APPENDIX F
EFFECTIVENESS OF TREATMENTS BY SPECIES

TREATMENT EFFECTIVENESS GUIDE – INTEGRATED PEST MANAGEMENT[1]

MANAGEMENT METHODS: A person can use more than one method to manage noxious weeds. To control, reduce or eliminate noxious weeds use one or more of the following management practices. Only a few select weed species are represented in this guide. Table F – 1 outlines a quick guide to treatment effectiveness and Table F – 2 outlines species-specific response to various herbicides. More detailed effectiveness discussion is found in Appendix I. Tables F – 3 through F - 6 outlines shrub and tree treatment effectiveness/susceptibility by treatment type and herbicide.

Control Method	Leafy Spurge	Spotted Knapweed	Sulfur cinquefoil	Whitetop	Dalmatian Toadflax	Russian Knapweed	St. Johnswort	Canada Thistle	Hounds tongue	Salt Cedar
Cut/Mow	N; Ineffective, increases density	ME; Reduces seed; will not kill plant	N; Ineffective	N; Ineffective	N; ineffective	N; ineffective	N; ineffective	N; generally ineffective	ME; moderately effective	ME; Suckers From Stump E; Saplings only
Hand Pull	ME; only on small sites	E; only on small sites	ME; only on small young sites	ME; only on small young sites	ME; only on small young sites	ME; only on small young sites	E; only on small sites	N; Too spiny for hand pulling	N; ineffective	E; Saplings Only
Burn	N; ineffective, may increase density	N; ineffective, only use as spray pretreat	N; ineffective, may increase density	N; Ineffective, may increase density	N; ineffective, may increase density	N; Ineffective, may increase density	N; ineffective	N; ineffective	N; ineffective	N; ineffective
Herbicide[3]	E; can reduce and keep in check	E; very effective	E; very effective	E; very effective	E; can reduce weed and keep in check	E; very effective	ME; moderately effective; must be persistent	E; effective	E; effective on first year rosette; up to 6-10" tall regrowth	E; consistency important
Biological control	E; 5-10 years to establish; some effect on some sites	ME; Isolated effects; marginal long term	N; not available	N; not available	ME; effective on some sites	N; not available	ME; cyclical, effective on some sites	N; not effective	N; not available	ME; Available for some sites
Reseeding	E; effective as follow-up treatment	E; effective as follow-up treatment	E ;effective as follow-up treatment	N; Not Available	ME; limited effectiveness on marginal	N; Not Available	ME; limited effectiveness	ME; effective as follow-up treatment	E; effective as follow-up treatment	N; Not Available
Grazing	ME; suppressed by sheep and goats only	ME; sheep and goats keep weed in check	N; ineffective	ME; generally ineffective	N; ineffective	N; ineffective	N; poisonous plant	N; ineffective	N; poisonous plant	ME; goat grazing/girdling of bark
Cultivate, disc, till	ME; generally ineffective	E; effective	ME; generally ineffective	ME; Questionable over short term	ME; generally ineffective	ME; Generally ineffective	ME; generally ineffective	E; effective combined with herbicides; biennial	E; effective in some situations; not in crop ground	N; Not Available

[1] Montana Dept. of Ag, 2002

[2]

[3] See Appendix I for species and herbicide specific effectiveness information.

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TABLE F – 2. SPECIES RESPONSE TO RANGELAND HERBICIDES[4]

Species	2,4-D	Milestone (Aminopyralid)	Transline (clopyralid)	Curtail (clopyralid + 2,4-D)	Telar, Glean (chlorsulfuron)	Banvel, Clarity (dicamba)	Diuron 4L (diuron – at max. rate)	Roundup Ultra, Rodeo, Accord, Glyphomate (glyphosate)	Velpar L, Pronone 10G (hexaxinone)	Plateau (imazapic)	Arsenal, Chopper (imazapyr)	Escort (metsulfuron)	Tordon 22K (picloram)	Tordon 22K + 2,4-D (picloram + 2,4-D)	Oust (sulfometuron)methyl)	Remedy, Redeem, Garlon (triclopyr)
Grasses																
downy brome					E		G	**E**	**E**					**G**	**G**	
quackgrass							**G**	**G-E**	**G-E**							
perennial grasses							**G**	**G-E**	**G-E**							
foxtail barley					**G**		**G**	**G**	**E**							
bulbous bluegrass					**P**		**G**	**G**	**E**							
Broadleaf Annuals																
bedstraw	**P**					**G**	**G**					**G**				
kochia	**G**			**G**	**G**	**G**	**G**	**E**					**P**			
russian thistle	**G**	**G-E**		**G**	**G**	**G**	**G**	**E**	**G**				**F**			
Biennials																
burdock	**F**			**F**			**G**					**E**				**G**
houndstongue	**F**			**P**		**G**	**G**					**E**	**G**			
mullein, common	**F**						**G**	**G**				**E**	**F**	**G**		
musk thistle	**F**	**G-E**	**G-E**	**G-E**		**F**	**G**					**E**	**E**	**E**		
plumeless thistle	**G**	**G**	**E**	**E**		**E**	**G**						**E**	**E**		
scotch thistle	**F**	**G**	**E**	**G**		**F**	**G**					**E**	**E**	**E**		
yellow starthistle	**F**	**G**	**E**	**E**		**G-E**	**G**					**P**	**E**	**E**		
Perennials																
field bindweed	**F**			**P**	**P**	**F**	**P**	**F**				**F**	**G**	**G**	**G**	
sulfur cinquefoil	**G**	**G-E**		**P**		**P**	**G**					**E**	**E**	**E**		**G**
common crupina	**G**			**F**		**G**	**G**	**G**				**E**	**E**	**E**		
dandelion	**F**		**G**	**G**	**P**	**G**	**P**	**G**	**G**			**E**	**G**	**G**		**G**
dyer's woad	**G**					**F**	**G**					**E**	**P**			
curlycup gumweed	**G**			**E**		**G**	**G**					**G**	**E**	**E**		
orange hawkweed		**G-E**	**G**	**G**		**G**	**G**					**P**	**E**	**E**		
yellow hawkweed	**F**	**G-E**	**G**	**G**		**P**	**G**					**P**	**E**	**E**		
horsetail							**G**		**G**			**P**				
diffuse knapweed	**F**	**G-E**	**G-E**	**G-E**		**F-G**	**G**	**F**				**P**	**E**	**E**		
Russian knapweed	**P**	**G-E**	**G**	**G**		**F**	**G**	**P**				**F**	**E**	**E**		
spotted knapweed	**G**	**G-E**	**E**	**E**		**G**	**G**	**F**	**F**			**P**	**E**	**E**		
larkspurs	**F**	**G-E**				**P**	**G**	**G**				**E**	**E**	**E**		

[4] Source: Bussan et al, 2001-2002.

Control Codes: **E = Excellent; G = Good, F = Fair; P = Poor or no control.**
Note: Absence of a weed from a label does not necessarily mean complete lack of control.

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Species	2,4-D	Milestone (Aminopyralid)	Transline (clopyralid)	Curtail (clopyralid + 2,4-D)	Telar, Glean (chlorsulfuron)	Banvel, Clarity (dicamba)	Diuron 4L (diuron – at max. rate)	Roundup Ultra, Rodeo, Accord, Glyphomate (glyphosate)	Velpar L, Pronone 10G (hexaxinone)	Plateau (imazapic)	Arsenal, Chopper (imazapyr)	Escort (metsulfuron)	Tordon 22K (picloram)	Tordon 22K + 2,4-D (picloram + 2,4-D)	Oust (sulfometuron)methyl)	Remedy, Redeem, Garlon (triclopyr)
locoweeds	G		G	E		E	G					E	E	E		
purple loosestrife	G						G	G				G				G
lupine	G			P		P	G					F-G	P	F		
plantain spp	G					F	G					G	G			
pricklypear cactus	P						G					P	E	E		
rush skeletonweed	F			G		F	G	P				P-F	E	E		
common tansy	P			F		F	G					E	G	G		
canada thistle		G-E	E	E		F	P	G				F	E	E		F
dalmatian toadflax						P	G			G		F-G	E-G	E-G		
yellow toadflax				P			G	G				F	G	G		
leafy spurge	F			P		F	G	G		G		P	G	G		
hoary cress (whitetop)	F						G	F				E	P			
Trees and Shrubs																
salt cedar[5]						P		F	F		G		P			
juniper*[2]									F-G				*			
poison ivy	E							E				F				G-E
grey rabbitbrush[3]	G					P			G					G		G
prickly rose								G	F			G				
big sagebrush	G-E		P			F		P	G				P			F-G
broom snakeweed	G		F			F			F			E	E	E		
pine spp					G				P			G		F		

Responses of weeds to any of the listed herbicides may be altered by growing conditions, weed populations, type of irrigation, genetic variations of weeds, soil type, pH, organic matter, time of application, and application rate. Ratings may vary from season-to-season and geographic areas within the area.

[5] *Individual plant treatments only
[2] Individual plant treatments only
[3] Need to be applied in early spring with reapplication one year later in early spring

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Shrubs and Trees

Herbicide drift onto adjacent desirable plants can be a problem when applying herbicides. Apply only when there is little or no hazard from spray drift. Do not spray when wind is blowing toward desirable plants that are near enough to be injured. When treating trees and brush use a low pressure coarse spray and treat all sides of the plant.

The following susceptibility charts[7] are to be used only as a guide when planning herbicide treatments. Consult research reports, product labels, and knowledgeable personnel for additional information.

TABLE F – 3. LABEL CLEARANCES FOR HERBICIDES

Herbicide	Type of Application					
	Foliar	Soil	Frill	Stump	Basal	Inject
2,4-D*[8]	x		x	x	x	x
Dicamba	x		x	x	x	
Glyphosate	x		x	x		x
Hexazinone	x	x				
Imazapyr	x		x	x	x	
Metsulfuron	x	x				
Picloram*	x		x	x		x
Triclopyr	x		x	x	x	x

TABLE F - 4. SUSCEPTIBILITY TO CUT SURFACE, INJECTION, AND STUMP TREATMENTS

Plant	Herbicide					
	2,4-D	Dicamba	Picloram plus 2,4-D	Triclopyr	Imazapyr	Glyphosate
Alder	G	G	G	G	G	G
Ash	P	F	F	G	G	G
Aspen	F	G	G	G	G	G
Cherry	G-F	G	G	G	G	G
Cottonwood	G	G	G	G	G	G
Douglas Fir	P		G	G		
Elm	F	G-F	G	G-F	G	G
Pines	F		G-F			
Russian-olive	F	F	F	F	G	G
Salt cedar[9]		G		G	G	G
Willow	F	G	G	G	G	F
G = Good control; F = Fair control, likely to need retreatment; P = Poor control						

[7] Washington State University Cooperative Extension. 1995. http://cru.cahe.wsu.edu/CEPublications/eb1551/eb1551.html
[8] All formulations of 2, 4-D* and picloram* are not suitable for all the uses indicated. Check manufacturer's label for uses and additional precautions. FOLLOW LABEL INSTRUCTIONS.
[9] Follow protection measures outlined in Appendix C for herbicide use near water.

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TABLE F - 5. SUSCEPTIBILITY TO FOLIAGE TREATMENTS

Plant	Herbicide						
	2,4-D	Dicamba	Glyphosate	Picloram plus 2,4-D	Triclopyr	Imazapyr	Metsulfuron
Alder	G	G	G	G	G	G	
Ash	P	G	G	P	F		G
Aspen	F-P	F	G	G-P	G	G	G
Chokecherry	G	F-P	G	G	G		
Cottonwood	F-P	G	G	F	G	G	G
Douglas Fir	F-P	G	G-P	G	G-P	G-F	
Elm	F-P	F-P	G	G	G-F	G	G
Pine	G	G	P	G	G	F	
Wild Rose		G	G	G	G		G
Russian-olive	F	G	G	G	F	G	
Sagebrush	G	G	F	G	G		
Snowberry	P	P	G	G-P	F	G	G
Sumac	G-F	G-F	G		G	G	
Willow	G-P	G-P	G-F	G-F	G-P	G	
G = Good control; F = Fair control, likely to need retreatment; P = Poor control							

TABLE F - 6. SUSCEPTIBILITY TO BASAL BARK TREATMENT

Plant	Herbicide			
	2,4-D	Triclopyr	Hexazinone	Picloram
Alder	G-F	G	G	G
Ash	P		G	
Aspen	G-F		G	G
Chokecherry	G-F	G		
Cottonwood	G	G		
Douglas Fir			P	G
Elderberry	G-F	G		
Elm	G-F	G-F	G	
Pine			P	G
Wild Rose			G	
Russian-olive			G	
Sagebrush	G			
Snowberry	F-P	F-P		
Sumac	P		G	G
Willow	G-F	G-F	G	
G = Good control; F = Fair control, likely to need retreatment; P = Poor control				

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- End of Appendix F -