Ash-throated flycatcher (*Myiarchus cinerascens*) **MODEL APPLICATION AND ASSESSMENT RESULTS**

Introduction

Ash-throated flycatcher was selected as focal for the Woodland group because it has the widest distribution throughout the planning area and covers the major risk factors well. Ash-throated flycatchers nest in tree cavities and may be affected by livestock grazing.

Source habitat description: Generally, arid and semiarid scrub and open woodland, as well as riparian woodland in arid and semiarid regions (Cardiff and Dittman 2002). Widespread, preferred general habitat types are desert scrub/thorn woodland, piñon pine (e.g., *Pinus monophylla*)–juniper (*Juniperus* spp.) woodland, oak (*Quercus* spp.) woodland, and various riparian associations.

Within these general requirements, main necessities are presence of shrubs or trees with trunks or branches thick enough to serve as nest-cavity substrates, presence of ≥1 woodpecker species to excavate cavities (or presence of trees, shrubs, or artificial structures that provide natural or artificial cavities of sufficient size and that occur in sufficient densities to support population of flycatchers), and relatively dry and open woodland or scrub habitat for foraging (Cardiff and Dittman2002). In many situations, nests located in “woodland” corridors along washes, streams, and canyon bottoms, or at edge of more extensive, denser woodland or forest (where nest sites more readily available), with adjacent foraging territories in more homogeneous, open desert scrub or dense semiarid scrub habitats (e.g., chaparral, coastal sage scrub, or sagebrush [*Artemisia* spp.]).

East of the Cascades (in Oregon), these flycatcher use semi-arid slopes and canyons with large western juniper (Littlefield 1990, Contreras and Kindschy 1996, Reinkensmeyer 2000), sometimes with an understory of sagebrush, bitterbrush, and/or rabbitbrush (Vromen 2003).

Tree canopy cover ranges from open shrublands to dense pinyon-juniper. Sufficient shrub/forb/grass cover is needed to support the insect prey-base (Zwartjes, et al.2005).

<u>Forest type</u>: Juniper
<u>Tree size</u>: >=15”dbh

Snag density
Ash-throated flycatchers are a secondary cavity nester (Cardiff and Dittman 2002). Nests primarily in natural cavities, woodpecker holes, nest boxes, and cavities in other human-made structures, usually in dead portions of trunks and larger branches of trees and large shrubs, in columnar cacti, and in wooden posts or hollow metal poles.

Opportunistic, using almost any natural or artificial cavity, size permitting and ≥0.3 m above ground. Presumably where cavity availability limited or competition for cavities is high birds will immediately occupy cavities as soon as they are vacated by other species (Purcell et al. 1997).

Ash-throated flycatchers take advantage of cavities in live or dead wood and frequently occupy natural or used woodpecker cavities in wooden fence posts and utility poles, occasionally fallen dead trees or trees in flooded woodland.

<u>Cavitiy density calculation:</u>

Use % of source habitat in >21" dbh juniper and ALL oak. Assume any oak has a large number of cavities (very little oak is in an early seral condition).

Low = <25 % of source habitat in >21" juniper
Moderate - >=25 - <50%
High - >=50%

Grazing

Brooks (1999) found that ash-throated flycatcher (*Myiarchus cinerascens*) abundance was 700% higher inside (inside 5 0.07 6 0.05, outside 5 0.0160.01, *F*1,30 55.06, *P*,0.0319) an exclosure that prohibited grazing and ohv use (for protection of desert tortoise). Habitat structure may not affect bird and lizard communities as much as availability of food at this desert site, and the greater abundance and species richness of vertebrates inside than outside the protected area may correlate with abundances of seeds and invertebrate prey.

On sites grazed versus ungrazed by livestock, densities (individuals/40 ha) were similar during May (17.4 and 17.8, respectively), but substantially lower on grazed (13.6) versus ungrazed (17.0) site in Jun (Verner and Ritter 1988)

The removal of cattle from the San Pedro River National Conservation Area (Arizona) in 1987 resulted in a four- to sixfold increase in herbaceous vegetation after 3 years; detections of ash-throated flycatchers increased significantly during this period (Krueper et al. 2003), possibly due to increased insect availability. In woodlands, grazing may negatively affect ash-throated flycatchers through (1) the loss of snags due to changes in the natural fire regime and the occurrence of catastrophic fire, and (2) decreased availability of insects (Zwartjes et al. 2005).

We calculated the percent of the suitable forest types (dry ponderosa pine and juniper) in active livestock grazing allotments.

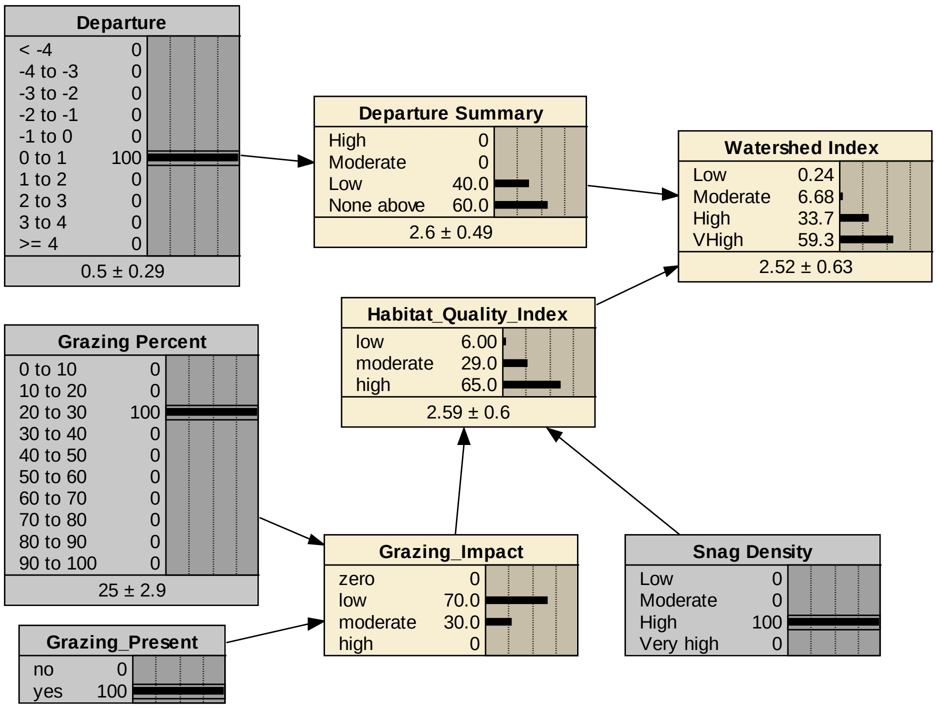
Weighting of variables:

Sensitivity of the Watershed Index due to a finding at another node:

1. Habitat Departure

2. Snag Density
3. Grazing

Ash-throated flycatcher focal species assessment model



Assessment Results

Watershed Index Scores

Forty watersheds within the range of the ash-throated flycatcher were analyzed. Habitat departure was high. Eighty-eight percent (n=35) had high departure (class -2, -3).

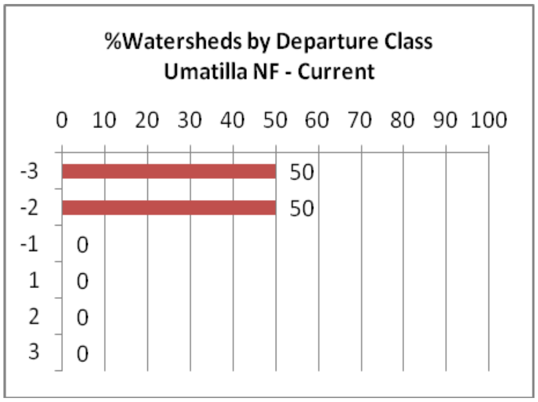
The risk factors of cavity abundance and grazing also contributed to low watershed index values. One watershed had 22% of the potential habitat in an active grazing allotment, while the rest had over 50%.

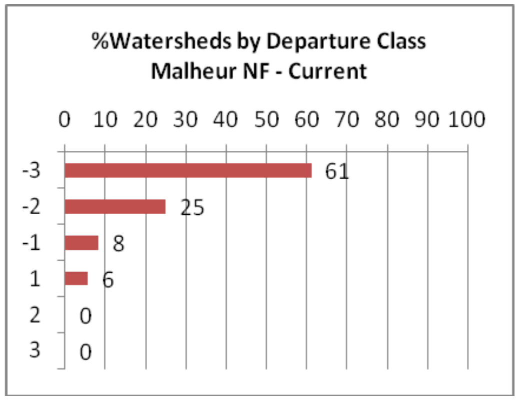
The amount of habitat that was in the >21” dbh class was overall low most watersheds were in this class.

% Habitat >=20"	Uma %Watersheds	Mal %Watersheds

Low	50	86
Moderate	33	6
High	17	8

Watershed index values for the current condition were ‘low’ (<1.0) for 88% (n=35), and the remainder were in the moderate class (>1.0-2.0).





Viability Outcome Scores

Viability Outcome	Umatilla NF		Malheur NF	
	Historical	Current	Historical	Current
Shabitat (Ad)		1,589		5,923
HisWWI/CurWWI	100	13	100	8
%Hucs >=40%	83	50	78	33
Clusters	1/1(high)	1/1(high)	3/3	2/3
A	85	0	80	0
B	11	0	14	0
C	4	7	5	3
D	1	67	1	55
E	0	26	0	42

Overall, the USFS manages relatively little juniper habitat in the planning area, the majority of habitat for species associated with juniper habitat in the Blue Mountains, occurs on non-USFS.

The viability outcome has declined since historical due to a reduction in the quantity and quality, and distribution of habitats for this species. Historically we estimated this species to have primarily an A outcome, and currently primarily a D/E outcome.

Alternative B Analysis
Assessment inputs:
Source Habitat – juniper forests >=15” dbh
Grazing-

Snag density-

All of these input attributes could change as a result of the implementation of any of the alternatives developed for the plan revision. However, because the USFS manages relatively little juniper habitat in the planning area, no vegetation modeling was done on this plant community.

Plan components exist that should benefit ash-throated flycatcher. The guidelines addressing protection of snags and live trees (G59, G60) are just some of the important components addressed in Alt. B, but also:

See section : ***Alternative Analysis : Ash-throated flycatcher, Sage Thrasher, Lark Sparrow, Northern Harrier –*** following the Northern Harrier section for a full discussion of potential impacts to ash-throated flycatchers under Alternative B.

WLD-HAB-13 S-7	**Standard** Where management activities occur within dry or cool moist forest habitat, all snags 21 inches DBH and greater and 50 percent of the snags from 12 to 21 inches DBH shall be retained, except for the removal of danger/hazard trees. Snags shall be retained in patches.
OF-1 G-59	**Guideline** Management activities in old forest stands should retain live old forest trees (≥ 21 inches DBH). Exceptions include: • old forest tree(s) need to be removed to favor hardwood species, such as aspen or cottonwood, or other special habitats • old forest late seral species, such as grand fir, are competing with large diameter early seral species, such as ponderosa pine • old forest tree(s) need to be removed to reduce danger/hazard trees along roads and in developed sites • a limited amount of old forest trees need to be removed where strategically critical to reinforce and improve effectiveness of fuel reduction in WUIs
OF-2 G-60	**Guideline** Management activities in non-old forest stands should retain live legacy old forest trees (≥ 21 inches DBH). Exceptions to retaining live legacy old forest trees are the same as those noted in the previous guideline (OF-1).

Summary: Likely due to implementation of Alternative B, viability for ash-throated flycatchers will remain the same as current or increase due to the plan components that will likely lead to increased abundance of source habitat, and increased snag densities.

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SAGE THRASHER (*Oreoscoptes montanus*) MODEL APPLICATION AND ASSESSMENT RESULTS

Introduction

Sage thrashers were selected as a focal species to represent species of concern and species of interest associated with the Shrub-steppe Group in the Woodland/Grass/Shrub Family. This species represents the full range of habitats and risks associated with this group, including loss, fragmentation, and degradation of sagebrush (*Artemisia* spp.) habitats. Sage thrashers are distributed more likely around the periphery of the Blue Mountains planning area (Miller 2003). Sage thrashers are easily surveyed using standard point count protocols. Sage thrashers were breeding-season residents of the planning area (Reynolds et al. 1999); this assessment was for nesting habitat.

Model Description

Probability of occurrence of sage thrashers in shrub-steppe habitats was most directly related to sagebrush cover, total shrub cover, shrub patch size, decreased disturbance, and similarity of habitat within a 1-km radius (Knick and Rotenberry 1995).

Source Habitat

Sage thrashers were almost entirely dependent on sagebrush habitats during the breeding season (Braun et al. 1976, McAdoo et al. 1989, Knick and Rotenberry 1995, Dobler et al. 1996, Reinkensmeyer et al. 2007). Abundance of breeding birds has been reported as positively correlated with sagebrush cover and negatively correlated with the cover of annual grasses (Wiens and Rotenberry 1981, Kerley and Anderson 1995, Reynolds et al. 1999). The primary limiting factor for sage thrashers was the loss, alteration, or degradation of sagebrush habitats (Braun et al. 1976, Weber 1980, Cannings 2000). Complete replacement of native sagebrush habitat with crested wheatgrass (*Agropyron cristatum*) has eliminated this species in some areas (Reynolds and Trost 1980, 1981). Even removal of only large sagebrush in breeding habitats can limit utilization by thrashers (Castrale 1982). Sage thrashers were least abundant on sagebrush sites in poor condition, suggesting that they were more productive in less disturbed communities (Vander Hagen et al. 2000).

The spread of cheatgrass (*Bromus tectorum*) has had a negative effect on sage thrasher populations through its influence on fire regimes in western grasslands (Knick and Rotenberry 1997). Fires pose a threat to sage thrashers in terms of habitat loss, since sagebrush does not resprout after being burned (Castrale 1982). Kerley and Anderson (1995) found that sage thrashers were not present on burned areas 9 years after a fire, and areas treated with herbicide had low sage thrasher populations 22 years after treatment. Although Petersen and Best (1987, 1999) found that sage thrasher abundance was unaffected by prescribed burning which resulted in a mosaic of burned and unburned areas in southeastern Idaho, Welch (2002), McIntyre (2002), and Holmes (2007) reported that sage thrasher presence was reduced or they did not occur on burned sagebrush sites.

- **Potential Vegetation (ILAP)** –

MTN_MAHOGANY
LOW_SAGE
RIGID_SAGE
PUTR (bitterbrush)
WYO_BIG_SAGE

We used a potential vegetation map to map habitat for this species (from ILAP). According to Hann et al. 1997, the dry grass and dry shrub potential vegetation groups in the Blue Mountains on USFS/BLM lands declined, due to invasion of exotics:

Blue Mtns ERU			
Dry Grass	BLM/FS	15% Exotic Herbland	p. 548 Han
Dry Shrub	BLM/FS	8% Exotic herbland	P. 549 Har
Cool Shrut	BLM/FS	4% Exotic herbland	p. 550 Han

For the current year analysis, we assumed a 5% decline in the amount of habitat but no change in the departure class (Class 1).

Roads Habitat Effectiveness

Density of sagebrush obligate birds (including sage thrashers) was reported to decrease 39% – 60% within a 100-m buffer of roads with low traffic volumes (Ingelfinger and Anderson 2004). As a result, we assumed that roads have a negative effect on the effectiveness of source habitat for sage thrashers. We assessed the potential for human disturbance to affect source habitat of sage thrashers with an adaptation of the habitat disturbance index described in Gaines et al. (2003). We buffered open roads by 100 meters on each side and then intersected this with our map of source habitat. We then used the following categories to estimate the potential effects of human disturbance on sage thrashers for each watershed:

low – >75% of the source habitat outside road buffer within a watershed
moderate – 50 – 75% of the source habitat outside road buffer within a watershed
high – <50%of the source habitat outside road buffer within a watershed

Patch Size

Knick and Rotenberry (1995, 2002) reported that sage thrashers were highly sensitive to fragmentation of shrublands in southeast Idaho. Also, Vander Haegen et al. (2002) found higher predation rates on nests of sage thrashers in small patches of sagebrush (median 146 ha) compared to large patches (median 115,368 ha). Although Vander Haegen et al. (2000) reported that sage thrashers were not area-limited in eastern Washington State and were often found nesting in small habitat patches (<10 ha), subsequent analyses indicated that birds nesting in small patches experienced reduced nest success when compared to birds nesting in large habitat patches (Vander Haegen 2007). This lower reproductive success was manifested in lower rates of nest survival, largely a result of increased predation on nests. Thus, small patches of sagebrush were reproductive sinks for this species. The following classes were used to describe the effect of patch size on habitat quality:

small – 0 – <500 ha mean patch size of sagebrush habitat within a watershed
moderate – 500 – 1,000 ha mean patch size of sagebrush habitat within a watershed
large – >1,000 ha mean patch size of sagebrush habitat within a watershed

We used a potential vegetation map to map habitat for this species, it is not likely that historically the amount or patch size of the habitat differed greatly on USFS lands.

Variables Considered But Not Included

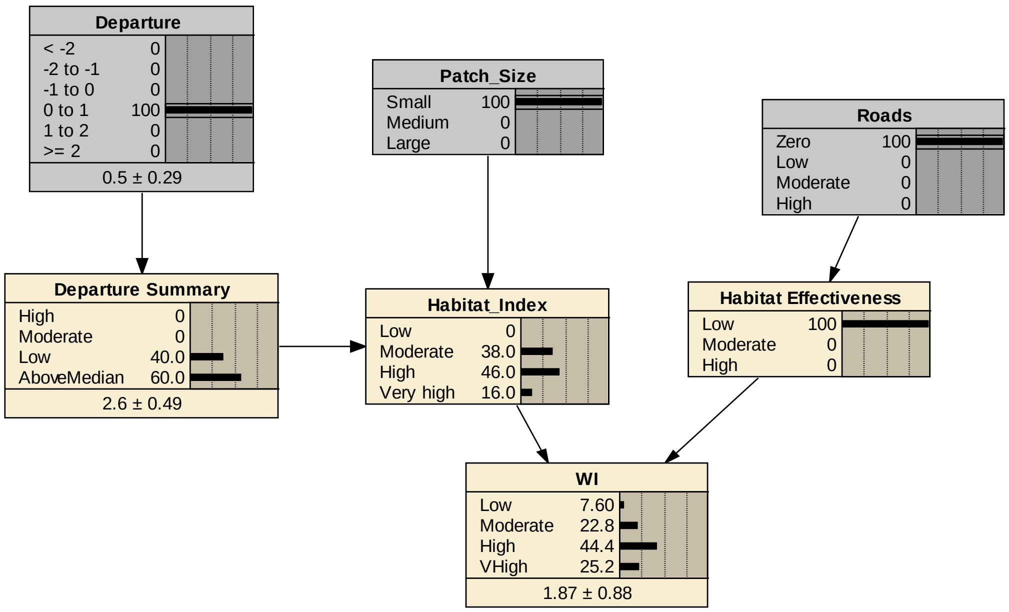
Grazing

Heavy grazing pressure has been reported to affect sage thrasher populations negatively (Kerley and Anderson 1995, Bradford et al. 1998), but they may be less sensitive to intensive grazing than other birds associated with shrub-steppe habitats (Reynolds and Trost 1981, Kantrud and Kologiski 1982). Saab et al. (1995) further reviewed several studies where heavy grazing resulted in a positive response in sage thrasher abundance. Because of the equivocal nature of the reported effects of grazing on sage thrashers, this variable was not included in the model.

Calculation of Historical Conditions

Values of the model variables were set with the following values to estimate historical habitat conditions:
Departure of source habitat from HRV – Class 1
Roads – class low
Patch size – same as current
We assumed historical habitat abundance was 5% greater than current.

Watershed Index Model



Figure—Focal species assessment model for sage thrasher

Table—Relative sensitivity of Watershed Index values to variables in the model for sage thrashers.

Variable	Sensitivity rank
Habitat departure	**1**
Patch size	**2**
Road density	**3**

Watershed Index Model Application

Habitat Influences

Ninety watersheds were evaluated for the sage thrasher. No departure in the amount of habitat was assumed to have occurred since historical on USFS lands though we assumed a loss of 5% in the amount of habitat from historical. The amount of habitat within 100m of open roads or motorized trails and average patch size of habitat lowered the watershed index values. The main influence on the scores was patch size. Though we found patch size to be low in all watersheds, this was not expected to have changed from historical. The abundance of this habitat type on FS lands is relatively low.

Road density in source habitat was generally low across the planning area. The amount of habitat within 100 m of open roads was determined to be low in 76% (n=68) of the watersheds and moderate in 20% (n=18) across the Blue Mountains.

		Watershed Index	Patch Size	Road Density

	# Watersheds	Low (<1)	Moderate (1-2)	High (>2)	Low	Low	Moderate	High
UMA	18		100%		100%	83% (n=15)	6% (n=1)	11% (n=2)
WAW	36		100%		100%	85% (n=35)	10% (n=4)	5% (n=2)
MAL	41		100%		100%	64% (n=23)	36% (n=13)	0%
Blue Mtns	90		100%		100%	76% (n=68)	20% (n=18)	4% (n=4)

Viability Outcome

Viability Outcome	Umatilla NF		Wallowa-Whitman NF		Malheur NF	
	Historical	Current	Historical	Current	Historical	Current
Shabitat (Ac)		7,346		68,638		167,686
HisWWI/CurWWI	64	55	64	55	64	54
%Hucs >=40%	72	67	68	68	69	69
Clusters	3/3	3/3	4/4	4/4	3/3	3/3
A	32	0	28	0	28	0
B	55	23	54	23	54	23
C	8	73	12	73	12	73
D	4	5	6	5	6	5
E	0	0	0	0	0	0

We assumed habitat declined 5% since historical, and did not change the departure class in the analysis for current conditions. The 2 habitat attributes that were included in the model were road densities and patch size. We found that the current viability for sage thrashers is primarily a class C in all 3 planning areas, indicating suitable environments are moderately distributed and/or exist at moderate abundance relative to historical conditions. It is likely that other species associated with the Shrub-steppe Group in the Woodland/Grass/Shrub Family had similar outcomes.

Historically, we changed the amount of habitat within 100 meters of a road to zero in all watersheds, but did not change the patch size (low). Historically, we predicted the WWI score to be 64% (as compared to 100% if the patch size was large). The resultant historical viability was estimated to be primarily B outcome across the planning areas, indicating habitat was broadly distributed and of moderate to high abundance relative to historical conditions. Habitat on the Umatilla NF was likely never high in abundance

In summary, under historical conditions, sage thrashers and other species associated with the Shrub-steppe Group in the Woodland/Grass/Shrub Family were likely well-distributed throughout the planning area; currently species with this outcome are likely well-distributed within only a portion of the plan area.

Alternative B Analysis

Assessment inputs:
Source habitat – sagebrush
Patch size of source habitat
Habitat effectiveness - % of source habitat outside 100 m road buffer

Because we are unable to model the amount of change in source habitat due to management activities proposed in Alternative B, a viability outcome was not modeled. We will qualitatively describe how the proposed action may affect viability for this species. Plan components in each alternative give us some indication of potential changes that may have an effect on viability for this species.

Management activities likely to occur in the primarily sagebrush source habitats for this species are primarily grazing, invasive plant species control, and fire suppression.

See section : ***Alternative Analysis : Ash-throated flycatcher, Sage Thrasher, Lark Sparrow, Northern Harrier –*** following the Northern Harrier section for a full discussion of potential impacts to sage thrashers under Alternative B.

In Summary: Likely due to implementation of Alternative B, viability will remain the same or improve due primarily plan components that encourage preventing invasive exotics, the main threat to loss of this habitat type.

Additionally, there is a possibility that a loss of sagebrush may occur in the planning area due to conversion to exotic vegetation due to forces not related to forest management (e.g. wildfire/climate change). Sagebrush habitats are severely stressed across much of the West, and the area of these habitats will likely decline in the relatively near future as a result of invasive species, fire, and climate change (Miller et al. 2011). Once cheatgrass is established in sagebrush communities, the effects cascade in synergistic feedbacks toward increasing cheatgrass dominance resulting from increased fire disturbance, loss of perennial species and their seed banks, and decreased stability and resilience to change in weather and climate patterns (d'Antonio and Vitrousek 1992, d'Antronio 2000, Brooks et al. 2004a, Chambers et al. 2007).

Fire, both managed and unmanaged is considered one of the key threats to sagebrush habitats (Crawford et al. 2004). The length of the fire cycle has changed, being more frequent in low elevations and less frequent at higher elevations resulting in invasion of exotic grasses at lower elevations and woodland expansion at higher elevations (Miller et al. 2011). As previously noted, all alternatives desire plant communities as well as disturbance regimes (i.e., fire) to be with HRV, which should preclude the use of fire as a management tool in the sagebrush community where the risk of exotic grass invasion is high. Additionally there are standards that address the spread of noxious weeds and that guide restoration.

Climate change will have an important influence on shrub-steppe habitats, as the various scenarios predict increasing temperature, atmospheric carbon dioxide, and severe weather events all of which favor cheatgrass expansion and increased wildfire activity (Miller et al. 2011). Increase temperature predictions suggest that sagebrush habitats could be replaced with other woody vegetation causing further decline in sage habitats (Bradley 2010, North American Bird Conservation Initiative (NABCI) 2010).

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LARK SPARROW (*Chondestes grammacus*) MODEL APPLICATION AND ASSESSMENT RESULTS

Introduction

Lark sparrows were chosen as a focal species to represent species of conservation concern in the Grassland Group of the Woodland/Grass/Shrub Family. Lark sparrows and other species in the Grassland Group were of conservation concern because grassland habitats throughout the United States were being lost to woody invasion and development (Grant et al. 2004). Lark sparrows were associated with dry, open grasslands and respond positively to well-managed grazing of domestic livestock, although they were highly susceptible to nest parasitism by brown-headed cowbirds (*Molothrus ater*). They have a distinctive song making this species easy to survey and monitor. Lark sparrows were breeding-season residents of the planning area (Martin and Parrish 2000); this assessment was for nesting and rearing habitat.

Model Description

Source Habitat

Lark sparrow habitat included shrub steppe, and mixed-grass and shortgrass uplands with a shrub component and sparse litter (Walcheck 1970, Wiens and Rotenberry 1981, Bock et al. 1995). Martin and Parrish (2000) reported that lark sparrows prefer structurally open herbaceous ground cover containing scattered trees or shrubs with <24% canopy cover. In northeastern Colorado lark sparrows were found in grazed prairies with widely spaced cottonwoods (Jacobson 1972, Fitzgerald 1978). In pinyon-juniper woodlands, lark sparrow abundance increased with decreasing tree density (Tazik 1991). Studies in the eastern United States indicated that habitat patches with >15% tree cover were avoided by nesting lark sparrows (Coulter 2008). Lark sparrows were reported to be more abundant in mixed-grass prairie than on tallgrass prairie or tame hayland in Colorado (Bock et al. 1999). Also, lark sparrows were significantly more abundant in native-grass-dominated areas than in areas dominated by exotic grasses (Flanders et al. 2006). Lark sparrow abundance has been reported to be negatively correlated with sagebrush density

(McAdoo et al. 1989). Lark sparrow habitat in Arizona had mean values of 38% bare ground, 54% grass cover, 7% forb cover, <2% canopy cover, 13 cm grass height, and 0.068 shrubs/m² (Bock and Webb 1984). For this analysis, source habitat was defined as structurally open habitats with grass and/or herbaceous ground cover with scattered shrubs and/or trees.

Though we evaluated a 10% decline in the abundance of habitat (Hann et al. 1997), we did not change the departure class.

- ILAP- bitterbrush, sagebrush (mountain big sagebrush, Wyoming big sagebrush), grassland , salt desert shrub
- <6000'

Invasive Animals

Lark sparrows were vulnerable to parasitism by brown-headed cowbirds (Wiens 1963, Newman 1970, Hill 1976, Shaffer et al. 2003). Proximity to agricultural areas increased the potential of parasitism (Goguen and Mathews 1999, 2000; Tewksbury et al. 1999; Young and Hutto 1999). The following classes were used to estimate the potential effect of brown-headed cowbirds on lark sparrows:
low – <30% of source habitat within 1km of agricultural areas within a watershed
moderate – 30 – 50% of source habitat within 1 km of agricultural areas within a watershed
high – >50% of source habitat within 1 km of agricultural areas within a watershed

Patch Size

In the core of their range, lark sparrows often inhabit large, unbroken prairies or fields (Martin and Parrish 2000). At the landscape scale lark sparrows used large habitat patches with low edge to interior ratios (Coulter 2008). Proximity of habitat patches and amount of edge were reported to be important predictors of grassland bird richness (including lark sparrows) (Hamer et al. 2006). Lark sparrows were more frequently found in interior survey plots >200 m from an edge in a habitat patch than in survey plots closer to an edge (Bock et al. 1999). They were edge sensitive with reduced abundance near edges (Bolger et al. 1997). This suggests that patches increasingly >13 ha in size provide progressively better habitat. They also exhibited a negative response to urban development (Jones and Bock 2002). Lark sparrows were strongly negatively affected by habitat fragmentation and preferred patches >100 ha (Bolger 2002). Occurrence of grassland species may be negatively affected by larger amounts of edge because of increased risk of predation and brood parasitism near wooded edges (Johnson and Temple 1990, Winter et al. 2000). The following classes were used to estimate the potential effect of patch size on lark sparrows:
small – <20 ha mean size for source habitat patches within a watershed
medium – 20 – 100 ha mean size for source habitat patches within a watershed
large – >100 ha mean size for source habitat patches within a watershed

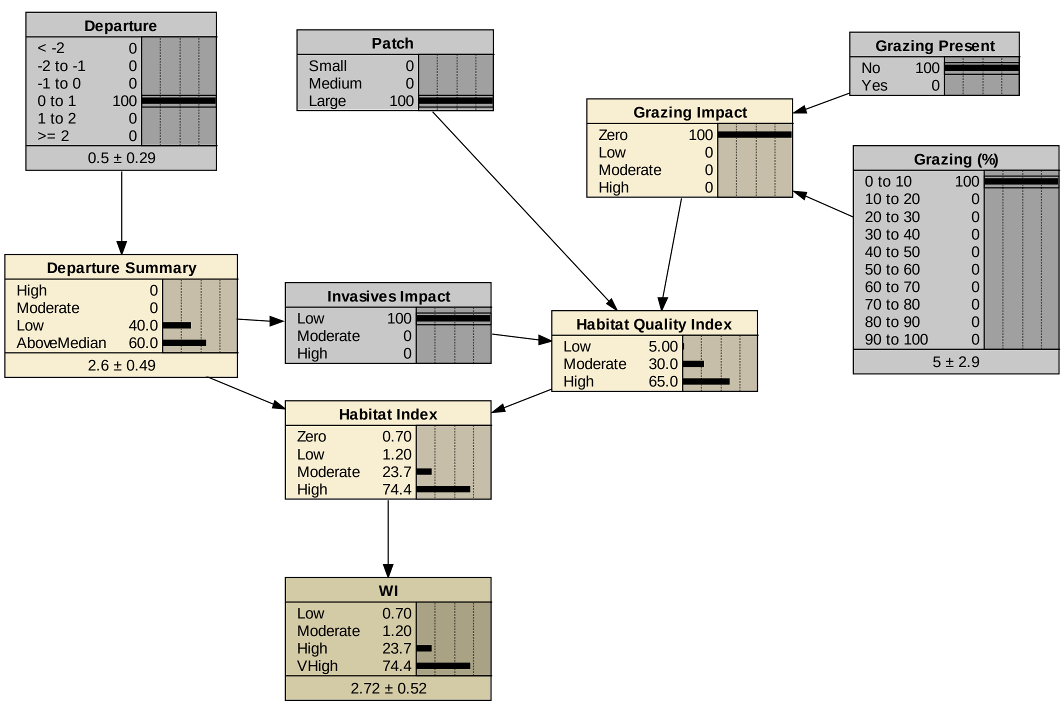
Grazing
Results reported in the literature on the effects of grazing on lark sparrows were unequivocal. Numerous sources reported a positive response from lark sparrows associated with livestock grazing (e.g., Bock and Webb 1984, Bock et al. 1984, Bock and Bock 1988, Martin and Parrish 2000, Lusk et al. 2003). However, timing and intensity of grazing may affect the magnitude of the response of lark sparrows (Goguen and Mathews 1998).

Impact of grazing on source habitat within a watershed was based on the percentage of source habitat with an active grazing allotment. The amount of source habitat in an active grazing allotment was categorized using 10% increments from 0-100%, with increasing habitat outcomes as the proportion of source habitat in an active allotment increased.

Calculation of Historical Conditions

Values of the model variables were set with the following values to estimate historical habitat conditions:
Departure of source habitat from HRV – Class 1
Invasive animals – class low
Patch size – same as current
Grazing – none

Watershed Index Model



Figure—Focal species assessment model for lark sparrow.

Table—Relative sensitivity of Watershed Index values to variables in the model for lark sparrow.

Variable	Sensitivity rank
Habitat departure	1
Patch size	2
Grazing impact	3
Invasive species	4

Assessment Results –

Watershed Index –

We included 105 watersheds with greater than 10ha of habitat within the Blue Mountain NFs. Though we evaluated a 10% decline in the abundance of habitat (Hann et al. 1997), we did not change the departure class. Likely on lands not managed by the USFS, habitat for lark sparrows has declined more due to development and agriculture.

		Watershed Index			Patch Size			Grazing	Invasives		
	# Water-sheds	Low (<1)	Moderate (1-2)	High (>2)	Small	Medium	Large	>=50%	Low	Moderate	High
UMA	26	0%	15% (n=4)	85% (n=22)	92% (n=24)	8% (n=2)	0%	69% (n=18)	73% (n=19)	19% (n=5)	8% (n=2)
WAW	48	0%	17% (n=8)	83% (n=40)	71% (n=34)	21% (n=10)	8% (n=4)	65% (n=31)	79% (n=38)	15% (n=7)	6% (n=3)
MAL	36	0%	0%	100%	92% (n=33)	8% (n=3)	0%	97% (n=35)	100%	0%	0%
Blue Mtns	105	0%	10% (n=11)	90% (n=94)	83% (n=87)	13% (n=14)	4% (n=4)	78% (n=82)	84% (n=88)	11% (n=12)	5% (n=5)

Lark sparrows were strongly negatively affected by habitat fragmentation and preferred patches >100 ha (Bolger 2002). Although the majority of patch sizes in our analysis were small, we did not predict that this changed on USFS lands since historical. The USFS, contains relatively little of this grassland and some shrublands, and its historical distribution has likely not changed on this ownership.

Lark sparrows were also vulnerable to brood parasitism by brown-headed cowbirds (Newman 1970). Proximity to agricultural areas increases the potential of parasitism (Goguen and Mathews 2000). Lark sparrows in the planning area were at low risk to brood parasitism.

Grazing by livestock may have a positive effect on lark sparrows and their habitat depending on the intensity and season of grazing (Bock and Webb 1984). The percentage of source habitat by watershed in an active allotment was generally high across the planning area.

Viability Outcome Scores

Viability Outcome	Umatilla NF		Wallowa-Whitman NF		Malheur NF	
	Historical	Current	Historical	Current	Historical	Current
HisWWI/CurWWI	72	71	87	85	74	76
%Hucs >=40%	85	81	65	63	78	69
Clusters	3/3	3/3	4/4	4/4	3/3	3/3
A	34	34	71	71	32	30
B	57	57	19	19	56	55
C	6	6	9	9	8	10
D	3	3	1	1	4	5
E	0	0	0	0	0	0

Currently the viability outcome is primarily an A or a B outcome. Because we modeled patch size as not changing from Current, the Historical VO was less than what would be expected in different parts of its range. However, historically, the outcome was slightly better, primarily due to an increase in the number of watersheds with >40% of the median amount of historical source habitat (median was calculated across all watersheds with source habitat).

The difference in viability outcome on the Wallowa-Whitman can be attributed to the number of watersheds with a moderate or high patch size, as these watersheds also contained the greatest amount of habitat. Most of these watersheds lie within or adjacent to the Hell's Canyon NRA.

It is likely that other species associated with the Grassland Group of the Woodland/Grass/Shrub Family had similar outcomes.

Alternative B Analysis
Assessment inputs:
Source habitat – sagebrush, grasslands
Patch size of source habitat
Grazing
Invasive species – nest parasitism

Because the abundance of sagebrush habitat is not expected to occur due management activities proposed in alternative B, a viability outcome was not modeled. We will qualitatively describe how the proposed action may affect viability for this species.

Plan components in each alternative give us some indication of potential changes that may have an effect on viability for this species.

See section : ***Alternative Analysis : Ash-throated flycatcher, Sage Thrasher, Lark Sparrow, Northern Harrier –*** following the Northern Harrier section for a full discussion of potential impacts to lark sparrows under Alternative B.

In Summary: Likely due to implementation of Alternative B, viability will remain the same as current. However, there is a possibility that a loss of sagebrush or native grasslands may occur in the planning area due to conversion to exotic vegetation due to forces not necessarily related to forest management proposed in this alternative.

A substantial number of invasive grasses, forbs and woody plants have invaded temperate grasslands in North America. Many of these species have been deliberately introduced and widely planted; some are still used for range improvement, pastures, lawns, and as ornamentals, though many are listed as state or federal noxious weeds. Others have been greatly facilitated by widespread land disturbance. Historically, fire has been a major selective force in the evolution of temperate grasslands (Grace et al. 2001). The interaction between fire and invasives can be complicated by additional factors such as grazing and other disturbances (Collins et al. 1995, 1998, Stohlgren et al. 1999). See section *Alternative Analysis : Ash-throated flycatcher, Sage Thrasher, Lark Sparrow, Northern Harrier* **–** following the Northern Harrier section for additional information on potential changes due to climate change.

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NORTHERN HARRIER (*Circus cyanus*) MODEL APPLICATION AND ASSESSMENT OF RESULTS

Introduction

The northern harrier was selected as focal for the Grasslands Group because it is a widely distributed species across grasslands in the planning area. In addition, this species will also be found in wetter grassy and marsh areas, similar to the short-eared owl another member of the group. All species in this group share human disturbance as a risk factor. Though some harrier's may remain in the area during the winter, we primarily evaluated breeding habitat.

Model Variable Descriptions

Source Habitat

Northern Harriers prefer relatively open grassland habitats characterized by tall, dense vegetation, and abundant residual vegetation (Duebbert and Lokemoen 1977, Hamerstrom and Kopeny 1981, Apfelbaum and Seelbach 1983, Kantrud and Higgins 1992). They are associated with wet or dry grasslands, fresh to alkali wetlands, lightly grazed pastures, croplands, fallow fields, old fields, and shrubby areas (Stewart and Kantrud 1965, Stewart 1975, Linner 1980, Evans 1982, Apfelbaum and Seelbach 1983, Faanes 1983, Kantrud and Higgins 1992, Dhol et al. 1994, Prescott et al. 1995, MacWhirter and Bildstein 1996, Prescott 1997). Although cropland and fallow fields were used for nesting, most nests were found in undisturbed wetlands or grasslands dominated by dense vegetation (Duebbert and Lokemoen 1977, Apfelbaum and Seelbach 1983, Kantrud and Higgins 1992). Nest success may have been lower in cropland and fallow fields than in undisturbed areas (Kibbe 1975).

Northern Harriers nested on the ground or over water on platforms of vegetation in stands of cattail (*Typha* spp.) or other emergent vegetation (Saunders 1913, Bent 1961, Sealy 1967, Clark 1972, Stewart 1975, MacWhirter and Bildstein 1996). Ground nests were well concealed by tall, dense vegetation, including living and residual grasses and forbs, or low shrubs, and are located in undisturbed areas with much residual cover (Hecht 1951, Duebbert and Lokemoen 1977, Hamerstrom and Kopeny 1981, Kantrud and Higgins 1992, Herkert et al. 1999).

Nests in wet sites may have an advantage in that fewer predators have access to them (Sealy 1967, Simmons and Smith 1985). In Alberta, Northern Harriers were more abundant in large (>8 ha) fresh wetlands than in small (<1 ha) fresh wetlands (Prescott et al. 1995).

Northern Harriers had large territories; in Idaho, home ranges averaged 1570 ha for males and 113 ha for females (Martin 1987). In North Dakota, breeding harriers were found only in grassland patches >= 100 hectares, and were encountered in large patches more than expected (Johnson and Igl 2001). All occupied patches exceeded 100 ha. In contrast, Herkert et al. (1999) suggested that harriers may respond more strongly to total amount of grassland within the landscape rather than to sizes of individual grassland tracts.

For this assessment, we identified grassland, and wetlands potential vegetation types developed by the ILAP project as source habitat for this species. We also included Palustrine Emergent and Palustrine Scrub-Shrub habitats as identified in the National Wetlands Inventory data set, the Forest Service PVG map, and Ecological Systems data. In addition we described source habitat as areas with <30% slope, patches of habitat >1 acre in size and in areas of less than 6000' elevation. Only watersheds with an estimated 50 ha of habitat historically were included in the analysis.

We assumed no departure in the amount of habitat currently as compared to historically on lands administered by the U.S.F.S. However, we assumed the amount of habitat on National Forest System lands has declined 10% since historical (Hann et al 1997).

Potential vegetation types (ILAP): Grasslands and Wetlands

We used three data sources to define source habitat for the Wilson's snipe:
National Wetlands Inventory: PSS and PEM
Forest Service PVG: Upland Wetland, Riparian Herbland, Riparian Shrubland
Ecological Systems:

North Pacific Bog and Fen
North Pacific Shrub Swamp
North American Arid West Emergent Marsh
Rocky Mountain Subalpine-Montane Mesic Meadow
Ruderal Wetland
Rocky Mountain Alpine-Montane Wet Meadow
Columbia Plateau Vernal Pool
Rocky Mountain Subalpine-Montane Fen
Temperate Pacific Subalpine-Montane Wet Meadow

Slope: <30%

Elevation: <6000'

Grazing

Overgrazing, the advent of larger crop fields, and fewer fencerows, together with the widespread use of insecticides and rodenticides, have reduced the availability of prey for northern harriers and thus the amount of suitable habitat for this species (Duebbert and Lokemoen 1977, Hamerstrom 1986). In the Great Plains, Southwest, and U.S. Intermountain West, Northern Harriers have been found to use livestock-grazed grasslands less than ungrazed areas (Linner 1980, Bock et al. 1993). Littlefield and Thompson advocated reducing or eliminating winter livestock-grazing from wetland and grassland ecosystems to improve winter habitat in the northern Great Basin. Northern Harriers preferred idle areas to grazed areas in North Dakota (Sedivec 1994). Northern Harriers do not use heavily grazed habitats (Stewart 1975, Berkey et al. 1993, Bock et al. 1993), but may use lightly to moderately grazed grasslands (Kantrud and Kologiski 1982, Bock et al. 1993). In North Dakota, Northern Harriers had significantly higher nesting density on ungrazed areas than areas grazed season-long or under a twice-over grazing rotation schedule (Messmer 1990, Sedivec 1994). In aspen parkland of Alberta, Northern Harriers were most abundant in deferred grazed (grazed after 15 July) mixed-grass, but were absent from continuously grazed mixed-grass and deferred or continuously grazed tame pasture (Prescott et al. 1995).

To account for possible impacts of livestock grazing on habitat, we categorized the amount of source habitat in an active grazing allotment using 10% increments from 0-100%, with increasing poorer habitat outcomes as the proportion of source habitat in an active allotment increased.

Habitat Effectiveness

Nesting harriers are sensitive to human disturbance especially from the pre-laying and egg-laying stages up to hatching (Hamerstrom 1969, Fyfe and Olendorff 1976). Predation of harrier young has occurred when predators followed humans to nests (Watson 1977, Toland 1985). Harriers will leave wintering areas with potentially suitable nesting habitat presumably in part due to heavy use by humans (Serrentino 1992).

Because of potential effects of humans on harriers mapped 200-meter bufferes on each side of open roads and motorized trails that occurred within source habitat. We also mapped 100-meter buffers on each side of non-motorized trails that occurred within source habitat. The amount of source habitat that was influenced by human activities (within the buffers) was then categorized as follows for each watershed:

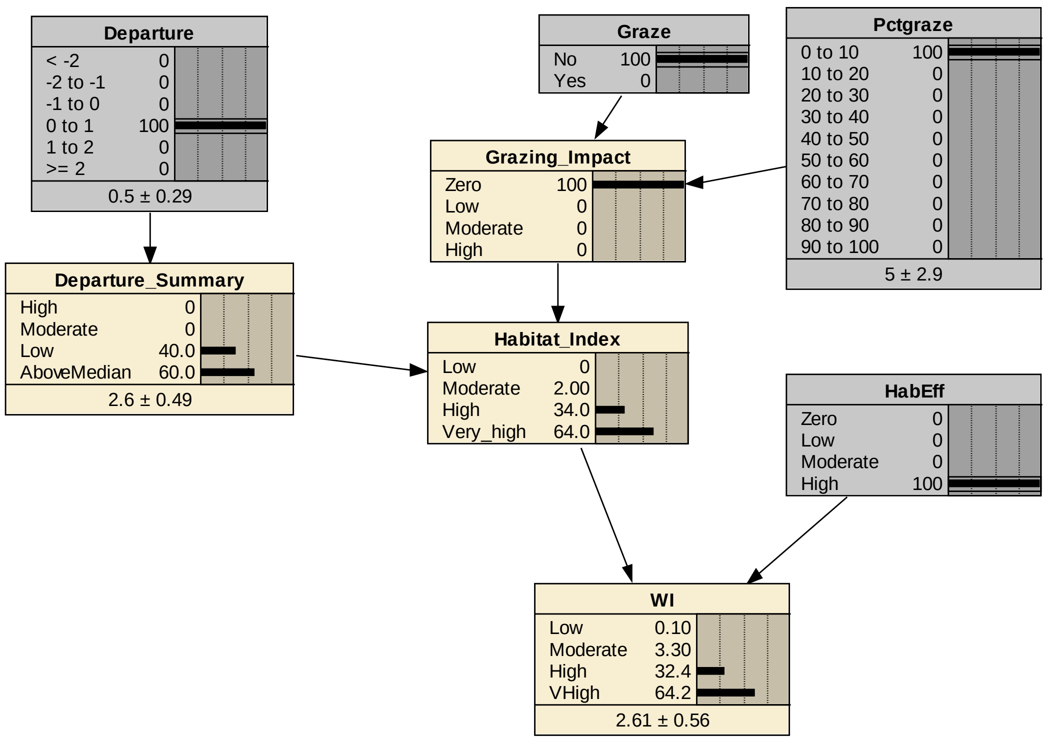
Zero habitat effectiveness = 100% of the source habitat inside the zone of influence
Low habitat effectiveness = <50% of the source habitat outside a zone of influence
Moderate habitat effectiveness = 50-70% of the source habitat outside a zone of influence

High habitat effectiveness = >70% of the source habitat outside a zone of influence

Historical Inputs for Focal Species Assessment Model

Departure of source habitat - Class 1
Grazing – 0%
Habitat effectiveness – Zero
The amount of source habitat was 10% greater in the historical assessment

Northern Harrier Focal Species Assessment Model



Figure—Focal species assessment model for Northern Harrier

Table -- Relative sensitivity of Watershed Index values to variables in the model for Northern harrier

Variable	Sensitivity rank
Habitat departure	1
Grazing	2
Habitat Effectiveness	3

Assessment Results

Watershed Index Scores

Sixty watersheds were estimated to have >50 ha of source habitat historically (and currently) and were included in our analysis. Overall, little source habitat for northern harriers existed on National Forest System lands. We assumed the amount of habitat on National Forest System lands has declined 10% since historical (Hann et al 1997). A greater loss of habitat on other lands has likely occurred due to development of agricultural and human development. Other research has shown that extensive draining of wetlands, monotypic farming, and reforestation of farmlands have led to a decline in habitat and population sizes of northern harriers (U.S. Fish and Wildlife Service 1987, Serrentino 1992, MacWhirter and Bildstein 1996).

Watershed index scores were affected by the density of roads and the amount of livestock grazing in source habitat.

	# Watersheds	% Habitat Grazed			Habitat Effectiveness		
		<10%	10-50%	>50%	Low	Moderate	High
UMA	18	6% (n=1)	11% (n=2)	83% (n=15	0%	56% (n=10)	44% (n=8)
WAW	23	22% (n=5)	13% (n=3)	65% (n=15)	9% (n=2)	61% (n=14)	30% (n=7)
MAL	22	0%	0%	100% (n=22)	32% (n=7)	55% (n=12)	14% (n=3)
Blue Mtns	60	8% (n=5)	8% (n=5)	83% (n=50)	15% (n=9)	57% (n=34)	28% (n=17)

Viability Outcome

Historically we estimated that an 'A' outcome where habitats are abundant and well distributed. In summary, it is likely that the Northern harrier and other species associated with the Grassland Group have experienced a loss in the quality of suitable environments across the planning area.

However, because we evaluated only U.S. Forest Lands and we expect habitat potential to have always been higher on other lands, this calculation of viability is likely inflated. We evaluated the historical median amount of source habitat on only U.S. F.S. lands, and likely this median historically was higher due to the contribution of habitat on private lands.

Viability Outcome	Umatilla NF		Wallowa-Whitman NF		Malheur NF	
	Historical	Current	Historical	Current	Historical	Current
HisWWI/CurWWI	100	66	100	65	100	63

%Hucs >=40%	88.9	88.9	78	78	59	59
Clusters	3/3	3/3	4/4	4/4	3/3	3/3
A	85	34	80	32	70	28
B	11	57	14	56	21	54
C	4	6	5	8	8	12
D	1	3	1	4	2	6
E	0	0	0	0	0	0

Figure – Historical and Current condition Viability Outcome Northern Harrier

Alternative B Analysis
Assessment inputs:
Source Habitat – grasslands, wetlands
Grazing - % source habitat within an open allotment
Habitat Effectiveness – % source habitat within zone of influence

Northern harrier's are a grassland and wetland species. Because we are unable to model the amount of change in source habitat due to management activities proposed in Alternative B for these species, a viability outcome was not modeled. We will qualitatively describe how the proposed action may affect viability for this species. Plan components in each alternative give us some indication of potential changes that may have an effect on viability for this species.

See section : ***Alternative Analysis : Ash-throated flycatcher, Sage Thrasher, Lark Sparrow, Northern Harrier –*** following this section on Northern Harrier's there is a full discussion of potential impacts under Alternative B.

In Summary: Likely due to implementation of Alternative B, viability will remain the same or improve due primarily plan components that encourage preventing invasive exotics, likely the main threat to loss of this habitat type.

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Alternative Analysis : Ash-throated flycatcher, Sage Thrasher, Lark Sparrow, Northern Harrier

Assessment inputs:

Species	Source Habitat	Model Inputs
Ash-throated flycatcher	juniper >15" dbh	grazing, % habitat with trees >=21" dbh (index to cavity abundance)
Sage Thrasher	sagebrush	habitat effectiveness, patch size
Lark Sparrow	grasslands	grazing, patch size, nest parasitism
Northern Harrier	grasslands, wetlands	grazing, habitat effectiveness

Because we are unable to model the amount of change in source habitat due to management activities proposed in Alternative B for these species, a viability outcome was not modeled. We will qualitatively describe how the proposed action may affect viability for this species. Plan components in each alternative give us some indication of potential changes that may have an effect on viability for this species.

The USFS manages relatively little area of sagebrush, grasslands, and juniper habitats that primarily make up source habitat for the focal species: ash-throated flycatcher, sage thrasher, lark sparrow and Northern harrier. Table 3.48 in Hann et al. (1997) shows that currently in the Blue Mountains ERU and ownership category USFS/BLM, 4% of the Dry shrub, 5% of the Dry grass, and 1% of the Woodland PVG's were in the ownership category of USFS/BLM. The Malheur NF has most of the sagebrush ecosystem across on USFS lands in the Blue Mountains, however it is not abundant. In an analysis of the John Day Province which includes much of the Malheur NF and Ochoco NF, the USDA Forest Service manages only 8.2% of the sagebrush (16,180 ha; much of this is mountain big sagebrush), but manages 32.8% of the John Day province (Rowland et al. 2008).

The sagebrush ecosystem (which includes much of the grassland and juniper habitats also) across the West has been substantially reduced in area and quality (Wisdom et al. 2005). Causes for loss and degradation are varied and pervasive (Knick et al. 2003, Connelly et al. 2004, Wisdom et al. 2005). Invasion of exotic vegetation, altered fire regimes, road development, and use, mining, energy development, climate change, encroachment of pinyon-juniper woodlands, intensive grazing by livestock, and conversion to agriculture, to urban use, and to non-native livestock forage all have contributed to the demise of the sagebrush ecosystem (Noss et al. 1995, Knick 1999, Miller and Eddleman 2001, Bachelet et al. 2001, Bunting et al. 2003).

In the Blue Mountains planning area, Countryman and Swanson (2009), characterized the herbland and shrubland environments into phases of departure. Phases A and B show minimal to moderate departure, phase C can be moderate to extremely departed from reference condition, and phase D are extremely departed and probably cannot return to phase C with natural succession. The current inventory of these habitats in the Blue Mountains shows 23 % in Phase D, 31% Phase C, and 46% phase A and B.

Management activities likely to occur in these woodland, shrubland and grassland habitats include primarily grazing, invasive plant species control, and fire suppression. Small prescribed fires may directly decrease habitat for sagebrush obligates, such as Brewer's sparrows (Spizella breweri) and sage thrashers (Oreoscoptes montanus) (Castrale 1982, Kerley and Anderson 1995).

Plan components that most directly address the restoration of these important habitats associated with the focal species Ash-throated flycatcher, Sage thrasher, Lark sparrow, Northern harrier include:

1.7 Plant Species Composition

DESIRED CONDITION: The mix of species across the landscape creates conditions that are resilient, sustainable, and compatible with maintaining disturbance processes at desired levels....

1.8 Stand Density

DESIRED CONDITION: The range of vegetation density across the landscape creates conditions that are resilient and sustainable. ..

1.6 Structural Stages

DESIRED CONDITION: The distribution and abundance of forested structural stages creates conditions that are resilient, sustainable, and compatible with maintaining disturbance processes.

The distribution and abundance of herbland and structural stages/age classes creates conditions that are resilient, sustainable, and compatible with maintaining disturbance processes. These conditions support the capacity of the plants to reproduce and persist on the landscape. Table 15 displays the desired condition for the percent of each structural stage/age class within each vegetation group that occurs on the landscape and includes both shrubland and herbland potential vegetation types, as well as grass and shrub layers in forested environments. The ranges given allow for variations in the mix of structural stages/potential vegetation group combinations across the landscape to respond to potential changes in climate.

Table 15. Structural stages in herbland and shrubland environments (desired condition)

Potential Vegetation Group	Seedlings/Sprouts	Young	Mature	Dead Stems
	desired percent of landscape			
Shrubland	10-20	10-20	50-80	0-10
Herbland	10-30	10-40	40-70	0-10

1.5 Invasive Species

DESIRED CONDITION: Healthy, native, and desired non-native plant and animal communities and high quality habitat dominate the landscape and are resilient given current and projected climate conditions. Invasive species are absent or occur in small areas. Invasive species do not jeopardize the ability of the national forests to provide the goods and services communities expect or the habitat that plant and animal community diversity depends upon. New invasive species resulting from changes in plant and animal habitats due to changes in climate occur only at low levels.

Standards and Guidelines in Alternative B pertaining to invasive species:

NOX-1 S-9	**Standard** Herbicides other than the 10 listed in the Region 6 2005 Invasive Plant Program FEIS (USDA 2005) may be used if project scale analysis shows that the potential for adverse effects to people and the environment is less than or equal to that of the aforementioned 10 herbicides. Adjuvants (e.g., surfactants and dyes) and inert ingredients shall be limited to those reviewed in Forest Service hazard and risk assessment documents, such as Bakke 2003 and SERA 1997a, 1997b.
NOX-2 G-29 *Changed to standard*	**Standard** Materials used for construction or restoration projects on National Forest System lands shall be free of invasive species.
NOX-3 S-10	**Standard** State certified weed-free straw and mulch shall be used for projects conducted or authorized on National Forest System lands.
NOX-4	**Standard**

G-30 *Changed to standard*	Pelletized or certified weed-free feed shall be used on National Forest System lands.
NOX-5 G-31 *Changed to standard*	**Standard** Gravel, fill, sand stockpiles, and borrow materials shall be free of invasive species before use or transport.
NOX-6 G-32 *Changed to standard*	**Standard** Native plant materials shall be used for restoration activities where timely natural regeneration of the native plant community is not likely to occur. Non-native non-persistent plant species may be used in the following situations: emergency situations to protect basic resource values, as an interim non-persistent measure to aid re-establishment of native plant communities if native plant material is not available, or in permanently altered plant communities.
NOX-7 G-33 *Changed to standard*	**Standard** Aerial application of herbicides shall not be authorized or allowed within 300 feet of developed campgrounds, recreation residences, or private land unless otherwise authorized by adjacent landowners.
NOX-8 G-34 *Changed to standard*	**Standard** The application of pesticides shall be conducted to minimize or eliminate direct or indirect negative effects to non-target species and water quality.
NOX-9 G-35 *Modified and changed to standard*	**Standard** When equipment, such as helicopter dip buckets, bulldozers, skidders, graders, backhoes, and dump trucks, (conducted by or authorized by written permit from the Forest Service) is used outside the Forest Service road prism, the equipment shall be cleaned of invasive species prior to entering NFS lands. This standard does not apply to initial attack of wildfire (unplanned fire) or other emergency situations where inspection and cleaning would delay response time.
NOX-10 G-36 *Changed to standard*	**Standard** All ground disturbing activities shall be conducted to minimize or prevent the potential spread or establishment of invasive species.
NOX-11 *New*	**Standard** Biological control agents other than those approved by the USDA Animal and Plant Health Inspection Service or state agencies shall not be used. Agents demonstrated to have direct negative effects on non-target organisms shall not be released.

Additionally, Yates (2011) in the effects analysis for Invasive species, thoroughly describes the current condition and how the action alternatives address reducing risks of invasive species across the Forests'. Yates (2011) concludes: Alternatives B, C, E and F assume fewer acres reduced per year than Alternative D. With these alternatives, the desired condition may be attained within 1 year on the Malheur National Forest, 5 years on the Umatilla National Forest, and 8 years on the Wallowa-Whitman National Forest. All alternatives could conceivably achieve the desired condition within the 10-15 year duration of the revised forest plan.

Source habitat abundance:
Wildfire and invasive plants have the potential to change the abundance of source habitat for these species; though no management actions proposed in this alternative are expected to change the overall abundance of these habitats.

Large tree habitat / cavity density– Ash-throated Flycatcher

OF-1 G-59	**Guideline** Management activities in old forest stands should retain live old forest trees (≥ 21 inches DBH). Exceptions include: • old forest tree(s) need to be removed to favor hardwood species, such as aspen or cottonwood, or other special habitats • old forest late seral species, such as grand fir, are competing with large diameter early seral species, such as ponderosa pine • old forest tree(s) need to be removed to reduce danger/hazard trees along roads and in developed sites • a limited amount of old forest trees need to be removed where strategically critical to reinforce and improve effectiveness of fuel reduction in WUIs
OF-2 G-60	**Guideline** Management activities in non-old forest stands should retain live legacy old forest trees (≥ 21 inches DBH). Exceptions to retaining live legacy old forest trees are the same as those noted in the previous guideline (OF-1).

Livestock Grazing – Ash-throated Flycatcher, Lark sparrow, Northern Harrier

Although this alternative is not changing the distribution or management of livestock grazing allotments, there are several plan components that speak to reducing potential negative effects of livestock grazing**.**

RNG-1 G-43 *Modified*	**Guideline** Grazing after wildland fire should be managed so as not to cause a trend away from the key species desired condition. This may include growing season deferment for one or more years following wildland fire.
RNG-2 G-44	**Guideline** New fences should be designed to accommodate wildlife movement.
RNG-3 G-45	**Guideline** All new water developments should provide for small mammal and bird escape.
RNG-4 G-46	**Guideline** In areas classified as less than fully capable or suitable, only limited grazing should be authorized or allowed only after the limitations of the site are considered in designing the site-specific allotment management plan.
RNG-5	***Utilization by Management System and Maximum Percent Utilization***

	(See riparian management area standards and guidelines for direction on grazing within the green-line zone adjacent to watercourses.)

Table xx. Key Grass and Forbs Species Utilization within Upland Sites

Management System	Maximum Percent Utilization	
	Alt. B Departure from Desired Condition - Guideline	
	Low	Moderate or Greater
Season long	50	30
Management systems that incorporate deferment, rest, rotation	55	35

Utilization in table xx should be based on a point in time measurement.

Utilization includes all use by permitted livestock, wildlife, insects, wildfire, or recreational use.
Utilization will be based on height-weight curves and/or ocular estimates.

Utilization is based on key species.

Low-moderate departure = phase A

Moderate-high departure = phases C or D

RNG-6 G-47	**Guideline** Shrub utilization should not exceed 45 percent. This should be based on mean annual vegetative production.

Habitat effectiveness – Sage thrasher and Northern harrier

Alternative B – There is little indication from this alternative that extensive road building will occur. Several plan components stress the need to reduce road densities or have no net increase on road densities especially in key watersheds.

KW-1 S-15	**Standard** There shall be no net increase in the mileage of Forest Roads in any key watershed unless the increase results in a reduction in road-related risk to watershed condition. Priority should be given to roads that pose the greatest relative ecological risks to riparian and aquatic ecosystems.
OF-3 *New*	**Guideline** New motor vehicle routes should not be constructed within old forest stands.
WLD-HAB-28 G-14	**Guideline** Roads and trails should not be constructed within high elevation riparian areas.
WLD-HAB-6 S-1	**Standard** Activities that have potential to cause abandonment or destruction of known denning, nesting, or roosting sites of threatened, endangered, or sensitive species shall not be authorized or allowed within 1,200 feet of those sites.

<u>Nest Parasitism</u> - The USFS has no control over the potential for agricultural development on private lands.

Patch size of source habitat: Patch size may change due to any management or fires that provide the possibility for loss of sagebrush habitat.

In Summary: Likely due to implementation of Alternative for these sagebrush/grassland/woodland species, viability will remain the same or improve due primarily plan components that encourage preventing invasive exotics, and creating conditions that are resilient, sustainable, and compatible with current disturbance processes.

There is a possibility that a loss of sagebrush may occur in the planning area due to conversion to exotic vegetation due to forces not related to forest management (e.g. wildfire/climate change). Sagebrush habitats are severely stressed across much of the West, and the area of these habitats will likely decline in the relatively near future as a result of invasive species, fire, and climate change (Miller et al. 2011). Once cheatgrass is established in sagebrush communities, the effects cascade in synergistic feedbacks toward increasing cheatgrass dominance resulting from increased fire disturbance, loss of perennial species and their seed banks, and decreased stability and resilience to change in weather and climate patterns (d'Antonio and Vitrousek 1992, d'Antonio 2000, Brooks et al. 2004, Chambers et al. 2007). Invasion by cheatgrass (Bromus tectorum) has led to a grass-fire cycle in which increasing cheatgrass promotes large fires that allow cheatgrass to increase further, eroding and fragmenting remaining stands of sagebrush (Whisenant 1990, Knick and Rotenberry 1997, Knick and Connelly 2011).

Fire, both managed and unmanaged is considered one of the key threats to sagebrush habitats (Crawford et al. 2004). The length of the fire cycle has changed, being more frequent in low elevations and less frequent at higher elevations resulting in invasion of exotic grasses at lower elevations and woodland expansion at higher elevations (Miller et al. 2011). As previously noted, all alternatives desire plant communities as well as disturbance regimes (i.e., fire) to be with HRV. Additionally there are standards that address the spread of noxious weeds and that guide restoration.

Climate change will have an important influence on shrub-steppe habitats, as the various scenarios predict increasing temperature, atmospheric carbon dioxide, and severe weather events all of which favor cheatgrass expansion and increased wildfire activity (Miller et al. 2011). Increase temperature predictions suggest that sagebrush habitats could be replaced with other woody vegetation causing further decline in sage habitats (Bradley 2010, North American Bird Conservation Initiative (NABCI) 2010).

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