REQUIREMENTS FOR PROCESSING LIVESTOCK GRAZING EFFECTS DEPARTURE AND UNCHARACTERISTIC LIVESTOCK GRAZING

NOTE: This documentation contains processing information for projected as well as current information. The projected data can be found in the released dataset SDEIS Landscape Variables Database (DBSLNDSV, #968).

Logic Overview

Uncharacteristic livestock grazing has effects outside of the normal range of effects that occurred in the historical (natural) system. The normal range is considered to be within the 400 year historic range of variability minimum +25% and maximum -25%. The 400 year period includes the variation that is predicted to occur within the recent and current climate without influence of Euro-American settlement influence. The historical regime accounts in general for influences of native species adaptations and soil development for the past 10-15 thousand years since the last glacial period. Some native species adaptations have evolved over the last 1-3 million years in response to changing paleoecological climates and disturbances.

Effects of livestock grazing are grouped at the broad-scale into successional change grazing (SCG) and successional no effect grazing (SNG). SCG can have several different or combined effects: 1) cause mortality to "decreaser" native plants, thus disturbing the community and causing change to another community dominated by "increasers" or "invaders"; 2) speeding the rate of succession by reducing the competitive ability of herbs in comparison to shrubs and trees; and 3) reducing herb fuels and thus causing a reduction in the historical fire frequency. SNG would not cause these effects, generally resulting in low to moderate utilization without consistent repetition in a given season or location. At the broad-scale in the historical (natural) system SCG did not occur; the predominance of effects were SNG, related to moving herds of large ungulates or scattered individuals. Consequently, uncharacteristic livestock grazing can be estimated by using the cumulative probability of SCG. Certain PVGs are much more sensitive to the cumulative effects of SCG. Some areas are subject to SCG effects from concentrated native large ungulate use (i.e. elk, deer), but at the broad-scale this does not emerge as an extensive effect.

None (N) = no grazing or very little grazing.
Low (L) = successional no effect grazing (SNG) occurs, but with no successional change grazing (SCG).
Moderate (M) = successional change grazing occurs with moderate probability of uncharacteristic effects.
High (H) = successional change grazing occurs with high probability of uncharacteristic effects.

Processing

The Livestock Grazing Effects Departure and Uncharacteristic Livestock Grazing are based on Successional Change Grazing and certain combinations of Potential Vegetation groups and Terrestrial Community groups.

The following process should be used to create the Uncharacteristic Livestock Grazing variable by Alternative and Year.

Process 1.0 – Assign Terrestrial Community Groups to H6AMP Strata.

Process 1.1 – Assign Terrestrial Community Groups to H6AMP Strata for Current, Year 0.

****Process 1.2 –** Assign Terrestrial Community Groups to H6AMP Strata for X1/Xx Yr.

Process 2.0 – Assign Uncharacteristic Grazing Effects (ULGE) to PVG/TCG combinations using the Uncharacteristic Livestock Grazing Effects Look up Table.

Process 3.0 – Calculate Uncharacteristic Grazing Coefficient (ULG) by H6AMPH and H6AMP strata and Average Annual Uncharacteristic Grazing (X1ULG_Yr or XxULG_Yr) using Animal Unit Months , X1ADC_Aum Yr/XxADC_AumYr, (SDEIS Variable 9 output).

Logic: This is the amount of no action or action uncharacteristic livestock grazing.

Process 3.1 – Calculate Uncharacteristic Grazing Coefficient by H6AMPH and H6AMP strata and Average Annual Uncharacteristic Grazing for Current Veg Yr 0. This calculation uses the H6 based GRO lookup table from Ah 56.5.3 and requires conversion of GRO class to GROulg values. See the GROulg lookup table at the end of the requirements.

X1XxULG_0 =(H6Amph strata average of ULGE) * (AumYr0/AumYr0) * GROulg * (1.3 - RxSim)

Note: Set any negative values to zero. If AUM Yr0 = 0 assign X1ULG0 a value of 0.

Process 3.2 – Calculate Uncharacteristic Grazing Coefficient by H6AMPH and H6AMP strata and Average Annual Uncharacteristic Grazing for X1 Veg Yr.

X1XxULG_Yr =(H6Amph strata average of ULGE) * (2 * AumYr/ (AumYr + AumYr0)) * GROulg * (1.3 - RxSim)

Note: Set any negative values to zero.

Process 4.0 – Calculate Subwatershed Uncharacteristic Grazing (ULG) by HUC6 using a weighted average of X1XxULG_Yr for Aquatic and Terrestrial.

Input Files

S1Vg0 grid
X1XxVegYr grids
TCG lookup table
PVG lookup table
H6PAM2 table
Uncharacteristic Grazing Look Up Table
Adjusted Animal Unit Months Coefficient
RxSim look up table
GROulg look up table

Look Up Tables

1. Uncharacteristic Grazing Look Up Table.

PVGRPID	PVGRPNAME	TCG_CODE	ULGE
1	AGRICULTURAL	AUR	1
1	AGRICULTURAL	ESF	1
1	AGRICULTURAL	HRB	1
1	AGRICULTURAL	LMF	1
1	AGRICULTURAL	LSF	1
1	AGRICULTURAL	MSF	1
1	AGRICULTURAL	RIA	1
1	AGRICULTURAL	SHB	1

PVGRPID	PVGRPNAME	TCG_CODE	ULGE
1	AGRICULTURAL	WRB	0
2	ALPINE	AUR	1
2	ALPINE	ESF	1
2	ALPINE	HRB	1
2	ALPINE	LMF	1
2	ALPINE	LSF	1
2	ALPINE	MSF	1
2	ALPINE	RIA	1
2	ALPINE	SHB	1
2	ALPINE	WRB	0
3	COLD FOREST	AUR	1
3	COLD FOREST	ESF	0.7
3	COLD FOREST	HRB	0.7
3	COLD FOREST	LMF	0.1
3	COLD FOREST	LSF	0.7
3	COLD FOREST	MSF	0.1
3	COLD FOREST	RIA	1
3	COLD FOREST	SHB	0.5
3	COLD FOREST	WRB	0
4	COOL SHRUB	AUR	1
4	COOL SHRUB	ESF	0.8
4	COOL SHRUB	HRB	0.8
4	COOL SHRUB	LMF	0.1
4	COOL SHRUB	LSF	0.8
4	COOL SHRUB	MSF	0.5
4	COOL SHRUB	RIA	1
4	COOL SHRUB	SHB	0.9
4	COOL SHRUB	WRB	0
5	DRY FOREST	AUR	1
5	DRY FOREST	ESF	0.7
5	DRY FOREST	HRB	0.7
5	DRY FOREST	LMF	0.1
5	DRY FOREST	LSF	0.7
5	DRY FOREST	MSF	0.1
5	DRY FOREST	RIA	1
5	DRY FOREST	SHB	0.9
5	DRY FOREST	WRB	0
6	DRY GRASS	AUR	1
6	DRY GRASS	ESF	1
6	DRY GRASS	HRB	1
6	DRY GRASS	LMF	0.2
6	DRY GRASS	LSF	1

PVGRPID	PVGRPNAME	TCG_CODE	ULGE
6	DRY GRASS	MSF	0.9
6	DRY GRASS	RIA	1
6	DRY GRASS	SHB	1
6	DRY GRASS	WRB	0
7	DRY SHRUB	AUR	1
7	DRY SHRUB	ESF	1
7	DRY SHRUB	HRB	1
7	DRY SHRUB	LMF	0.2
7	DRY SHRUB	LSF	1
7	DRY SHRUB	MSF	0.9
7	DRY SHRUB	RIA	1
7	DRY SHRUB	SHB	1
7	DRY SHRUB	WRB	0
8	MOIST FOREST	AUR	1
8	MOIST FOREST	ESF	0.2
8	MOIST FOREST	HRB	0.2
8	MOIST FOREST	LMF	0.1
8	MOIST FOREST	LSF	0.2
8	MOIST FOREST	MSF	0.1
8	MOIST FOREST	RIA	1
8	MOIST FOREST	SHB	0.4
8	MOIST FOREST	WRB	0
9	RIPARIAN HERB	AUR	1
9	RIPARIAN HERB	ESF	1
9	RIPARIAN HERB	HRB	1
9	RIPARIAN HERB	LMF	1
9	RIPARIAN HERB	LSF	1
9	RIPARIAN HERB	MSF	1
9	RIPARIAN HERB	RIA	1
9	RIPARIAN HERB	SHB	1
9	RIPARIAN HERB	WRB	0
10	RIPARIAN SHRUB	AUR	1
10	RIPARIAN SHRUB	ESF	1
10	RIPARIAN SHRUB	HRB	1
10	RIPARIAN SHRUB	LMF	1
10	RIPARIAN SHRUB	LSF	1
10	RIPARIAN SHRUB	MSF	1
10	RIPARIAN SHRUB	RIA	1
10	RIPARIAN SHRUB	SHB	1
10	RIPARIAN SHRUB	WRB	0
11	ROCK	AUR	1
11	ROCK	ESF	0

PVGRPID	PVGRPNAME	TCG_CODE	ULGE
11	ROCK	HRB	0
11	ROCK	LMF	0
11	ROCK	LSF	0
11	ROCK	MSF	0
11	ROCK	RIA	0
11	ROCK	SHB	0
11	ROCK	WRB	0
12	URBAN	AUR	1
12	URBAN	ESF	0
12	URBAN	HRB	0
12	URBAN	LMF	0
12	URBAN	LSF	0
12	URBAN	MSF	0
12	URBAN	RIA	0
12	URBAN	SHB	0
12	URBAN	WRB	0
13	WATER	AUR	1
13	WATER	ESF	0
13	WATER	HRB	0
13	WATER	LMF	0
13	WATER	LSF	0
13	WATER	MSF	0
13	WATER	RIA	0
13	WATER	SHB	0
13	WATER	WRB	0
14	WOODLAND	AUR	1
14	WOODLAND	ESF	1
14	WOODLAND	HRB	1
14	WOODLAND	LMF	0.2
14	WOODLAND	LSF	1
14	WOODLAND	MSF	0.2
14	WOODLAND	RIA	1
14	WOODLAND	SHB	1
14	WOODLAND	WRB	0
15	RIPARIAN WOODLAND	AUR	1
15	RIPARIAN WOODLAND	ESF	1
15	RIPARIAN WOODLAND	HRB	1
15	RIPARIAN WOODLAND	LMF	1
15	RIPARIAN WOODLAND	LSF	1
15	RIPARIAN WOODLAND	MSF	1
15	RIPARIAN WOODLAND	RIA	1
15	RIPARIAN WOODLAND	SHB	1

PVGRPID	PVGRPNAME	TCG_CODE	ULGE
15	RIPARIAN WOODLAND	WRB	0

2. RxSim Look Up Table.

Rx	RxSim
A1	.95
A2	.75
A3	.8
C1	.7
C2	.4
C3	.3
N1	.9
N2	.6
N3	.5
N4	.7
N5	.6
N6	.75
N7	.6
N8	.5
P1	.65
P2	.3
P3	.2

3) GROulg Look Up Table.

GRO Class (Ah 56.5.3)	GROulg
VH	.9
H	.8
M	.7
L	.2
VL	.1

CLASS INTERPRETATIONS -UNCHARACTERISTIC LIVESTOCK GRAZING DEFINITION AND CLASSIFICATION

For modeling purposes it may be necessary to classify the weighted average coefficients in the deliverable dbf files. The following suggestions are provided for determining class breaks for each coefficient for this particular variable.

Time Period Definitions

Current (CUR) - Current time period generally reflects the current year (1999) plus or minus 5 years (i.e. 1994 - 2004). Developed from data and models using administrative unit data from the past 10 years as one input. Reflects the disturbance from 1988 to 1997 (10 year average) .

Uncharacteristic Livestock Grazing, Planned Disturbance
Subwatershed current year statistics:
Average current year non-zero values:
Standard deviation current year non-zero values:
Minimum current year non-zero values:
Maximum current year non-zero values:
Number current year zeros:
Current year distribution shape: j-shape

Definition: area coefficient for relative probability of uncharacteristic livestock grazing effects within the subwatershed. Current levels based on administrative unit 10 year average (1988-1997) as one input. Uncharacteristic livestock grazing effects have a probability of causing a change of more than 20% dissimilarity compared to native (historical) vegetation composition and structure, and effects to soil cover and surface characteristics. These effects are outside the normal range of the historical (natural) system. The normal range is considered to be within the 400 year historic range of variability minimum + 25% and maximum - 25%. Uncharacteristic effects of these types could reduce native species habitat quality, vegetation/litter cover, root binding capability, and riparian condition, and increase probability of erosion, compaction, weeds and exotic plants, stream bank erosion/failure, and increased stream temperatures. This variable does not account for recent (past 5 years) changes in grazing systems that exclude or reduce livestock grazing through fencing or have aggressive weed management/control programs. This variable does account for recent reductions in livestock stocking (animal unit months) levels and general changes as a result of implementation of healthy rangelands strategies.

Classification method: j-shape distribution split into classes with 1/3 in low, moderate, high excluding the zeros (none class). Very high class added to account for increases above the current distribution.

Class	Low	High	Interpretation
None	0	.0000000001	Almost no probability of uncharacteristic livestock grazing in the subwatershed. Spatial distribution highly correlated with agricultural, urban lands, and moist forest.
Low	.0000000002	.049981818	Low probability of uncharacteristic livestock grazing in the subwatershed - It is unlikely that this level of uncharacteristic livestock grazing would cause extensive effects, but in steep, complex terrain could result in negative impacts on riparian systems. Spatial distribution highly correlated with the dry forest, moist forest, and cool shrub PVGs.

Class	Low	High	Interpretation
Moderate	.049981819	.549471264	Moderate probability of extensive uncharacteristic livestock grazing effects in the subwatershed - This level of uncharacteristic livestock grazing could result in negative effects, particularly on riparian systems in steep, complex terrain, unless mitigated with distribution mgt. Spatial distribution highly correlated with the dry shrub, cool shrub, and moist forest.
High	.549471265	.900000000	High probability of extensive uncharacteristic livestock grazing effects in the subwatershed with considerable cumulative effects from high stocking levels in the early to mid 1900s - This level of uncharacteristic livestock grazing would likely result in negative effects to both upland and riparian systems, unless mitigated with distribution mgt. Spatial distribution highly correlated with the dry shrub PVGs.
Very High	.900000001	1.0	Very High probability of uncharacteristic livestock grazing in the subwatershed.