

National Capital Region Invasive Plant List

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Introduction

The National Capital Region contains a large number of invasive plants. Invasive plants vary in their impact and in their distribution. This document is meant to provide information about which plants occur in and around NCR parks and to provide a measure for the level of risk posed by each species. The National Capital Region Invasive Plant Management Plan (NPS 2016) calls for a list of prioritized invasive plants to be provided to the parks each year; this document serves that function. However, much work remains to be done to collect distribution data, rank additional species, and review old rankings.

Because resources are limited, species targeted for control must be prioritized (Fox and Gordon 2004, Krug et al. 2010). Prioritization schemes can identify species for treatment (e.g., Brunel et al. 2010, DPI 2008, Essl et al. 2011, Hiebert and Stubbendieck 1993, Nel et al. 2004, Ou et al. 2008), sites for protection (e.g., Dawson et al. 2014, Goodall and Naudé 1998), populations for treatment (e.g., Frey et al. 2015), or through a combination of species and site prioritization (Downey et al. 2010, Williams et al. 2014). The work described here involves prioritizing species for treatment. Species prioritization protocols have been developed by government agencies (e.g., Gross and Olin 2011, Heffernan et al. 2001, Jordan et al. 2012, Self 1986, cited in Hiebert and Stubbendieck 1993) and non-governmental organizations (e.g., Cal-IPC 2012, Washington Invasive Species Council, n.d., Fox et al. 2009) for at least 30 years.

In the early 2000s, NPS collaborated with NatureServe to create the Invasive Species Assessment Protocol (ISAP; Morse et al. 2004, Randall et al. 2008). NatureServe created the ISAP to build upon the organization's assessments of native species and to assess the impact of non-native species on native biodiversity (Randall et al. 2008). The ISAP was designed to be used "in a large geographical area such as a nation, state, province, or ecological region" (Morse et al. 2004). The ISAP results in an Invasive Species Impact Rank (I-Rank). NatureServe used the ISAP to rank 538 plant species for the United States (NatureServe 2014). In addition, the ISAP has been used in its published form or in a modified form to rank at least 183 species in New York State (United States; Jordan et al. 2012), 52 species in Nebraska (United States; Williams 2013), and 134 species in Vietnam (Tan et al. 2012). I chose the ISAP as a prioritization tool because it had been used for many species in many areas, it included a way to express uncertainty, and it included the following factors: ecological impact, rate of spread, similar habitats invaded elsewhere. Ecological impact is an important factor because non-native species are only a concern when they have ecological impacts (Hulme et al. 2013, Ricciardi et al. 2013, Simberloff et al. 2013) and can spread from where they are introduced. Rate of spread is an important factor because a fast-spreading species has the potential to impact a larger area than a species that spreads slowly. The factor "similar habitats invaded elsewhere" is the factor that is most predictive for invasiveness (Gordon et al. 2008, Kolar and Lodge 2001, Mack 1996, Reichard and Hamilton 1997). In 2016 the IUCN (International Union for Conservation of Nature) adopted a global standard for ranking invasive species (Hawkins et al. 2016). It may be that the IUCN standard (call EICAT) will become a true global standard. Even though it would mean hundreds of extra hours of work for the NCR list it would be beneficial in the long term as many rankings can be shared globally.

If the reader wants to see which plants are reported for a given park two lists must be examined; List 1 includes plants that have been ranked and List 2 includes plants that have not been ranked.

Methods

In 2013 I obtained a list of plants reported as invasive in and around National Capital Region parks from EDDMapS (Early Detection and Distribution Mapping System; EDDMapS 2013), an online repository of invasive species occurrence data. EDDMapS staff produced a list of records from within 150 miles (241.4 km) of Washington, DC with a two-step process. First, staff queried the database for all records within a square area roughly 150 miles (241.4 km) on each side that is centered on Washington, DC (between 36° 0' 0" N and 42° 0' 0" N and between 74° 0' 0" W and 80° 0' 0" W; DMS). Second, EDDMapS staff overlaid the query results in ArcGIS with a map layer of a circle with a 150-mile radius around Washington, DC, and trimmed the output to exclude records outside the circle. The radius of 150 miles was chosen because it included all NCR parks and at least a few counties beyond each park. Because the query was built on a latitude/longitude search it did not include records that did not have a latitude and longitude associated with them. Some records may never have had latitude and longitude or may have had it withheld when EDDMaps received the data. Many of the records without latitude and longitude were provided to EDDMaps from the USDA Plants Database (USDA, NRCS 2015), the Biota of North America Program (Kartesz 2015), the USFS Forest Inventory and Analysis Database (USDA, USFS 2015), or herbaria. Excluding these records may have excluded species in our area. However, because of the large number of records, it is likely that the vast majority of taxa are represented in both categories (those with and those without latitude/longitude data).

There are many lists of plants produced in our area but most of them identify a subset of species that are very common and/or very detrimental. I sought lists that were more comprehensive so that the compiled list would include every species found in natural areas in our region. Additional taxa were added from an EDDMaps query in March 2016, an extensive compilation of plants reported as invasive in Maryland and adjacent states (UMD 2016), a list compiled for Washington DC for the District of Columbia Cooperative

Weed Management Area (Damien Ossi, personal communication), EPMT records stored in the Access database known as APCAM covering all taxa treated in 2014 and earlier, and a list maintained by Jil Swearingen and updated in 2012 by polling park resource managers (Jil Swearingen, personal communication). The resulting compiled list is extensive but not comprehensive.

The compiled list is maintained in a Microsoft Excel file with the ranked taxa separated from the taxa not yet ranked. Each taxa has fields for:

- Lifeform
- Aquatic? (is the taxa submerged, floating, or emergent)
- Species (scientific name)
- ITIS.gov species (approved scientific name)
- Nature Serve IRank
- Comments/Reason Nature Serve IRank was Changed
- IRank (Reflects level of invasiveness in the Mid-Atlantic region)
- Common name
- A field for each park (to indicate presence)
- Notes
- Subrank I - Ecological Impact
- Subrank II - Current Distribution/Abundance
- Subrank III - Trend in Distribution/Abundance
- Subrank IV - Management Difficulty
- I-Rank Review Date
- Evaluator
- Native anywhere in the U.S?
- Native Range
- A field for each of the 198 counties within approximately 150 miles (to indicate presence)

Plants only have park records if they were on Jil Swearingen's list or the APCAM list, and plants don't have county records unless they came from EDDMaps. I removed synonyms based on ITIS.gov¹, removed names for species native in all three primary jurisdictions (Maryland, District of Columbia, and Virginia), and combined records that had subspecific taxa with those that were recorded to the specific level.

Taxa were searched for in the NatureServe Explorer. Any taxa with a completed I-Rank had its I-Rank reviewed and, if needed, modified for our region. Modifications were performed if additional information was available since the ranking had been conducted by NatureServe, or if there was evidence that the behavior of the taxa in the Mid-Atlantic differed from the behavior of the taxa nationally. Taxa without an existing I-Rank were put through the NatureServe ISAP. The ISAP comprises 20 questions divided into four sections (Figure 1). Answers range from A (High) to D (Insignificant). In cases where the information available is not sufficient to narrow the rank to a specific level (e.g., B; Medium), a range I-Rank (e.g., A/B; High/Medium) is assigned. U (Unknown) is given for a plant that warrants a ranking of AD (High/Insignificant). Initial assessments were conducted by dozens of volunteers who spent approximately four hours per taxa to gather key references and make preliminary assessments for each of the 20 questions. In batches of 10-50 these initial rankings were reviewed by an intern to ensure consistent treatment across taxa. After the secondary review I conducted a final review of all assessments

¹ Nomenclature follows ITIS.gov. However, I understand that ITIS.gov is not always the most up to date source for taxonomic information.

for all taxa. Uncertainty may be a reflection of conflicting published information or uncertainty about the quality of the published information.

<p>QUALIFYING QUESTIONS</p> <ol style="list-style-type: none">i. Non-native established outside of cultivation in region of interest?ii. Occurs in conservation areas? <p>I. ECOLOGICAL IMPACT</p> <ol style="list-style-type: none">1. Impact on ecosystem processes and system-wide parameters2. Impact on ecological community structure3. Impact on ecological community composition4. Impact on individual native plant or animal species5. Conservation significance of the communities and native species threatened <p>II. CURRENT DISTRIBUTION AND ABUNDANCE</p> <ol style="list-style-type: none">6. Current range size in region7. Proportion of current range where species is negatively impacting biodiversity8. Proportion of region's biogeographic units invaded9. Diversity of habitats or ecological systems invaded in region <p>III. TREND IN DISTRIBUTION AND ABUNDANCE</p> <ol style="list-style-type: none">10. Current trend in total range within region11. Proportion of potential range currently occupied12. Long-distance dispersal potential within region13. Local range expansion or change in abundance14. Inherent ability to invade conservation areas and other native species habitats15. Similar habitats invaded elsewhere16. Reproductive characteristics <p>IV. MANAGEMENT DIFFICULTY</p> <ol style="list-style-type: none">17. General management difficulty18. Minimum time commitment19. Impacts of management on native species20. Accessibility of invaded areas
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Figure 1 I-Rank questions answered for each evaluated species. Answers range from A (high) to D (insignificant). Answers can have two letters (e.g., AC). U (unknown) is given in place of AD.

Next steps

Many (394) species have been ranked or adapted from the NatureServe Explorer, but 172 species still need full rankings. After all species have received a full rank I hope to develop a system whereby each species gets re-ranked once every ten years. The first species to be reviewed would be those species that have been ranked by NatureServe and reviewed by the process described above.

The key next steps include:

1. Finish ranking the 44 species with preliminary ranks
2. Add taxa from EDDMaps that lack lat/long information
3. Rank the 128 species with no rank
4. Go through the list for each park and update if present
5. Categorize each presence as one of a range (Common, Rare, Moderate) for each park

6. Categorize each species as one of a range (Common, Rare, Moderate) for the region

Once the above tasks are complete annual tasks include:

1. Annually update the list of taxa with newly reported species (EDDMaps, iNaturalist, experts)
2. Annually review the ranks of the 10% of species with the oldest IRanks

Each taxa requires additional information about which parks it is known from (#3 above), and where in each park it is known. Only with this more detailed information can we build a robust prioritization list for each park.

The process of taxa prioritization described here is an essential component of a robust invasive plant management program. However, for a program to be successful taxa prioritization must be paired with site prioritization. Site prioritization has been done on a coarse scale at the Appalachian Trail and is done in an ad hoc manner at many NCR parks. Over time a more robust process must be developed at each park.

Lists

List 1 - All ranked taxa

This list includes 394 taxa ranked (or adapted from the NatureServe Explorer) for the National Capital Region. This list includes the majority of taxa targeted for control in national parks within our area. An “X” indicates the species is present in natural areas in that park. The lack of an X either means the taxa is absent or unconfirmed.

List 2 - Taxa to be ranked

At the time of publication 172 additional taxa have been identified that have the potential to be invasive taxa in our region. Some of these taxa are currently targeted for control (e.g., *Lonicera morrowii x bella*), have only recently been reported in our area (e.g., *Pyrus pyrifolia*), some are found sporadically in natural areas (e.g., *Taxus baccata*), and some have been reported in our area for some time but are not generally targeted in natural areas (e.g., *Galium mollugo*). Of these taxa 44 are marked with an X – these have had a preliminary ranking performed by volunteers but they have not yet completed the full ranking process. Additional taxa are added roughly once per month as new taxa are reported in natural areas in our area.

List 3 - Watch List

The Watch List is the result of a 2014 effort that took all non-native plant taxa reported in EDDMaps within 150 miles of District of Columbia that had not been identified by NPS park managers as invasive in natural areas. The resulting pool of candidate species was ranked and those that included “high” make up the Watch List. This list is becoming out of date as new species are being identified and species on the Watch List are reported in parks but it is still a useful list of species to watch for in our parks. Note the caveats at the bottom of that table related to the species on the list. See Frey (2016) for more details on the Watch List process. The term “candidate species” refers to those species that were ranked as part of the watch list creation process. Now that many more species have been ranked all species in this document should be considered candidates.

List 4 - Prioritized ranked taxa

Any taxa on List 1 that has a ranking that includes “high” is included in this list.

List 1 - All ranked taxa

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
<i>Abutilon theophrasti</i>	Medium/Low												
<i>Acer ginnala</i>	Medium/Insignificant												
<i>Acer palmatum</i>	Low/Insignificant											X	
<i>Acer platanoides</i>	High/Medium	X		X	X	X	X	X	X			X	X
<i>Acer pseudoplatanus</i>	Low/Insignificant								X				
<i>Aegopodium podagraria</i>	Medium/Insignificant					X							
<i>Aesculus flava</i>	Low/Insignificant												
<i>Agrostis gigantea</i>	Medium/Low												
<i>Agrostis stolonifera</i>	Medium/Low												
<i>Ailanthus altissima</i>	Medium	X	X	X	X	X	X	X	X	X	X	X	X
<i>Ajuga reptans</i>	Medium/Insignificant												
<i>Akebia quinata</i>	Medium/Low			X	X							X	
<i>Albizia julibrissin</i>	Medium			X	X	X	X		X		X	X	X
<i>Aldrovanda vesiculosa</i>	Medium												
<i>Alliaria petiolata</i>	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
<i>Allium vineale</i>	Low	X				X	X	X					
<i>Alnus glutinosa</i>	Medium												
<i>Alopecurus geniculatus</i>	Low												
<i>Alternanthera philoxeroides</i>	Medium												
<i>Ambrosia artemisiifolia</i>	Medium/Low					X				X			
<i>Ampelopsis brevipedunculata</i>	Medium/Low	X	X	X	X	X	X	X	X	X	X	X	X
<i>Anchusa officinalis</i>	Medium/Insignificant												
<i>Anthemis cotula</i>	Medium/Insignificant												
<i>Anthoxanthum odoratum</i>	Low-Insignificant				X				X				
<i>Aphanes microcarpa</i>	Insignificant												
<i>Aralia elata</i>	Low/Insignificant		X						X			X	
<i>Arctium lappa</i>	Insignificant												
<i>Arctium minus</i>	Medium	X		X	X	X	X	X	X	X		X	X
<i>Arrhenatherum elatius</i>	Low/Insignificant												
<i>Artemisia annua</i>	Low	X		X	X	X			X	X			
<i>Artemisia vulgaris</i>	Medium/Low				X			X	X	X		X	X

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Arthraxon hispidus	Medium					X		X				X	
Arum italicum	Medium											X	
Arundo donax	High/Medium												
Asparagus officinalis	Medium/Insignificant												
Bambusa bambos (likely incorrect)	Medium/Insignificant			X		X			X			X	
Bambusa vulgaris (likely incorrect)	Medium/Low			? ?								X	
Barbarea vulgaris	Insignificant												
Berberis bealei	Medium/Insignificant			X	X	X			X			X	X
Berberis julianae	Medium/Low												
Berberis thunbergii	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Berberis vulgaris	Medium/Insignificant												
Brachypodium sylvaticum	Medium/Low												
Brassica nigra	High/Low												
Brassica rapa	Medium/Insignificant	X						X					
Bromus commutatus	Medium/Insignificant												
Bromus inermis	High/Medium												
Bromus sterilis	Medium/Low												
Bromus tectorum	High/Medium	X				X							
Broussonetia papyrifera	Insignificant			X	X	X			X			X	
Buddleja davidii	Low		X					X					
Butomus umbellatus	Medium/Low												
Buxus microphylla	Insignificant		X		X	X	X		X		X	X	X
Buxus sempervirens	Insignificant											X	
Cabomba caroliniana	High/Medium												
Callitriche stagnalis	Low												
Cannabis sativa	Medium/Low												
Capsella bursa-pastoris	Insignificant	X					X			X	X		
Cardamine impatiens	Low												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Cardiospermum halicacabum	Insignificant												
Carduus acanthoides	Medium						X				X		
Carduus crispus	Insignificant												
Carduus nutans	Medium	X	X		X	X	X	X					
Carex kobomugi	Medium/Insignificant												
Carlina vulgaris	Low												
Castanea mollissima	Low/Insignificant												
Catalpa ovata	Low/Insignificant							X				X	
Celastrus orbiculatus	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Cenchrus alopecuroides	Insignificant				X							X	
Cenchrus compressus	Insignificant												
Cenchrus setaceus	High/Medium											X	
Centaurea cyanus	Low	X					X						
Centaurea jacea	Insignificant												
Centaurea macrocephala	Low							X					
Centaurea nigra	Insignificant												
Centaurea solstitialis	High/Medium												
Centaurea stoebe	Medium					X						X	
Cerastium fontanum	Low/Insignificant							X					X
Chelidonium majus	Medium/Low	X						X					
Chenopodium album	Low/Insignificant							X	X	X			
Chenopodium glaucum	Low/Insignificant												
Chionodoxa luciliae	Insignificant												
Cichorium intybus	Low	X				X	X		X			X	X
Cirsium arvense	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Cirsium vulgare	Medium/Low	X	X		X	X	X	X	X	X	X	X	X
Clematis terniflora	Medium/Low				X	X			X	X		X	
Coincya monensis	Low												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
<i>Commelina communis</i>	Medium/Low	X		X					X		X	X	
<i>Conium maculatum</i>	Medium/Low	X		X	X	X		X					
<i>Convolvulus arvensis</i>	Medium/Low												
<i>Conyza canadensis</i>	Low/Insignificant						X						
<i>Corydalis incisa</i>	High/Low												X
<i>Crataegus monogyna</i>	Medium												
<i>Crocus vernus?</i>	Low/Insignificant												
<i>Crupina vulgaris</i>	Medium/Low												
<i>Cynodon dactylon</i>	Medium/Low												
<i>Cynoglossum officinale</i>	Medium/Low												
<i>Cyrtomium falcatum</i>	Low												
<i>Cytisus scoparius</i>	High												
<i>Dactylis glomerata</i>	Low	X					X	X				X	
<i>Datura stramonium</i>	Medium/Low	X		X		X	X	X	X				
<i>Daucus carota</i>	Low	X		X	X	X	X	X	X	X			
<i>Deutzia scabra</i>	Medium-Low											X	
<i>Dianthus armeria</i>	Low/Insignificant	X					X						
<i>Digitaria sanguinalis</i>	Low												
<i>Dioscorea polystachya</i>	High/Medium					X						X	
<i>Dipsacus fullonum</i>	Medium/Low	X						X					
<i>Dipsacus laciniatus</i>	Medium/Low												
<i>Duchesnea indica</i>	Low/Insignificant	X		X	X	X	X	X	X	X		X	
<i>Echinochloa crus-galli</i>	Low												
<i>Echium vulgare</i>	Low	X					X						
<i>Egeria densa</i>	High/Medium												
<i>Eichhornia azurea</i>	Medium/Low												
<i>Eichhornia crassipes</i>	High												
<i>Elaeagnus angustifolia</i>	High/Medium	X	X	X	X	X	X	X	X		X	X	X

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Elaeagnus pungens	Low/Insignificant	X										X	
Elaeagnus umbellata	High	X	X	X	X	X	X	X	X		X	X	X
Eleutherococcus sieboldianus	Medium/Low											X	
Elymus repens	Medium	X											
Epilobium hirsutum	Medium/Low												
Epipactis helleborine	High/Medium												
Eragrostis cilianensis	Medium/Insignificant												
Eragrostis curvula	Medium												
Eranthis hyemalis	Low/Insignificant												
Euonymus alatus	Low	X		X	X	X	X		X		X	X	X
Euonymus europaeus	Low/Insignificant								X				
Euonymus fortunei	Medium			X	X	X		X	X		X	X	
Euphorbia cyparissias	Medium/Low												
Euphorbia esula	Medium												
Euphorbia lathyris	Low/Insignificant												
Fallopia japonica	High/Medium			X	X			X	X		X	X	
Fallopia sachalinensis	High/Medium												
Fatoua villosa	Low												
Festuca trachyphylla	Medium/Insignificant												
Foeniculum vulgare	Medium/Low												
Forsythia viridissima	Medium/Insignificant					X	X		X			X	
Fumaria officinalis	Low												
Galanthus nivalis	Low/Insignificant			X								X	
Galega officinalis	Low/Insignificant												
Galinsoga parviflora	Insignificant							X					
Galinsoga quadriradiata	Insignificant	X						X					
Geranium columbinum	Insignificant	X											
Geranium lucidum	Medium												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Glechoma hederacea	Medium/Low	X	X	X	X	X	X	X	X	X	X	X	X
Glossostigma cleistanthum	High/Medium												
Hedera helix/hibernica	High	X		X	X	X	X		X	X	X	X	X
Hemerocallis fulva	Medium/Low	X			X	X	X	X	X		X	X	
Hemerocallis lilioasphodelus	Insignificant	X										X	
Heracleum mantegazzianum	Insignificant											X	
Hesperis matronalis	Low	X				X							
Hibiscus syriacus	Low/Insignificant							X		X		X	
Hieracium aurantiacum	Medium/Low												
Hieracium caespitosum	Medium/Insignificant												
Hieracium pilosella	Medium/Low												
Hieracium piloselloides	Medium/Insignificant												
Holcus lanatus	Medium						X						
Houttuynia cordata	Medium/Low												
Hovenia dulcis	Low/Insignificant												
Humulus japonicus	Medium/Low	X		X	X	X		X	X			X	
Hyacinthoides hispanica	Medium/Low												
Hydrilla verticillata	High/Medium			X									
Hydrocharis morsus-ranae	High/Low												
Hypericum perforatum	High/Medium				X		X						
Hypochaeris radicata	High/Low												
Ilex aquifolium	Low							X					
Ilex crenata	Insignificant				X							X	X
Impatiens glandulifera	Medium/Low												
Ipomoea aquatica	Medium												
Ipomoea purpurea	Medium/Low												
Iris pseudacorus	Medium				X				X	X	X		
Isatis tinctoria	High/Low												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Acer platanoides	High/Medium	X		X	X	X	X	X	X			X	X
Alliaria petiolata	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Arundo donax	High/Medium												
Berberis thunbergii	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Brassica nigra	High/Low												
Bromus inermis	High/Medium												
Bromus tectorum	High/Medium	X				X							
Cabomba caroliniana	High/Medium												
Celastrus orbiculatus	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Cenchrus setaceus	High/Medium											X	
Centaurea solstitialis	High/Medium												
Cirsium arvense	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Corydalis incisa	High/Low												X
Cytisus scoparius	High												
Dioscorea polystachya	High/Medium					X						X	
Egeria densa	High/Medium												
Eichhornia crassipes	High												
Elaeagnus angustifolia	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Elaeagnus umbellata	High	X	X	X	X	X	X	X	X		X	X	X
Epipactis helleborine	High/Medium												
Fallopia japonica	High/Medium			X	X			X	X		X	X	
Fallopia sachalinensis	High/Medium												
Glossostigma cleistanthum	High/Medium												
Hedera helix/hibernica	High	X		X	X	X	X		X	X	X	X	X
Hydrilla verticillata	High/Medium			X									
Hydrocharis morsus-ranae	High/Low												
Hypericum perforatum	High/Medium				X		X						
Hypochaeris radicata	High/Low												
Isatis tinctoria	High/Low												
Lepidium latifolium	High												
Ligustrum sinense	High/Medium			X		X	X	X			X	X	X

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Ligustrum vulgare	Medium	X	X	X	X	X	X	X	X		X	X	X
Linaria vulgaris	Medium	X	X			X					X		
Liriope muscari	Low/Insignificant										X	X	
Liriope spicata	Low/Insignificant												
Lobelia chinensis	Medium/Insignificant												
Lonicera fragrantissima	Low												
Lonicera japonica	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Lonicera maackii	High/Medium	X	X	X	X		X	X	X		X	X	X
Lonicera morrowii	Medium	X		X	X	X	X	X	X			X	
Lonicera standishii	High/Medium												
Lonicera tatarica	Medium	X		X									
Lotus corniculatus	Medium/Low						X						
Ludwigia grandiflora	High												
Ludwigia peploides	Medium/Low												
Lycopus europaeus	Insignificant												
Lysimachia nummularia	Medium/Low	X		X		X		X					
Lysimachia vulgaris	Medium												
Lythrum salicaria	High			X	X				X	X		X	
Maclura pomifera	Low	X			X	X		X	X				
Malus baccata	Insignificant												
Malus floribunda	Low/Insignificant				X								
Malus prunifolia	Insignificant												
Malus pumila	Medium/Insignificant												
Malus sieboldii	Medium/Insignificant												
Malva neglecta	Medium/Insignificant												
Marrubium vulgare	Medium/Low												
Marsilea mutica	Medium/Low												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Marsilea quadrifolia	Medium/Low												
Medicago lupulina	Medium												
Melia azedarach	Medium/Low												
Melilotus indicus	Medium/Insignificant												
Melilotus officinalis	Medium/Low			X		X	X						
Mentha aquatica	Low/Insignificant												
Mentha spicata	Insignificant												
Mentha x gracilis	Insignificant												
Microstegium vimineum	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Miscanthus sinensis	Medium/Low										X	X	
Mollugo verticillata	Insignificant		X		X		X						
Morus alba	High/Medium	X		X	X	X	X	X	X	X	X	X	X
Murdannia keisak	Medium				X				X				
Muscari botryoides	Low/Insignificant	X				X							
Myosotis discolor	Low/Insignificant												
Myosotis scorpioides	Medium/Low												
Myosoton aquaticum	Low/Insignificant												
Myriophyllum aquaticum	High/Medium												
Myriophyllum spicatum	High				X								
Najas minor	High/Medium				X								
Nandina domestica	High/Medium				X					X		X	
Narcissus poeticus	Medium/Insignificant												
Narcissus pseudonarcissus	Low/Insignificant	X		X		X					X	X	
Nasturtium officinale	Medium/Low	X											
Nelumbo nucifera	Low/Insignificant												
Nepeta cataria	Low/Insignificant	X				X		X					
Nymphoides peltata	High/Medium												
Oenanthe javanica	Low												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
<i>Oplismenus undulatifolius</i>	High				X				X			X	
<i>Ornithogalum nutans</i>	Insignificant	X		X									
<i>Ornithogalum umbellatum</i>	Medium/Low	X				X		X				X	
<i>Osmanthus heterophyllus</i>	Low/Insignificant											X	
<i>Pachysandra terminalis</i>	High/Low				X				X			X	
<i>Paspalum dilatatum</i>	Low							X					
<i>Pastinaca sativa</i>	Low/Insignificant												
<i>Paulownia tomentosa</i>	Medium	X	X	X	X	X	X	X	X	X	X	X	X
<i>Perilla frutescens</i>	Low	X	X	X	X	X	X	X	X		X	X	X
<i>Persicaria longiseta</i>	High/Medium												
<i>Persicaria maculosa</i>	Insignificant	X						X					
<i>Persicaria perfoliata</i>	Medium		X		X	X		X	X		X	X	X
<i>Phalaris arundinacea</i>	High/Medium		X		X			X	X				
<i>Phellodendron amurense</i>	High/Low				X				X				
<i>Phleum pratense</i>	Medium	X											
<i>Phragmites australis</i>	High			X	X	X	X		X				
<i>Phyllostachys aurea</i>	Medium/Low												
<i>Phyllostachys aureosulcata</i>	Medium/Low				X	X			X			X	
<i>Phyllostachys reticulata</i>	Medium												
<i>Picea abies</i>	Low/Insignificant				X			X			X		
<i>Pinus sylvestris</i>	Medium/Insignificant												
<i>Pinus thunbergii</i>	Low												
<i>Pistia stratiotes</i>	Medium												
<i>Plantago lanceolata</i>	Medium/Low							X					X
<i>Plantago major</i>	Insignificant	X					X	X		X		X	X
<i>Plectranthus amboinicus</i>	Insignificant										X		
<i>Pleioblastus fortunei</i>	Medium											X	
<i>Poa annua</i>	Medium/Insignificant												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Poa compressa	Medium					X							
Poa pratensis	Medium/Insignificant												
Poa trivialis	Medium/Low												
Polygonum aviculare	Low												
Poncirus trifoliata	Medium/Insignificant												
Populus alba	Medium/Low						X						
Potamogeton crispus	Medium												
Potentilla recta	Medium							X					
Premna serratifolia	Insignificant												
Prunus avium	Medium/Low	X					X						
Prunus cerasus	Medium/Insignificant												
Prunus mahaleb	Medium/Insignificant												
Prunus persica	Insignificant												
Prunus subhirtella	Insignificant				X								
Pseudosasa japonica	Medium					X	X						
Puccinellia distans	Low/Insignificant												
Pueraria montana var. lobata	High/Medium			X	X	X	X	X	X			X	
Pyrus betulifolia	Low/Insignificant												
Pyrus calleryana	Low												X
Quercus acutissima	Low												
Ranunculus acris	Low/Insignificant	X						X				X	
Ranunculus bulbosus	Low								X				
Ranunculus ficaria	Medium/Low			X	X				X			X	X
Ranunculus parviflorus	Insignificant												
Ranunculus repens	Medium												
Rhamnus cathartica	High				X								
Rhamnus frangula	High/Medium												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Rhamnus utilis	Medium /Low												
Rhodotypos scandens	Medium/Low				X	X						X	
Ribes rubrum	Low/Insignificant												
Robinia pseudoacacia	Medium				X	X							
Rorippa sylvestris	Medium/Low												
Rosa lucieae	Medium/Low												
Rosa multiflora	Low/Insignificant	X	X	X	X	X	X	X	X	X	X	X	X
Rosa rugosa	Low												
Rubus bifrons	Low/Insignificant				X								
Rubus phoenicolasius	Medium	X	X	X	X	X	X	X	X		X	X	X
Rumex acetosella	Medium/Low					X							
Rumex crispus	Low	X	X	X	X	X	X	X	X	X		X	X
Rumex obtusifolius	Low/Insignificant							X					
Sagina procumbens	Low/Insignificant												
Salix alba	Low												
Salix cinerea	Medium/Low												
Salix fragilis	Medium												
Salix matsudana	Medium/Low												
Salix purpurea	Medium/Low												
Salvinia molesta	Medium												
Saponaria officinalis	Low/Insignificant	X		X		X							
Schedonorus arundinaceus	High/Medium				X								
Schedonorus pratensis	Medium	X							X				
Schoenoplectus mucronatus	Medium												
Scilla bifolia	Insignificant												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Scilla siberica	Low/Insignificant												
Securigera varia	High/Medium	X	X	X							X		
Senecio vulgaris	Low/Insignificant												
Setaria faberi	Low/Insignificant		X				X	X	X			X	
Setaria pumila	Low/Insignificant												
Sherardia arvensis	Low/Insignificant												
Sinapis arvensis	Low/Insignificant												
Skimmia japonica	Insignificant												
Solanum dulcamara	Low	X								X			X
Solanum viarum	Low												
Sonchus arvensis	Medium/Low												
Sorghum halepense	High/Medium	X			X	X	X	X					
Spergula morisonii	Medium/Insignificant												
Spiraea japonica	High/Medium		X		X								
Spiraea thunbergii	Low/Insignificant												
Stellaria media	Medium												
Stellaria pallida	Low/Insignificant	X		X		X							X
Styphnolobium japonicum	Low				X								
Syringa vulgaris	Insignificant												
Tamarix parviflora	High/Low												
Tanacetum vulgare	Low	X											
Taraxacum officinale	Low	X	X	X	X	X	X	X	X	X	X	X	X
Tarenaya hassleriana	Insignificant												
Taxus baccata	Low/Insignificant											X	
Thlaspi alliaceum	Medium/Insignificant												

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Tragopogon dubius	Medium/Low												
Tragopogon pratensis	Medium/Insignificant	X											
Trapa natans	Medium												
Triadica sebifera	High/Medium												
Trifolium arvense	Low												
Trifolium campestre	Low			X									
Trifolium dubium	Low	X											
Trifolium hybridum	Medium/Low												
Trifolium pratense	Low/Insignificant	X		X			X	X		X		X	
Trifolium repens	Medium/Low	X		X								X	
Tripidium ravennae	Low												
Tussilago farfara	Insignificant												
Ulmus parvifolia	Low/Insignificant											X	
Ulmus procera	Insignificant												
Ulmus pumila	Medium/Low											X	
Urtica dioica	Medium/Insignificant	X		X	X	X	X					X	
Verbascum thapsus	Medium/Low	X	X	X	X	X	X	X	X	X	X	X	X
Veronica beccabunga	Low/Insignificant												
Veronica hederifolia	Medium/Low	X			X	X		X					
Veronica serpyllifolia	Medium/Low	X											
Viburnum dilatatum	High/Low			X	X						X	X	X
Viburnum lantana	Medium/Low												
Viburnum plicatum	High/Medium											X	X
Viburnum setigerum	Low/Insignificant												
Viburnum sieboldii	Medium/Insignificant			X									

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Viburnum x rhytidophylloides	Medium/Low												
Vigna radiata	Low/Insignificant												
Vinca major	Medium/Low						X		X			X	
Vinca minor	Low	X		X	X	X	X	X	X		X	X	
Vincetoxicum nigrum	High												
Vincetoxicum rossicum	High/Medium												
Vincetoxicum hirundinaria	Low												
Vitex rotundifolia	Medium/Low												
Wisteria floribunda	Medium			X		X		X	X		X		
Wisteria sinensis	Medium		X	X	X	X	X	X	X		X	X	
Youngia japonica	Medium/Low											X	
Yucca glauca	Insignificant												

List 2 - Taxa to be ranked

	<i>Acer campestre</i>		<i>Eleusine indica</i>
	<i>Acer buergerianum</i>		<i>Epilobium parviflorum</i>
X	<i>Achillea millefolium</i>	X	<i>Eschscholzia californica</i>
	<i>Achyranthes japonica</i>	X	<i>Euonymus japonicus</i>
	<i>Actinidia arguta</i>		<i>Falcaria vulgaris</i>
	<i>Aesculus hippocastanum</i>		<i>Fallopia convolvulus</i>
	<i>Aesculus pavia</i>	X	<i>Galium mollugo</i>
	<i>Aethusa cynapium</i>	X	<i>Galium verum</i>
	<i>Agrostemma githago</i>		<i>Genista tinctoria</i>
	<i>Agrostis capillaris</i>		<i>Hieracium × floribundum</i>
	<i>Amaranthus palmeri</i>		<i>Hieracium flagellare</i>
X	<i>Amaranthus hypochondriacus</i>		<i>Hippophae rhamnoides</i>
	<i>Anthriscus sylvestris</i>		<i>Hosta ventricosa</i>
X	<i>Artemisia stelleriana</i>		<i>Imperata cylindrica</i>
X	<i>Aucuba japonica</i>		<i>Ipomoea coccinea</i>
	<i>Azolla filiculoides</i>	X	<i>Ipomoea hederacea</i>
	<i>Betula pendula</i>		<i>Iris domestica</i>
X	<i>Bromus arvensis</i>		<i>Kerria japonica</i>
	<i>Bromus japonicus</i>		<i>Kolkwitzia amabilis</i>
	<i>Bromus racemosus</i>		<i>Lactuca saligna</i>
	<i>Bromus secalinus</i>		<i>Lantana montevidensis</i>
	<i>Buglossoides arvensis</i>	X	<i>Lathyrus laetivirens</i>
X	<i>Calystegia sepium</i>		<i>Leonurus cardiaca</i>
	<i>Carex macrocephala</i>		<i>Lepidium campestre</i>
	<i>Cayratia japonica</i>		<i>Lepidium ruderales</i>
X	<i>Centaurea nigrescens</i>		<i>Ligustrum amurense</i>
	<i>Cerastium glomeratum</i>		<i>Lilium lancifolium</i>
	<i>Cerastium tomentosum</i>		<i>Lonicera caprifolium</i>
	<i>Clematis flammula</i>		<i>Lonicera morrowii x bella</i>
	<i>Clinopodium acinos</i>		<i>Lonicera xylosteum</i>
	<i>Cornus kousa</i>		<i>Lunaria annua</i>
	<i>Cosmos bipinnatus</i>	X	<i>Lycium barbarum</i>
	<i>Cruciata laevipes</i>		<i>Lythrum hyssopifolia</i>
	<i>Cruciata pedemontana</i>		<i>Lythrum virgatum</i>
	<i>Cuscuta japonica</i>		<i>Macleaya cordata</i>
X	<i>Cyperus difformis</i>		<i>Magnolia kobus</i>
X	<i>Cyperus iria</i>		<i>Malus hupehensis</i>
	<i>Cyperus microiria</i>		<i>Malus sieboldii</i>
X	<i>Cyperus rotundus</i>		<i>Malva moschata</i>
X	<i>Cyperus esculentus</i>		<i>Malva sylvestris</i>
X	<i>Dioscorea oppositifolia</i>		<i>Malva verticillata</i>
X	<i>Dysphania ambrosioides</i>	X	<i>Melilotus albus</i>
	<i>Echinochloa crus-galli</i> var. <i>crus-</i> <i>galli</i>		

	Mentha x piperita		Salix caprea
	Mentha x rotundifolia		Salix pentandra
	Mentha x verticillata	X	Salsola kali
	Microthlaspi perfoliatum		Salvia glutinosa
X	Ophiopogon japonicus	X	Schedonorus arundinaceus
X	Panicum capillare		Schoenoplectiella mucronata
	Papaver dubium		Sedum sarmentosum
	Papaver somniferum	X	Setaria faberi
X	Parthenocissus tricuspidata		Setaria italica
X	Pennisetum glaucum	X	Setaria parviflora
	Persicaria hydropiper		Setaria verticillata
	Persicaria orientalis	X	Setaria viridis
	Phalaris canariensis		Silene flos-cuculi
	Phellodendron lavellei	X	Silene latifolia
	Philadelphus coronarius	X	Silene vulgaris
	Philadelphus inodorus		Sisymbrium altissimum
	Photinia villosa		Sisymbrium officinale
	Phyllanthus urinaria	X	Solanum nigrum
	Phyllostachys nigra		Sonchus asper
	Pimpinella saxifraga		Sonchus oleraceus
	Pinus thunbergii		Sorghum bicolor
X	Platanus acerifolia		Stellaria graminea
	Potentilla reptans		Styrax japonicus
X	Prunella vulgaris		Taraxacum erythrospermum
	Prunus padus	X	Taxus baccata
	Prunus yedoensis		Taxus cuspidata
	Ranunculus arvensis		Tetradium daniellii
	Ranunculus sardous		Torilis arvensis
X	Raphanus raphanistrum	X	Tragopogon porrifolius
	Rhamnus davurica	X	Tribulus terrestris
	Rhododendron x obtusum		Trifolium aureum
	Rosa bracteata		Trifolium incarnatum
	Rosa canina		Trifolium resupinatum
	Rosa gallica		Tripidium ravennae ssp. ravennae
	Rosa lucieae		Typha x glauca
	Rosa rubiginosa var. nemoralis	X	Verbascum blattaria
	Rosa rubiginosa var. rubiginosa		Veronica arvensis
	Rottboellia cochinchinensis	X	Veronica persica
	Rubus illecebrosus		Viburnum opulus
	Rubus laciniatus	X	Vicia minutiflora
	Rubus parvifolius		Vicia sativa
X	Rumex obtusifolius		Vicia tetrasperma
	Salix atrocinerea		Wisteria x formosa
		X	Zelkova serrata

List 3 - Watch List

Species	NCR Iran
<i>Cenchrus setaceus</i> (Forssk.) Morrone	High/Medium
<i>Egeria densa</i> Planch.	High/Medium
<i>Eichhornia crassipes</i> (Mart.) Solms	High
<i>Fallopia sachalinensis</i> (F. Schmidt) Ronse Decr.	High/Medium
<i>Glossostigma cleistanthum</i> W.R. Barker	High/Medium
<i>Hypericum perforatum</i> L.	High/Medium
<i>Lamium galeobdolon</i> (L.) L.	High/Low
<i>Ludwigia grandiflora</i> (Michx.) Greuter & Burdet	High
<i>Myriophyllum aquaticum</i> (Vell.) Verdc	High/Medium
<i>Myriophyllum spicatum</i> L.	High
<i>Najas minor</i> All.	High/Medium
<i>Nandina domestica</i> Thunb.	High/Medium
<i>Nymphoides peltata</i> (S.G. Gmel.) Kuntze	High/Medium
<i>Phellodendron amurense</i> Rupr.	High/Low
<i>Poncirus trifoliata</i> (L.) Raf.	High/Low
<i>Rhamnus cathartica</i> L.	High
<i>Rhamnus frangula</i> L.	High/Medium
<i>Spiraea japonica</i> L. f.	High/Medium
<i>Tamarix parviflora</i> DC.	High/Low
<i>Vincetoxicum nigrum</i> (L.) Moench	High
Note <i>Cenchrus setaceus</i> is likely a mis-identified <i>C. compressus</i> (R. Br.) Morrone	
The production of the Watch List encouraged the identification of and reporting of the species on the list. It is now known that these species do occur in NCR parks: <i>Cenchrus setaceus</i> , <i>Cenchrus compressus</i> , <i>Hypericum perforatum</i> , <i>Lamium galeobdolon</i> , <i>Myriophyllum spicatum</i> , <i>Najas major</i> , <i>Nandina domestica</i> , <i>Phellodendron amurense</i> , <i>Poncirus trifoliata</i> , <i>Rhamnus cathartica</i> , and <i>Spiraea japonica</i> .	
Many Candidate species are known to occur in parks. They occur on this list because they are not considered invasive in park natural areas, they are poorly known, or they were not known to occur in park natural areas at the time the Park List was created.	

List 4 - Prioritized ranked species

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Acer platanoides	High/Medium	X		X	X	X	X	X	X			X	X
Alliaria petiolata	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Arundo donax	High/Medium												
Berberis thunbergii	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Brassica nigra	High/Low												
Bromus inermis	High/Medium												
Bromus tectorum	High/Medium	X				X							
Cabomba caroliniana	High/Medium												
Celastrus orbiculatus	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Cenchrus setaceus	High/Medium											X	
Centaurea solstitialis	High/Medium												
Cirsium arvense	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Corydalis incisa	High/Low												X
Cytisus scoparius	High												
Dioscorea polystachya	High/Medium					X						X	
Egeria densa	High/Medium												
Eichhornia crassipes	High												
Elaeagnus angustifolia	High/Medium	X	X	X	X	X	X	X	X		X	X	X
Elaeagnus umbellata	High	X	X	X	X	X	X	X	X		X	X	X
Epipactis helleborine	High/Medium												
Fallopia japonica	High/Medium			X	X			X	X		X	X	
Fallopia sachalinensis	High/Medium												
Glossostigma cleistanthum	High/Medium												
Hedera helix/hibernica	High	X		X	X	X	X		X	X	X	X	X
Hydrilla verticillata	High/Medium			X									
Hydrocharis morsus-ranae	High/Low												
Hypericum perforatum	High/Medium				X		X						
Hypochaeris radicata	High/Low												
Isatis tinctoria	High/Low												
Lepidium latifolium	High												
Ligustrum sinense	High/Medium			X		X	X	X			X	X	X

ITIS.gov species (if avail)	IRank	ANTI	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	NAMA	PRWI	ROCR	WOTR
Lonicera japonica	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Lonicera maackii	High/Medium	X	X	X	X		X	X	X		X	X	X
Lonicera standishii	High/Medium												
Ludwigia grandiflora	High												
Lythrum salicaria	High			X	X				X	X		X	
Microstegium vimineum	High/Medium	X	X	X	X	X	X	X	X	X	X	X	X
Morus alba	High/Medium	X		X	X	X	X	X	X	X	X	X	X
Myriophyllum aquaticum	High/Medium												
Myriophyllum spicatum	High				X								
Najas minor	High/Medium				X								
Nandina domestica	High/Medium				X					X		X	
Nymphoides peltata	High/Medium												
Opismenus undulatifolius	High				X				X			X	
Pachysandra terminalis	High/Low				X				X			X	
Persicaria longiseta	High/Medium												
Phalaris arundinacea	High/Medium		X		X			X	X				
Phellodendron amurense	High/Low				X				X				
Phragmites australis	High			X	X	X	X		X				
Pueraria montana var. lobata	High/Medium			X	X	X	X	X	X			X	
Rhamnus cathartica	High				X								
Rhamnus frangula	High/Medium												
Schedonorus arundinaceus	High/Medium				X								
Securigera varia	High/Medium	X	X	X							X		
Sorghum halepense	High/Medium	X			X	X	X	X					
Spiraea japonica	High/Medium		X		X								
Tamarix parviflora	High/Low												
Triadica sebifera	High/Medium												
Viburnum dilatatum	High/Low			X	X						X	X	X
Viburnum plicatum	High/Medium											X	X
Vincetoxicum nigrum	High												
Vincetoxicum rossicum	High/Medium												

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