



NOXIOUS WEED MANAGEMENT PLAN

FRONT RANGE-MIDWAY SOLAR PROJECT El Paso County, CO Project No. 17-012

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July 24, 2017

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EXECUTIVE SUMMARY

CORE Consultants, Inc. (CORE) was retained by Tradewind Energy (Client) to prepare a Noxious Weed Management Plan (Plan) for the proposed Front Range-Midway Solar Project (Project) in El Paso County, Colorado. The Project would consist of a 100.2 megawatt (MW) distributed generation photovoltaic solar facility that would encompass approximately 1,170 acres in El Paso County (EPC), Colorado.

This Plan is a Project-specific document that has been designed to set forth Project level regulations to prevent and control the spread of noxious weeds within the Project and vicinity. Noxious weeds are defined as those non-native plants that aggressively invade and are detrimental to native vegetation communities and ecosystems. The *Colorado State Noxious Weed Act* (Colorado Revised Statute 35-5.5-103) developed a list of plants considered noxious in the state of Colorado that should be targeted for control by various methods dependent on list category (A, B, C). El Paso County Environmental Services requested submittal of a Project-specific Noxious Weed Management Plan since the Project is located adjacent to an area known to contain noxious weed populations. The Plan should tier to the requirements set forth by the El Paso County (County) Noxious Weed Management Plan (2003, updated 2014) which contains guidelines for control and treatment of noxious weeds found in the County. The County requires that commercial or industrial projects that include ground disturbing activities submit a project-specific noxious weed management plan. This Plan provides methods to prevent and control the spread of noxious weeds at pre-construction, construction, and post-construction phases of the Project.

I.0 INTRODUCTION

Tradewind Energy (Client) retained CORE Consultants, Inc. (CORE) to prepare a Noxious Weed Management Plan for the proposed Front Range-Midway Solar Project (Project) located in El Paso County, Colorado. The Project is located west of Interstate-25 (I-25) approximately 20 miles south of downtown Colorado Springs on private and county owned lands. The Project is bound on the west by county lands and by dispersed residential development to the northwest and southwest, by rangeland to the north, by a gravel pit to the east, and by the Midway Waste Management Landfill to the south (**Appendix I: Vicinity Map**). Other facilities in the near vicinity include the Pikes Peak International Raceway approximately 1.5 miles to the north and the Fort Carson Military Reservation approximately one mile to the west.

The Project lies within the Fountain watershed, referenced as 8-digit Hydrologic Unit Code (HUC) 11020003. One swale-like drainage was dammed that created a stock pond in the north-central part of the Project; no other jurisdictional drainages traverse the Project. Land use in the region is typified by rangeland grazing with increasing urban and residential development. Topography of the Project consists of shortgrass prairie within the Piedmont Plains and Tablelands ecoregion (Chapman et al. 2006).

Dominant species within the Piedmont Plains and Tablelands include buffalograss (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), galleta grass (*Pleuraphis jamesii*), alkali sacaton (*Sporobolus airoides*), sand dropseed (*Sporobolus cryptandrus*), sideoats grama (*Bouteloua curtipendula*), and yucca (*Yucca* spp.).

2.0 NOXIOUS WEED MANAGEMENT

The spread of invasive species roughly mirrors the rise in human travel and commerce (Mack et al., 2000; Sheley et al., 1996). Many noxious weeds have been identified as aggressive, weather resistant escaped ornamentals from residential landscapes (Westbrooks, 1998). *The Federal Noxious Weed Act* (7 U.S.C. 2801 et seq.; 88 Stat. 2148) was enacted in 1975 in an effort to halt the spread of noxious weeds across the country. Following guidelines set forth by the *Federal Noxious Weed Act*, Colorado passed the *Colorado Noxious Weed Act* (Act) (C.R.S. 35-5.5-103) in 1990. The Act identified noxious weeds particular to the landscape of Colorado. The Act defines noxious weeds as any non-native plant that:

- Aggressively invades or is detrimental to economic crops or native plant communities;
- Is poisonous to livestock;
- Is a carrier of detrimental insects, diseases, or parasites;
- Is detrimental, either by direct or indirect effects, to the environmentally sound management of natural or agricultural ecosystems.

The Act was amended in 2002 to require counties to establish individual management plans relevant to local municipalities. El Paso County developed the *El Paso County Noxious Weed Management Plan* in 2003 (updated 2014) to identify county-level noxious weed management practices that would preserve the economic and environmental value of County lands (EPC, 2014).

Disturbed areas are vulnerable to infestation from noxious weeds due to the aggressive nature by which noxious weeds can spread. Construction activities including clearing, grading, and excavation promote the establishment of noxious weed species before native vegetation can reestablish within the cleared area. As such, the *EPC Noxious Weed Management Plan* requires integrated management plans for any activities requiring dirt moving activities within the County (EPC, 2014). Project-specific integrated management plans should include methods to prevent, control, and monitor the spread of noxious weeds and should consider the multiple methods by which noxious weeds germinate. Annuals typically reproduce through seed which can easily attach to equipment during construction activities. Perennials often propagate through an extensive root system. Ground disturbing activities have the potential to redistribute root sections that could quickly propagate in other areas. Because of the multiple methods by which noxious weeds spread and propagate, integrated management plans should outline education and native revegetation methods in addition to chemical control methods (EPC, 2014).

3.0 NOXIOUS WEED MANAGEMENT PLAN

3.1 Purpose and Goals

Construction of the Project would occur over six to eight months. Upon completion of construction, the solar farm would produce energy for a minimum of 20 years. It is anticipated that ground disturbance would be minimized to access road construction, the new substation location, and some minimal grading for solar panel installations. This integrated management plan includes pre-construction, construction, and maintenance methods to prevent, control, and monitor the spread of identified noxious weed populations within the Project. It would become the responsibility of the owner/operator (Front Range-Midway Solar Project, LLC) to maintain a noxious weed-free site during the life of the Project. It is assumed that the site would be treated for noxious weeds throughout the life of the Project. Integrated management methods should include the following:

- Surveys to inventory and map established noxious weed populations;
- Sharing of data with the County to aid in County level inventory;
- Chemical treatment of all identified noxious weed populations;
- Periodic post-construction treatment as needed and as determined by the owner/operator.

Management methods identified within this Plan will comply with *Chapter 6: General Development Standards of the EPC Land Development Code* (EPC, 2015), the *EPC Noxious Weed Management Plan* (EPC, 2014) and the Act (Colorado Revised Statutes 35-5.5-103). Biological control methods are not included due to the prohibition of their use on plants targeted for eradication (Colorado Weed Management Association, 2015). Noxious weed species targeted would be those identified in the Act, with special consideration for those species listed in the *EPC Noxious Weeds and Control Methods* (EPC, 2008).

3.2 Regulated Species

The Act identifies three levels of priority for control of noxious weeds throughout the State of Colorado (State). The Colorado Weed Management Association (CWMA) maintains an updated list of noxious weeds known to occur in the State. CWMA also maintains a “watch list” of noxious weeds that occur in proximity to State borders and/or those species with a distribution that is not

yet understood. Refer to **Appendix II: Colorado State Noxious Weed List (CWMA, 2015)**. List A noxious weeds are those species targeted for eradication. List A noxious weed populations are typically isolated in nature or rare throughout much of the State (*Colorado Revised Statutes 35-5.5-103*). Eradication and reporting of List A populations is required by law (Colorado Department of Agriculture [CDA], 2006). List B species are discretely distributed throughout the State and must be eradicated, contained, or suppressed (*Colorado Revised Statutes 35-5.5-103*). The County requires control of all List B noxious weed populations located within the Project area (EPC, 2014). List C noxious weed populations are widespread and well established. The County requires control of List C species through education of the public and/or chemical control.

3.3 Pre-Construction

Pre-construction noxious weed management protocols would include prevention and treatment. Prevention and treatment would be accomplished through surveys of construction easements, followed by primary chemical treatment.

Noxious weed surveys would be conducted within all construction easements prior to construction; i.e., prior to any ground disturbing activities. Surveyors would use GPS units to collect population data. Data collected for List C populations would include species and coordinates of population. Data collected for List A and B populations would include species, coordinates for the approximate center of each identified population, approximate radius of infestation, and approximate density (measured in percent coverage within the estimated extent of a population). The County would receive a map of identified noxious weed populations within the Project. Should surveyors locate List A species, specific data collected would be sent to the County. Treatment type would be selected depending on the priority rank of the noxious weed species (List A, B, C), and the location and density of the infestation. Chemical treatment would include herbicide application. The suggested chemical treatment protocol is described below.

List A species must be eradicated by law (USDA, 2006). Should surveyors identify List A species, a plant sample would be collected for positive identification through the EPC Environmental Division. Upon positive confirmation of a List A species, hand pulling of the population would be performed to remove the mechanism for creation of a seed-bank. Chemical treatment would be applied to the area and would be selected in compliance with the *EPC Noxious Weeds and Control Methods* (EPC, 2008). List B and List C species would be chemically treated with an herbicide selected in compliance with the *EPC Noxious Weeds and Control Methods*. Herbicide selection may vary depending upon time of year and life cycle of the plant. All herbicide application would occur a minimum of two weeks prior to scheduled ground disturbing activities. The herbicide applicator would treat noxious weed populations with County recommended chemicals (EPC 2014).

3.4 Construction

Construction phase noxious weed management protocols would include prevention and maintenance. Contractors would prevent the spread of noxious weeds through the use of clean equipment and through treatment of all noxious weed populations prior to ground disturbing activities. Heavy equipment used on the site would be washed and sprayed prior to mobilization on the Project. Doing so would ensure that soils and seeds are not transported from other sites. Noxious weed treatment would occur to areas slated for ground disturbance prior to construction. Doing so would ensure that active noxious weed populations would become inactive prior to construction.

It is anticipated that some top-soil could be salvaged from the site during access road construction and minimal grading. Salvaged top-soil piles would be maintained and protected from erosion and/or noxious weed establishment during construction through Best Management Practices (BMPs) identified in the Project Grading, Erosion, and Sediment Control (GESC) Plan. Native-site top-soil would be used during reestablishment of native seed mixes post-construction in disturbed areas.

3.5 Post-Construction

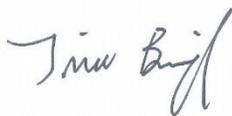
Post-construction noxious weed management protocols would be limited to maintenance treatment, as needed. It is anticipated that the owner/operator would monitor and for and treat noxious weed populations during the life of the Project. Typically, the owner/operator would contract a Colorado licensed herbicide applicator to treat noxious weeds on a seasonal basis.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This Project Noxious Weed Management Plan was written to comply with guidelines in the Colorado Noxious Weed Act (Colorado Revised Statutes 35-5.5-103) and the EPC Noxious Weed Management Plan. CORE recommends that the Client survey for and treat any noxious weed populations located on the Project. The owner/operator would be responsible for maintaining a weed-free property following construction. Typically, chemical treatment would be applied between late spring and early fall depending on the recommended treatment protocols for each noxious weed species.

Should you have any questions regarding this or any other matter, please feel free to contact our office at (303) 703-4444.

Sincerely,
CORE Consultants, Inc.



Tina Brazil
Environmental Consultant



Chris Haas
Vice President

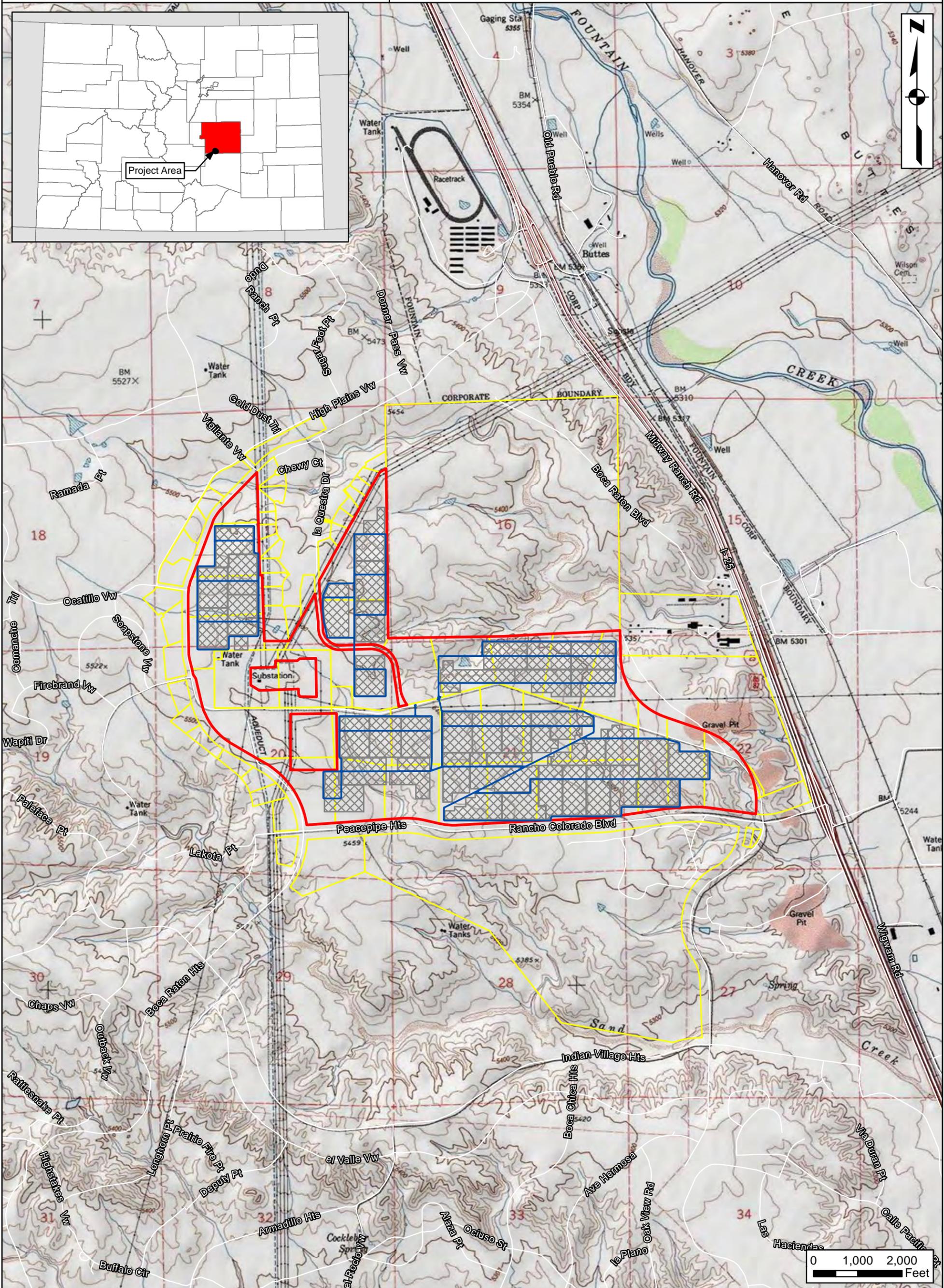
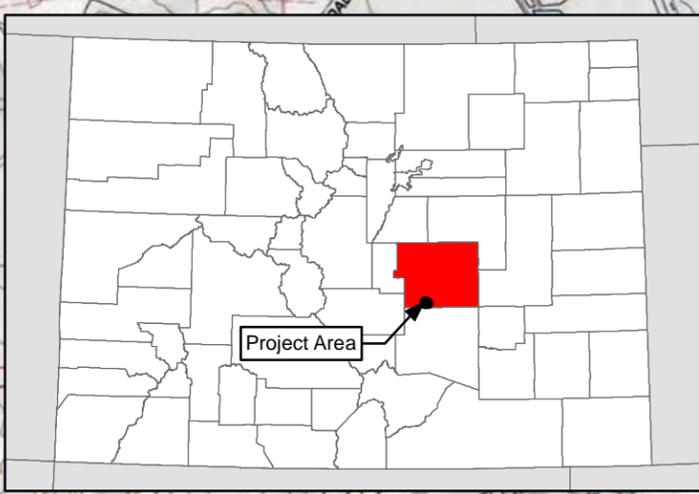
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APPENDIX I

VICINITY MAP



- Proposed Project Boundary
- Parcel Boundary
- Preliminary Array
- Proposed Road

Reference:
 USGS 7.5 Minute Topographic Quadrangle
 Buttes, CO Quad





APPENDIX II

COLORADO STATE NOXIOUS WEED LIST



COMMON NAME	SCIENTIFIC NAME	LIST
African rue	<i>Peganum harmala</i>	A
camelthorn	<i>Alhagi pseudalhagi</i>	A
Cypress spurge	<i>Euphorbia cyparissias</i>	A
Dyer's woad	<i>Isatis tinctoria</i>	A
elongated mustard	<i>Brassica elongata</i>	A
flowering rush	<i>Butomus umbellatus</i>	A
giant reed	<i>Arundo donax</i>	A
giant salvinia	<i>Salvinia molesta</i>	A
hairy willow-herb	<i>Epilobium hirsutum</i>	A
hydrilla	<i>Hydrilla verticillata</i>	A
Japanese, giant and bohemian knotweed	<i>Polygonum cuspidatum, P. sachalinense and P. bohemicum</i>	A
meadow knapweed	<i>Centaurea pratensis</i>	A
Mediterranean sage	<i>Salvia aethiopsis</i>	A
medusahead	<i>Taeniatherum caput-medusae</i>	A
myrtle spurge	<i>Euphorbia myrsinites</i>	A
orange hawkweed	<i>Hieracium aurantiacum</i>	A
parrot feather	<i>Myriophyllum aquaticum</i>	A
purple loosestrife	<i>Lythrum salicaria</i>	A
rush skeletonweed	<i>Chondrilla juncea</i>	A
squarrose knapweed	<i>Centaurea virgata</i>	A
tansy ragwort	<i>Senecio jacobaea</i>	A
yellow starthistle	<i>Centaurea solstitialis</i>	A
absinth wormwood	<i>Artemisia absinthium</i>	B
black henbane	<i>Hyoscyamus niger</i>	B
bouncingbet	<i>Saponaria officinalis</i>	B
bull thistle	<i>Cirsium vulgare</i>	B
Canada thistle	<i>Cirsium arvense</i>	B
Chinese clematis	<i>Clematis orientalis</i>	B
common tansy	<i>Tanacetum vulgare</i>	B
common teasel	<i>Dipsacus fullonum</i>	B
corn chamomile	<i>Anthemis arvensis</i>	B
cutleaf teasel	<i>Dipsacus laciniatus</i>	B
dalmatian toadflax (broad leaved)	<i>Linaria dalmatica</i>	B
dalmatian toadflax (narrow leaved)	<i>Linaria genistifolia</i>	B
dame's rocket	<i>Hesperis matronalis</i>	B



diffuse knapweed	<i>Centaurea diffusa</i>	B
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	B
hoary cress	<i>Cardaria draba</i>	B
houndstongue	<i>Cynoglossum officinale</i>	B
jointed goatgrass	<i>Aegilops cylindrica</i>	B
leafy spurge	<i>Euphorbia esula</i>	B
mayweed chamomile	<i>Anthemis cotula</i>	B
moth mullein	<i>Verbascum blattaria</i>	B
musk thistle	<i>Carduus nutans</i>	B
oxeye daisy	<i>Leucanthemum vulgare</i>	B
perennial pepperweed	<i>Lepidium latifolium</i>	B
plumeless thistle	<i>Carduus acanthoides</i>	B
Russian knapweed	<i>Acroptilon repens</i>	B
Russian-olive	<i>Eleagnus angustifolia</i>	B
salt cedar	<i>Tamarix chinensis, T. parviflora, and T. ramosissima</i>	B
scentless chamomile	<i>Tripleurospermum perforatum</i>	B
scotch thistle	<i>Onopordum acanthium and O. tauricum</i>	B
sulfur cinquefoil	<i>Potentilla recta</i>	B
wild caraway	<i>Carum carvi</i>	B
yellow nutsedge	<i>Cyperus esculentus</i>	B
yellow toadflax	<i>Linaria vulgaris</i>	B
bulbous bluegrass	<i>Poa bulbosa</i>	C
chicory	<i>Cichorium intybus</i>	C
common burdock	<i>Arctium minus</i>	C
common mullein	<i>Verbascum thapsus</i>	C
common St. Johnswort	<i>Hypericum perforatum</i>	C
downy brome	<i>Bromus tectorum</i>	C
field bindweed	<i>Convolvulus arvensis</i>	C
halogeton	<i>Halogeton glomeratus</i>	C
johnsongrass	<i>Sorghum halepense</i>	C
perennial sowthistle	<i>Sonchus arvensis</i>	C
poison hemlock	<i>Conium maculatum</i>	C
puncturevine	<i>Tribulus terrestris</i>	C
quackgrass	<i>Elymus repens</i>	C
redstem filaree	<i>Erodium cicutarium</i>	C
velvetleaf	<i>Abutilon theophrasti</i>	C
wild proso millet	<i>Panicum miliaceum</i>	C



Asian mustard	<i>Brassica tournefortii</i>	WATCH
baby's breath	<i>Gypsophila paniculata</i>	WATCH
bathurst burr	<i>Xanthium spinosum</i>	WATCH
Brazilian egeria	<i>Egeria densa</i>	WATCH
common bugloss	<i>Anchusa officinalis</i>	WATCH
common reed	<i>Phragmites australis</i>	WATCH
garden loosestrife	<i>Lysimachia vulgaris</i>	WATCH
garlic mustard	<i>Alliaria petiolata</i>	WATCH
Himalayan blackberry	<i>Rubus armeniacus</i>	WATCH
Japanese blood grass	<i>Imperata cylindrica</i>	WATCH
meadow hawkweed	<i>Hieracium caespitosum</i>	WATCH
onionweed	<i>Asphodelus fistulosus</i>	WATCH
purple pampas grass	<i>Cortaderia jubata</i>	WATCH
scotch broom	<i>Cytisus scoparius</i>	WATCH
sericea lespedeza	<i>Lespedeza cuneata</i>	WATCH
Swainson pea	<i>Sphaerophysa salsula</i>	WATCH
Syrian beancaper	<i>Zygophyllum fabago</i>	WATCH
water hyacinth	<i>Eichhornia crassipes</i>	WATCH
water lettuce	<i>Pistia stratiotes</i>	WATCH
white bryony	<i>Bryonia alba</i>	WATCH
woolly distaff thistle	<i>Carthamus lanatus</i>	WATCH
yellow flag iris	<i>Iris pseudacorus</i>	WATCH
yellow floatingheart	<i>Nymphoides peltata</i>	WATCH
yellowtuft	<i>Alyssum, A. corsicum</i>	WATCH