LANDFIRE Biophysical Setting Model

Biophysical Setting 2511490 Western Great Plains Shortgrass Prairie

☐ *This BPS is lumped with:*
☐ *This BPS is split into multiple models:*

General Information

Contributors (also see the Comments field) **Date** 8/28/2006

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Vegetation Type
Upland Grassland/Herbaceous

Dominant Species
BOGR2
BUDA

Map Zone
25

Model Zone
☐ Alaska
☐ California
☐
☐ Great Basin
☐ Great Lakes
☐ Hawaii
☐ Northeast
☐ Northern Plains
☐ N-Cent.Rockies
☐
☐ Pacific Northwest
☐ South Central
☐ Southeast
☐ S. Appalachians
☑ Southwest

General Model Sources
☑ Literature
☐ Local Data
☑ Expert Estimate

PASM
KOMA
HECO
ARPU
SPCR

Geographic Range

This system is found primarily in the western half of the Western Great Plains Division in the rainshadow of the Rocky Mountains and ranges from the Nebraska Panhandle south into TX and NM, although grazing-impacted examples may reach as far north as southern Canada where it grades into Northwestern Great Plains Mixedgrass Prairie (CES303.674).

Biophysical Site Description

This system occurs primarily on flat to rolling uplands with loamy, ustic soils ranging from sandy to clayey.

Vegetation Description

In much of its range, this system forms the matrix system with Bouteloua gracilis dominating this system. Associated graminoids may include Aristida purpurea, Bouteloua curtipendula, Bouteloua hirsuta, Buchloe dactyloides, Hesperostipa comata, Koeleria macrantha (= Koeleria cristata), Pascopyrum smithii (= Agropyron smithii), Pleuraphis jamesii, Sporobolus airoides, and Sporobolus cryptandrus.Although mid-height grass species may be present, especially on more mesic land positions and soils, they are secondary in importance to the sod-forming short grasses. Sandy soils have higher cover of Hesperostipa comata, Sporobolus cryptandrus, and Yucca elata. Scattered shrub and dwarf-dwarf species such as Artemisia filifolia, Artemisia frigida, Artemisia tridentata, Atriplex canescens, Eriogonum effusum, Gutierrezia sarothrae, and Lycium pallida may also be present. Also, because this system spans a wide range, there can be some differences in the relative dominance of some species from north to south and from east to west.

**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

Disturbance Description

Large-scale processes such as climate, fire and grazing influence this system. High variation in amount and timing of annual precipitation impacts the relative cover of cool- and warm-season herbaceous species. In contrast to other prairie systems, fire is less important, especially in the western range of this system, because the often dry and xeric climate conditions can decrease the fuel load and thus the relative fire frequency within the system. However, historically, fires that did occur were often very expansive. Currently, fire suppression and more extensive grazing in the region have likely decreased the fire frequency even more, and it is unlikely that these processes could occur at a natural scale. A large part of the range for this system (especially in the east and near rivers) has been converted to agriculture. Areas of the central and western range have been impacted by the unsuccessful attempts to develop dryland cultivation during the Dust Bowl of the 1930s. The short grasses that dominate this system is drought and grazing-tolerant. These species evolved with drought and large herbivores and, because of their stature, are relatively resistant to overgrazing. This system in combination with the associated wetland systems represents one of the richest areas for mammals and birds. Endemic bird species to the shortgrass system may constitute one of the fastest declining bird populations. Scale and frequency of disturbance needs review by local experts. McPherson, Lauenroff(?CSU)

Adjacency or Identification Concerns

Native Uncharacteristic Conditions

Scale Description

Subjective because of the small amount in this BpS.

Issues/Problems

Minor part of this BpS, at the edge of the range of distirubtion

Comments

This is a new model developed for this MZ. No previous model was modified to develop this model. This model should be refined at MZ 27 and 33 workshops. Possible reviewers, McPherson(U of AZ), Laurenoff(CSU), Dan Milchunas(Colo State).
Final QA/QC conducted by D. Johnson 03/26/2007.

Vegetation Classes

Class A **11 %**

Early Development 1 Open

Upper Layer Lifeform

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model

1

Indicator Species and Canopy Position

BOGR2
Upper
BUDA
Upper
PASM
Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	30 %
Height	Herb 0m	Herb 0.5m
Tree Size Class	None	

- [ ] Upper layer lifeform differs from dominant lifeform.

Description

0-3yrs post fire. Perennial grasses resprout the following growing season. Forbs and annual grasses depend on seasonal mositrue available to resestablish.

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Class B 74 %

Late Development 1 Closed

Upper Layer Lifeform

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model

1

Indicator Species and Canopy Position

BOGR2 Upper
BUDA Upper
PASM Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	31 %	70 %
Height	Herb 0m	Herb 0.5m
Tree Size Class	None	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Four or more years post fire. Dominated by Blue grama. Amount of grass and other species composition highly variable depending upon moisture, native grazing by large and small mammals, and insects.

Class C 15 %

Late Development 1 Open

Upper Layer Lifeform

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model

Indicator Species and Canopy Position

BOGR2 Upper
YUEL Upper
ARFR4 Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	30 %
Height	Herb 0.6m	Herb 1.0m
Tree Size Class	None	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Prairie dog complexes and Buffalo wallows. Sparse vegetation on large scale prairie dog town complexes. Higher forb diversity. Species will vary greatly within this class across the MZ. Towns may limit extent of landscape scale fires. Note that Prairie dog complexes may have 0% canopy cover for remote sensing purposes, they may keep it well clipped.

Class D 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- [ ] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model

Indicator Species and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	0 %
Height		
Tree Size Class	None	

☐ Upper layer lifeform differs from dominant lifeform.

Description

**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

Class E **0 %**

[Not Used] [Not Used]

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model

Indicator Species and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class	None	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

Fire Regime Group:** **II**

Historical Fire Size (acres)

Avg 1000
Min 10
Max 100000

Sources of Fire Regime Data

☐ Literature
☐ Local Data
☑ Expert Estimate

Fire Intervals	*Avg FI*	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	20	4	30	0.05	100
Mixed					
Surface					
All Fires	20			0.05002	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class.

Additional Disturbances Modeled

☐ Insects/Disease
☑ Native Grazing
☑ Other (optional 1) small mammal soil disturbance
☑ Wind/Weather/Stress
☐ Competition
☐ Other (optional 2)

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