Appendix C: Priority Weed Species

Non-native Vegetation Mapping

Non-native species pose a significant threat to many natural systems in the West Trail Study Area. Weedy species can out-compete or replace native species, decrease overall native biodiversity, degrade wildlife habitat, change natural fire regimes, and decrease the overall aesthetic value of an area. The management of non-native species on OSMP lands is a key focus of the department and integrated pest management considerations factor into almost all management decisions (Table 15). A key to effective weed management is having accurate and consistent mapping of weed occurrences across the system. The "Coverage of Weeds" map in this appendix is a visual representation of weed densities in mapped areas of the West TSA.

Top: Canada thistle (*Breea arvensis*)

Middle: Jointed goatgrass (*Cylindropyrum cylindricum*)

Bottom: Myrtle spurge (*Tithymalus myrsinites*)

In 2006 staff began mapping weeds across the OSMP system using methods developed by Utah State University and referred to as Rapid Assessment Mapping or RAM. The primary objective of this project is to document the distribution and abundance of targeted invasive non-native plant species across the range of native habitats and areas of management within Boulder OSMP lands. The information from this inventory will be useful in the City's ongoing efforts to improve strategic planning and to increase the effectiveness of field operations associated with invasive plant management and conservation efforts.

Weed mapping in 2008 focused on large portions of the West Trail Study Area in anticipation of the TSA planning process. The 2008 RAM inventory was conducted between June and August. Staffing and timing restrictions limited the amount of mapping that was possible so staff focused efforts on low elevation forest stands along the forest/ grassland edge, and in areas with existing high recreation use and along existing designated and undesignated trails west of the Mesa Trail. The lower grasslands in the TSA, south of Shanahan Ridge, were mapped in 2006 in advance of planning efforts for the Grassland Management Plan. Additional portions of the forested areas of OSMP will be mapped during the 2009 field season. Much of this work will focus on the denser, mixed conifer forests that have yet to be inventoried.

Field searches were conducted at the finest scale required to be confident that 90 percent or more of all targeted invasive plant infestations 0.01 acre or larger within the inventory area were detected. Mapping consisted of walking transects from one side of a property to the other covering the entire unit. Transect swaths varied in width based on topography, vegetation cover, and target species. Widths ranged from less than 25 meters in denser riparian areas to 100 meters in open grasslands. All designated trails and some undesignated trails west of the Mesa Trail were surveyed for 50 meters on each side to get a quick assessment of weed occurrences along existing trails. Geo XT GPS units were used to navigate along inventory transects and to collect data related to each weed occurrence using a RAM specific data dictionary. For each weed patch the staff member recorded the species name, size of the infestation, and a percent cover in five categories ranging from a trace (less

than one percent) to a majority (51%-100%). Scattered patches separated by less than 50 meters were considered one distinct patch.

Map 2 displays a weighted density of all the RAM weed inventory data currently completed on the OSMP system. To account for the size of the infestation and the percent cover an importance value, or weight, was assigned to each mapped weed occurrence. The importance value was calculated as acreage multiplied by percent cover and then multiplied by a constant value to assure all cells had an integer value. The density analysis was performed using a 500 foot search radius to obtain the value of each cell in the map. The spectrum of low to high weed densities on the map represents areas with increasingly higher non-native cover and larger infestation sizes. The density could be attributed to one individual species or a combination of multiple species occurrences. It's important to note that this map displays all the RAM data collected to date. Large portions of the WTSA are still to be mapped and will be a focus in the upcoming field season. Current indicator conditions are based on the best available data and may change as additional mapping is completed.

Table 17: OSMP priority non-native species list

SPECIES			Associated Habitats											
			FOOTHILLS						PLAINS					
Designation	Common Name	Scientific Name	Forest / Woodland	Shrubland	Grassland	Riparian / Wetland / Aquatic	Forest / Grassland Interface	Grassland/ Forest Edge	Shrubland	Native Grassland	Non-Native Grassland	Restoration Areas	Riparian / Wetland / Aquatic
OSMP	Absinth wormwood	*Artemisia absinthium*	M										
OSMP	Bladder senna	*Colutea arborescens*	M	M	M		M						
B	Bouncing bet	*Saponaria officinalis*	L		L	M	M					L	L
B / OSMP	Buckthorn	*Rhamnus cathartica*	L	H		H	M						
B	Canada thistle	*Breea arvensis*	L	M	M	M	L			M	H	H	H
C	Cheat grass	*Anisantha tectorum*	M	L	H	L	L		L	M	M	M	H
B	Common tansy	*Tanacetum vulgare*											M
B	Common teasel	*Dipsacus fullonum*				M	L					H	H
OSMP	Crown vetch	*Securigera varia*			L		M						M
B / OSMP	Cut-leaf teasel	*Dipsacus laciniatus*					L						H
B	Dalmatian toadflax	*Linaria genistifolia*	L	L	M		H			H	L		L
B	Dame's rocket	*Hesperis matronalis*				H							M
B	Diffuse knapweed	*Acosta diffusa*	M	L	M	L	M		M	H	H	H	L
B	Eurasian watermilfoil	*Myriophyllum spicatum*											H
	Garlic Mustard	*Alliaria petiolata*				M							M
B	Hoary cress	*Cardaria draba*								L	H	M	M
B	Houndstongue	*Cynoglossum officinale*	L	L	L	M	L			L	L	L	L
	Japanese knotweed	*Reynoutria japonica*									M		H
C	Jointed goatgrass	*Cylindropyrum cylindricum*	H		H		H			H		H	
B	Leafy spurge	*Tithymalus uralensis*	H		H		H						
A	Mediterranean sage	*Salvia aethiopis*					**H**			**H**		**H**	
B	Musk thistle	*Carduus nutans*	L	L	L	L	L			L	M	L	L
A	Myrtle spurge	*Tithymalus myrsinites*	**H**	**H**	**H**		**H**			**H**			**H**
A	Orange hawkweed	*Hieracium aurantiacum*	**H**										
B	Oxeye daisy	*Leucanthemum vulgare*									H		H

B	Perennial pepperweed	*Cardaria latifolia*					L				L	M	M
OSMP	Perennial sweetpea	*Lathyrus latifolius*		M	H	M	M						L
A	Purple loosestrife	*Lythrum salicaria*				**H**							**H**
OSMP	Queen of the Meadow	*Filipendula ulmaria*											H
B	Russian knapweed	*Acroptilon repens*					L				H	H	
B	Russian olive	*Elaeagnus angustifolia*				H	L		H	L	L	H
B	Scotch thistle	*Onopordum acanthium*					M		M	M	H	M
OSMP	Smooth brome	*Bromopsis inermis*	M	M	H	H	H		L		M	H
B+	Spotted knapweed	*Acosta maculosa*	**H**							**H**		
B	Sulfur cinquefoil	*Potentilla recta*	M	L	H	M	H		H		H	M
OSMP	Tall oatgrass	*Arrhenatherum elatius*			H		H					
B+	Tamarisk	*Tamarix ramosissima*								**H**	**H**	**H**
OSMP	White campion	*Melandrium dioicum*			L		L					H
B	Yellow toadflax	*Linaria vulgaris*	M		M	H	M		M	H		M

H	= **HIGH** priority as designated by State of CO as List A or B+
H	= **HIGH** priority per OSMP
M	= **MODERATE** priority per OSMP
L	= **LOW** priority per OSMP

	= ignore; species not known or expected in this habitat
	= Watch out; may be on the way and we should be looking for it in these habitats

State Noxious Weed Designations

List A Species- Designated by the CO Department of Agriculture for eradication

List B Species- are species for which the Department of Ag, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, develops and implements state noxious weed management plans designed to stop the continued spread of these species. Species designated as "B+" are targeted for eradication on OSMP lands.

List C Species- are species for which the Department of Ag, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.