Those specific areas identified with noxious invasive species have limited essential habitat elements for diverse species, populations, and communities in those areas.

Based on surveys completed to date, there are no known special status plants on the allotment.

Locally important cultural plants still reside within the allotment including, *Lewisia rediviva* (bitterroot), *Oryzopsis hymenoides* (Indian rice grass), and *Perideridia* sp. (yampah).

Wildlife

Special status wildlife species or their habitats present within the Willow Creek Allotment include the Bald Eagle (*Haliaeetus leucocephalus*), Ferruginous Hawk (*Buteo regalis*), Peregrine Falcon (*Falco peregrinus*), Burrowing Owl (*Speotyto cunicularia*), kit fox (*Vulpes macrotis*), Greater Sage-Grouse (*Centrocercus urophasianus*), California bighorn sheep (*Ovis canadensis*), and pygmy rabbit (*Brachylagus idahoensis*). There are also two species with high public interest: mule deer (*Odocoileus hemionus*) and pronghorn antelope (*Antilocapra americana*).

The only update concerning species or their habitats within this allotment is for Greater Sage-Grouse. Greater Sage-Grouse occur throughout most of the Willow Creek Allotment. This allotment is almost entirely within a Priority Habitat Management Area (PHMA), with a small portion in the north and south in a General Habitat Management Area (GHMA). There are five known sage-grouse lek sites; two occupied, two occupied pending, and one unoccupied pending. The active lek sites are within the vicinity of Red Knoll and are impacted by medusahead rye.

Habitat Assessment Framework surveys have been conducted within the Willow Creek Allotment (Maps 4 - 7). Portions of this allotment are currently unsuitable to sage-grouse due to past grassland conversion. The following table depicts the acreage of habitats available for sage-grouse use, with some habitats overlapping.

Habitat Assessment Framework (HAF)	**Acres**
Breeding marginal – summer marginal	542
Breeding marginal – summer suitable	659
Breeding marginal – winter suitable	29
Breeding suitable – summer marginal	259
Breeding suitable – summer suitable	417
Breeding suitable – winter suitable	37
Summer marginal – winter suitable	37
Yearlong marginal	5,159
Yearlong suitable	1,826
Unsuitable all	1,538
Unknown	1,435
BLM land total	11,938
Total HAF surveyed	10,503

Wildlife move throughout the allotment and surrounding area, possibly with a higher energetic cost due to the presence of invasive species, in efforts to find suitable forage and cover. The occurrence of non-native seedings and invasive noxious weeds are limiting factors, decreasing full potential for sage-grouse and most sagebrush dependent wildlife species; however, sustainable populations of wildlife can occur because the invasives are generally scattered within the allotment. Over time, or with an increase of invasive species, wildlife populations may decrease, including sage-grouse activity at lek sites, and could render this standard as not met in the future. Efforts to improve these conditions should focus on active sagebrush habitat restoration with prescribed fire, native seeding, and/or herbicide treatment of invasives. Current livestock grazing is not substantially impacting sage-grouse habitat.

Based on these findings this standard is being met on the allotment.

2015 Team Members

Name	Title
Lori Crumley	Rangeland Management Specialist
David Probasco	Wildlife Biologist
Theresa Romasko	Assistant Field Manager
Grace Haskins	Weed Management Specialist
Grace Haskins	Botany
Jimmy Leal	Fisheries Biologist
Jami Ludwig	Assistant Field Manager
Paul Whitman	Planning and Environmental Coordinator

Recommendations

The ID team recommends aggressively treating medusahead rye infestations on the allotment (Map 3) with an appropriate ground and aerial herbicide and reseeding of those areas lacking in perennial native vegetation with appropriate understory species to successfully improve upland watershed health, ecological conditions, and wildlife habitat. These applications should be followed up by monitoring and additional restoration efforts, where needed.

The ID team also recommends treating encroaching juniper on the allotment to improve other resource values, including sage-grouse habitat conditions.

2015 Determination

(X) Existing grazing management practices on the Willow Creek Allotment promote achievement of, or significant progress towards the Oregon Standards for Rangeland Health and conform with the applicable Guidelines for Livestock Grazing Management.

( ) Existing grazing management practices on the Willow Creek Allotment will require modification or change prior to the next grazing season to promote achievement of the Oregon Standards for Rangeland Health and conform with the applicable Guidelines for Livestock Grazing Management.

10/7/15

J. Todd Forbes, Field Manager — Date

Monitoring Summary 2015:

The Willow Creek Allotment is grazed during the spring and summer (3/16-7/31). The total permitted AUMs is 565. The average actual use over the last 10 years has been 455 AUMs and an overall average utilization of 34%. Use in each pasture has been within the permitted dates.

Table 1. Permitted use within the Willow Creek Allotment

Permittee	Dates of use	Pastures	Public Land use	AUMs
Dennis and Andrea Flynn	3/16-6/1	Red Knoll, Juniper Creek, South, North	100%	214
Martin and Janis Murphy	3/16-6/1	Heckman and Moss Creek	11%	46
Martin and Janis Murphy	3/16-6/1	Red Knoll	100%	131
Keith and Patty Barnhart	3/15-6/16	Coyote Creek	62%	133
Keith and Patty Barnhart	6/16-7/31	Coyote Meadow	62%	41

Table 2. Actual Use and Utilization for Moss Creek, North Creek, South Creek, and Bull Pastures

Year	Moss Creek		North Creek		South Creek		Bull*	
	AUM	% use	AUM	% use	AUM	% use	AUM	% use
2015	2	10	0	0	0	0	0	0
2014	6	40	35	50	36	46	14	39
2013	9	--	45	--	24	--	20	--
2012	18	30	100	43	38	77	24	39
2011	93	--	43	40	rested	--	24	22
2010	10	--	120	30	30	80	15	--
2009	12	--	108	50	27	--	7	58
2008	10	--	74	--	10	--	9	--
2007	8	--	79	43	30	--	11	46
2006	9	--	85	43	36	--	--	50
2005	--	--	104	31	25	--	--	--
2004	11	37	60	37	35	45	11	20
2003	9	--	40	32	27	30	14	--
2002	7	30	113	22	21	19	--	--
Average	10	29	72	35	33	42	25	28

*Bull pasture is often grazed with another pasture (North Creek, South Creek, or Red Knoll) and AUMs are estimated. – lack of data

Table 3. Actual Use and Utilization for Heckman Seeding, Juniper Creek, and Red Knoll Pastures

Year	Heckman Seeding		Juniper Creek		Red Knoll	
	AUM	% use	AUM	% use	AUM	% use
2015	--	15	0	0	181	26
2014	14	50	--	32	35	33
2013	19	--	40	--	89	--
2012	17	50	--	26	124	44
2011	15	--	rested	--	100	--
2010	13	30	24	50	--	--
2009	23	51	27	3.8	--	--
2008	14	--	--	--	108	--
2007	13	48	16	30	100	41
2006	18	--	--	--	--	--
2005	36	--	--	45	--	--
2004	14	37	49	--	43	26
2003	21	--	--	--	86	40
2002	15	31	--	--	91	--
Average	28	39	26	31	96	35

Table 4. Actual Use and Utilization for Coyote Creek and Coyote Meadow Pastures*

Year	Coyote Creek		Coyote Meadow	
	AUM	% use	AUM	% use
2015	0	0	0	0
2014	19	--	0	--
2013	60	--	21	--
2012	133	30	30	32
2011	68	--	0	--
2010	45	--	58	--
2009	74	--	76	70
2008	113	--	0	--
2007	99	--	51	--
2006	83	--	58	50
2005	72	13	0	--
2004	94	30	71	--
Total	61	18	52	51
	AUM		% use	
2003	119		30%	
2002	74		--	

* used in conjunction until 2004 when a fence was built to create two pastures.

Table 5. Key Species and Target Utilization Levels for the Willow Creek Allotment (00404)

Pasture	BLM Acres	Trend Plot	Key Species	Utilization Target %
Moss Creek		WC-09	Crested Wheatgrass (*Agropyron cristatum*), Squirreltail (*Sitanion hystrix*), Bluebunch Wheatgrass (*Agropyron spicatum*), Thurber Needlegrass (*Stipa thurberiana*)	50
Heckman Seeding		WC-06	Crested Wheatgrass (*Agropyron cristatum*), Squirreltail (*Sitanion hystrix*), Bluebunch Wheatgrass (*Agropyron spicatum*), Thurber Needlegrass (*Stipa thurberiana*)	50
North Creek		WC-08	Crested Wheatgrass (*Agropyron cristatum*)	50
South Creek		WC-04	Crested Wheatgrass (*Agropyron cristatum*)	50
Bull		-	Crested Wheatgrass (*Agropyron cristatum*), Squirreltail (*Sitanion hystrix*), Thurber Needlegrass (*Stipa thurberiana*), Sandberg Bluegrass (*Poa secunda*)	50
Juniper Creek		WC-01	Thurber Needlegrass (*Stipa thurberiana*), Sandberg Bluegrass (*Poa secunda*), Squirreltail (*Sitanion hystrix*)	50
Red Knoll		WC-03, 05	Squirreltail (*Sitanion hystrix*), Thurber Needlegrass (*Stipa thurberiana*), Sandberg Bluegrass (*Poa secunda*)	50

Willow Creek Allotment (#00404) Monitoring Summary

WC-01

Juniper Creek Pasture

Years Data Recorded - 1976, 1979, 1982, 1990, 2000, 2003, 2009, 2012, 2014

This key species on this site are squirreltail, Thurber's needlegrass, low sagebrush, and big sagebrush. Vegetation cover increased from 12% in 1979 to 40% in 2014. Photos indicate this site has increased in overall vegetation cover and photo trend is stable to upward. Perennial grasses sandburgs bluegrass and squirreltail have increased in frequency while needlegrass has decreased in density. Cheatgrass populations are stable in density and frequency on site while medusahead is increasing in frequency in recent years. Current photos show an increase in grass cover where previous photos show bare ground dominating the shrub interspaces.

Photo trend is stable to upward and observed apparent trend is stable.

Table 6. Observed Apparent Trend

WC-01	2012	2014
Vigor	6	6
Seedlings	3	4
Surface Litter	3	5
Pedestals	5	4
Gullies	5	5
Total	22	24
Rating	*Stable*	*Stable*

Table 7. Cover

WC-01	1979	2012	2014
Bare Ground	17	10	15
Litter	30	27	17
Rock	40	22	30
Vegetation	12	41	38
Crust	1	-	-

WC-02

Coyote Creek Pasture

Years Data Recorded: 1981, 1991, 2000, 2003, 2009, 2012,

Photo trends is downward due to a decrease frequency of the perennial grass (poa secunda) from 78% frequency in 19781 to 4% frequency in 2012. Annual invasive species, medusa head, has increased in frequency from 6% occurrence in 1981 to 48% occurrence in 2012. This site is heavily infested with medusa head and cheatgrass contributing to a downward trend. Past grazing utilization within the pasture was observed between 13 and 30% between 2004 and 2015. Grazing is not a factor contributing to this change. Observed apparent trend for this site is stable. The aggressive nature of Medusahead and some drought like conditions are likely the reason for a shift in frequency and composition of plants.

Table 8. Observed Apparent Trend

WC-02	2012
Vigor	2
Seedlings	1
Surface Litter	4
Pedestals	4
Gullies	5
Total	21
Rating	*stable*

Table 9. Cover

WC-02	1981	2012
Bare Ground	10	3
Litter	61	47
Rock	12	17
Vegetation	17	33
Crust		

WC-03

Red Knoll Pasture
Years Data Recorded- 1981, 1990, 2000, 2008, 2012, 2014

This site is dominated by annual invasive grasses cheatgrass, and medusahead. This area has received treatments for annual invasive weed control including, burnin, herbicide applications, and subsequent reseeding. Although this area is still dominated by medusahead and cheatgrass recent years have shown a large improvement in density of perennial grass species. Photo trend is stable to upward based on additional field observations in 2015 of increased perennial grass density. However, very susceptible to a downward trend if invasive weeds are left untreated.

Table 10. Observed Apparent Trend

WC-03	2012	2014
Vigor	2	3
Seedlings	2	2
Surface Litter	3	5
Pedestals	4	4
Gullies	5	5
Total	16	19
Rating	*downward*	*stable*

Table 11. Cover

WC-03	1981	2014
Bare Ground	15	32
Litter	40	8
Rock	30	28
Vegetation	15	25
Crust	0	6

WC-04

South Creek Pasture

Years Data Recorded- 1982, 1990, 2000, 2005, 2008, 2012, 2014

This site was seeded to creasted wheatgrass in the late 1980s. Dominant plants on site include crested wheatgrass, big sagebrush, and cheatgrass. Photo trend and observed apparent trend are stable.

Table 12. Observed Apparent Trend

WC-04	2012	2014
Vigor	6	3
Seedlings	4	3
Surface Litter	3	4
Pedestals	3	4
Gullies	5	5
Total	21	19
Rating	*stable*	*stable*

Table 13. Cover

WC-04	2012	2014
Bare Ground	37	37
Litter	22	27
Rock	0	0
Vegetation	41	36
Crust	0	0

WC-05

Red Knoll Pasture

Years Data Recorded- 1961, 1990, 2000, 2008, 2012, 2014

Vegetation composition includes Sandburg's bluegrass, cheatgrass, squirreltail, and low sagebrush. The vegetation is healthy and providing adequate cover. Photo trend and observed apparent trend are stable.

Table 14. Observed Apparent Trend

WC-05	2012	2014
Vigor	6	4
Seedlings	5	4
Surface Litter	4	5
Pedestals	3	3
Gullies	5	5
Total	23	21
Rating	*stable*	*stable*

Table 15. Cover

WC-05	2012	2014
Bare Ground	15	23
Litter	32	19
Rock	11	18
Vegetation	42	40
Crust	0	0

WC-06

Heckman Seeding Pasture

Years Data Recorded- 1961, 1991, 1996, 2000, 2005, 2008, 2012, 2014

Species on site are, big sagebrush, rabbit brush, horsebrush, Thurber's needlegrass , squirreltail, Sandburg's bluegrass, and cheatgrass. Photo trend and observed apparent trend are stable moving toward upward.

Table 16. Observed Apparent Trend

WC-06	2012	2014
Vigor	5	5
Seedlings	3	5
Surface Litter	4	5
Pedestals	5	5
Gullies	5	5
Total	22	25
Rating	*stable*	*stable*

Table 17. Cover

WC-06	2012	2014
Bare Ground	11	21
Litter	33	32
Rock	17	16
Vegetation	39	31
Crust	0	0

WC-07

Coyote Creek Pasture

This is a photo trend plot located within the riparian area on Willow Creek.
Years Data Recorded:1989,1994, 2000, 2005, 2008, 2012
Photo Trend: *upward*

Early photos depict a changing stream channel with some cut banks and deep rooted riparian plant occupying the site. Recent photos show large improvements of stream channel achieving its potential extent, with thick increased cover of riparian vegetation. Willow recruitment and establishment from photos is greatly improved.

WC-08

North Creek Pasture

Years Data Recorded- 2005, 2008, 2012, 2014

This site was established in the North Creek pasture in 2005. The dominant species at this site are crested wheatgrass and cheatgrass. Photo trend and observed apparent trend are stable to upward.

Table 18. Observed Apparent Trend

WC-08	2012	2014
Vigor	8	6
Seedlings	7	6
Surface Litter	4	4
Pedestals	4	5
Gullies	5	5
Total	28	26
Rating	*upward*	*stable*

Table 19. Cover

WC-09	2014
Bare Ground	56
Litter	27
Rock	0
Vegetation	17
Crust	0

WC-09

Moss Creek Pasture

Years Data Recorded- 2012, 2014

This site was established in the Moss Creek Pasture in 2012. The vegetation at this site is a low sagebrush site with crested wheatgrass, Sandburg's bluegrass, and cheatgrass. Photo trend and observed apparent trend are stable.

Table 20. Observed Apparent Trend

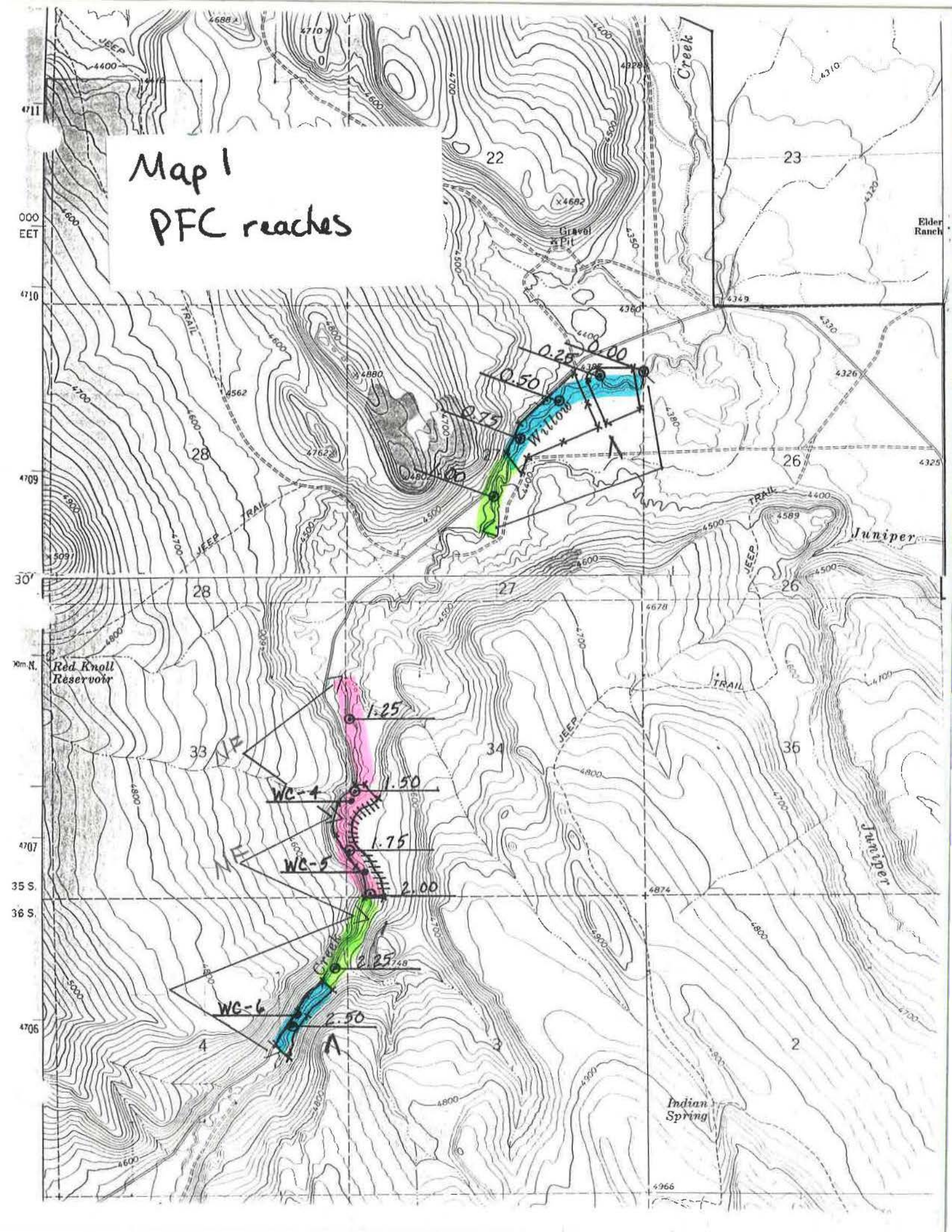
WC-09	2012	2014
Vigor	6	5
Seedlings	2	5
Surface Litter	4	5
Pedestals	4	5
Gullies	5	5
Total	21	25
Rating	*stable*	*stable*

Table 21. Cover

WC-09	2012	2014
Bare Ground	12	16
Litter	32	15
Rock	19	15
Vegetation	37	54
Crust	0	0

Table 22. Shrub cover for all plots in Willow Creek Allotment in 2012

Plot	Percent cover LI-1	Percent cover LI-2	Percent cover LI-3	Average Shrub Height	Species
WC-01	32%	26%	16%	1-3’	ARTR, ARAR
WC-04	17%	13%	13%	1-3’	ARTR
WC-05	21%	34%	37%	1-3’	ARAR
WC-06	24%	11%	22%	1-3’	ARTR, CHVI, TESP, CHNA, ATSP
WC-09	29%	32%	31%	1-3’	ARAR, TESP


Map 1
PFC reaches
0.00
0.25
0.50
0.75
1.25
1.50
1.75
2.00
2.25
2.50
WC-4
WC-5
WC-6
Willow
Creek
Red Knoll
Reservoir
Juniper
Indian
Spring
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Ranch
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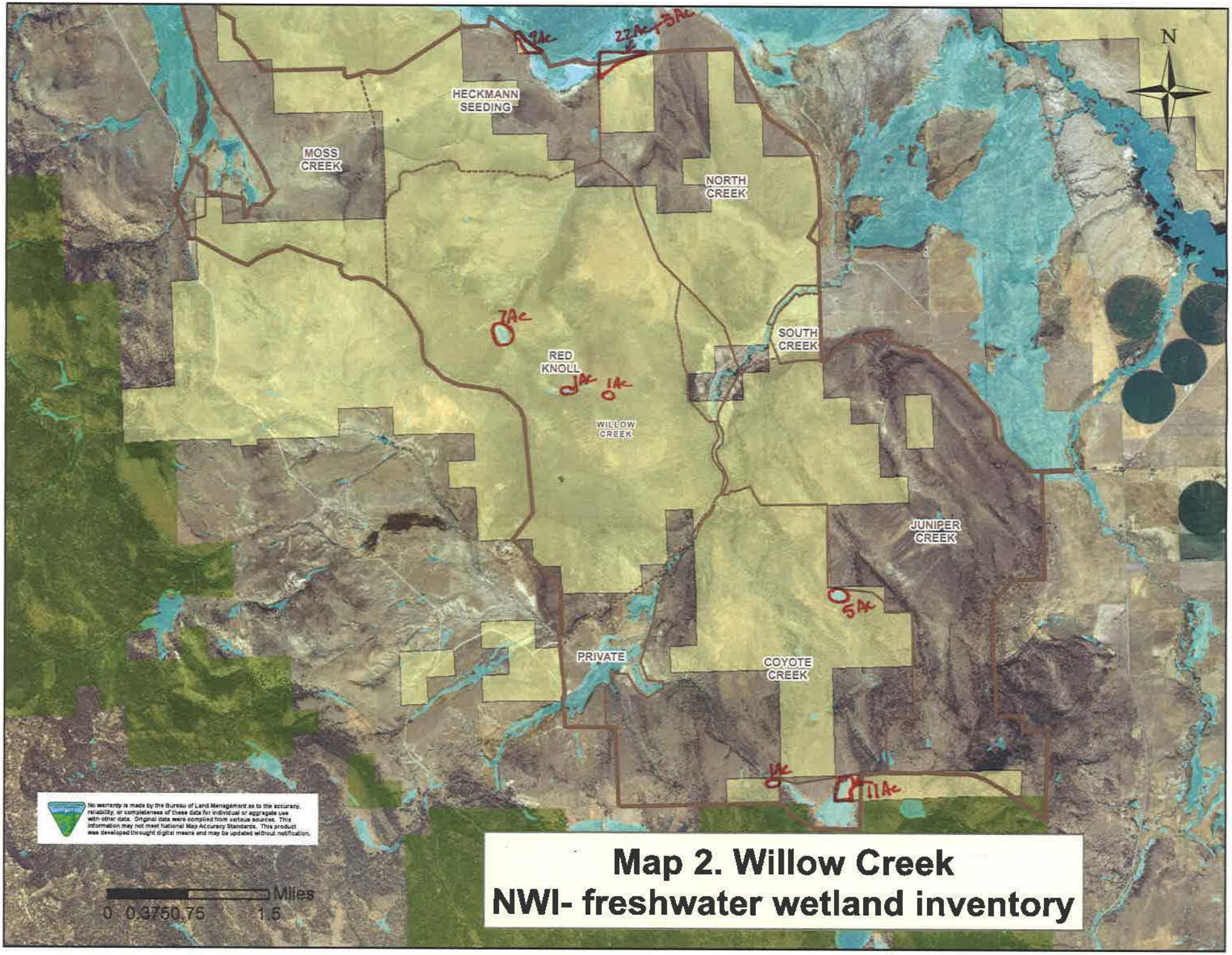
TRAIL



Map 2. Willow Creek
NWI- freshwater wetland inventory

Project Map

US DEPARTMENT OF INTERIOR
Bureau of Land Management
Lakeview District, Oregon

Willow Creek Allotment #404
Range Land Health Assessment
Know Noxious Weeds
as of October 1, 2015

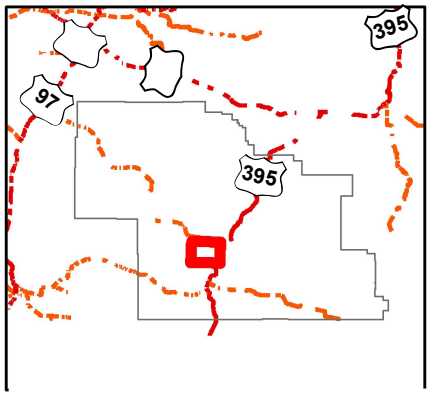
Legend

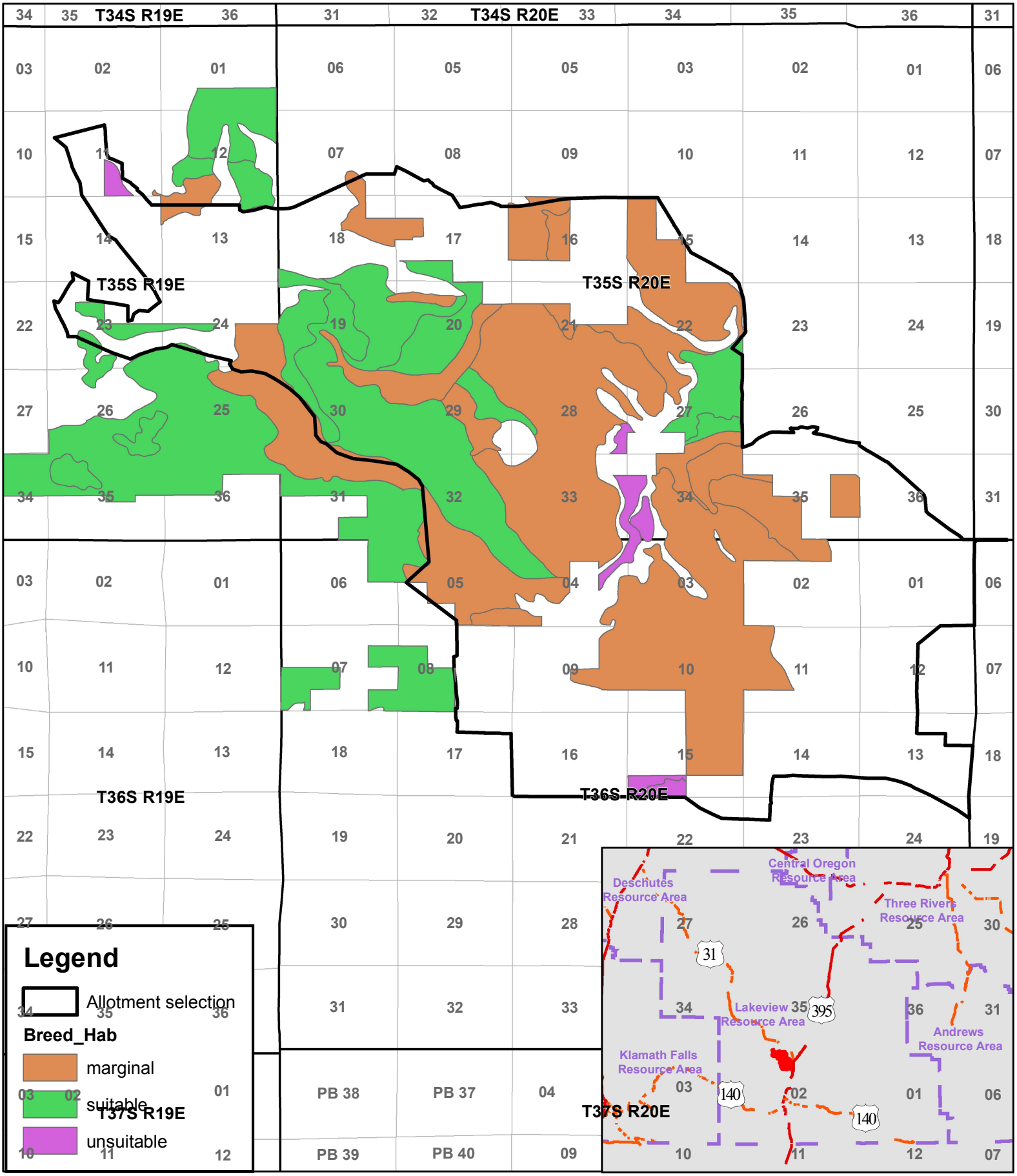
<all other values>

Noxious Weeds SCNTFC_CD

- CIAR4
- CIVU
- SAAE
- TACA8
- Allotment
- Bureau of Land Management
- U.S. Forest Service
- National Park Service
- U.S. Fish and Wildlife Service
- Bureau of Indian Affairs
- Other Federal
- State
- Local Government
- Private/Unknown

1 inch equals 1.33 miles



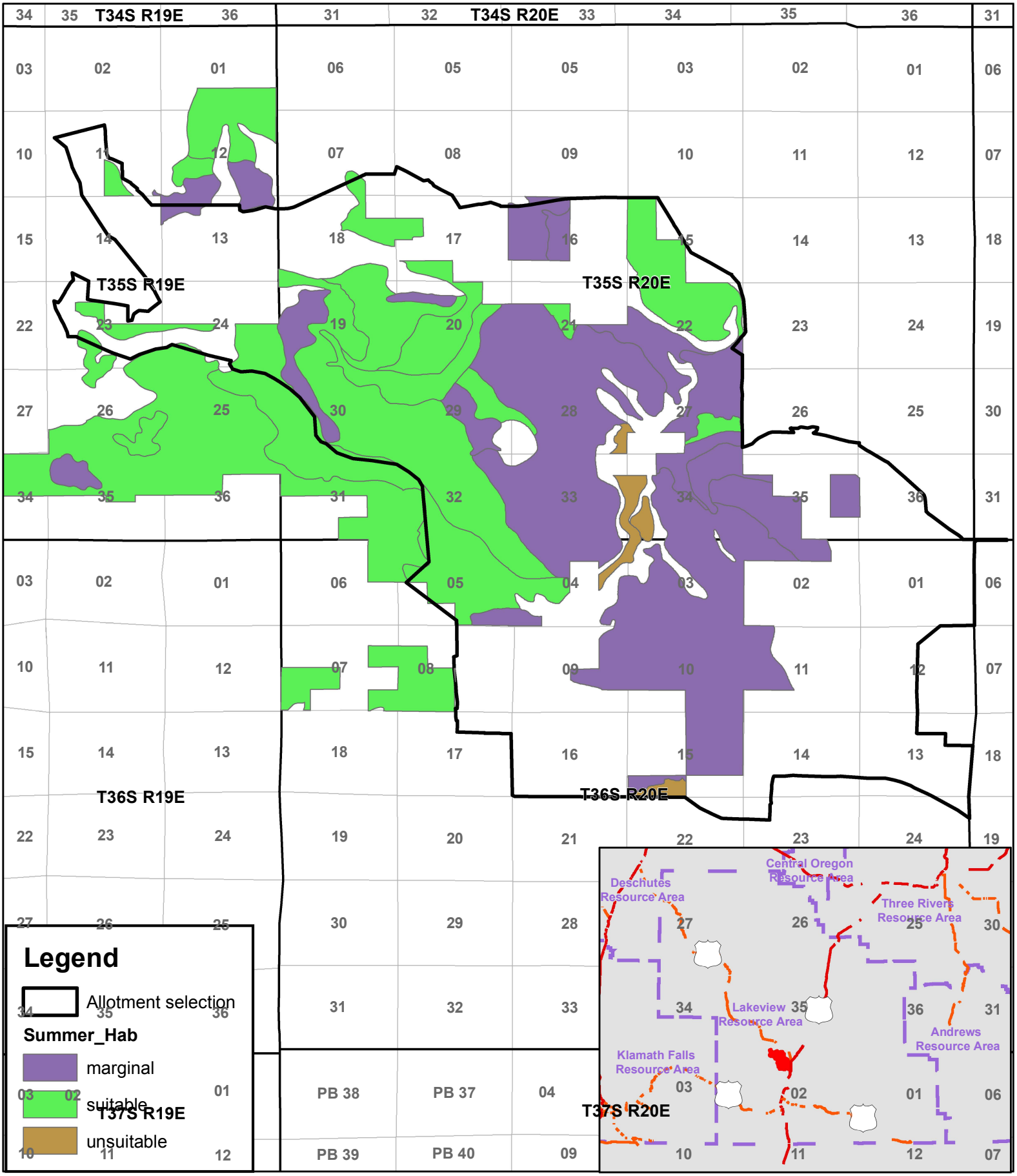


No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

0 0.5 1 2 Miles

N W E S

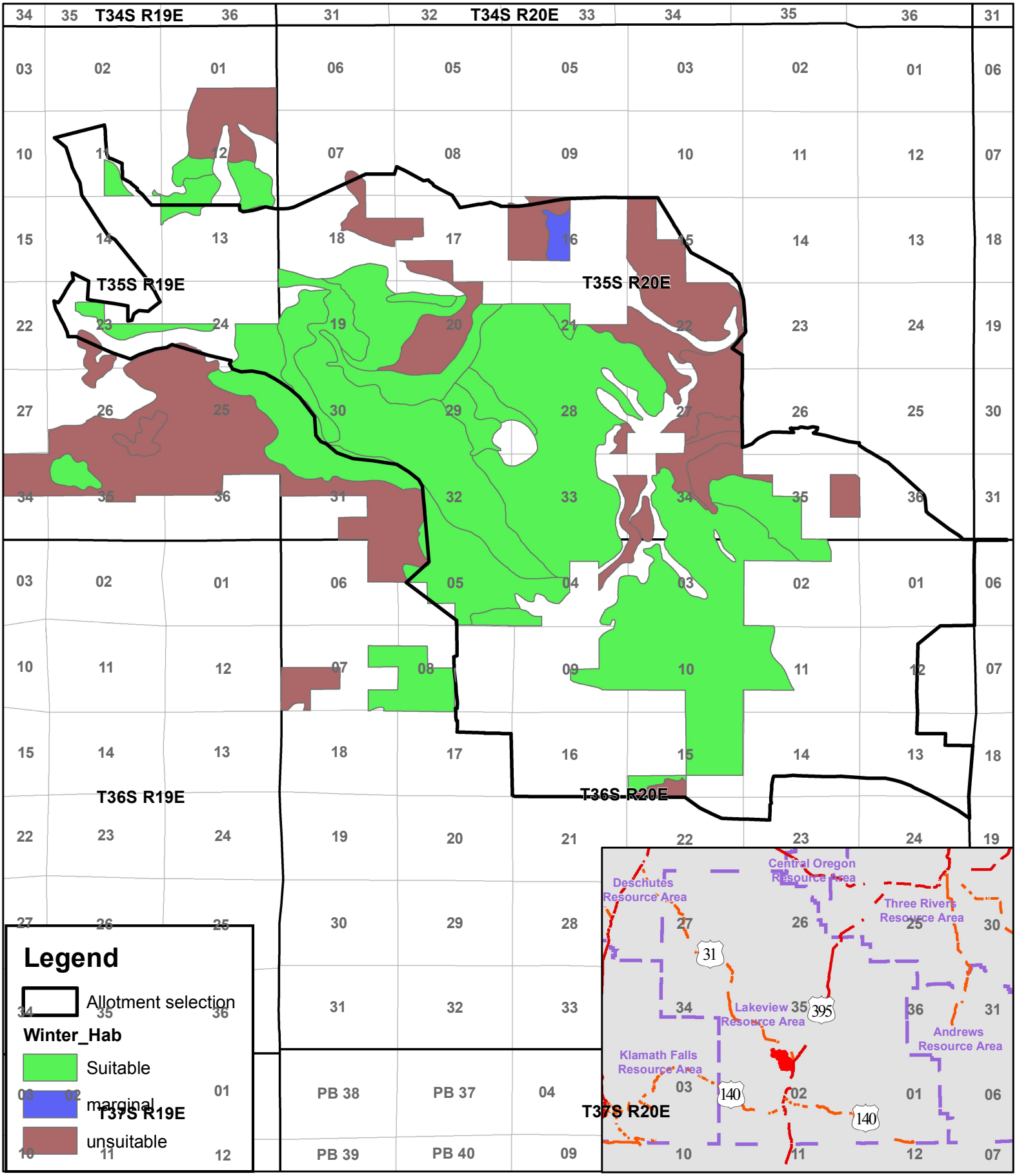
Map 4 - Sage-grouse breeding habitat



0 0.5 1 2 Miles

N W E S

Map 5 - Sage-grouse summer habitat



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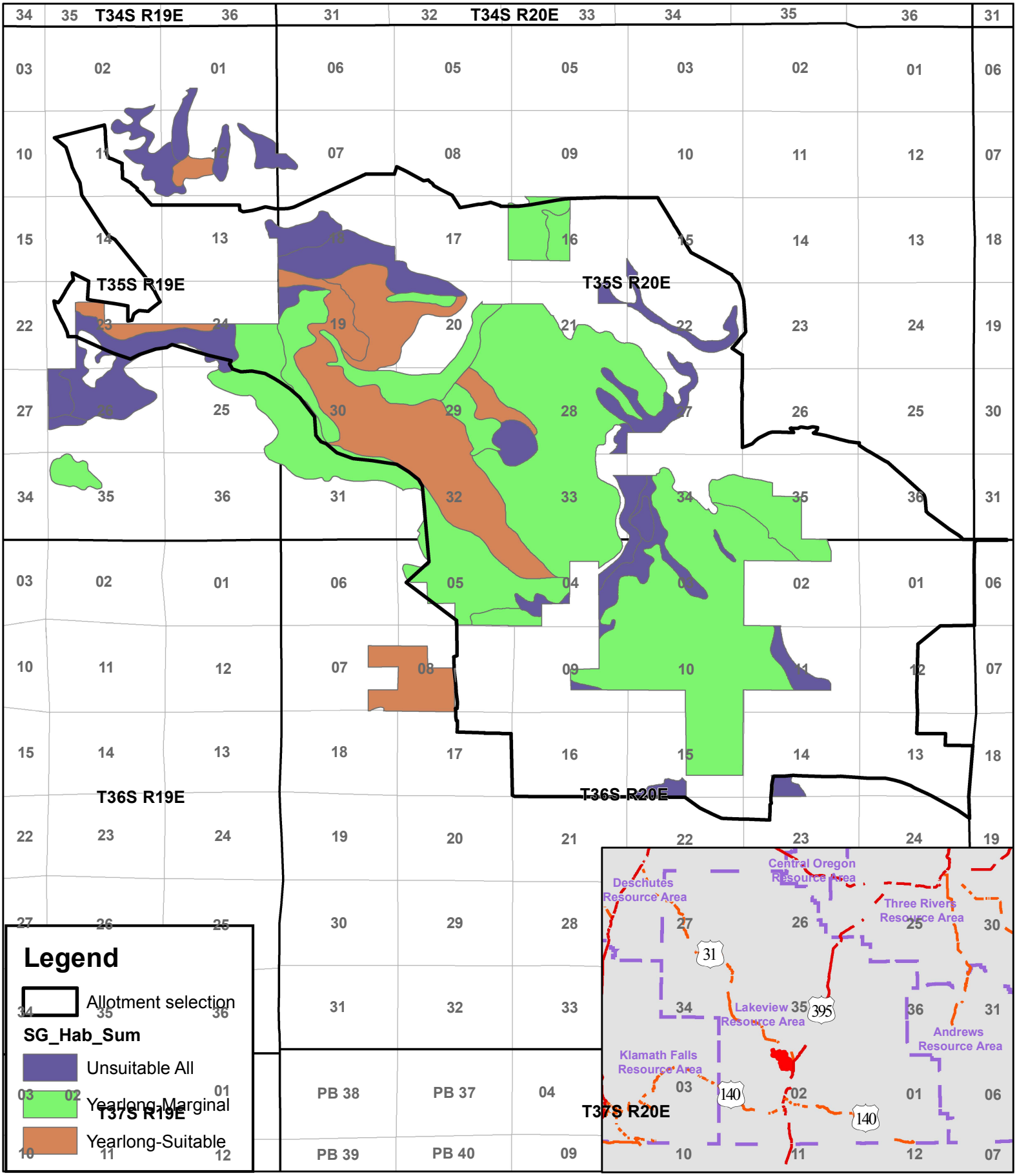
0 0.5 1 2 Miles

N W E S

Map 6 - Sage-grouse winter habitat



0 0.5 1 2 Miles

N W E S

Map 7 - Sage-grouse yearlong and unsuitable habitat