APPENDIX C

TNC CLIMATE CHANGE REPORT: ADDITIONAL TABLES AND PRESCRIPTIVE ACTIONS

Class Code Definitions

Table C.1. The following are the descriptions of biophysical settings' vegetation classes for the WAP.

Class Code	*Class abbreviation and brief description*
Alpine 1071	
A	***Early***: 0-10% cover of graminoids; <90% soil cover; 0-2 yrs
B	***Late-closed****:* >11% cover of graminoids and forbs; <10% cover of low shrubs; >2 yrs
Aspen-Mixed Conifer 1061	
A	***Early***; 0-100% cover aspen <5m; mountain snowberry and *ribes* common; 0-19 yrs
B	***Mid-closed***: 40-99% cover aspen <5-10m; mountain snowberry and *ribes* common; 11-39 yrs
C	***Mid-closed***: 40-99% cover aspen 10-24m; conifer saplings visible in mid-story; mountain snowberry and *ribes* common; 40-79 yrs
D	***Late-open***: 0-39% cover aspen 10-25 m; 0-25% montane and subalpine conifer cover 5-10 m; mountain snowberry and *ribes* common; >80 yrs
E	***Late-closed***: 40-80% cover of mixed conifer 10-50m; <40% cover of aspen 10-25m; mountain snowberry and *ribes* present; >100 yrs
Aspen Woodland 1011	
A	***Early***: 0-100% cover of aspen <5m tall; 0-9 yrs
B	***Mid-closed***: 40-99% cover of aspen <5-10m; 10-39 yrs
C	***Late-closed***: 40-99% cover of aspen 10-25m; few conifers in mid-story; >39 yrs
D	***Late-open***: 0-39% cover of aspen 10-25 m; 0-25% conifer cover 10-25 m; >99 yrs
U-DP	***Depleted***: 10-50% cover of older aspen 10-25m; no or little aspen regeneration; few conifers in mid-story
Big Sagebrush Steppe 1125	
A	***Early***: 20-80% grass (Idaho fescue, Thurber's needlegrass, bluebunch wheatgrass) and forb cover; 0-10% canopy of big sagebrush (mountain and Wyoming)/mountain brush; 0-12 yrs;
B	***Mid-open***: 11-30% cover of big sagebrush (mountain and Wyoming)/mountain shrub; >50% grass (Idaho fescue, Thurber's needlegrass, bluebunch wheatgrass) and forb cover; 13-38 yrs
C	***Mid-closed***: 31-50% cover of big sagebrush (mountain and Wyoming)/mountain brush; 25-50% herbaceous cover, <10% conifer sapling cover; 38+ yrs
U-AG	***Annual-Grass***: 10-30% cover of cheatgrass; <10% shrub cover
U-ES	***Early-Shrub*:**20-50% cover rabbitbrush species
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 21-50% cover of big sagebrush (mountain and Wyoming)/mountain brush; if native grass >5% cover, then >5% cover of cheatgrass or if native grass ≤5% cover, then 0-20% cheatgrass cover; <10% conifer sapling cover; >50 yrs
U-SD	***Seeded***: >10% cover of seeded herbaceous and/or shrub species, either native, introduced, and mixed native and introduced;<5% cheatgrass cover

Class Code	*Class abbreviation and brief description*
U-TA	***Tree-Annual-Grass***: 20-80% conifer (pinyon, juniper, or montane conifer) cover; <5% shrub cover; if native grass >5% cover, then >5% cover of cheatgrass or if native grass ≤5% cover, then 0-20% cheatgrass cover; >140 yrs
Big Sagebrush upland (10-14 inch precipitation zone) 10801	
A	***Early***: 10-80% grass/forb cover; 0-10% cover of big sagebrush (mountain and Wyoming)/mountain brush; 0-12 yrs
B	***Mid-open***: 11-30% cover of big sagebrush (mountain and Wyoming)/mountain shrub; >50% herbaceous cover; 13-38 yrs
C	***Mid-closed***: 31-50% cover of big sagebrush (mountain and Wyoming)/mountain brush; 25-50% herbaceous cover, <10% conifer sapling cover; 38+ yrs
D	***Late-open***: 10-30% cover conifer <5m for PJ and <10m for mixed conifers; 25-40% cover of big sagebrush (mountain and Wyoming)/mountain brush; <30% herbaceous cover; 80-129 yrs
E	***Late-closed***: 31-80% conifer cover (lower for PJ, greater for mixed conifers) 10-25m; 6-20% shrub cover; <20% herbaceous cover; 130+ yrs
U-AG	***Annual-Grass***: 10-30% cover of cheatgrass; <10% shrub cover
U-DP	***Depleted***: 20-50% cover of big sagebrush (mountain and Wyoming)/mountain brush; <5% herbaceous cover; <5% cheatgrass cover; <10% conifer sapling cover; >50 yrs
U-ES	***Early-Shrub***:20-50% cover rabbitbrush species
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 21-50% cover of big sagebrush (mountain and Wyoming)/mountain brush; ≥5% cover of native grass; 5-10% cheatgrass cover; <10% conifer sapling cover; >50 yrs
U-SA	***Shrub-Annual-Grass***: 21-50% cover of big sagebrush (mountain and Wyoming)/mountain brush; <5% cover of native grass; 5-10% cheatgrass cover; <10% conifer sapling cover; >50 yrs
U-SD	***Seeded***: >10% cover of seeded herbaceous and/or shrub species, either native, introduced, and mixed native and introduced; <5% cheatgrass cover
U-TA	***Tree-Annual-Grass***: 31-80% conifer cover 10-25m; <5% shrub cover; <5% herbaceous cover, ≥5% cheatgrass cover; >140 yrs
U-TE	***Tree-Encroached***: 31-80% conifer cover 10-25m; <5% shrub cover; <5% herbaceous cover, <5% cheatgrass cover; >140 yrs
Blackbrush - mesic (>9 inch precipitation zone; BM) 10821	
A	***Early***: 0-40% cover of snakeweed, big sagebrush, turpentine bush, yucca, and desert bitterbrush; young blackbrush may be present; 0-199 yrs
B	***Mid-closed***: 10-50% cover blackbrush <1.0m; >5% cover of young Joshua trees; <10% cover of grasses (desert needlegrass, Indian ricegrass, galleta grass, fluff grass, and threeawn); other shrubs present; Joshua trees may be present; pinyon or juniper saplings present; 200+ yrs
C	***Late-closed***: 10-40% of pinyon or juniper; 5-40% blackbrush cover; >5% cover of Joshua trees; <10% cover of grasses (desert needlegrass, Indian ricegrass, galleta grass, fluff grass, and threeawn); other shrubs present; Joshua trees may be present; 400+ yrs
U-TA	***Tree-Annual-Grass***: 10-40% of pinyon or juniper; >5% cover of non-native grasses; <20% blackbrush cover; Joshua trees may be present
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 10-50% cover of blackbrush or other shrubs <1.0m tall; Joshua trees may be present; 5-20% non-native grass or forb cover; native grass cover may be spotty to common

Class Code	*Class abbreviation and brief description*
U-AG	***Annual-Grass*****:** >10% cover of exotic forbs or annual grasses; <10% cover of blackbrush or other shrubs
U-SD	***Seeded***: >10% seeded native or non-native grasses, forbs, and shrubs
U-BG	***Bare ground***: mineral soil exposed by human disturbances
Blackbrush - thermic (≤9 inch precipitation zone; BT) 10820	
A	***Early***: 0-50% cover of snakeweed, turpentine bush, yucca; <10% cover blackbrush; 0-499 yrs
B	***Late-closed***: 500+ yrs; 10-40% cover blackbrush <1.0m; white bursage or creosotebush present; >5% cover of Joshua trees; 0-10% cover of grasses (desert needlegrass, Indian ricegrass, galleta grass, fluff grass, and threeawn); other shrubs present
U-SAP	***Shrub- Annual-Grass-Perennial-Grass*****:** 10-40% cover of blackbrush or other shrubs <1.0m tall, 5-20% non-native grass or forb cover; Joshua trees may be present; ≥5% native grass cover
U-AG	***Annual-Grass***: >10% cover of exotic forbs or annual grasses; <10% cover of blackbrush or other shrubs
U-BG	***Bare ground***: mineral soil exposed by human disturbances
Chaparral 1104	
A	***Early***: 10-100% cover of *Quercus turbinella, Quercus toumeyi, Cercocarpus montanus, Canotia holacantha, Ceanothus greggii* <3m tall; forbs abundant; 0-10 yrs
B	***Late-closed***: 50-100% cover of *Quercus turbinella, Quercus toumeyi, Cercocarpus montanus, Canotia holacantha, Ceanothus greggii* >3m tall; 10+ yrs
U-SAP	***Shrub-Annual-Perennial-Grass***: >5% cheatgrass cover in spaces between shrubs; 10-100% cover of *Quercus turbinella, Quercus toumeyi, Cercocarpus montanus, Canotia holacantha, Ceanothus greggii* <3m tall; forbs abundant
Creosotebush-White Bursage Scrub 1087	
A	***Early***: 5-9% cover of creosote and white bursage builds up over time; 5-20% grass cover depending on winter precipitation and season; 0-19 yrs
B	***Late-closed***: 10-40% creosote and white bursage cover; 5-20% grass and forb cover (depending on winter precipitation, soil productivity, and season); Joshua trees may be present; 20+ yrs
U-AG	***Annual-Grass***: >10% cover of annual exotic forbs or grasses; <10% cover of creosotebush, white bursage, or other shrubs
U-BG	***Bare ground***: mineral soil exposed by human disturbances
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 10-40% cover of creosote and white bursage; >5% non-native grass or forb cover; native grass and forb may be present to common (depending on winter precipitation, soil productivity, and season); Joshua trees may be present
Curl-leaf Mountain Mahogany 1062	
A	***Early***: 10-55% cover mountain mahogany seedlings and saplings, 0-2m; mineral soil abundant; grasses and shrubs present but not abundant; 0-19 yrs
B	***Mid-Closed***: 30-45% cover of mountain mahogany, mountain sagebrush, snowberry, and mountain snowberry 2-5m high; 60-59 yrs
C	***Mid-Open***: 0-30% cover mountain mahogany 2-5m; mineral soil abundant; grasses and mountain sagebrush, snowberry, and mountain snowberry common; 20-59 yrs
D	***Late-Open***: 0-30% cover of large diameter mountain mahogany 5-25m; grasses and mountain sagebrush, snowberry, and mountain snowberry common; >60 yrs
E	***Late-Closed***: 30-55% cover of mature mountain mahogany, 5-25m; >49 yrs;

Class Code	*Class abbreviation and brief description*
U-AG	***Annual-Grass***: 5-30% cheatgrass cover; <10% shrub cover
U-TA	***Tree-Annual-Grass***: 10-55% cover of mountain mahogany; 5-20% cheatgrass cover
Greasewood 1153	
A	***Early***: 0-20% herbaceous (inland saltgrass, bottlebrush squirreltail, and alkali sacaton) cover; <5% cover rabbitbrush and resprouting greasewood; 0-5 yrs
B	***Late-closed***: 15-25% greasewood cover; <10% cover other shrubs (rabbitbrush, saltbushes, and budsage); <10% cover of grass (inland saltgrass, bottlebrush squirreltail, and alkali sacaton); >5 yrs
U-AG	***Annual-Grass***: 5-30% non-native annual grass cover; <10% shrub cover
U-SA	***Shrub-Annual-Grass***: 5-25% cover of greasewood; 5-20% non-native grass cover
U-SD	***Seeded***: 5-20% seeded native or introduced species cover
High Elevation Meadow 1145	
A	***Early***: 20-60% cover of diverse tall forbs with a minor graminoid component (*Agastache* spp., *Chamerion* spp., *Erigeron* spp., *Senecio* spp., *Helianthella* spp., *Mertensia* spp., *Penstemon* spp., *Campanula* spp., *Hackelia* spp., *Lupinus* spp., *Solidago* spp., *Ligusticum* spp., *Osmorhiza* spp., *Thalictrum* spp., *Valeriana* spp.,*Balsamorhiza* spp., *Wyethia* spp., *Bromus* spp, *Danthonia* spp., *Deschampsia* spp., *Koeleria* spp., *Elymus* spp., *Phleum* spp., and *Dasiphora* spp.); 40-80% fine textured soil; 0-4 years
B	***Mid-closed***: 60-100% cover of diverse tall forbs with a minor graminoid component; <5% shrub cover; 5-9 years
C	***Late-closed***: 5-10% shrub cover of *Populus tremuloides*, *Arrtemisia cana*, *Artemisia tridentata*, *Rosa woodsii*, *Ribes* spp., *Amelanchier* spp.; 90-95% cover of diverse tall forbs with a minor graminoid component; 10-300 years
U-UF	***Unpalatable Forb***: >60% cover of uncharacteristic forbs usually dominated by *Wyethia* spp.
U-US	***Unpalatable Shrub***: >60% cover of uncharacteristic shrubs dominated by *Artemisia cana* and *Rosa woodsii*.
Jeffrey Pine 1031	
A	***Early***: 0-60% cover of shrub/grass; conifer seedlings can be abundant <5m; 0-39yrs;
B	***Mid-closed***: 40-60% cover of Jeffrey pine, white fir and 5-10m; dense shrub cover possible; 40-159yrs
C	***Mid-open***: 10-39% cover of Jeffrey pine; abundant shrub and grass cover; 40-159yrs
D	***Late-open***: 10-39% cover of Jeffrey pine 11--50m; abundant shrub and grass cover; >160 yrs
E	***Late-closed***: 40-80% cover of Jeffrey pine,11-50m; mountain snowberry common; ; >160 yrs
U-AG	***Annual-Grass***: >10% cheatgrass cover; trees largely absent; charred logs or standing dead trees often present; native grasses and forbs present to abundant
U-TA	***Tree-Annual-Grass***:10-80% cover of young and older Jeffrey pine and white fir; >5% cheatgrass cover; native grass and shrubs present to abundant
Juniper Savanna 1115	
A	***Early***: 10-30% herbaceous cover ; 0-19 yrs
B	***Mid-Open***: 10-30% cover big sage <0.5m tall; 10-40% herbaceous cover; 20-39 yrs
C	***Mid-Closed***: 10-40% shrub cover 0.5-1.0m tall; 11-30% cover of juniper <2m; <20% herbaceous cover; 40-99 yrs

Class Code	*Class abbreviation and brief description*
D	***Late-Open***:10-20% cover of juniper <5m tall; 10-20% shrub cover; <20% herbaceous cover; 100-399 yrs
E	***Late-Closed***:21-40% cover of juniper <10m tall; 10-20% shrub cover; <20% herbaceous cover; >400 yrs
U-AG	***Annual-Grass***: 10-30% non-native annual grass; <10% rabbitbrush or snakeweed cover; charred stumped of juniper evident
U-TA	***Tree-Annual-Grass***: 10-40% cover of juniper; 10-20% shrub cover; <10% herbaceous cover; 5-20% cover of annual grass
Limber-Bristlecone Pine Woodland 1020	
A	***Early***: 0-10% limber and bristlecone pine cover 0-5m high; abundant mineral soil or talus cover; sparse ground cover; 0-99 yrs
B	***Mid-Open***: 11-30% limber and bristlecone pine cover 5-10m high; abundant mineral soil or talus cover; sparse ground cover; 100-249 yrs
C	***Late-Open***: very old trees; 11-30% limber and bristlecone pine cover 5-25m high; abundant mineral soil or talus cover; sparse ground cover; >250 yrs
Low-Black Sagebrush 1079	
A	***Early***: <10% cover rabbitbrush; 10-40% cover of grass; 50-80% cover mineral soil; 0-25 yrs
B	***Mid-open***: 10-20% cover of black sagebrush or low sagebrush and rabbitbrush; 10-30% grass cover; <40% cover of mineral soil; 25-119 yrs
C	***Late-Open***: 20-30% cover of black sagebrush or 10-30% cover of low sagebrush; 10-30% cover of grasses; 1-10% pinyon-juniper sapling cover; 120-194 yrs
D	***Late-Closed***: 10-30% cover of mature pinyon or juniper on black sagebrush sites or 5-20% cover of mature pinyon or juniper on low sagebrush sites; <10% black sagebrush or 5-20% cover of low sagebrush; <10% grass cover; >195 yrs
U-AG	***Annual-Grass***: 10-30% cover of cheatgrass
U-DP	***Depleted***: 20-50% cover of black sagebrush or 10-30% cover of low sagebrush; <5% herbaceous cover; <10% pinyon or juniper sapling cover
U-ES	***Early-Shrub***: 10-40% cover rabbitbrush species
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 20-50% cover of black sagebrush or 10-30% cover of low sagebrush; >5% cover of native grass; 5-20% cheatgrass cover; <10% pinyon or juniper sapling cover
U-SA	***Shrub-Annual-Grass***: 20-50% cover of black sagebrush or 10-30% cover of low sagebrush; <5% cover of native grass; 5-20% cheatgrass cover; <10% pinyon or juniper sapling cover
U-SD	***Seeded***: 5-20% cover of native or non-native (crested wheatgrass, forage koshia) seed mix; ≤5% cover of annual grass
U-TA	***Tree-Annual-Grass***: >20% pinyon or juniper cover on black sagebrush sites or >10% pinyon or juniper cover on low sagebrush sites 10m; >5% cover of annual grass; <5% shrub cover; <5% herbaceous cover
U-TE	***Tree-Encroached***: >20% pinyon or juniper cover on black sagebrush sites or >10% pinyon or juniper cover on low sagebrush sites; <5% shrub cover; <5% native herbaceous cover; ≤5% cover of annual grass
Low Sagebrush Steppe (>14 inch precipitation zone) 1124	
A	***Early***: 15-25% herbaceous cover (bluebunch wheatgrass, Thurber's needlegrass); 0-10% cover of rabbitbrush; 0-25 yrs

Class Code	*Class abbreviation and brief description*
B	***Mid-open***: 11-20% cover of low sagebrush and mountain snowberry; 15-25% herbaceous cover (bluebunch wheatgrass, Thurber's needlegrass); 25-99 yrs
C	***Late-Closed***: 21-30% cover of low sagebrush and Utah serviceberry; 10-15% herbaceous cover (bluebunch wheatgrass); >100 yrs
U-DP	***Depleted***: 10-30% cover of low sagebrush; <5% herbaceous cover; <10% pinyon or juniper sapling cover
U-ES	***Early*-Shrub**: 10-40% cover rabbitbrush species
U-TE	***Tree-Encroached***: >10% pinyon, juniper cover, or montane-subalpine conifer; <5% shrub cover; <5% native herbaceous cover; annual grass usually absent
Low Elevation Grassland 1139	
A	***Early***: 10-30% grass cover (*Festuca idahoensis*, *F. compestris*, Pseud*oroegneria spicata*, *Koeleria macratha*); 0-10% cover of forbs (*Colinsia* spp., *Lupinus* spp., *Epilobium* spp., *Balsamorhiza* spp., *Geum* spp., *Potentilla* spp.); 0-4 yrs
B	***Mid-Closed***: 41-80% cover of grass; 10-20% forb cover; shrubs present but low stature; 5-64 yrs
C	***Late-Open***: 11-20% shrub cover (*Symphoricarpus alba* and *Rosa* spp.); 41-80% grass cover; <10% forb cover; >65 yrs
U-AG	***Annual-Grass***; 5-30% cheatgrass cover; <5% shrub cover; native tree cover <5%
U-ES	***Early-Shrub***: 10-40% cover rabbitbrush species
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: >20% shrub cover; >5% annual grass; <40% herbaceous cover; mineral soil common
U-TA	***Tree-Annual-Grass***: >5% pinyon, juniper cover, or montane conifer; shrub herbaceous cover variable but usually >20%; <41% native grass cover; annual grass may be present, especially under the canopy of trees
Mixed Conifer 1052	
A	***Early***: 0-15% cover of tree/shrub/grass; <5m; 0-29 yrs
B	***Mid-closed***: 35-100% cover of white fir and other conifers <24m; 30-99 yrs
C	***Mid-open***: 0-35% cover of white fir and other conifers <24m; 30-99 yrs
D	***Late-open***: 0-35% cover of white fir and other conifers 25-49m; >100 yrs
E	***Late-closed***: 35-100% cover of white fir and other conifers 25-49m; >100 yrs
U-AG	***Annual-Grass***: >10% cheatgrass cover; <10% shrub cover; trees largely absent; charred logs or standing dead trees often present; native grasses and forbs present to abundant
U-TA	***Tree-Annual-Grass***: 10-80% cover of young and older white fir and other conifers; >5% cheatgrass cover; native grass and shrubs present to abundant
Mixed Salt Desert Scrub 1081	
A	***Early***: 0-5% cover of young *Atriplex* spp. or other shrubs, Indian ricegrass and squirreltail common; 0-5 yrs
B	***Late1*-open**: 5-20% cover *Atriplex* spp. or other shrubs; >6 yrs
C	***Late2*-open**: 5-20% cover budsage <0.25m; >7 years
U-AG	***Annual-Grass***: 5-30% cheatgrass cover; <10% shrub cover
U-SA	***Shrub-Annual-Grass***: 5-20% cover of *Atriplex* spp. or other shrubs; 5-20% cheatgrass cover
U-SD	***Seeded***: native or non-native (crested wheatgrass, forage koshia) seed mix cover 5-20%
Montane Riparian (carbonate or non-carbonate geology) 1154	
A	***Early***: 0-50% cover of cottonwood, willow, Wood's rose <3m; carex present; 0-5 yrs
B	***Mid-open***: 31-100% cover of cottonwood, aspen, willow, Wood's rose <10m; 5-20 yrs;

Class Code	*Class abbreviation and brief description*
C	***Late-closed***: 31-100% cover of cottonwood, alder, aspen, willow 10-24m; >20 yrs
U-EF	***Exotic-Forb***: 5-100% cover of exotic forbs (knapweed, tall whitetop, purple loosestrife, thistle), salt cedar, or Russian olive
U-DE	***Desertification***: Entrenched river/creek with 10-50% cover of upland shrubs (e.g., big sage); cheatgrass absent to common
U-PA	***Pasture***: agricultural pasture
U-SFE	***Shrub-Forb-Encroached***: 10-50% cover of unpalatable shrub and forb species (*Rosa woodsii* and *Rhus trilobata*) in open areas or under tree canopy
Montane Sagebrush Steppe mountain (≥14 inch precipitation zone) 1126m	
A	***Early***: 0-10% canopy of mountain sagebrush/ mountain brush; >50% grass/forb cover; 0-12 yrs
B	***Mid-open***: 11-30% cover of mountain sagebrush / mountain shrub; >50% herbaceous cover; 13-37 yrs
C	***Mid-closed***; 31-50% cover of mountain sagebrush / mountain brush; 25-50% herbaceous cover; <10% conifer sapling cover; >38 yrs
D	***Late-open***: 10-30% cover conifer <10m; 25-40% cover of mountain sagebrush / mountain brush; <30% herbaceous cover; 80-129 yrs
E	***Late-closed***: 31-80% conifer cover 10-25m; 6-20% shrub cover, <20% herbaceous cover; >129 yrs
U-AG	***Annual-Grass***: 10-30% cover of cheatgrass; <10% shrub cover
U-DP	***Depleted***; 20-50% cover of mountain big sagebrush/mountain brush; <10% herbaceous cover; <5% cheatgrass cover; <10% conifer sapling cover; >50 yrs
U-ES	***Early-Shrub***: 10-50% cover rabbitbrush species
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 21-50% cover of mountain big sagebrush/mountain brush; ≥10% cover of native grass; 5-10% cheatgrass cover; <10% conifer sapling cover; >50 yrs
U-TE	***Tree-Encroached***: 31-80% conifer (usually montane conifer and pinyon) cover 10-25m; <5% shrub cover; <5% herbaceous cover; >130 yrs
Mountain Shrub 1086	
A	***Early***: 0-10% canopy of Utah snowberry/antelope bitterbrush; 10-80% grass/forb cover; 0-12 yrs
B	***Mid-open***: 11-30% cover of Utah snowberry/antelope bitterbrush; >50% herbaceous cover; 13-38 yrs
C	***Mid-closed***: 31-50% cover of Utah snowberry/antelope bitterbrush/mountain big sagebrush; 25-50% herbaceous cover, <10% conifer sapling cover; 38+ yrs
D	***Late-open***: 10-20% pinyon pine-white fir cover <5m; 25-40% cover of Utah snowberry/antelope bitterbrush/mountain big sagebrush; <30% herbaceous cover; 80-129 yrs
U-DP	***Depleted***: 20-50% cover of Utah snowberry/antelope bitterbrush/mountain big sagebrush; <5% herbaceous cover; <10% pinyon sapling cover
U-ES	***Early-Shrub***: 20-50% cover rabbitbrush species
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 20-50% cover of Utah snowberry/antelope bitterbrush/mountain big sagebrush; >5% cover of native grass; 5-10% cheatgrass cover; <10% pinyon sapling cover
U-TE	***Tree-Encroached***: >21% pinyon pine-white fir cover 10-25m; <5% shrub cover; <5% herbaceous cover
Paloverde Mixed Cacti 1109	
A	***Early-open***: 5-30% herbaceous cover dominated by brittlebrush (*Encelia farinosa*); 0-19 yrs

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B	***Mid-open***: 5-30% cover of brittlebrush with woody succulents and woody early-succession plants growing beneath the brittlebrush canopy; 20-94 yrs
C	***Late-closed***: 5-30% cover of white bursage (*Ambrosia dumosa*); 10-30% cover of succulents and small tree-dominated communities (*Carnegiea gigantea*, *Parkinsonia* spp., *Ferocactus* spp., *Fouqueria splendens*, *Acacia greggii*, and *Olneya tesota*); >95 yrs
Pinyon-Juniper 1019	
A	***Early***: 5-20% herbaceous cover; 0-9 yrs
B	***Mid1-open***: 11-20% cover big sage or black sage <1.0m; 10-40% herbaceous cover; 10-29 yrs
C	***Mid2-open***: 11-30% cover of pinyon and/or juniper <5m; 10-40% shrub cover; <20% herbaceous cover; 30-99 yrs
D	***Late-open***: old growth, 31-50% cover of pinyon and/or juniper <5m-9m; 10-40% shrub cover; <20% herbaceous cover; >99 yrs
U-AG	***Annual-Grass***: 5-30% cheatgrass cover; <10% shrub cover
U-TA	***Tree-Annual-Grass***: 31-50% cover of pinyon and/or juniper <5m-9m; 10-40% shrub cover; <20% cheatgrass cover
Ponderosa Pine 1054	
A	***Early***: 0-60% cover of shrub/grass; conifer seedlings can be abundant <5m; 0-39yrs;
B	***Mid-closed***: 31-60% cover of ponderosa pine, Douglass-Fir, and white fir 5-10m; dense shrub cover possible; 40-159yrs
C	***Mid-open***: 10-30% cover of ponderosa pine (dominant), Douglass-Fir, and limber pine 5-10m; abundant shrub and grass cover; 40-159yrs
D	***Late-open***: 10-30% cover of ponderosa pine (dominant), Douglass-Fir, and limber pine 11--50m; abundant shrub and grass cover; >160 yrs
E	***Late-closed***: 31-80% cover of ponderosa pine, Douglass-Fir, and limber pine 11-50m; mountain snowberry common; >160 yrs
U-AG	***Annual-Grass***: >10% cheatgrass cover; trees largely absent; charred logs or standing dead trees often present; native grasses and forbs present to abundant
U-TA	***Tree-Annual-Grass***: 10-80% cover of young and older ponderosa pine and other conifer; >5% cheatgrass cover; native grass and shrubs present to abundant
Semi-Desert Grassland 1135	
A	***Early***: 0-20 yrs; 10-40% cover of grasses (Indian ricegrass and desert needlegrass, and in the Mojave Desert big galleta and bush muhly); <5% shrub cover (spiny menadora)
B	***Mid-closed***: 20+ yrs; >25% cover of grasses (Indian ricegrass and desert needlegrass, and in the Mojave Desert big galleta and bush muhly); 5-25% shrub cover (spiny menadora)
U-DP	***Depleted***: 5-30% shrub cover; <10% cover of grasses; 10-30% bare ground cover
U-ES	***Early-Shrub***: 10-30% cover of rabbitbrush; 10-30% bare ground cover; <10% native grass cover
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 5-30% shrub cover; 5-15% cover of annual grasses; native grasses may be present to common
Spruce-Fir 1056	
A	***Early***: 0-100% cover of Engelman spruce seedling/shrub/grass <5m; 0-39 yrs
B	***Mid1-closed***: 40-100% cover of Engelman spruce and aspen 5-24m; 40-129yrs
C	***Mid1-open***: 0-40% cover of Engelman spruce 5-24m pole size; ; 40-129yrs
D	***Late-closed***: 40-100% cover of Engelman spruce 25-49m; >129 yrs

Class Code	*Class abbreviation and brief description*
Subalpine Riparian 1160	
A	***Early***: 0-50% cover of willow, <3m; large patches of basin wildrye, sedges, and tufted grasses; 0-2 yrs
B	***Mid-open***: 10-30% cover of mixed conifers 0-5m; aspen and willow abundant; large patches of basin wildrye, sedges, and tufted grasses; 3-22 yrs
C	***Late-closed***: 31-50% cover of mixed conifers 5-10m; aspen and willow abundant; >22 yrs
U-EF	***Exotic-Forbs***: >5% of thistle or other exotic forbs (tall whitetop, Russian knapweed, purple loosestrife); native woody shrubs and trees present to abundant; graminoids dominated patches may be presernt
Warm Desert Riparian (WDR) 11550	
A	***Early***: 10-50% cover of Gooding willow and Fremont Cottonwood seedlings and shrubs; riparian and wetland graminoids may co-dominate; 0-4 yrs post-flooding
B	***Mid-closed***: 51-100% cover of willow and small trees (willow and cottonwood) <3 m; patches of graminoids and halophytic shrubs common; 5-19 yrs after flooding
C	***Mid-open***: 11-50% cover of fire resprouts of mesquite and Gooding willow; patches of graminoids frequent after fire; mesquite mature to larger trees several years after fire; 1-89 yrs after fire
D	***Late1-closed***: 51%-90% of mature Gooding willow and Fremont cottonwood; patches of graminoids in saturated soils and of halophytic shrubs on drier sediment deposits or more saline surfaces; 10-89 yrs
E	***Late2-closed***: 51-90% mesquite cover; Gooding willow and Fremont cottonwood minor component; understory often dominated by graminoids and forbs; >90 yrs
U-DE	***Desertified*****:** incised river bank caused by human disturbance; 10-90% native halophytic shrub or riparian tree cover; graminoid patches may be present
U-EF	***Exotic Forb***: >5% exotic forb species regardless of native cover; river bank not incised
U-ET	***Exotic-Tree***: >5% exotic tree species (tamarisk or Russian olive) regardless of native cover; river bank not incised
U-DEF	***Desertified-Exotic-Forb***: >5% exotic forb species regardless of native cover; river bank incised
U-DET	***Desertified-Exotic-Tree***: >5% exotic tree species (tamarisk or Russian olive) regardless of native cover; river bank incised
Washes 11551	
A	***Early***: 20-50% cover may be gravel, sands, and/or flood debris; 10-19% cover of shrubs (species varies between southern and northern Nevada: desert almond, burrobrush, rabbitbrush, creosotebush, desert willows present); 5-15% cover of grasses (species varies between southern and northern Nevada); 0-5 yrs
B	***Mid-closed:*** 20-50% cover of shrubs (species varies between southern and northern Nevada: desert almond, bursage, burrobrush, creosotebush, Anderson's wolfberry, rabbitbrush); 5-10% cover of grasses (species varies between southern and northern Nevada); <30% of gravel and rocks; 5-19 yrs
C	***Late-closed***: 30-50% cover of shrubs (species varies between southern and northern Nevada: bursage, burrobrush, creosotebush, Anderson's wolfberry, rabbitbrush, mesquite); Joshua tree may be present in southern Nevada; 5-10% cover of grasses (species varies between southern and northern Nevada), <10% of gravel and rocks; >20 yrs
U-ET	***Exotic-Tree*****:** >5% cover of salt cedar; 0-50% cover of shrubs

Class Code	*Class abbreviation and brief description*
Wyoming Big Sagebrush (8-10 inch precipitation zone) 10800	
A	***Early***: 20-40% herbaceous cover; <10% cover of rabbitbrush species and Wyoming big sagebrush; 0-19 yrs
B	***Mid-open***: 11-20% cover Wyoming big sagebrush; 10-40% herbaceous cover; 20-59 yrs
C	***Late-closed****:* 20-40% cover of Wyoming big sagebrush; <20% native herbaceous cover; 60-99 yrs
U-AG	***Annual-Grass***: 10-40% cover of cheatgrass; <10% shrub cover
U-ES	***Early-Shrub***; 20-50% cover rabbitbrush species
U-SAP	***Shrub-Annual-Grass-Perennial-Grass***: 10-30% Wyoming big sagebrush <0.5m, if >5% native grass cover, then >5% cover cheatgrass or if ≤5% native grass cover, then 0-20% cheatgrass cover; >10 yrs
U-TA	***Tree-Annual-Grass***: 11-60% cover of trees 5-9m; <20% cheatgrass cover; >125 yrs

Habitat Support Tables

- ***Intermountain Cold Desert Shrub***

Table C.2. Uncharacteristic Class Percentages And Percent Increase In Annual Grass Class By Region For Mixed Salt Desert.

Region	*Current % U-Class*	*%U-Class No CC*	*%U-Class CC no mgmt*	*%change in Annual Grass Class*
Black Rock	72%	80%	76%	17%
Calcareous	44%	59%	54%	24%
Clover	51%	62%	60%	26%
E Sierra	5%	28%	26%	11%
Elko	35%	53%	56%	-7%
Eureka	40%	60%	48%	10%
Humboldt	66%	76%	70%	23%
Lahontan	45%	61%	55%	22%
Mojave	8%	29%	35%	16%
Owyhee	4%	35%	26%	6%
Toiyabe	12%	33%	34%	13%
Tonopah	1%	25%	24%	7%
Walker	3%	26%	26%	9%

Table C.3. Uncharacteristic Class Percentages and Percent Increase in Annual Grass Class By Region For Greasewood.

Region	*Current % U-Class*	*%U-Class No CC*	*%U-Class CC no mgmt*	*%change in Annual Grass Class*
Black Rock	57%	71%	68%	27%
Calcareous	25%	45%	46%	19%
Clover	31%	52%	53%	18%
E Sierra	4%	27%	24%	7%
Elko	35%	53%	48%	3%

Eureka	41%	60%	56%	18%
Humboldt	34%	53%	52%	19%
Lahontan	18%	42%	41%	16%
Mojave	2%	26%	37%	13%
Owyhee	3%	35%	25%	7%
Toiyabe	7%	30%	35%	12%
Tonopah	1%	25%	26%	7%
Walker	1%	25%	27%	8%

- ***Mojave Desert Scrub***

Table C.4. Acres of New Creosote-Bursage in Regions Adjacent (North) to the Mojave.

Region	*Low-High Acres Of New Creosote-Bursage Created In 50 Years*
Calcareous	1350-7100 A
Eureka	0-1400 A
Toiyabe	0-8400 A
Tonopah	18350-30400 A
Walker	350-18000 A

Table C.5. Acres of New Creosote-Bursage *Annual Grass* in Regions Adjacent (North) to the Mojave.

Region	*Low-High Acres Of New Creosote-Bursage Annual Grass Created In 50 Years*
Calcareous	79800-188000 A
Eureka	28000-47900 A
Toiyabe	37600-72500 A
Tonopah	37650-64250 A
Walker	48600-130350 A
Total	187910-503000 A

- ***Warm Desert Riparian***

Table C.6. Vegetation Class Percentages for Warm Desert Riparian.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC no Mgmt*	*Acres CC no Mgmt*
Clover							
	WDR-A:AL	early	9%	41%	30%	40%	172
	WDR-B:CL	mid-closed	16%	59%	25%	30%	129
	WDR-C:OP	mid-open	16%	0%	0%	0%	0
	WDR-D:CL	late1-closed	35%	0%	0%	5%	22
	WDR-E:CL	late2-closed	24%	0%	10%	0%	0
	WDR-U:DE	desertification	0%	0%	0%	0%	0
	WDR-U:DEF	desertified-exotic forb	0%	0%	0%	0%	0
	WDR-U:DET	desertified-exotic tree	0%	0%	0%	0%	0

	WDR-U:EF	exotic-forb	0%	0%	5%	10%	43
	WDR-U:ET	exotic-tree	0%	0%	30%	15%	65
Mojave							
	WDR-A:AL	early	9%	59%	0%	0%	0
	WDR-B:CL	mid-closed	16%	25%	0%	0%	0
	WDR-C:OP	mid-open	16%	3%	0%	0%	0
	WDR-D:CL	late1-closed	35%	2%	0%	0%	0
	WDR-E:CL	late2-closed	24%	0%	0%	0%	0
	WDR-U:DE	desertification	0%	1%	46%	50%	75110
	WDR-U:DEF	desertified-exotic forb	0%	0%	17%	17%	26111
	WDR-U:DET	desertified-exotic tree	0%	4%	20%	21%	30981
	WDR-U:EF	exotic-forb	0%	0%	7%	4%	6052
	WDR-U:ET	exotic-tree	0%	4%	10%	8%	12244
Tonopah							
	WDR-A:AL	early	9%	84%	0%	0%	0
	WDR-B:CL	mid-closed	16%	16%	0%	0%	0
	WDR-C:OP	mid-open	16%	0%	0%	0%	0
	WDR-D:CL	late1-closed	35%	0%	0%	0%	0
	WDR-E:CL	late2-closed	24%	0%	0%	0%	0
	WDR-U:DE	desertification	0%	0%	50%	62%	17729
	WDR-U:DEF	desertified-exotic forb	0%	0%	16%	10%	2924
	WDR-U:DET	desertified-exotic tree	0%	0%	17%	12%	3551
	WDR-U:EF	exotic-forb	0%	0%	9%	6%	1787
	WDR-U:ET	exotic-tree	0%	0%	8%	9%	2437

- ***Sagebrush***

Table C.7. Gains in Big Sagebrush Steppe (Acres) by Region.

Region	*New Acres Big Sagebrush Steppe in 50 Years*	*Average of Five Modeling Replications*
Calcareous Ranges	28000-32400	29800
Eastern Sierra	9200-12200	11100
Eureka	24800-28800	26000
Humboldt Ranges	8700-9700	9100
Lahontan Basin	12000-15000	14400
Toiyabe	43200-52800	47700
Tonopah	14600-17700	16300
Walker Corridor	4600-7900	6000

Table C.8. Percentage of Low-Black Sagebrush BpS in Uncharacteristic Classes by Region.

Region	*Initial*	*No CC*	*CC no Mgmt*	*Increase in U-Classes*
Black Rock	21%	34%	0%	13%

Calcareous	64%	79%	68%	15%
Clover	74%	86%	0%	12%
E. Sierra	30%	50%	0%	20%
Elko	62%	65%	57%	3%
Eureka	21%	46%	0%	25%
Humboldt	43%	66%	0%	23%
Lahontan	54%	75%	50%	21%
Mojave	50%	97%	0%	47%
Owyhee	17%	29%	0%	12%
Toiyabe	22%	52%	0%	30%
Tonopah	28%	61%	0%	33%
Walker	17%	54%	33%	37%

Table C.9. Percentage of Low Sagebrush Steppe BpS in Uncharacteristic Classes By Region.

Region	*Initial*	*No CC*	*CC no Mgmt*	*Increase in U-Classes*
Black Rock	3%	15%	15%	12%
Calcareous	71%	73%	74%	
Clover	70%	81%	84%	14%
Elko	2%	7%	7%	
Eureka	82%	80%	100%	18%
Humboldt	62%	0%	0%	lost
Owyhee	0%	4%	3%	
E Sierra	60%	58%	63%	
Toiyabe	85%	100%	100%	15%

Table C.10. Percentage of Montane Sagebrush Steppe Mountain BpS in Uncharacteristic Classes By Region.

Region	*Initial*	*CC no Mgmt*	*CC w Mgmt*	*Increase in U Classes*
Black Rock	41%	51%		10%
Calcareous	21%	50%	29%	29%
Clover	18%	56%		38%
E. Sierra	22%	37%		15%
Elko	37%	48%	50%	11%
Eureka	31%	45%		14%
Humboldt	57%	68%		11%
Lahontan	81%	77%	66%	
Mojave	33%	94%		61%
Owyhee	17%	24%		
Toiyabe	25%	46%		21%
Tonopah	22%	53%		29%
Walker	28%	55%		27%

Table C.11. Predicted Loss of Montane Sagebrush Steppe Mountain BpS In 50 Years With Climate Change By Region.

Region	*Current Acres*	*Acres in 50 yrs w Climate Change*	*Acres Lost*	*percent loss of current*
Black Rock	1518593	1248873	269720	18%
Calcareous	1765168	1384481	380687	22%
Clover	55824	43598	12226	22%
E. Sierra	584318	458184	126134	22%
Elko	1195612	1023545	172067	14%
Eureka	1539183	1206152	333031	22%
Humboldt	529202	427037	102165	19%
Lahontan	817159	663575	153584	19%
Mojave	8761	7699	1062	12%
Owyhee	115014	89815	25200	22%
Toiyabe	2989534	2366072	623462	21%
Tonopah	980187	768313	211874	22%
Walker	375830	297305	78526	21%

Table C.12. Percentage of Wyoming Big Sage BpS in Uncharacteristic Classes By Region.

Region	*Initial*	*CC no mgmt*	*CC w mgmt*	*Increase in U Classes*
Black Rock	89%	91%		
Calcareous	87%	94%	93%	
Clover	90%	96%		
E. Sierra	59%	69%		10%
Elko	53%	58%	70%	
Eureka	62%	77%		15%
Humboldt	78%	90%		12%
Lahontan	89%	95%	60%	
Mojave	0%	0%		
Owyhee	1%	35%		34%
Toiyabe	89%	90%		
Tonopah	89%	93%		
Walker	77%	83%	18%	

- ***Aspen***

Table C.13. Distribution of Aspen-Mixed Conifer among Characteristic Classes In Three Primary Nevada Regions.

Region	*Class*	*Description*	*Reference*	*Initial*	*CC no mgt*	*CC w mgt*	*%loss*
Black Rock	ASM-A:AL	early	19%	62%	12%		
	ASM-A:FD	early	0%	0%	0%		
	ASM-B:CL	mid-closed	45%	8%	60%		
	ASM-C:CL	mid-closed	26%	1%	5%		
	ASM-D:OP	late-open	5%	28%	19%		
	ASM-E:CL	late-closed	6%	0%	3%		12%
Calcareous	ASM-A:AL	early	17%	9%	15%	39%	
	ASM-A:FD	early	0%	0%	0%	0%	
	ASM-B:CL	mid-closed	44%	4%	20%	39%	
	ASM-C:CL	mid-closed	25%	6%	5%	4%	
	ASM-D:OP	late-open	5%	0%	7%	3%	
	ASM-E:CL	late-closed	9%	80%	53%	14%	20%
Elko	ASM-A:AL	early	19%	0%	10%	4%	
	ASM-A:FD	early	0%	0%	0%	0%	
	ASM-B:CL	mid-closed	45%	0%	13%	37%	
	ASM-C:CL	mid-closed	26%	0%	0%	43%	
	ASM-D:OP	late-open	5%	0%	3%	16%	
	ASM-E:CL	late-closed	6%	100%	74%	0%	16%

Table C.14. Uncharacteristic Class Percentages And Percent Aspen Loss By Region For Aspen Woodland.

Region	*Current % U-Class*	*% U-Class no CC*	*% U-Class with CC no mgt*	*% aspen loss*
Black Rock	87%	19%	40%	12%
Calcareous	51%	17%	21%	21%
Clover	93%	30%	37%	31%
E Sierra	27%	11%	18%	8%
Elko	69%	25%	41%	17%
Eureka	44%	7%	15%	29%
Humboldt	65%	12%	27%	19%
Lahontan	35%	7%	15%	19%
Owyhee	80%	0%	0%	+21*
Toiyabe	30%	7%	11%	12%
Tonopah	7%	0%	4%	3%
Walker	32%	0%	0%	100%

**+21% gain in Owyhee Region is not supported by a transition pathway; considered an anomaly of small sample size and high standard error.*

➢ *Lower Montane Woodlands & Chaparral*

Table C.15. Vegetative Class Percentages for Pinyon-Juniper.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC No Mgmt*	*CC W Mgmt*
Black Rock	PJ-A:AL	early	3%	0%	3%	0%	
	PJ-B:OP	mid1-open	6%	11%	5%	1%	
	PJ-C:OP	mid2-open	20%	43%	29%	26%	
	PJ-D:OP	late-open	71%	27%	38%	51%	
	PJ-U:AG	annual grass	0%	6%	10%	3%	
	PJ-U:TA	tree-annual grass	0%	14%	14%	17%	
Calcareous	PJ-A:AL	early	2%	0%	3%	0%	23%
	PJ-B:OP	mid1-open	6%	0%	4%	2%	37%
	PJ-C:OP	mid2-open	19%	18%	13%	10%	0%
	PJ-D:OP	late-open	73%	82%	74%	82%	0%
	PJ-U:AG	annual grass	0%	0%	1%	0%	0%
	PJ-U:TA	tree-annual grass	0%	0%	5%	6%	0%
Clover	PJ-A:AL	early	2%	0%	3%	0%	
	PJ-B:OP	mid1-open	6%	0%	4%	2%	
	PJ-C:OP	mid2-open	19%	18%	12%	9%	
	PJ-D:OP	late-open	73%	80%	75%	82%	
	PJ-U:AG	annual grass	0%	0%	1%	0%	
	PJ-U:TA	tree-annual grass	0%	1%	5%	6%	
E Sierra	PJ-A:AL	early	2%	6%	4%	1%	30%
	PJ-B:OP	mid1-open	6%	3%	7%	2%	31%
	PJ-C:OP	mid2-open	20%	57%	36%	35%	6%
	PJ-D:OP	late-open	72%	32%	47%	57%	0%
	PJ-U:AG	annual grass	0%	1%	2%	0%	14%
	PJ-U:TA	tree-annual grass	0%	0%	4%	4%	0%
Elko	PJ-A:AL	early	3%	1%	3%	1%	
	PJ-B:OP	mid1-open	6%	37%	13%	8%	
	PJ-C:OP	mid2-open	20%	38%	43%	49%	
	PJ-D:OP	late-open	71%	8%	20%	27%	
	PJ-U:AG	annual grass	0%	11%	13%	7%	
	PJ-U:TA	tree-annual grass	0%	5%	7%	8%	
Eureka	PJ-A:AL	early	2%	0%	2%	0%	
	PJ-B:OP	mid1-open	6%	5%	5%	2%	
	PJ-C:OP	mid2-open	19%	36%	21%	19%	
	PJ-D:OP	late-open	73%	49%	55%	65%	
	PJ-U:AG	annual grass	0%	2%	5%	1%	
	PJ-U:TA	tree-annual grass	0%	9%	12%	13%	
Humboldt	PJ-A:AL	early	2%	0%	2%	0%	

	PJ-B:OP	mid1-open	6%	1%	6%	1%	
	PJ-C:OP	mid2-open	19%	38%	18%	16%	
	PJ-D:OP	late-open	73%	42%	51%	61%	
	PJ-U:AG	annual grass	0%	1%	7%	1%	
	PJ-U:TA	tree-annual grass	0%	17%	17%	20%	
Lahontan	PJ-A:AL	early	2%	0%	3%	0%	
	PJ-B:OP	mid1-open	6%	2%	6%	2%	
	PJ-C:OP	mid2-open	19%	51%	23%	21%	
	PJ-D:OP	late-open	73%	32%	48%	59%	
	PJ-U:AG	annual grass	0%	1%	6%	1%	
	PJ-U:TA	tree-annual grass	0%	14%	15%	17%	
Mojave	PJ-A:AL	early	2%	0%	3%	0%	17%
	PJ-B:OP	mid1-open	3%	19%	6%	2%	53%
	PJ-C:OP	mid2-open	13%	44%	34%	33%	24%
	PJ-D:OP	late-open	82%	36%	52%	58%	0%
	PJ-U:AG	annual grass	0%	0%	1%	0%	6%
	PJ-U:TA	tree-annual grass	0%	1%	4%	7%	0%
Owyhee	PJ-A:AL	early	3%	0%	10%	0%	
	PJ-B:OP	mid1-open	6%	2%	0%	0%	
	PJ-C:OP	mid2-open	20%	37%	20%	30%	
	PJ-D:OP	late-open	71%	30%	20%	30%	
	PJ-U:AG	annual grass	0%	1%	0%	0%	
	PJ-U:TA	tree-annual grass	0%	30%	50%	40%	
Toiyabe	PJ-A:AL	early	2%	0%	3%	0%	
	PJ-B:OP	mid1-open	6%	1%	3%	2%	
	PJ-C:OP	mid2-open	19%	21%	13%	12%	
	PJ-D:OP	late-open	73%	77%	75%	79%	
	PJ-U:AG	annual grass	0%	0%	1%	0%	
	PJ-U:TA	tree-annual grass	0%	1%	5%	7%	
Tonopah	PJ-A:AL	early	2%	0%	3%	0%	
	PJ-B:OP	mid1-open	6%	1%	6%	2%	
	PJ-C:OP	mid2-open	19%	30%	14%	14%	
	PJ-D:OP	late-open	73%	68%	71%	79%	
	PJ-U:AG	annual grass	0%	0%	1%	0%	
	PJ-U:TA	tree-annual grass	0%	0%	4%	5%	
Walker	PJ-A:AL	early	2%	0%	3%	0%	
	PJ-B:OP	mid1-open	6%	2%	4%	3%	
	PJ-C:OP	mid2-open	19%	37%	19%	17%	
	PJ-D:OP	late-open	73%	60%	68%	74%	
	PJ-U:AG	annual grass	0%	0%	1%	0%	

	PJ-U:TA	tree-annual grass	0%	1%	6%	6%	

Table C.16. Vegetative Class Percentages for Juniper Savanna.

Region	*Class*	*Description*	*Initial*	*No CC*	*CC no mgmt*	*CC w mgmt*
Calcareous	JUN-A:OP	early	3%	0%	2%	1%
	JUN-B:OP	mid-open	4%	0%	3%	3%
	JUN-C:OP	mid-closed	11%	0%	3%	2%
	JUN-D:OP	late-open	50%	98%	78%	73%
	JUN-E:OP	late-closed	33%	2%	9%	15%
	JUN-U:AG	annual grass	0%	0%	1%	0%
	JUN-U:TA	tree-annual grass	0%	0%	4%	6%
Elko	JUN-A:OP	early	3%	0%	2%	0%
	JUN-B:OP	mid-open	4%	0%	2%	1%
	JUN-C:OP	mid-closed	11%	36%	18%	22%
	JUN-D:OP	late-open	50%	16%	27%	29%
	JUN-E:OP	late-closed	33%	0%	3%	2%
	JUN-U:AG	annual grass	0%	0%	8%	3%
	JUN-U:TA	tree-annual grass	0%	48%	40%	44%
Mojave	JUN-A:OP	early	3%	0%	0%	0%
	JUN-B:OP	mid-open	4%	0%	0%	0%
	JUN-C:OP	mid-closed	11%	2%	10%	30%
	JUN-D:OP	late-open	50%	23%	0%	0%
	JUN-E:OP	late-closed	33%	75%	90%	70%
	JUN-U:AG	annual grass	0%	0%	0%	0%
	JUN-U:TA	tree-annual grass	0%	0%	0%	0%

Table C.17. Vegetative Class percentages for Mountain Mahogany.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC no mgmt*
Black Rock	MM-A:AL	early	8%	3%	8%	2%
	MM-B:OP	mid-closed	11%	1%	9%	6%
	MM-C:CL	mid-open	14%	8%	4%	5%
	MM-D:OP	late-open	11%	71%	57%	64%
	MM-E:CL	late-closed	57%	15%	16%	18%
	MM-U:AG	annual grass	0%	0%	1%	0%
	MM-U:TA	tree-annual grass	0%	1%	5%	5%
Calcareous	MM-A:AL	early	7%	39%	19%	3%
	MM-B:OP	mid-closed	11%	19%	17%	15%
	MM-C:CL	mid-open	14%	15%	30%	42%
	MM-D:OP	late-open	10%	5%	8%	10%
	MM-E:CL	late-closed	58%	22%	24%	27%
	MM-U:AG	annual grass	0%	0%	0%	0%

	MM-U:TA	tree-annual grass	0%	0%	2%	2%
Clover	MM-A:AL	early	7%	26%	8%	0%
	MM-B:OP	mid-closed	11%	29%	18%	16%
	MM-C:CL	mid-open	14%	17%	40%	45%
	MM-D:OP	late-open	10%	5%	7%	8%
	MM-E:CL	late-closed	58%	19%	20%	23%
	MM-U:AG	annual grass	0%	4%	5%	8%
	MM-U:TA	tree-annual grass	0%	0%	2%	0%
E Sierra	MM-A:AL	early	8%	51%	20%	11%
	MM-B:OP	mid-closed	12%	2%	17%	18%
	MM-C:CL	mid-open	13%	9%	24%	28%
	MM-D:OP	late-open	12%	28%	25%	29%
	MM-E:CL	late-closed	55%	11%	12%	13%
	MM-U:AG	annual grass	0%	0%	1%	0%
	MM-U:TA	tree-annual grass	0%	0%	2%	1%
Elko	MM-A:AL	early	8%	5%	8%	2%
	MM-B:OP	mid-closed	11%	26%	12%	9%
	MM-C:CL	mid-open	14%	21%	21%	29%
	MM-D:OP	late-open	11%	8%	12%	13%
	MM-E:CL	late-closed	57%	0%	7%	8%
	MM-U:AG	annual grass	0%	1%	11%	4%
	MM-U:TA	tree-annual grass	0%	38%	29%	35%
Eureka	MM-A:AL	early	7%	31%	7%	3%
	MM-B:OP	mid-closed	11%	2%	18%	15%
	MM-C:CL	mid-open	14%	26%	21%	26%
	MM-D:OP	late-open	10%	19%	20%	21%
	MM-E:CL	late-closed	58%	20%	27%	30%
	MM-U:AG	annual grass	0%	0%	1%	1%
	MM-U:TA	tree-annual grass	0%	3%	5%	4%
Humboldt	MM-A:AL	early	7%	16%	12%	2%
	MM-B:OP	mid-closed	11%	1%	14%	9%
	MM-C:CL	mid-open	14%	34%	17%	23%
	MM-D:OP	late-open	10%	40%	36%	42%
	MM-E:CL	late-closed	58%	4%	15%	15%
	MM-U:AG	annual grass	0%	0%	3%	2%
	MM-U:TA	tree-annual grass	0%	5%	4%	7%
Lahontan	MM-A:AL	early	7%	15%	16%	1%
	MM-B:OP	mid-closed	11%	2%	15%	13%
	MM-C:CL	mid-open	14%	57%	18%	26%
	MM-D:OP	late-open	10%	19%	24%	27%

	MM-E:CL	late-closed	58%	5%	24%	30%
	MM-U:AG	annual grass	0%	0%	1%	1%
	MM-U:TA	tree-annual grass	0%	1%	3%	3%
Mojave	MM-A:AL	early	21%	82%	0%	30%
	MM-B:OP	mid-closed	43%	6%	40%	31%
	MM-C:CL	mid-open	28%	6%	60%	11%
	MM-D:OP	late-open	3%	0%	0%	0%
	MM-E:CL	late-closed	5%	2%	0%	0%
	MM-U:AG	annual grass	0%	3%	0%	28%
	MM-U:TA	tree-annual grass	0%	1%	0%	0%
Toiyabe	MM-A:AL	early	7%	25%	8%	3%
	MM-B:OP	mid-closed	11%	1%	14%	14%
	MM-C:CL	mid-open	14%	23%	17%	20%
	MM-D:OP	late-open	10%	15%	16%	17%
	MM-E:CL	late-closed	58%	36%	42%	43%
	MM-U:AG	annual grass	0%	0%	0%	0%
	MM-U:TA	tree-annual grass	0%	0%	2%	4%
Tonopah	MM-A:AL	early	7%	21%	12%	2%
	MM-B:OP	mid-closed	11%	1%	9%	7%
	MM-C:CL	mid-open	14%	6%	11%	16%
	MM-D:OP	late-open	10%	4%	3%	4%
	MM-E:CL	late-closed	58%	68%	62%	69%
	MM-U:AG	annual grass	0%	0%	1%	1%
	MM-U:TA	tree-annual grass	0%	0%	2%	1%
Walker	MM-A:AL	early	7%	29%	0%	0%
	MM-B:OP	mid-closed	11%	1%	0%	0%
	MM-C:CL	mid-open	14%	55%	0%	0%
	MM-D:OP	late-open	10%	5%	0%	0%
	MM-E:CL	late-closed	58%	9%	0%	0%
	MM-U:AG	annual grass	0%	0%	0%	0%
	MM-U:TA	tree-annual grass	0%	1%	0%	0%

Table C.18. Vegetative Class Percentages for Chaparral.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC No Mgmt*	*CC W Mgmt*
Calcareous	Chp-A:AL	early	16%	1%	16%	9%	0%
	Chp-B:CL	late-closed	84%	99%	60%	63%	20%
	Chp-U:SAP	shrub-annual-perennial	0%	0%	24%	28%	0%
Clover	Chp-A:AL	early	16%	5%	18%	5%	
	Chp-B:CL	late-closed	84%	94%	58%	69%	
	Chp-U:SAP	shrub-annual-perennial	0%	0%	24%	26%	

E Sierra	Chp-A:AL	early	17%	57%	20%	14%	0%
	Chp-B:CL	late-closed	83%	31%	47%	52%	80%
	Chp-U:SAP	shrub-annual-perennial	0%	13%	33%	34%	0%
Eureka	Chp-A:AL	early	16%	78%	0%	0%	
	Chp-B:CL	late-closed	84%	21%	80%	80%	
	Chp-U:SAP	shrub-annual-perennial	0%	2%	20%	20%	
Lahontan	Chp-A:AL	early	16%	76%	18%	8%	
	Chp-B:CL	late-closed	84%	9%	40%	53%	
	Chp-U:SAP	shrub-annual-perennial	0%	14%	42%	38%	
Mojave	Chp-A:AL	early	16%	54%	23%	8%	19%
	Chp-B:CL	late-closed	84%	46%	77%	92%	81%
	Chp-U:SAP	shrub-annual-perennial	0%	0%	1%	1%	0%
Toiyabe	Chp-A:AL	early	16%	90%	0%	0%	
	Chp-B:CL	late-closed	84%	9%	0%	0%	
	Chp-U:SAP	shrub-annual-perennial	0%	1%	0%	0%	
Tonopah	Chp-A:AL	early	16%	88%	18%	7%	
	Chp-B:CL	late-closed	84%	12%	55%	67%	
	Chp-U:SAP	shrub-annual-perennial	0%	0%	26%	26%	

Table C.19. Vegetative Class Percentages for Mountain Shrub.

Region	*Class*	*Description*	*Ref*	*Initial*	*No CC*	*CC no Mgt*	*CC w Mgt*
Black Rock	MSh-A:AL	early	7%	70%	7%	3%	
	MSh-B:CL	mid-open	24%	21%	22%	14%	
	MSh-C:CL	mid-closed	39%	4%	46%	66%	
	MSh-D:OP	late-open	30%	0%	1%	0%	
	MSh-U:DP	depleted	0%	0%	7%	3%	
	MSh-U:ES	early shrub	0%	0%	8%	3%	
	MSh-U:SAP	shrub-annual-perennial	0%	5%	10%	11%	
	MSh-U:TE	tree-encroached	0%	0%	0%	0%	
Calcareous	MSh-A:AL	early	7%	8%	5%	2%	12%
	MSh-B:CL	mid-open	23%	9%	13%	4%	20%
	MSh-C:CL	mid-closed	40%	60%	23%	21%	30%
	MSh-D:OP	late-open	30%	0%	9%	13%	17%
	MSh-U:DP	depleted	0%	0%	6%	10%	4%
	MSh-U:ES	early shrub	0%	0%	11%	10%	6%
	MSh-U:SAP	shrub-annual-perennial	0%	16%	25%	30%	10%
	MSh-U:TE	tree-encroached	0%	7%	8%	10%	2%
Clover	MSh-A:AL	early	7%	9%	5%	1%	
	MSh-B:CL	mid-open	23%	42%	6%	4%	
	MSh-C:CL	mid-closed	40%	40%	17%	16%	
	MSh-D:OP	late-open	30%	0%	3%	3%	

	MSh-U:DP	depleted	0%	0%	22%	36%	
	MSh-U:ES	early shrub	0%	0%	23%	16%	
	MSh-U:SAP	shrub-annual-perennial	0%	4%	16%	16%	
	MSh-U:TE	tree-encroached	0%	5%	8%	7%	
Elko	MSh-A:AL	early	7%	40%	14%	8%	1%
	MSh-B:CL	mid-open	24%	3%	10%	5%	5%
	MSh-C:CL	mid-closed	39%	0%	23%	29%	37%
	MSh-D:OP	late-open	30%	39%	22%	26%	0%
	MSh-U:DP	depleted	0%	0%	1%	2%	27%
	MSh-U:ES	early shrub	0%	1%	8%	5%	25%
	MSh-U:SAP	shrub-annual-perennial	0%	1%	5%	4%	4%
	MSh-U:TE	tree-encroached	0%	16%	17%	21%	0%
Mojave	MSh-A:AL	early	7%	0%	0%	0%	2%
	MSh-B:CL	mid-open	23%	0%	0%	0%	10%
	MSh-C:CL	mid-closed	41%	14%	0%	0%	62%
	MSh-D:OP	late-open	29%	0%	0%	0%	6%
	MSh-U:DP	depleted	0%	1%	4%	6%	4%
	MSh-U:ES	early shrub	0%	0%	37%	24%	4%
	MSh-U:SAP	shrub-annual-perennial	0%	0%	1%	1%	6%
	MSh-U:TE	tree-encroached	0%	85%	58%	69%	6%
Owyhee	MSh-A:AL	early	7%	41%	8%	0%	
	MSh-B:CL	mid-open	24%	44%	12%	8%	
	MSh-C:CL	mid-closed	39%	4%	68%	92%	
	MSh-D:OP	late-open	30%	0%	4%	0%	
	MSh-U:DP	depleted	0%	9%	0%	0%	
	MSh-U:ES	early shrub	0%	0%	0%	0%	
	MSh-U:SAP	shrub-annual-perennial	0%	1%	8%	0%	
	MSh-U:TE	tree-encroached	0%	0%	0%	0%	

- ***Intermountain Coniferous Forests & Woodlands***

Table C.20. Predicted Change In Acreage of Mixed Conifer With 50 Years of Climate Change.

Region	*Current Acres*	*Projected Acres w CC*	*Net Change*	*Percent change*
Black Rock	7424	7470	288	4%
Calcareous	109655	111616	2736	3%
Elko	37235	36740	5274	17%
Mojave	22261	22308	-918	-4%

Table C.21. Vegetative Class Percentages for Mixed Conifer in Four Primary Regions.

Region	*Class*	*Description*	*reference*	*Initial*	*No CC*	*CC no Mgmt*	*CC w Mgmt*
Black Rock	MC-A:AL	early	22%	21%	25%	20%	
	MC-B:CL	mid-closed	21%	20%	19%	39%	
	MC-C:OP	mid-open	13%	55%	18%	3%	
	MC-D:OP	late-open	28%	1%	27%	6%	
	MC-E:CL	late-closed	16%	3%	10%	31%	
	MC-U:AG	annual grass	0%	0%	0%	0%	
	MC-U:TA	tree-annual grass	0%	0%	0%	1%	
Calcareous	MC-A:AL	early	23%	11%	25%	20%	41%
	MC-B:CL	mid-closed	21%	74%	26%	27%	30%
	MC-C:OP	mid-open	14%	15%	16%	9%	2%
	MC-D:OP	late-open	28%	0%	22%	16%	9%
	MC-E:CL	late-closed	14%	0%	10%	28%	18%
	MC-U:AG	annual grass	0%	0%	0%	0%	0%
	MC-U:TA	tree-annual grass	0%	0%	0%	0%	0%
Elko	MC-A:AL	early	22%	1%	12%	13%	40%
	MC-B:CL	mid-closed	21%	0%	3%	4%	0%
	MC-C:OP	mid-open	13%	0%	0%	0%	0%
	MC-D:OP	late-open	28%	0%	11%	3%	0%
	MC-E:CL	late-closed	16%	0%	6%	20%	0%
	MC-U:AG	annual grass	0%	0%	34%	8%	0%
	MC-U:TA	tree-annual grass	0%	99%	33%	52%	0%
Mojave	MC-A:AL	early	18%	22%	22%	15%	20%
	MC-B:CL	mid-closed	16%	3%	15%	24%	23%
	MC-C:OP	mid-open	11%	1%	11%	5%	7%
	MC-D:OP	late-open	30%	15%	35%	16%	24%
	MC-E:CL	late-closed	25%	60%	16%	39%	24%
	MC-U:AG	annual grass	0%	0%	0%	0%	0%
	MC-U:TA	tree-annual grass	0%	0%	0%	1%	0%

Table C.22. Predicted Change In Acreage of Limber Pine/Bristlecone Pine With 50 Years of Climate Change.

Region	*Current Acres*	*Projected Acres w CC*	*Net Change*	*Percent change*
Black Rock	1989	1995	6	0%
Calcareous	45295	47966	2670	6%
E Sierra	6480	6424	-57	-1%
Elko	29255	33918	4664	16%
Eureka	1418	1345	-73	-5%
Mojave	12830	12545	-285	-2%
Toiyabe	34841	34187	-653	-2%

Table C.23. Vegetative Class Percentages for Limber Pine/Bristlecone Pine.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC no mgmt*
Black Rock	LB-A:AL	early	10%	55%	28%	27%
	LB-B:OP	mid-open	12%	18%	43%	43%
	LB-C:OP	late-open	78%	27%	29%	30%
Calcareous	LB-A:AL	early	10%	19%	17%	11%
	LB-B:OP	mid-open	13%	22%	24%	28%
	LB-C:OP	late-open	77%	59%	59%	61%
E Sierra	LB-A:AL	early	10%	27%	21%	18%
	LB-B:OP	mid-open	13%	47%	41%	44%
	LB-C:OP	late-open	77%	25%	38%	39%
Elko	LB-A:AL	early	10%	47%	34%	27%
	LB-B:OP	mid-open	12%	52%	52%	60%
	LB-C:OP	late-open	78%	1%	14%	12%
Eureka	LB-A:AL	early	10%	21%	15%	12%
	LB-B:OP	mid-open	13%	39%	33%	33%
	LB-C:OP	late-open	77%	40%	52%	55%
Humboldt	LB-A:AL	early	10%	50%	10%	30%
	LB-B:OP	mid-open	13%	31%	60%	50%
	LB-C:OP	late-open	77%	19%	30%	20%
Lahontan	LB-A:AL	early	10%	72%	60%	47%
	LB-B:OP	mid-open	13%	27%	33%	47%
	LB-C:OP	late-open	77%	1%	7%	7%
Mojave	LB-A:AL	early	10%	0%	4%	3%
	LB-B:OP	mid-open	12%	12%	9%	9%
	LB-C:OP	late-open	78%	88%	88%	89%
Toiyabe	LB-A:AL	early	10%	21%	14%	13%
	LB-B:OP	mid-open	13%	30%	30%	28%
	LB-C:OP	late-open	77%	49%	57%	59%
Tonopah	LB-A:AL	early	10%	26%	25%	5%
	LB-B:OP	mid-open	13%	38%	25%	40%
	LB-C:OP	late-open	77%	36%	50%	55%
Walker	LB-A:AL	early	10%	100%	0%	0%
	LB-B:OP	mid-open	13%	0%	0%	0%
	LB-C:OP	late-open	77%	0%	0%	0%

Table C.24. Vegetative Class Percentages for Ponderosa Pine.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC no Mgmt*	*CC w Mgmt*
Calcareous	PP-A:AL	early	11%	17%	3%	45%	0%
	PP-B:CL	mid-closed	2%	47%	8%	10%	0%
	PP-C:OP	mid-open	34%	12%	35%	15%	0%

	PP-D:OP	late-open	52%	3%	17%	10%	0%
	PP-E:CL	late-closed	1%	22%	4%	0%	0%
	PP-U:AG	annual grass	0%	0%	17%	0%	0%
	PP-U:TA	tree-annual grass	0%	0%	17%	20%	0%
Clover	PP-A:AL	early	11%	6%	7%	0%	
	PP-B:CL	mid-closed	2%	25%	1%	7%	
	PP-C:OP	mid-open	34%	54%	39%	30%	
	PP-D:OP	late-open	52%	1%	26%	27%	
	PP-E:CL	late-closed	1%	3%	1%	6%	
	PP-U:AG	annual grass	0%	0%	12%	1%	
	PP-U:TA	tree-annual grass	0%	11%	15%	29%	
Mojave	PP-A:AL	early	11%	6%	3%	2%	3%
	PP-B:CL	mid-closed	3%	2%	1%	3%	1%
	PP-C:OP	mid-open	33%	1%	14%	12%	19%
	PP-D:OP	late-open	52%	21%	60%	46%	43%
	PP-E:CL	late-closed	1%	69%	5%	20%	18%
	PP-U:AG	annual grass	0%	0%	3%	0%	0%
	PP-U:TA	tree-annual grass	0%	0%	14%	17%	16%

Table C.25. Predicted Change In Acreage of Ponderosa Pine With 50 Years of Climate Change.

Region	*Current Acreage*	*Projected Acreage*	*Net Change*	*Percent Change*
Calcareous	547	101	-446	-82%
Clover	5519	6040	521	9%
Mojave	24557	26189	1632	7%

Table C.26. Vegetative Class Percentages for Spruce-Fir.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC no Mgmt*	*CC w Mgmt*
Black Rock	SF-A:AL	early	18%	82%	27%	7%	
	SF-B:CL	mid1-closed	38%	0%	47%	65%	
	SF-C:OP	mid1-open	2%	11%	16%	10%	
	SF-D:CL	late-closed	42%	7%	9%	18%	
Calcareous	SF-A:AL	early	18%	8%	25%	13%	37%
	SF-B:CL	mid1-closed	38%	20%	33%	42%	56%
	SF-C:OP	mid1-open	2%	42%	11%	5%	7%
	SF-D:CL	late-closed	42%	30%	32%	40%	0%
Elko	SF-A:AL	early	18%	28%	27%	10%	0%
	SF-B:CL	mid1-closed	38%	31%	41%	53%	20%
	SF-C:OP	mid1-open	2%	41%	14%	13%	0%
	SF-D:CL	late-closed	42%	0%	18%	24%	0%

Table C.27. Predicted Change in Spruce-Fir with 50 Years of Climate Change.

Region	*Current Acres*	*Projected Acres W CC*	*Net Change*	*Percent Change*
Black Rock	869	928	59	7%
Calcareous	22077	24530	2453	11%
Elko	43829	47794	3966	9%

- ***Warm Desert Riparian***

Table C.28. Vegetative Classes for Warm Desert Riparian.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC no mgmt*
Clover	WDR-A:AL	early	9%	41%	30%	40%
	WDR-B:CL	mid-closed	16%	59%	25%	30%
	WDR-C:OP	mid-open	16%	0%	0%	0%
	WDR-D:CL	late1-closed	35%	0%	0%	5%
	WDR-E:CL	late2-closed	24%	0%	10%	0%
	WDR-U:DE	desertification	0%	0%	0%	0%
	WDR-U:DEF	desertified-exotic forb	0%	0%	0%	0%
	WDR-U:DET	desertified-exotic tree	0%	0%	0%	0%
	WDR-U:EF	exotic-forb	0%	0%	5%	10%
	WDR-U:ET	exotic-tree	0%	0%	30%	15%
Mojave	WDR-A:AL	early	9%	59%	0%	0%
	WDR-B:CL	mid-closed	16%	25%	0%	0%
	WDR-C:OP	mid-open	16%	3%	0%	0%
	WDR-D:CL	late1-closed	35%	2%	0%	0%
	WDR-E:CL	late2-closed	24%	0%	0%	0%
	WDR-U:DE	desertification	0%	1%	46%	50%
	WDR-U:DEF	desertified-exotic forb	0%	0%	17%	17%
	WDR-U:DET	desertified-exotic tree	0%	4%	20%	21%
	WDR-U:EF	exotic-forb	0%	0%	7%	4%
	WDR-U:ET	exotic-tree	0%	4%	10%	8%
Tonopah	WDR-A:AL	early	9%	84%	0%	0%
	WDR-B:CL	mid-closed	16%	16%	0%	0%
	WDR-C:OP	mid-open	16%	0%	0%	0%
	WDR-D:CL	late1-closed	35%	0%	0%	0%
	WDR-E:CL	late2-closed	24%	0%	0%	0%
	WDR-U:DE	desertification	0%	0%	50%	62%
	WDR-U:DEF	desertified-exotic forb	0%	0%	16%	10%
	WDR-U:DET	desertified-exotic tree	0%	0%	17%	12%
	WDR-U:EF	exotic-forb	0%	0%	9%	6%
	WDR-U:ET	exotic-tree	0%	0%	8%	9%

- ***Alpine Tundra***

Table C.29. Vegetative Classes for Alpine Tundra.

Region	*Class*	*Description*	*Reference*	*Initial*	*No CC*	*CC no mgt*
E. Sierra	ALP-A:AL	early	1%	0%	0%	0%
	ALP-B:CL	late-closed	99%	100%	100%	100%
Elko	ALP-A:AL	early	1%	60%	13%	10%
	ALP-B:CL	late-closed	99%	40%	87%	90%

Table C.30. Vegetative Classes for Semi-desert Grassland.

Region	*Class*	*Description*	*reference*	*Initial*	*No CC*	*CC No Mgt*
Black Rock	SG-A:OP	early	18%	0%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	2%	1%	1%
	SG-U:ES	early shrub	0%	0%	0%	0%
	SG-U:SAP	shrub-annual-perennial	0%	98%	99%	99%
Calcareous	SG-A:OP	early	18%	9%	2%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	18%	14%	12%
	SG-U:ES	early shrub	0%	0%	12%	15%
	SG-U:SAP	shrub-annual-perennial	0%	72%	73%	73%
Clover	SG-A:OP	early	18%	12%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	39%	33%	37%
	SG-U:ES	early shrub	0%	0%	13%	10%
	SG-U:SAP	shrub-annual-perennial	0%	49%	53%	53%
Elko	SG-A:OP	early	18%	0%	0%	0%
	SG-B:OP	mid-closed	82%	5%	1%	1%
	SG-U:DP	depleted	0%	0%	2%	3%
	SG-U:ES	early shrub	0%	95%	97%	96%
	SG-U:SAP	shrub-annual-perennial	0%	0%	0%	0%
Eureka	SG-A:OP	early	18%	5%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	10%	8%	9%
	SG-U:ES	early shrub	0%	0%	7%	6%
	SG-U:SAP	shrub-annual-perennial	0%	84%	85%	85%
Humboldt	SG-A:OP	early	18%	0%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	0%	0%	0%
	SG-U:ES	early shrub	0%	1%	1%	1%
	SG-U:SAP	shrub-annual-perennial	0%	99%	99%	99%

Lahontan	SG-A:OP	early	18%	4%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	28%	21%	24%
	SG-U:ES	early shrub	0%	0%	9%	8%
	SG-U:SAP	shrub-annual-perennial	0%	68%	70%	67%
Mojave	SG-A:OP	early	18%	29%	0%	0%
	SG-B:OP	mid-closed	82%	22%	0%	4%
	SG-U:DP	depleted	0%	21%	24%	20%
	SG-U:ES	early shrub	0%	0%	32%	24%
	SG-U:SAP	shrub-annual-perennial	0%	29%	44%	52%
Owyhee	SG-A:OP	early	18%	7%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	1%	0%	0%
	SG-U:ES	early shrub	0%	0%	0%	0%
	SG-U:SAP	shrub-annual-perennial	0%	93%	100%	100%
Toiyabe	SG-A:OP	early	18%	5%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	3%	1%	2%
	SG-U:ES	early shrub	0%	0%	6%	5%
	SG-U:SAP	shrub-annual-perennial	0%	92%	93%	93%
Tonopah	SG-A:OP	early	18%	50%	6%	6%
	SG-B:OP	mid-closed	82%	0%	24%	34%
	SG-U:DP	depleted	0%	35%	24%	24%
	SG-U:ES	early shrub	0%	0%	23%	6%
	SG-U:SAP	shrub-annual-perennial	0%	15%	23%	30%
Walker	SG-A:OP	early	18%	2%	0%	0%
	SG-B:OP	mid-closed	82%	0%	0%	0%
	SG-U:DP	depleted	0%	2%	0%	0%
	SG-U:ES	early shrub	0%	0%	0%	0%
	SG-U:SAP	shrub-annual-perennial	0%	96%	100%	100%

Additional Information on Prescriptive Actions

Lower Montane Woodlands and Chaparral

Mojave

Prescribed burning and native seeding was applied in the tree-encroached shrubland at a rate of 11,800 acres per year for five years at a cost of $150 per acre. Without treatment, the mountain shrub type was projected to essentially "vanish" from the Mojave landscape as it transitioned to the Chaparral BpS. The treatment produced better results. Although the BpS shrunk, but not entirely, ecological departure was much improved with 80 percent of the BpS restored to characteristic classes and only 20 percent left in uncharacteristic classes.

Calcareous

Two treatments were applied in the Calcareous region – prescribed burning in the "mid-closed" class and herbicide to control annuals in the "shrub annual perennial grass" class. The burning treatment was applied to 150 acres per year over fifty50 years at a cost of $50 per acre, while the herbicide treatment was applied to 40 acres per year over 50 years at a cost of $100 per acre. The result was a decrease in the overstocked "mid-closed" class, more percentage in the two youngest types, and a better distribution over all characteristic classes more closely approximating reference conditions. Percentages in uncharacteristic classes were maintained at levels very similar to current conditions, but the percent transition predicted after 50 years of climate change was reduced by 40 percent. Loss of the mountain shrub BpS to sagebrush conversion was slightly elevated (2,800 acres, 22 percent lost) from the same loss projected for 50 years of climate change without treatment (2,500 acres, 20 percent lost), but the gain in ecological health of the type was expected to improve it as mule deer summer range as a mitigating element. Monitoring of mule deer population response to the changes would be required to quantify the net result.

Elko

In the Elko region, prescribed burning was applied in the two older characteristic classes (Cmid-closed and late-open) in order to redistribute stands among characteristic classes. Annual grass invasion was ignored. The prescription was applied to 500 acres per year over the first 1010 years at a cost of $50 per acre, the least expensive application of the three regions. Results were less than satisfactory – while the Dlate-open class was transitioned back to Cmid-closed class, the current "early" class was transitioned largely to "depleted" and "early shrub" (rabbitbrush) classes, where apparently the "tree-encroached" class was also largely transitioned. An increase of 38 percent in uncharacteristic classes from current conditions resulted, including a 24 percent increase in "early shrub", a class deemed unsuitable for priority wildlife. Fifty years of climate change without treatment would have resulted in a better distribution across characteristic classes and only a 14 percent increase in uncharacteristic classes, including only a four percent increase in the "early shrub" class. One positive outcome of treatment was that loss of the BpS to sagebrush conversion was reduced from 18 percent with climate change and no management to 12 percent with management. That most if not all of that six percent salvaged was "parked" in "early shrub" would require an evaluation of the feasibility of restoring the rabbitbrush expression back to functional mountain brush habitat post-2062 to determine if net ecological gain was achieved. Otherwise, the prescription seems risky at best.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
Mojave			
• Prescribed burning and native seeding in tree-encroached shrubland (TE)	11,789	1st 5	150
Calcareous			
• Prescribed burning in third oldest reference class (C)	150	50	50
• Herbicide to control annuals in Shrub-Annual-Grass-Perennial-Grass class (SAP)	40	50	100

Elko			
• Prescribed burning in two older reference classes (C and D)	500	1st 10	50

Mojave Warm Desert and Mixed Desert Scrub

Thermic and Mesic Blackbrush

The herbicide is 40-60 percent successful, but success changes from the first to the second year after application (Dr. Leslie DeFalco, USGS Henderson, NV, personal communication, 2011); therefore, we chose a 50 percent success rate. Herbicide alone was applied to the Shrub-Annual-Grass-Perennial-Grass class to recover late-succession blackbrush. Recovery of the Annual Grass class is the greatest challenge because the success rate of native seedlings is currently very low (one percent). Mojave ecosystem scientists are currently very active in the research of developing new plant material and species combinations with better restoration success rates (Abella et al., 2010); therefore "hypothetical" restoration treatments were proposed that assumed continuation of the current level of success (one percent) for the first 20 years, then, following a 20-year period of research, a 10 percent success rate for the remaining 30 years of the simulation. The newer success rate was dependent on one important assumption that made a great difference: livestock grazing had to be deferred in the new seeded areas, otherwise the seeding failed because of herbivory on young plants. The average annual cost of these treatments was, respectively, $1,530,943 and $1,228,790 for a total of $76,547,162 in mesic blackbrush and $61,439,475 in thermic blackbrush over 50 years.

Management actions reduced ED by 40 percent in mesic blackbrush and by 11 percent in thermic blackbrush. Reduction of ED in thermic blackbrush was more difficult than in mesic blackbrush because succession is much slower at the lower elevations in thermic blackbrush.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
• Spray herbicide to control exotic annuals in blackbrush with an understory of exotic annuals	15,000	50	25
• Spray herbicide to control exotic annuals and seed native species (current seed mix) in annual grassland	10,000	1st 20	100
• Spray herbicide to control exotic annuals and seed native species (new seed mix) in annual grassland	15,000	last 30	150
• Retire livestock grazing in areas seeded with native seed		50	

Creosote Bush-White Bursage

This BpS is more extensive than blackbrush; therefore, implementation rates were also more extensive. The 50-year outcome resulted in ED being reduced by 32 percent for creosote bush-white bursage. The average annual cost of these treatments was $1,535,558 for a total of $76,777,892 in creosote bush-white bursage over the 50 year period.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
• Spray herbicide to control exotic annuals in blackbrush with an understory of exotic annuals	37,000	50	25
• Spray herbicide to control exotic annuals and seed native species (current seed mix) in annual grassland	5,500	1st 20	100
• Spray herbicide to control exotic annuals and seed native species (new seed mix) in annual grassland	37,000	last 30	150
• Retire livestock grazing in areas seeded with native seed		50	

Sagebrush

Big Sagebrush Upland

The following text comes directly from the TNC Report:

> *The Big Sagebrush-upland BpS represents most people's idea of the traditional mountain big sagebrush communities; however, this BpS also includes the upland soils of Wyoming big sagebrush communities and their hybrid zone. The BpS is fairly productive, but experiences high levels of invasion of cheatgrass and encroachment of pinyon and juniper into open shrublands. Moreover, decades of management have homogenized the BpS towards late-succession class dominance and past livestock practices have often depleted the understory of its herbaceous layer. Although the BpS probably deserves restoration in all regions of Nevada, the added effect of climate change was only detected in the Walker region where late-succession classes with pinyon-juniper were over-represented. Mechanical methods of tree removal were simulated as partners expressed local agency resistance to the use of prescribed fire.*

The average annual cost of this treatment in big sagebrush-upland in the Walker region was ~$196,800 for a total of ~$9,838,200 over 50 years. Mastication of trees reduced ecological departure by 16 percent and high risk classes by 14 percent. Mastication caused the early and mid-succession classes to increase and prevented the late-succession class from converting to the tree-encroached class.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
Walker			
• Mastication of late-succession class (E)	275	50	700

Low/Black Sagebrush

Low and black sagebrush are found on harsh soils with shallow root restricting layers. Cheatgrass invasion is usually low to moderate. Pinyon and juniper invasion also occurs slowly, although more rapidly and completely in black sagebrush communities. Given the importance of both low and black sagebrush to Greater Sage-grouse diet and the intolerance of grouse for trees, restoration was focused on tree removal in the Tree-Encroached class (TNC Report).

The average annual cost of the treatment of low/black sagebrush in the Calcareous region was ~$1,208,000 for a total of ~$60,403,700 over 50 years. The tree-encroached class was reduced 11 percent from its predicted level with 50 years of climate change (Appendix G). Other wildlife-unsuitable classes were hardly affected if at all. This seemed a very costly application of resources for such minimal positive result.

In the Walker region, average annual cost was ~$55,300 for a total of ~$2,769,700 over 50 years. The distribution between characteristic classes was improved considerably over current conditions, but not so much over what was predicted to result with 50 years of climate change (Appendix G). Reductions in wildlife-unsuitable classes were more successful – the early shrub (rabbitbrush) class was reduced 15 percentage points from what was predicted to occur with 50 years of climate change. Tree-invaded classes were reduced 10 percentage points from the 50-year climate change prediction. These results coupled with the noticeably more economical price tag of the Walker prescription suggested better cost-return for the conservation action in the Walker region when compared to the Calcareous region.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
Calcareous			
• Chaining and native seeding in Tree-Encroached class	9,300	50	130
• Mastication and native seeding in Tree-Encroached class	1,000	50	350
Walker			
• Chainsaw-lop and seed in Tree-Annual-Grass and Tree-Encroached classes	1,000	50	350

Montane Sagebrush Steppe Mountain

This vegetation community is relatively cost-effective to treat because of its built-in resiliency facilitated by a 14-inch precipitation regime, healthy seed sources, and the general absence of cheatgrass. The management action most often applied is prescribed fire. The average annual cost of treatment in the Calcareous region was ~$222,300 for a total of ~$11,113,000 over 50 years. In the Lahontan region, average annual cost ran ~$330,100 for a total of ~$16,503,600 over 50 years.

In the Calcareous region, prescribed burning redistributed acreage between the three early and mid-successional stages to more closely approximate reference conditions, reduced the percentages of depleted class and early shrub (rabbitbrush) each five percent lower than climate change with no management, but produced little or no significant change in the percentages of annual grass or tree-encroached). Wildlife habitat improvement occurred in some reduction of rabbitbrush-domination, and could also be inferred through the general concept of ecosystem health. Thirteen percent of the type in the early class in 50 years would be temporarily unsuitable to many sagebrush birds and mammals for the next 12 to 15 years, but as explained previously, on a good track for vegetative recovery

In the Lahontan region, treatment produced little effect on the distribution of acres among all classes from what would occur with climate change and no management. Percentages in the early shrub class were reduced five percent but the annual grass class increased five percent for no net effect. These results indicated that a strong case for treatment to improve wildlife habitat could not be made in this region without addressing the source and incidence of annual grass invasion.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
Calcareous			
• Prescribed burning in the three oldest succession classes (C, D, and E)	8,800	50	25
Lahontan			
• Prescribed burning in the three oldest succession classes (C, D, and E)	3,000	50	110

Wyoming Big Sage

From the TNC Report:

> *The Wyoming Big Sagebrush BpS is difficult to restore because the success of any seeding is low at semi-desert elevations (about 50 percent successful without livestock grazing), unless introduced crop species such as crested wheatgrass are used. During simulations with partners, it became clear that large areas of this BpS are very expensive to restore and restoration would accomplish meager ecological returns. The two regions where management simulations were conducted reflect very different approaches to restoration. The Calcareous region is mostly dominated by black sagebrush communities with Wyoming big sagebrush communities found in shallow valleys or at the toe of non-carbonate mountain ranges; therefore, management in semi-desert Wyoming big sagebrush is often conducted for small wildlife projects where the primary goal is to remove trees. In contrast, the Wyoming Big Sagebrush BpS is the dominant matrix community in the Elko region; therefore, restoration is at large scale.*

The average annual cost of Wyoming big sagebrush treatment in the Calcareous region was ~$22,000 for a total of ~$1,101,900 over 50 years. As a result of the treatment, the model predicted that annual grass and shrub-annual grass increased because of the failure rate of re-seeding, thus rendering this treatment suspect for improving or maintaining long term wildlife-suitable habitat; however, removal of trees achieved it's short term goal..

The average annual cost of Wyoming big sagebrush treatment in the Elko region was ~$154,100 for a total of ~$7,705,200 over 50 years. The treatment essentially shifted half the acres from the shrub-annual grass class to annual grass and tree-annual grass classes – both decidedly inferior to the already impacted shrub-annual grass class with respect to wildlife habitat suitability, thus this expenditure of resources did not seem particularly fruitful.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
Calcareous			
• Chainsaw lopping of pinyon and juniper in the tree-encroached and cheatgrass invaded class (TA) for wildlife value	450	50	50

Elko			
• Mechanically thin dense sagebrush cover, spray herbicide to control cheatgrass, and seed native species in the Shrub-Annual-Grass class	3,000	1st 20	130

Sierra Coniferous Forests and Woodlands

A multi-tiered prescription was developed for Jeffrey pine involving prescribed burning, mastication of young conifers, prescriptive sheep grazing in annual grass classes, pre-commercial thinning of young conifers, and commercial thinning of mid-succession closed stands. For mixed conifer, treatment was limited to thinning, pile burning, and prescribed burning in closed classes. An annual cost of $272,000 for the Jeffrey pine prescription projected out to $13.5 million spent over 50 years, while the mixed conifer prescription cost $16,700 per year for a total of $836,000 over 50 years. Despite the amount of money spent reducing closed-canopy classes, conditions improved only very slightly in both BpS's (four percent decrease in ecological departure). The prescriptive grazing did have a positive impact in the annual-grass-invaded classes of Jeffrey pine, decreasing them by 13 percent after 50 years. This reduction was probably most valuable in providing a somewhat reciprocal increase in fire management options and capability. The main reason for these small gains is that the area treated is small due to severe regulatory limitations placed on the use of mechanical methods and access to areas needing restoration.

The Northern Sierra Report recommended applying prescribed fire to dry lodgepole pine stands to prevent predominant late-open classes from progressing on toward late-closed and redistribute stands more heavily in early and mid-successional stages. The report predicted that an intensive prescribed burning program (called "maximum management" in the report) applied in the first 20 years would effectively return the dry lodgepole BpS to reference conditions and a natural resiliency that might preclude further treatment over the last 30 years. The average annual cost for the most effective treatment (maximum management) was $6.60 per acre, so if 290 acres of the dry lodgepole pine type exists in Nevada (TNC 2011), the average annual cost would be approximately $1900 for a total cost of $38,000 over the 20-year treatment period. On the other hand, if there really are less than 300 acres of this type existing in Nevada, an evaluation of the priority need to act as well as the predicted responses of wildlife to the treatment would be in order as the need to treat at such a small scale without specific high-priority wildlife objectives might not be sufficient to warrant the effort and expense.

Strategy	Rate (acres/yr)	Years of Application	Cost ($/acre)
Jeffrey Pine			
• Prescribed burning in mid-succession closed class (B)	30	50	650
• Masticate young conifers in early succession class (A)	50	50	300
• Prescriptive livestock (mostly sheep) grazing in Annual Grassland and Tree-Annual-Grass classes (AG and TA)	1000	50	10
• Pre-commercial thinning of young conifers in early succession class (A)	250	50	750
• Commercial thinning of mid-succession closed class (B)	55	50	750
Mixed Conifer			
• Thinning, pile burning, and prescribed burning in closed classes (B and E)	10	50	2000