March 2000

REQUIREMENTS FOR PROCESSING HISTORICAL RANGE OF VARIABILITY DEPARTURE (HRVDEP) VARIABLE 16 (VB 16)

Logic Overview: Calculated value will be a probability of departure (100-similarity) from the historical disturbance intensity regime and the terrestrial community group for the potential vegetation group.

The classification of this departure into three classes of low, moderate, and high will provide a very similar variable to the landscape mosaic fragmentation departure (FRAG) variable developed for integrated risk and used in the supplemental draft EIS spatial prioritization analysis.

The integrated risk landscape mosaic similarity (SIM) and fragmentation departure (FRAG) variables were extrapolated at the subwatershed scale using data from Hessburg and others (1998) which assessed differences in fragmentation index (contagion) and landscape mosaic composition and structure between historic and current conditions in relation to ownership, management history, road density, and fire exclusion.

The calculated HRVDCLASS values are a probability of departure from HRV landscape mosaics. The classes of these values are comparable to those calculated for historical and current in integrated risk.

Processes

Process 1.0 Assign X1/Xx Disturbance Intensity Regimes using the look up table for "No Action and Action Assignment of Disturbance Intensity Regime."
For X1/Xx all Years.

Process 1.1 Assign Terrestrial Community Groups to X1/XxVegYr data.

Process 1.2 Assign X1/Xx Disturbance Intensity Regime.

Process 2.0 Calculate Disturbance Intensity Regime Change Classes/Coefficients.
For X1/Xx all Years.

Process 2.1 Assign DIC change Classification to H6AMPH/TCG strata.

DIClss =
NL (No Change in Low), If HDI_CODE = LI and DIR = L.

NH (No Change in High), If (HDI_CODE = HI or UK) and DIR = H.

LH (Low to High), If HDI_CODE = LI and DIR = H.

HL (High to Low), If (HDI_CODE = HI or UK) and DIR = L.

Process 2.2 Calculate DIC coefficients (DICoeff) for H6AMPH strata.

NLCoeff = (H6AMPH/TCG hectares "where DIClss = NL" / H6AMPH hectares).
NHCoeff = (H6AMPH/TCG hectares "where DIClss = NH" / H6AMPH hectares).
LHCoeff = (H6AMPH/TCG hectares "where DIClss = LH" / H6AMPH hectares).
HLCoeff = (H6AMPH/TCG hectares "where DIClss = HL" / H6AMPH hectares).

QC Step: (NLCoeff + NHCoeff + LHCoeff + HLCoeff) = 1.0

Process 3.0 Calculate Intermediate Similarity Coefficients from DICoefficients for X1/Xx all Years.

SimCoI = (sum of NLCoeff per H6AMPH) + (sum of NHCoeff per H6AMPH).

Logic: In actual HRV similarity calculation would use Sorenson's similarity formula for calculating similarity of terrestrial vegetation, succession/disturbance regimes, hydrologic conditions, soil conditions, and aquatic and terrestrial species composition to estimate similarity to HRV. In this Hrvdep variable we are using the disturbance regime where there is no change as a proxy to broad-scale terrestrial vegetation and succession/disturbance regime similarity. In the next step we will bring in the mid-scale SIM variable and management prescription as proxies for hydrologic conditions, soil conditions, and aquatic and terrestrial species composition.

Process 4.0 Adjust Strata Similarity Coefficient with H6 Mid-scale Similarity Context at H6AMPH strata level. For X1Yr0:

SimCo = ((.60 * SimCoI) + (.35 * ((SIM + 1) / (10 + 1))) + (.05 * RxSim)) * (PVGsim).

For X1/Xx Yr 10:

SimCo = ((.60 * SimCoI) + (.35 * ((SIM + 1) / (10 + 1))) + (.05 * RxSim)) * (PVGsim).

For X1/Xx Yr 100:

SimCo = ((.75 * SimCoI) + (.05 * ((SIM + 1) / (10 + 1))) + (.2 * RxSim)) * (PVGsim).

Note: PVGsim values are in the "Potential Vegetation Group Similarity to HRV Look Up Table," whereas RxSim values can be found in the "Prescription Management Similarity to HRV Look Up Table."

Logic: This is the coefficient for similarity of the strata based on use of proxies for similarity of succession/disturbance regime, terrestrial vegetation, hydrologic conditions, soil conditions, and aquatic and terrestrial species composition. Adjustments were made to include context of current subwatershed mid- and fine-scale landscape mosaic similarity, PVG, and adjustment based on the management prescription. The subwatershed current SIM variable is ranked from 0 to 10, with 10 inferring 100% similarity and 0 inferring 0% similarity of current condition to HRV. This current SIM condition affects the starting point for how future management and disturbances may change overall similarity. In this formula 1 is added to the SIM rank and the sum is divided by 10 + 1 so there will be no zero values. The current SIM is used to adjust the 0 year and 10 year, but not the 100 year.

Process 5.0 Calculate Historical Range Of Variation Departure. For X1/Xx all Years.

Process 5.1 Calculate H6 Similarity Coefficient.

H6SimCo = weighted average of H6AMPH SimCo at HUC6.

Process 5.2 Create Historical Range of Variation Departure by Classifying H6HrvDep.

Create 2 page frequency diagrams for X1Yr0 **H6HrvDep**.

Classify class breaks in frequency distribution in correlation with summary findings from terrestrial subbasin departure (assessment and DEIS eval of alts) and Sim (integrated risk Huc6 similarity variable).

Class breaks based on frequency diagrams of H6HrvDep:

H6HrvDep = None (N) < .225
H6HrvDep = Low (L) >= .225, < .375
H6HrvDep = Moderate (M) >= .375, < .595
H6HrvDep = High (H) >= .595

Note: This is very similar to the Landscape Mosaic Fragmentation Departure (Frag) from integrated risk and as used for the SDEIS spatial prioritization.

Look Up Tables

1. Look Up Table for No Action and Action Assignment of Disturbance Intensity Regime.

Look Up Table Variables:
PVG = potential vegetation group.

HDI = historical disturbance intensity regime (fire disturbance).

X1XxYxDI = disturbance intensity regime for no action (X1) and action (x) alternatives all years.

To use table:
If PVG = x and HDI = x and X1XxYxTCG = x, then X1XxYxSimco = x
Note: L = LI and H = HI
Note: treat HDI = UK as = HI

PVG	HDI	X1XxYxTCG	X1XxYxDI
Agricultural, Urban	L, H	AUR	H
Water, Rock	L	WRB	L
Woodland	L	HRB	L
"Same"	H	"Same"	L
Woodland	L	SHB	H
"Same"	H	"Same"	H
Woodland	L	MSF	H
"Same"	H	"Same"	H
Dry Forest	L	HRB	L
"Same"	H	"Same"	L
Dry Forest	L	SHB	L
"Same"	H	"Same"	L
Dry Forest	L	ESF	L

PVG	HDI	X1XxYxTCG	X1XxYxDI
“Same”	H	“Same”	L
Dry Forest	L	MSF	H
“Same”	H	“Same”	H
Dry Forest	L	LSF	L
“Same”	H	“Same”	L
Dry Forest	L	LMF	H
“Same”	H	“Same”	H
Moist Forest	L	HRB	L
“Same”	H	“Same”	L
Moist Forest	L	SHB	L
“Same”	H	“Same”	L
Moist Forest	L	ESF	L
“Same”	H	“Same”	L
Moist Forest	L	MSF	H
“Same”	H	“Same”	H
Moist Forest	L	LSF	L
“Same”	H	“Same”	L
Moist Forest	L	LMF	H
“Same”	H	“Same”	H
Cold Forest	L	HRB	L
“Same”	H	“Same”	L
Cold Forest	L	SHB	L
“Same”	H	“Same”	L
Cold Forest	L	ESF	L
“Same”	H	“Same”	L
Cold Forest	L	MSF	H
“Same”	H	“Same”	H
Cold Forest	L	LSF	L
“Same”	H	“Same”	L

PVG	HDI	X1XxYxTCG	X1XxYxDI
Cold Forest	L	LMF	H
“Same”	H	“Same”	H
Dry Grass	L	HRB	L
“Same”	H	“Same”	L
Dry Grass	L	SHB	H
“Same”	H	“Same”	H
Dry Grass	L	MSF	H
“Same”	H	“Same”	H
Dry Shrub	L	HRB	L
“Same”	H	“Same”	L
Dry Shrub	L	SHB	L
“Same”	H	“Same”	H
Dry Shrub	L	MSF	H
“Same”	H	“Same”	H
Cool Shrub	L	HRB	L
“Same”	H	“Same”	L
Cool Shrub	L	SHB	L
“Same”	H	“Same”	H
Cool Shrub	L	MSF	H
“Same”	H	“Same”	H
Alpine, Riparian Shrub, Riparian Herb, Riparian Woodland	L	exclude AUR and WRB	L
“Same”	H	“same”	H

2. Potential Vegetation Group Similarity to HRV Look Up Table

PVG	PVGsim
Agricultural	.01
Urban	.01
Water	1.0

PVG	PVGsim
Rock	1.0
Woodland	.95
Dry Forest	1.0
Moist Forest	.95
Cold Forest	.95
Dry Shrub	.9
Dry Grass	.9
Cool Shrub	.95
Alpine	1.0
Riparian Shrub	.95
Riparian Herb	.95
Riparian Woodland	.95

3. Prescription Management Similarity to HRV Look Up Table

Logic: This is a factor that accounts for the emphasis of the management prescription in attempting to mimic historical range of variability (HRV). HRV in this context includes all biological and physical components of the historical or native system: 1) effects of anthropogenic native Americans; 2) the diversity of native aquatic and terrestrial species and their habitats; 3) vegetation composition/structure and landscape mosaic patterns; 4) succession/disturbance regime patterns; 5) hydrologic channel, sedimentation, and flow regimes; 6) soil development and erosion regimes.

Rx	RxSim
A1	.95
A2	.75
A3	.8
C1	.7
C2	.4
C3	.3
N1	.9
N2	.6
N3	.5
N4	.7

Rx	RxSim
N5	.6
N6	.75
N7	.6
N8	.5
P1	.65
P2	.3
P3	.2