

May 1993

SPRING BURNING BY HABITAT TYPE
in relation to artificial reforestation
PAYETTE NATIONAL FOREST

"Are there habitat types on the Payette NF that can be spring burned, planted the following spring, and still meet site preparation objectives where competition for moisture, due to shrubs and grasses, will not adversely affect survival and growth of planting seedlings?"

In response to the above question, Steve Donnelly, Council District Silviculturist, developed guidelines for the Payette NF on habitat types that could be spring burned, habitat types that are marginal for spring burning, and those habitat types that should not be spring burned if reforestation objectives are to be met. The document was reviewed by various personnel on the Forest familiar with vegetation response following burning, plus Ron Hamilton, Regional Geneticist and Bob Steele, Research Ecologist. Supporting documentation on shrub and grass response is included.

The main objective is to prevent adverse affects of moisture competition by shrubs and grasses on growth and survival of planted seedlings.

QUESTION? Are there habitat types on the Payette NF that can be spring burned and planted the following spring and still meet site preparation objectives where the competition for moisture due to shrubs and grasses will not adversely affect survival and growth of planted seedlings?

Habitat types that could possibly be spring burned and planted the following year: hot spring burn necessary.

PSME/OSCH	DF - Mountain sweet root (sweet cicely)
ABLA/VASC	AF - Grouse whortleberry
ABLA/VAGL	AF - Blue huckleberry
PIPO/SYAL	PP - Common snowberry
ABGR/LIBO	GF - Twinflower

(Concern is the amount of pinegrass, elk sedge in these types)

Habitat types that are very marginal for spring burning and planting the following year: Hot spring burn necessary.

ABGR VAGL	GF - Blue huckleberry
ABGR ACGL/PHMA	GF - Mountain maple ninebark phase
ABGR SPBE	GF - White spirea (with pinegrass)
ABLA STAM	AF - Twisted stalk
ABLA/XETE	AF - Beargrass
PSME SPBE	DF - White spirea
ABLA VACA	AF - Dwarf huckleberry
PSME SYAL	DF - Common snowberry

Habitat types where spring burning and planting the following year should NOT be allowed:

PSME PHMA/CARU	DF - Ninebark - pine grass phase
PSME CABE	DF - Elk sedge
PSME PHMA	DF - Ninebark
PSME CARU	DF - Pinegrass
ABGR VACA	GF - Dwarf huckleberry
ABLA CARU	AF - Pinegrass
ABGR CARU	GF - Pinegrass
ABLA CACA	AF - Bluejoint
ABLA CAGE	AF - Elk sedge
ABGR ACGL	GF - Mtn maple
ABGR CLUN	GF - Clintonia
ABLA CLUN	AF - Clintonia
ABLA MEFE	AF - Menziesia

NOTE: Spring burning on north slopes does not meet site preparation objective if planting is planned for the following year.

Areas previously harvested with good shrub response pose a problem with species response & increased competition.

PLANT RESPONSE - BURN SEVERITY

Plant and shrub species can be favored by burning prescriptions. The response will be on a severity gradient. Example: Acgl has the greatest response with a light severity burn - the least with a burn of high severity. The Ceve response from seed has a reversed behavior.

BURN SEVERITY

Light Moderate High

Acgl (mtn. maple) : sprouts	Ceve (snow brush) : seed
Sasc (Scouler's willow) : sprouts	Sasc (Scouler's willow) : sprout & seed
Alsi (Sitka alder) : sprouts	Alsi (Sitka alder) : seeds
Phma (ninebark) : sprouts	Potr (aspen) : suckers/sprouts
Epan (fire weed) : sprouts & seeds	Epan (fireweed) : seeds
Hodi (oceanspray) : sprouts & seeds	Shca (buffaloberry) : seeds
Shca (buffaloberry) : sprouts & seeds	
Prvi (chokecherry) : sprouts	
Prem (bittercherry) : sprouts	
Caca (bluejoint reedgrass) : sprouts	
Caru (pine grass) : rhizomes	
Rupa (thimbleberry) : rhizomes & seeds	
Spbe (spirea) : sprouts & rhizomes	
Syal (common snowberry) : sprouts & rhizomes	
Vagl (blue huckleberry) : rhizomes	
Vasi (sitka valerian) : rhizomes	
Cage (elk sedge) : rhizomes	
Xete (bear grass) : rhizomes & seed	

THE COMPETITIVE UNDERSTORY SPECIES - EXPECTED COMPETITION FACTORS AND HEIGHT GROWTH.


Acgl :	Moderate growth loss, mortality only with shade intolerant conifers and mechanical damage to all conifers. MOUNTAIN MAPLE height growth = 4 ft. to 5 ft. in 3 years.
Alsi :	Shade, physical, snow and rodent damage. (PP,ES,LP,DF,WL). ALDER height growth = 1ft. to 6ft. in 3 years depending on elevation.
Phma :	Moisture stress and light competition. (PP,DF,WL). NINEBARK height growth = 1ft. to 3ft. in 3 years.
Hodi :	Moisture stress and light competition. (PP,DF,WL). OCEANSPRAY height growth = 2ft. to 4ft. in 3 years.
Prem/Prvi :	Dense thickets, light competition, moisture stress, snow damage to conifers. (possible allelopathy) CHERRY height growth = 2ft. to 4 ft. in 3 years.
Caca :	Moisture stress through root competition, shade, snow crush and smothering to seedlings (DF,ES,LP). Although BLUEJOINT REEDGRASS is found in moist habitat types it effectively ties up the available moisture with a dense fibrous root system.

- Caru : Survival and growth are directly related to PINEGRASS coverage. Seedlings established either with the grass or later will grow poorly. (DF PP LP WL)
- Cage : Moisture stress is the primary competition factor associated with ELKSEDGE. Early mortality of DF and LP seedlings and slow growth on larger LP can be expected.
- Rupa : Primarily competition for light and moisture. Early mortality to conifers is a result of snow crush and smothering from the large leaf and stem biomass. THIMBLEBERRY height growth = 1ft. to 2ft.+ in 3 years.
- Syal/ Spbe : Prompt (first year) planting. Moisture stress short term. SNOWBERRY & SPIREA growth 1.0 ft.
- Vagl : If trees are planted in the first year then moisture stress is short term. BLUE HUCKLEBERRY height growth 1.0 ft.
- Vasi : Reduced light, moisture stress are the competition factors. An added mortality factor for primarily small ES and LP is crushing by the collapse of the stem biomass of the VALERIAN. Height 1ft. to 3 ft.+ in a year.
- Ceve : If trees not planted immediately after fire or mechanical disturbance, moisture stress and snow damage to shade intolerant conifers is an expected result. CEANOTHUS height growth = 3ft. to 5ft. in 3 years. Although CEVE contributes Nitrogen at low densities the moisture competition factor outweighs the benefit at higher densities. CEANOTHUS in low (sparse) density situations can have another benefit by providing partial shading for species.
- Sasc : Moisture stress, growth suppression, mortality from snow and rodent damage. (DF, PP, LP,WL) WILLOW height growth = 3ft to 5ft. in 3 years.
- Potr : Moisture from root competition and mechanical damage to crowns of conifers. A cool burn reduces coverage of ASPEN and favors conifers. ASPEN height growth = 3ft. to 7ft. in 3 years.
- Epan : Cover density increase with burn intensity. Greatest damage from FIREWEED occurs on moister sites. Light and snow crush damage causes mortality early (esp. ES,WL,and DF).
- Xete : Moisture and growth competition (LP,DF). Each BEARGRASS plant occupies extensive underground surface area.
- Shca : Early moisture, growth and light competition. Although a Nitrogen fixer, it is an aggressive competitor at higher densities. BUFFALOBERRY height growth = 3ft. to 5ft. in 3 years.

REPRODUCTIVE METHODS AND EXPECTED RESPONSE OVER EXISTING COVERAGES IN PARENTHESIS:

Plant response to fire can be tied to % duff removed because of a plant's root or rhizome depth, seed dispersal and seed storage method. Fire effects are measured in terms of intensity and severity. Fire intensity is in terms of temperature and duration (fuels, fuel concentrations, moisture relations in duff, litter and soil etc.). Fire severity is more in line with plant response and is used in the following discussion of individual species.

- Acgl : With a light severity burn the MOUNTAIN MAPLE resprout response can be (4x) greater than the existing coverage. With a moderate to a high severity burn root crown resprout is reduced and seed is the primary recovery method at a slower rate.
- Alsi : SITKA ALDER responds to a light to moderate severity burn by root crown sprouting and seeding (4X). On moderate to high severity burns alder recovery is slow and primarily by seed.
- Phma & Hodi : NINEBARK & OCEANSPRAY respond to a light burn by root crown and rhizome sprout (10 to 30x) with a temporary slight decrease immediately after a burn. Coverage reduction is a function of the percent root crown and rhizome kill which equates to a moderate to a high fire severity. This is dependent on depth of heating of mineral soil.
- Prem & Prvi : BITTER & CHOKE CHERRY respond by sprout from root crown, rhizomes, and seed response after light to moderate severity burn (3 to 7X).
- Caca : WITH BLUEJOINT REEDGRASS an increase can be expected by rhizomes, sprout, and seed. Fire severity does not appear to affect density, and responses are greatest on the moister sites (4x).
- Caru : With PINEGRASS a light to moderately severe fire is favorable to sprout and seed (4 to 5x). Severe duff reduction produces short term losses but results in a strong second year response of heavy flowering. Spot application of herbicides can be effective with hand scalp.
- Cage : A light to moderate severity burn will increase existing coverage (2X) in ELKSEDGE. Spot application of herbicide effective with hand scalp to remove competition.(36"x36" scalp)
- Rupa : Fire of a light severity increases the coverage of THIMBLEBERRY by resprout from rhizomes and root crowns (5x). A fire of moderate to high severity appears to reduce existing coverage but triggers seed germination.
- Syal & Spbe : A burn of light to moderate severity in SNOWBERRY & SPIREA increases coverage by root resprout and rhizomes(10x)
- Vagl : A light severity burn in HUCKELBERRY results in heavy resprout from rhizomes (2 to 4x). Moderate to high reduction of coverage can occur with a moderate to high severity burn.

- Vasi : For VALERIAN a light to moderate burn severity results in rhizome resprout.(2x+)
- Ceve : With CEANOTHUS the stored seed response has a direct relation to fire severity - even to the high severity classification (100x). It will sprout from the root crown on light severity / intensity fires.
- Sasc : A light to moderate burn severity in WILLOW results in root crown resprout and airborne seeding (10x). A moderate to high severity burn resprout is reduced with depth of kill. Reseeding does occur.
- Potr :  A high severity fire in ASPEN increases resprout and stem densities. Light to moderate severity burns can be used to thin aspen and increase conifer coverage. Suckers increase with fire intensity to a degree. They will prolifically resprout after a severe burn, but the sprouts will soon die back to a stable density (h=100X;low -%).
- Epan : Airborne seed colonization followed by vegetative expansion (buds on old stem) is the norm for FIREWEED (100X). The more intense the burn, the more response from seed. Rhizomes respond to low fire severities and intensities.
- Xete : A light severity burn in BEARGRASS results in an increase in vigor of the existing plants. There is a sprout response from surface rhizomes with no duff reduction.
- Shca : Light to moderately severe fires: sprouts arise from crown and root buds (2x). BUFFALOBERRY is a major competitor primarily in stands that have been harvested with multiple entries. The lower layer of duff needs to be consumed to reduce existing coverages.

RESPONSE to MECHANICAL DISTURBANCE

Acgl : Severe disturbance to the root crown reduces the abundance of MOUNTAIN MAPLE; however, seeding does occur on bare ground in partial shade.

Alsi : ALDER can resprout aggressively from the root crown. A treatment combination consisting of uprooting and herbicide treatment is effective. Seeding can be reduced but it is dependent on the amount of mineral soil exposed. An increase can be expected the more mineral soil exposed.

Phma & Hodi : NINEBARK and OCEANSPRAY will root sprout from a moderate soil depth.

Prvi/Prem : CHOKE and BITTER CHERRY will increase in root crown sprouts.

Caca : 2-3 years after scarification, BLUEJOINT REEDGRASS becomes a serious competitor due to a very aggressive rhizome response. Other wet site associated sedges can also proliferate (36"x36"hand scalp).

Caru : 36"x36" hand scalp to remove PINEGRASS sod/roots will reduce coverage for two years. Rhizomes must be killed to reduce competition.

Cage : ELKSEDGE coverage increases coverage with light scarification.

Rupa : THIMBLEBERRY in 2-3 yrs. has a total recovery by vigorous resprout.

Syal & Spbe : With light to moderate soil disturbance SNOWBERRY and SPIREA, resprouting will return species coverage to previous levels in a year.

Vagl : 2-5 year control on BLUE HUCKLEBERRY when the plants are uprooted.

Vasi : 1-2 years VALERIAN will return to pretreat size.

Ceve : CEANOTHUS responds with a scattered low percent cover - unless burned or on a hot south exposure.

Sasc : WILLOW can regenerate in disturbed areas by seeds, roots, broken stems and branches.

Potr : Scarification will increase suckering of ASPEN. Extensive cultivation is required for complete control.

Epan : Seeds to mineral soil. FIREWEED does not compete well with established species.

Xete : BEARGRASS is reduced by the intensity of disturbance.

Shca : An increase in the coverage of BUFFALOBERRY can be expected. It is dependent on the intensity of disturbance.

HABITAT TYPES CONTAINING TREE SEEDLING COMPETITORS
 (A GENERAL LIST OF EXISTING SPECIES FROM LOW TO HEAVY COVERAGE)

ACGL (mountain maple)

COMPETITION FACTORS (MOISTURE - 1-2 YEARS, SNOW DAMAGE 1-12 YEARS)

LOW	MODERATE	HIGH
PSME CAGE(elksedge)	PSME SYAL(c.snowbery)	ABGR SPBE(spirea)
PSME CARU(pine grass)	PSME PHMA(ninebark)	ABGR
		ACGL/ACGL(mtn.maple)
PSME SPBE(spirea)	ABGR VAGL	ABGR ACGL/PHMA
ABLA VAGL(bluehuckleberry)	ABGR LIBO(twinflower)	ABGR CLUN(clintonia)
	ABGR VACA(dwarfhuckleberry)	

ALSI (Sitka alder)

COMPETITION FACTORS : LIGHT, MOISTURE, SNOW , AND ANIMAL DAMAGE 1-12+ YEARS. CAN BE VEGETATION CONTROL PROBLEM.

LOW	MODERATE	HIGH
ABGR ACGL	ABGR CLUN	ABLA MEFE(menziesia)
ABGR VAGL	ABLA CLUN	
ABGR LIBO		
ABLA STAM(twistedstalk)		
ABLA CACA(bluejoint reedgrass)		

PHMA (ninebark)

COMPETITION FACTORS : LIGHT(EARLY), MOISTURE (EARLY), AND ANIMAL DAMAGE 1-7 YEARS.

LOW	MODERATE	HIGH
PIPO SYAL	ABGR ACGL	PSME PHMA
PSME CARU	ABGR CLUN	ABGR ACGL/PHMA
PSME SPBE		
PSME SYAL		
ABGR VAGL		
ABGR LIBO		
ABGR VACA		
ABLA VAGL		

PRVI/PREM (chokecherry)/(bittercherry)

COMPETITION FACTORS : LIGHT, MOISTURE, SNOW AND ANIMAL DAMAGE 1-12 YEARS
VEGETATION CONTROL NEEDED IN SOME OLDER PLANTATIONS.

LOW	MODERATE	HIGH
PIPO SYAL	PSME CAGE	PSME OSCH(sweet cicely)
ABGR SPBE	PSME CARU	PSME PHMA
ABGR ACGL	PSME SPBE	
ABGR ACGL/PHMA	PSME SYAL	

CACA (bluejoint reedgrass)

COMPETITION FACTORS : MOISTURE, LIGHT, EARLY MORTALITY FROM SNOW CRUSH. 36" X 36"+ HAND SCALP AN AID IN TREE ESTABLISHMENT. DAMAGE 1-3 YEARS.

LOW	MODERATE	HIGH
ABLA XETE(beargrass)	ABLA STAM	ABLA CACA
ABLA STAM	ABLA VACA	
ABLA LUHI(woodrush)	ABLA CARU	

CARU (pine grass)

COMPETITION FACTORS : MOISTURE. MORTALITY CAN BE EXPECTED UNLESS COVERAGE REDUCED 50%. (36" X 36" SCALP TWO YEAR AID FOR TREE ESTABLISHMENT). HERBICIDE SPOT APPLICATION USEFUL. EARLY MORTALITY 1-3 YEARS.

LOW	MODERATE	HIGH
PSME OSCH	PIPO SYAL	PSME CARU
PSME CAGE	PSME SPBE	PSME SYAL
PSME PHMA	PSME PHMA	PSME PHMA/CARU
ABGR ACGL	ABGR SPBE	ABGR CARU
ABGR CLUN	ABGR ACGL/PHMA	ABGR VACA
ABGR VAGL	ABGR LIBO	ABLA VACA
ABLA CACA	ABLA XETE	ABLA CARU
ABLA CLUN	ABLA VAGL	
ABLA MEFE	ABLA VASC(grouse whortleberry)	
ABLA CAGE		

CAGE (elk sedge)

COMPETITION FACTOR : MOISTURE. MORTALITY CAN BE EXPECTED. (36" X 36"+ SCALP 2 YEAR AID FOR TREE ESTABLISHMENT). HERBICIDE WITH SCALP. DAMAGE 1-5 YEARS.

LOW	MODERATE	HIGH
PSME CARU	PIPO SYAL	PSME CAGE
ABGR CARU	PSME OSCH	PSME SPBE
ABGR SPBE	PSME SYAL	ABGR VACA
ABGR ACGL	PSME PHMA	ABLA CAGE
ABGR ACGL/PHMA	ABLA CARU	
ABGR CLUN	ABLA VASC	
ABGR VAGL	ABLA VACA	
ABGR LIBO	ABLA XETE	
ABLA CLUN	ABLA VAGL	
ABLA MEFE		

RUPA (thimbleberry)

COMPETITION FACTORS : LIGHT, SNOW, AND ANIMAL. DAMAGE 1-5 YEARS. AREA SIZE USUALLY SMALL, EXCEPT IN PREVIOUSLY LOGGED AREAS.

LOW	MODERATE	HIGH
PSME PHMA	ABGR ACGL	
ABGR CARU	ABGR ACGL/PHMA	
ABGR SPBE	ABGR CLUN	
ABGR VAGL	ABLA CLUN	
ABGR LIBO	ABLA VAGL	
ABLA STAM		
ABLA MEFE		

SHCA (Buffaloberry)

COMPETITION FACTORS : MOISTURE,AND LIGHT. DAMAGE 1-3 YEARS. PARTIAL CUT UNITS APPEAR TO ALLOW HIGHER COVERAGES TO BECOME ESTABLISHED.

LOW	MODERATE	HIGH
ABGR VACA	ABLA MEFE	
ABGR CLUN		
ABLA CACA		
ABLA VAGL		
ABLA LIBO		
ABLA VACA		
PSME SPBE		
PSME CARU		

SYAL (common snowberry)

COMPETITION FACTOR : MOISTURE 1-2 YEARS. WITH FIRST SEASON PLANTING IT IS A RELATIVELY MINOR COMPETITOR.

LOW	MODERATE	HIGH
PSME CAGE ABGR CARU ABGR CLUN ABGR LIBO ABGR VACA	PSME PHMA ABGR SPBE ABGR ACGL ABGR ACGL/PHMA	PIPO SYAL PSME SYAL

SPBE (white spirea)

COMPETITION FACTOR : MOISTURE 1-2 YEARS. PLANT FIRST SEASON MINOR COMPETITOR.

LOW	MODERATE	HIGH
PSME CAGE PSME CARU PSME SYAL ABGR CARU ABGR VAGL ABGR LIBO ABLA VASC ABLA VACA	ABGR CLUN ABGR VACA ABGR ACGL/ACGL ABGR ACGL/PHMA	PIPO SYAL PSME SPBE ABGR SPBE

VAGL (blue huckleberry)

COMPETITION FACTOR : MOISTURE 1-2 YEARS. PLANT FIRST SEASON. IT'S ASSOCIATES SALIX, ETC, ARE OF MORE CONCERN.

LOW	MODERATE	HIGH
PSME SYAL ABGR CARU ABGR SPBE ABLA CACA ABLA VASC	PSME PHMA ABGR ACGL ABGR ACGL/PHMA ABGR LIBO ABLA STAM ABLA XETE	ABGR VAGL ABGR CLUN ABLA CLUN ABLA MEFE ABLA VACA ABLA VAGL

VASI (sitka valerian)

COMPETITION FACTORS : MOISTURE, LIGHT AND SNOW CRUSH. DAMAGE 1-2 YEARS.
(MORTALITY- SNOW CRUSH)

LOW	MODERATE	HIGH
PSME CAGE		
PSME OSCH		
PSME PHMA		
ABGR HT'S		
ABLA HT'S		

CEVE (snow brush)

COMPETITION FACTORS : MOISTURE, LIGHT, SNOW, ANIMAL. DAMAGE 1-7 YEARS.
(MORTALITY TO CONIFERS IF OVERTOPPING.) WITH PROMPT PLANTING THE CONIFERS CAN
SUCCESSFULLY COMPETE. A DELAY RESULTS IN HIGH MORTALITY. BACKLOG AREAS
DEMAND BRUSH CONTROL FOR SUCCESSFUL REFORESTATION.

LOW	MODERATE	HIGH
PIPO SYAL	PSME CARU	
PSME CAGE	PSME SPBE	
PSME SYAL	PSME PHMA	
ABGR CARU	ABGR SPBE	
ABGR ACGL	ABGR ACGL/PHMA	
ABGR VAGL	ABGR LIBO	

SASC (Scouler's willow)

COMPETITION FACTOR : MOISTURE, LIGHT, SNOW, AND ANIMAL. DAMAGE 1-12 YEARS
VEGETATION CONTROL PROBABLE. BACKLOG AND SOME OLDER PLANTATIONS IN NEED OF
HERBICIDE, MANUAL OR MECHANICAL RELEASE.

LOW	MODERATE	HIGH
PIPO SYAL	PSME SPBE	ABGR ACGL/PHMA.
PSME CARU	ABGR SPBE	
PSME SYAL	ABGR CARU	
PSME PHMA	ABGR ACGL	
ABGR LIBO	ABGR CLUN	
ABLA CACA	ABGR VAGL	
ABLA XETE	ABLA CACA	
ABLA VASC	ABLA VAGL	

POTR (aspen)

COMPETITION FACTOR : LIGHT, MOISTURE, SNOW, AND ANIMAL. DAMAGE 1-INDEFINITE YEARS. VEGETATION CONTROL PROBABLE BUT LIMITED IN AREA.

LOW	MODERATE	HIGH
PSME CAGE	PIPO SYAL	
PSME CARU	ABGR SPBE	
PSME SPBE	ABGR VACA	
PSME SYAL	ABLA VAGL	
ABGR ACGL	ABLA CAGE	
ABGR VAGL	ABLA CARU	

EPAN (fireweed)

COMPETITION FACTORS : MOISTURE AND SNOW. DAMAGE 1-2 YEARS. (MORTALITY FROM SNOW CRUSH) ESPECIALLY WITH SMALL SEEDLING STOCK. VEGETATION CONTROL 36"+ X 36"+ SCALP.

LOW	MODERATE	HIGH
PSME HT'S.		
ABGR HT'S.		
	NOTE: THE MOISTER THE HABITAT TYPES, THE HIGHER THE RE- SPONSE	
ABLA HT'S.		

XETE (beargrass)

COMPETITION FACTOR : MOISTURE 1-5 YEARS (MORTALITY EARLY) VEGETATION CONTROL 36"+ X 36"+ SCALP.

LOW	MODERATE	HIGH
ABLA MEFE	ABLA CACA	ABLA VACA ABLA XETE

HABITAT TYPES WITH A TALL SHRUB LAYER COVERAGE (MODERATE or GREATER)
SUPPORTING 3+ OF FOLLOWING SPECIES.
(ACGL, ALSI, PREM, PRVI, SASC, POTR)

PIPO	PSME	ABGR	ABLA
	Phma Osch	Spbe Acgl/Acgl Acgl/Phma Clun	Clun Mefe

HABITAT TYPES WITH A TALL SHRUB LAYER COVERAGE
SUPPORTING 1 OR 2 OF THE FOLLOWING SPECIES
(ACGL, ALSI, PREM, PRVI, SASC, POTR)

PIPO	PSME	ABGR	ABLA
Spbe	Vagl Syal	Vagl Vaca	

HABITAT TYPES SUPPORTING THE FOLLOWING SPECIES (MODERATE TO HIGH COVERAGE)
(PHMA, VAGL, SYAL, RUPA, HODI)

PIPO	PSME	ABGR	ABLA
Syal	Phma Syal	Acgl Acgl/Phma Clun Vagl	Clun Mefe Vaca Vagl

HABITAT TYPES SUPPORTING.

CEVE

PIPO	PSME	ABGR	ABLA
Syal Syal Caru Spbe Phma	Cage Acgl Vagl Spbe Acgl/Phma Libo	Caru	

HABITAT TYPES SUPPORTING THESE SOD FORMERS
(CACA, CARU, CAGE)

PIPO	PSME	ABGR	ABLA
Syal	Caru Syal Phma/Caru Cage Spbe	Caru Vaca Spbe	Vaca Caru Cage Caca Vagl Xete Vasc Stam

VASI,EPAN : 1. THE MOISTER THE HABITAT TYPE THE GREATER THE RESPONSE. 2. THE ABIES LASIOCARPA SERIES HAS THE GREATEST RESPONSE FOR EPAN COVERAGE ON HOT BURNS. 3.VASI RESPONSE IS GREATEST ON LIGHT TO MODERATE BURNS.

HABITAT TYPES IN ORDER OF WOODY SPROUT RESPONSE. MOISTURE AND LIGHT ARE TREE COMPETITORS FOR SURVIVAL AND GROWTH. ANIMALS (RODENTS ESP. MICE AND HARES) ALSO CAUSE MORTALITY AND GROWTH LOSS AND POPULATIONS RESPOND WITH INCREASING BRUSH COVER. COMBINE THE FORMER MENTIONED COMPETITORS, SPROUT RESPONSE AND SNOW CRUSH DAMAGE WITH A TIME DELAY AND THE PLANTED TREE WILL NOT HAVE THE ADVANTAGE IN IT'S RACE FOR SURVIVAL. THESE HABITATS ARE A GENERAL RANKING OF COMPETITIVE CAPABILITIES. TO FURTHER COMPLICATE MATTERS MANY OF THE BRUSH SPECIES: 1. HAVE A HIGH TOLERANCE TO REGISTERED HERBICIDES, MUCH HIGHER THAN THAT OF THE CONIFERS.

2. THE COOLER THE BURN THE GREATER THE SPROUT RESPONSE AND THE LESS DAMAGE TO EXISTING BRUSH COMPETITORS. IMMEDIATE REFORESTATION IS THE KEY TO THE BRUSH COMPETITION - A DELAY IS AN INEVITABLE, COSTLY FAILURE. (REPLANT)

- | | | |
|------------------|--------------|--------------|
| 1 ABGR CLUN | 10 ABGR LIBO | 19 ABLA VACA |
| 2 ABGR ACGL | 11 ABGR VACA | 20 PSME OSCH |
| 3 ABGR ACGL/PHMA | 12 PSME SPBE | 21 PSME CAGE |
| 4 PSME PHMA | 13 ABLA MEFE | 22 PSME CARU |
| 5 ABGR SPBE | 14 PIPO SYAL | 23 ABLA CAGE |
| 6 ABLA VAGL | 15 ABGR CARU | 24 ABLA CARU |
| 7 ABGR VAGL | 16 ABLA STAM | |
| 8 PSME SYAL | 17 ABLA CACA | |
| 9 ABLA CLUN | 18 ABLA XETE | |

THE MAJOR CAUSE OF EARLY TREE MORTALITY IN OUR AREA IS MOISTURE STRESS. THE FOLLOWING IS A GENERAL RANKING IN SOD FORMING CAPABILITY BY HABITAT TYPE. TREE SURVIVAL CAN BE DIRECTLY RELATED TO SOD COVERAGE. WHEN USING FIRE TO RETREAT A SITE FOR ARTIFICIAL OR NATURAL REGENERATION DAMAGE TO THE ROOT SYSTEMS OF THE SOD FORMERS IS A NECESSITY (HOTTER BURN).

- | | |
|------------------|-------------------|
| 1 ABLA CACA | 12 ABLA STAM |
| 2 ABGR CARU | 13 ABGR SPBE |
| 3 ABLA CARU | 14 ABGR ACGL/PHMA |
| 4 PSME PHMA/CARU | 15 ABGR LIBO |
| 5 PSME CARU | 16 PSME PHMA |
| 6 PSME CAGE | 17 ABLA XETE |
| 7 PSME SYAL | 18 PIPO SYAL |
| 8 ABGR VACA | 19 ABLA VAGL |
| 9 ABLA VACA | 20 ABLA VASC |
| 10 ABLA CAGE | 21 PSME OSCH |
| 11 PSME SPBE | |

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GLOSSARY OF TERMS

ALLELOPATHY : The influence of plants, other than microorganisms, upon each other, arising from the products of their metabolism.

COMPETITION FACTORS

ANIMAL : Primarily rodents. This damage, or in many instances mortality factor a compounding affect of other damaging or competitive factors. **EXAMPLE :** SNOW CRUSH places stems on the ground surface; mortality / girdling can be expected from gophers.

LIGHT : This factor refers to shading. A conifer competes for available light for survival and growth. The rapid height growth of many of the species discussed can outdo the early height growth of conifers. The result can be a further reduction in conifer growth predisposing them to damage or mortality from snow, animals or mechanical from the established competitors.

MOISTURE: The most obvious are the sod formers, however the sprouters can under the right conditions can be just as formidable. Available moisture competition is one of the highest contributing factors to early mortality in the natural and planted conifers.

SNOW CRUSH : This factor pertains primarily to the role snow plays as a weight. It combines with the other competition factors to further their damaging affects.

FIRE

INTENSITY

LIGHT : Surface temperature @ <350 F. Debris is partially consumed, and larger material charred. Litter partly cons, partly charred. Soil no apparent color change.

MODERATE : Surface temperatures 350 to 930 F. Debris most of it is consumed, large material deep char. Litter most of it is consumed. Soil surface covered with gray ash, no soil color change.

HIGH : Surface temperatures > 590 F. plus. Debris is consumed. Litter is consumed. Mineral soil color red or gray.

SEVERITY

LIGHT : Chars the surface of the litter. High mortality to species with reproductive parts near the surface. It has no affect on deep rooted species.

MODERATE : The fine and small diameter dead fuels are consumed. High consumption and mortality to plants with root systems found in the litter and top duff layer. Sprouting occurs from the deep duff or soil layers.

HIGH : This consumes most of the duff layer and a portion of the large woody debris. Significant soil heating can occur in areas of fuel concentrations. Sprouting occurs from deep buried plant roots and rhizomes.

SPECIES COVERAGE : Based on plant species constancy tables from Forest Habitat Types of Central Idaho.

- LOW :** This category is a weighted relative value between constancy and frequency values. It contains plant species with constancy values of less than 25% and low per cent canopy coverages.
- MODERATE :** This category contain the plant species with constancy values in the 25 % to 45 % range and canopy coverages of 10 to 20 %.
- HIGH :** This category contains the plant species with the constancy values in excess of 45% and canopy coverages 20% and greater.
- SPROUT :** A shoot arising from a woody plant from the base or a sucker.
- SUCKER :** A shoot arising from below ground level, either from a rhizome or a root.