

Utilitarian Area

This character area is approximately one acre in size. It includes the garden beds and shrub massings south of the drive that surround the house, barn, and outbuildings; it extends to the southern property line. It was identified as a separate character area because the plant composition in this area differs from the other garden areas, and the overall spatial arrangement appears more domestic or utilitarian.

Landscape description

In the large shrub mass adjacent the drive, boxwoods and southern magnolias line the main drive and barn access road. A large disturbed area remains in this bed where a tree fell and struck the ca. 1900 house during a hurricane in 2003, see Figure 4-19. This house was demolished and removed in December 2004. At the time of the inventory, a mound of dirt rested at the base of a holly and dogwood tree. In the opening created by the fallen tree, many understory plants were beginning to sprout, including a large amount of pokeweed. The bed surrounding the demolished house contained a mixture of yew, lindera, euonymus, bush honeysuckle, and azaleas. A Norway maple, black walnut, and a large arborvitae are also located near the former house site. Directly in front of the former house site a specimen beech stands in the center of an open lawn area. Just south of the former house site, two garden beds surround a fence. The western bed contains a few rhododendrons, azaleas and a section of boxwoods in tight rows. Hazelnuts line the entire fence, see Figure 4-20. The southern portion of this character is mown lawn with a variety of trees scattered throughout. Black walnuts are the dominant tree; other trees include pecan, Chinese chestnut, hickory, an American linden, and a black cherry with privet on either side. Within the mown lawn area, one section is overgrown with mainly pokeweed; this is the area where rhododendron seedlings were planted, as identified by Mrs. White.⁶ A garden bed consisting of azaleas, privet, and English ivy wraps the southern edge of the parking area behind the barn. A black walnut stands at the southwest corner of the barn and a large wisteria vine grows up the south face of the barn, see Figure 4-21. A large mass of bush honeysuckle wraps the southeast corner of the parking area. East of the barn, two rows of black walnuts create a spatial arrangement typical of an old road corridor.

Condition

The overall condition of this area can be considered **fair**. A considerable amount of plants in this area are in fair to poor condition. Plants that were in the path of the fallen tree have been damaged, several trees are in poor condition, some of the boxwoods are dying back, and there are quite a few invasive plants within this area. The wisteria on the barn could become problematic and cause damage to the structure. The privet and bush honeysuckle in the area will continue to seed out into other areas and English ivy poses a threat to the trees it is growing on.

⁶ Margaret K. White, field observations, July 22, 2004.

Landscape Management Issues

- Maintain mowing frequency in lawn areas and reestablish lawn where needed.
- The demolished house site should be monitored for invasive species, as they grow quickly and easily invade disturbed areas. If not already done so, any disturbed area should be temporarily planted with a non-invasive herbaceous cover.
- Individual shrubs and trees identified in fair to poor condition should be further assessed to determine cause and then treated accordingly. Refer to the Resource Inventory in Chapter Three for the condition assessment of each shrub, shrub massing, tree, or garden bed. Plants that have died or that cannot be recovered should be removed and replaced in kind.
- As with other garden areas, invasive groundcovers like English ivy and microstegium pose a potential threat to the surrounding woodlands if allowed to remain. Microstegium should be removed as it was not planted but rather spread in from outside sources. English ivy was most likely planted, and if it is eventually determined desirable in the garden beds, it should be actively contained by routine maintenance. The other ornamental groundcovers in this area pose only a minor threat of woodland invasion, but should be regularly observed and maintained nonetheless. See Treatment Recommendations for Invasive Plant Species at the end of this chapter for more information.
- The entire character area should undergo a thorough cleanup and would benefit from routine maintenance. See Treatment Recommendations for Maintaining the Garden Areas at the end of this chapter for specific recommendations.
- The removal of invasive plants would further prevent spread into natural areas. Bush honeysuckle and privet pose the most significant threat in this area. See Treatment Recommendations for Invasive Plant Species at the end of this chapter.



Source: John Milner Associates, Inc., 2004

Figure 4-19: House after being hit by a tree during Hurricane Isabel. This structure has since been demolished and removed.
846



Source: John Milner Associates, Inc., 2004

Figure 4-20: Hazelnuts lining fence.
736



Source: John Milner Associates, Inc., 2004

Figure 4-21: A large wisteria vine grows up the side of the barn. 661

Field

This character area includes the large field east of the White residence. It is approximately three acres in size.

Landscape description

This character area is a maintained field that gently slopes towards the pond and eastern edge of the property. Plant composition is a variety of grasses and herbaceous species maintained at an approximate height of six to eight inches. A few trees and small shrubs are scattered in the southern part of the field. A few of the original fruit trees planted by the White family remain but are slowly declining in health and fruit production. A large shrub mass near a black walnut is unidentifiable because it is completely covered in grapevine, see Figure 4-22. Several paulownia trees are clustered just east of the barn. Nearby, there are two small shrub massings consisting of azalea, bush honeysuckle, and Bradford pears that have been significantly cut back.⁷ Along the northern edge of the field, three crape myrtles form a straight line perpendicular to the woodland edge.

Condition

The overall condition of this area can be considered **good**. Overall, the mixture of grasses and herbaceous plants that make up the field appears to be in good condition. Most of the trees are also in good condition. The declining fruit trees were not considered a significant enough threat to decrease the overall condition assessment of this area. The two shrub massings are more unsightly than in poor condition. The azaleas should be transplanted and the remaining mulberry, stunted Bradford pears, and bush honeysuckle removed. Paulownia is considered a moderately invasive species by the Virginia Department of Conservation and Recreation (VDCR) and will spread into the surrounding woodlands.⁸

Landscape Management Issues

- Continue mowing frequency to maintain the field and prevent woodland succession. This area would be highly susceptible to invasive species if not continually managed.
- Consider managing the field for native grasses to reduce maintenance and decrease invasive plant species.
- Individual shrubs and trees identified in fair to poor condition should be further assessed to determine cause and then treated accordingly. Plants that have died or that cannot be recovered should be removed and replaced in kind.

⁷ It is possible that these Bradford pears were removed after the field survey. During a January, 2006 field visit, FCPA staff were unable to locate these trees. If these trees are no longer present, the database should be updated to reflect their removal.

⁸ Virginia Department of Conservation and Recreation, *Invasive Alien Plant Species of Virginia*, <http://www.dcr.virginia.gov/dnh/invlist.pdf> (accessed September, 2004).

- Invasive species do not pose a significant threat in this area but should be regularly monitored. Specifically, Paulownia is moderately invasive and should be removed. See Treatment Recommendations for Invasive Plant Species at the end of this chapter for more information.



Source: John Milner Associates, Inc., 2004

Figure 4-22: Shrub mass completely covered in grapevine.
800

Circulation Features

Paths, trails, and drives are typical features found in more than one character area. They are grouped together because they have similar characteristics and conditions issues. The network of paths in the garden areas typically consists of mown lawn or other herbaceous groundcover. These paths widen in some areas to create small open spaces of lawn.

Several brick walks are found throughout the property, most connecting to the house. A long brick walk begins near the entrance to the property at the drive, winds through the woodland towards the house where it lines the circle drive, and continues parallel to it before terminating at the barn, see Figures 4-23 and 4-24. Arborvitae off the corner of the greenhouse obscure the walk in this area. The portion of the walk adjacent to the barn is in very poor condition. Stone steps and bricks are upturned and loose; it appears as if a large vehicle drove over this walk, see Figure 4-25.

Two short walks from the house intersect this long walk at the circle drive. A short section of brick makes up one of the upper garden paths, see Figure 4-26. Many of the brick walks are slippery when wet and contain many trip hazards from upturned bricks.

The woodland trails consist of mainly earthen paths. Numerous sections of these trails are rutted and can become very muddy, refer to Figures 4-2 and 4-7. The drive to the house and barn is gravel and in good condition, see Figure 4-27. No obvious ruts or other states of disrepair were observed.

Landscape Management Issues

- Keep paths clear and open until the future use of this property is determined. Remove fallen branches and other debris from pathways. Maintain mown paths through regular mowing.
- Minimize safety hazards on brick walks by resetting upturned bricks and advise users that walk may be slippery when wet. Any unobtrusive measures to increase surface grip should be considered. If walks in poor condition are not improved, consider restricting access.
- Document and reset the stacked stone steps located along the entrance drive. These steps pose a safety hazard as they are uneven. Add new stones where necessary to create an even and safe walkable surface.
- Portions of woodland trails may become impassable following heavy rain events. Until future use of this area is determined, temporary measures may be needed in the interim to use these paths. Consider refilling ruts to reduce trip hazards. In muddy areas, create slip resistant surfaces by applying a sufficient depth of straw in level areas or bark mulch.



Source: John Milner Associates, Inc., 2004

Figure 4-23: Stacked stone steps and brick walk located along drive near entrance.
835



Source: John Milner Associates, Inc., 2004

Figure 4-24: Brick walk through woodland and garden area.
828



Source: John Milner Associates, Inc., 2004

Figure 4-25: Portion of walk along barn in poor condition.
844



Source: John Milner Associates, Inc., 2004

Figure 4-26: Small brick landing along a garden path north of the house.
818



Source: John Milner Associates, Inc., 2004

Figure 4-27: Gravel drive and fencing at entrance to property.
749

Cultural Features

The following condition assessments are provided for the cultural features identified in the Chapter Three Resource Inventory. For the purpose of this report, cultural features are those constructed for the purpose of utilizing or managing the site. Archeological resources were not identified as part of this project. Where necessary, treatment recommendations follow the condition assessment.

Fences

As the focus of this landscape management plan is placed on horticultural, rather than constructed resources, the following fence condition assessments are based upon information provided in the draft Fairfax County Park Authority General Management Plan for the White Horticultural Park, and from general observations in the field.

- The box-wire fence along the south of property is generally in good condition. Two cuts were made in the fence near the southwest corner to access the neighboring Kennedy property.
- The painted, wooden post and three-board fence along the west property is in good condition. The gate across Hawthorne Lane where Rolfs Road ends is not secure and is unstable. The fence portion flanking the entrance drive is also in good condition, it may need repainting.
- The wooden split-rail fence along the outlet road is in poor condition and is showing signs of deterioration.
- The wire (chain-link) fence along the northeast property is in fair condition; it is rusted and some areas show signs of weakening.
- The fence south of the former house site is in fair condition, as it shows minor signs of deterioration.

It is recommended that little treatment action be taken until the future use of the property is determined. It may be necessary to stabilize, with minimal interference, any fence that appears to be in poor or hazardous condition. Any barbed wire should be removed.

Overhead Utility Lines

The overhead utility lines appear to be functioning and in good condition. The following issues should be considered:

- Power lines must be taken into consideration for any future plan of the site.
- Understory growth and surrounding trees may need to be pruned or removed from these lines.
- The service lines to the house and barn must be taken into consideration and any low-lying lines, especially over paths should be considered hazardous and rectified.

Stone Features

The various stone features throughout the site were not assessed for structural integrity. The dry-stacked stone wall along the edge of the drive and stone retaining wall at the barn should be further assessed to determine condition, see Figures 4-28 and refer to 4-25. The stone stormwater features were also not evaluated to determine functionality, see Figure 4-29. Existing storm water features should be evaluated if any site changes occur that would effect overall drainage patterns or flow quantities.

Debris piles

The large debris piles located around the property are unsightly when in close proximity to the garden areas. They may also prove to be dangerous if children attempt to play on them or if they harbor rodents or other wildlife. These piles should be removed if visitation to the site increases before an overall treatment plan is identified. Care should be taken when removing these piles because contents could contain hazardous materials.

Pond

The pond, in the southeast corner, is approximately ninety by fifty feet and is covered by surrounding tree canopy. Small fish were observed in the pond which may indicate suitable conditions. However, a condition assessment of this water feature exceeds the scope of this project. It is recommended the impoundment structure built by Mr. and Mrs. White be evaluated to determine if any repair is necessary. A water quality test is also recommended to determine pond ecosystem health. It is also recommended that the pond's watershed be identified in order to determine potential sources of pollution and runoff. Over time, possible sedimentation and buildup of leaf matter may cause the pond to fill-in. Until a management plan is determined, it is recommended the pond be kept clear of debris (like fallen branches) and routinely inspected to ensure no damage to the impoundment structure has occurred.

[Note: FCPA is going to undertake a Natural Resource Management Plan that will include testing, analysis, and watershed determination in early 2006].



Source: John Milner Associates, Inc., 2004

Figure 4-28: Stacked stone retaining wall along edge of drive.
795



Source: John Milner Associates, Inc., 2004

Figure 4-29: Stacked stone culvert alongside the drive.
750

Treatment Recommendations for Maintaining the Garden Areas

The following recommendations apply to all garden character areas: upper garden, lower garden, White residence surrounds, and the utilitarian area. Until the future use of the property is determined, all garden areas should either remain in, or be improved to, a state of good condition. Potentially hazardous conditions should be addressed and areas maintained to ensure horticultural resources are not damaged or lost.

- All unwanted plants including weeds, volunteer seedlings and saplings, and invasive plants should be removed. Extreme care should be taken to not disturb surrounding plants. Invasive species should be properly disposed of to prevent further spreading. At best, these plants should be kept from damaging desired plants. See Treatment Recommendations for Aggressive Native Species and for Invasive Species for more information on removing these types of plants.
- Vines growing on shrubs should be removed; these include, but are not limited to, English ivy, honeysuckle, wild grape, and greenbrier. Extreme care should be taken not to harm the host plant. See Treatment Recommendations for Aggressive Native Species and Treatment Recommendations for Invasive Species for more information.
- English ivy, most likely planted, has since spread into woodland areas and up trees in the garden areas. Until a long-term treatment approach is determined, it is recommended that ivy within garden areas be contained and prevented from growing into new areas through routine maintenance.
- All debris including fallen branches should be removed from bed and lawn areas.
- Trees and shrubs should be selectively pruned to remove hazardous or dead branches, especially any extending out into paths.
- Bed edges should be maintained and clearly defined to ensure original garden design is preserved.
- All efforts taken in the garden areas should be documented, especially if dead plants are removed and replaced.

Treatment Recommendations for Aggressive Native Plants

In a healthy ecosystem, species composition is kept in balance by an array of natural factors. However, a disturbance—whether it is natural or cultural—can create an opportunity for native plant species to flourish in abundance to the point where they can be considered aggressive. Typically, a prolific native plant is balanced over time by other species as the ecosystem achieves equilibrium. However, in the case of the White property, horticultural or managed areas are prone to sustain aggressive native species unless treated. These areas include: the West Woodland edge covered in wild grape, garden areas not actively maintained, and along trail edges. The three major aggressive native plants are wild grape (*Vitis* spp.), greenbrier (*Smilax* spp.), and brambles (*Rubus* spp.). The following recommendations are provided for managing these species in the horticultural or maintained portions of the property, only. Those species occurring within the woodlands should not be managed as they are a natural component of the woodland.



Wild grape.

Source: Clarence A. Rechenthin @
USDA-NRCS PLANTS Database
(accessed January 2006).

Wild grape (*Vitis* spp.) is a native woody vine that uses tendrils to climb on trees and shrubs. The fruit of the wild grape is an important food source for wildlife that then spreads the seeds to new places. Wild grape can smother horticultural resources if left alone.

- Consider pulling vines by hand, and disposing of the debris offsite. Care should be taken not to harm host plant.
- Remove vines growing on trees or shrubs by cutting through the stems, and pulling the rooted portions from the ground.
- In heavily infested areas, wound or scarify vines using mechanical means like cutting or mowing. Follow up mechanical cutting with the controlled use of systemic herbicide, such as glyphosate, applied in concentrated form to the cut areas.



Greenbrier.

Source: Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database / USDA SCS. 1991. *Southern wetland flora: Field office guide to plant species*. South National Technical Center, Fort Worth, TX.

Greenbrier (*Smilax* spp.) is a thorny native vine that grows in thickets and climbs on trees and shrubs. If left in garden areas, greenbrier can retard or deform the growth of preferred ornamental plants.

- Consider pulling vines by hand, and disposing of the debris offsite. Care should be taken not to harm host plant.
- Remove vines growing on shrubs by cutting through the stems, and pulling the rooted portions from the ground.
- Cut or wound vine and follow up with the controlled use of systemic herbicides, such as glyphosate, applied in concentrated form to the cut areas.



Brambles along edge of field (615).

Source: John Milner Associates, Inc., 2004.

Brambles (*Rubus* spp.) are also commonly known as raspberries and blackberries. They are thorny, woody vine-like shrubs. If left in garden areas, brambles can retard or deform the growth of preferred ornamental plants. Brambles along trail edges can also be hazardous or cumbersome due to the thorns grabbing passersby.

- Consider pulling smaller plants by hand, and disposing of the debris offsite. Care should be taken not to disturb surrounding plants.
- Cut or wound plant and follow up with the controlled use of systemic herbicides, such as glyphosphate, applied in concentrated form to the cut areas.

Treatment Recommendations for Invasive Plant Species

Recommendations for containing, controlling, and managing the invasive species that pose the most serious threat to park resources follow. *Alien Plant Invaders of Natural Areas* by Plant Conservation Alliance and *The Invasive Species Initiative*, a program of the Nature Conservancy, provide extensive information on invasive species and control measures.⁸ These recommendations also consider the guidance available in the following sources, which provide additional detail: *Nonnative Invasive Plants of Southern Forests, A Field Guide for Identification and Control*, *A Handbook for Forest Vegetation Management in Recreation and Historic Parks*, and at the website, www.invasivespecies.gov.⁹ A publication by Virginia Department of Conservation and Recreation (VDCR) entitled *Managing Invasive Alien Plants in Natural Areas, Parks, and Small Woodlands* also provides a basic overview of invasive plant species management in Virginia.¹⁰

The FCPA needs to determine an overall approach for invasive species that appear to be planted as part of garden beds and may be components of the original design. If they are allowed to remain, it will be a constant maintenance issue to contain and prevent these plants from spreading into other areas.

Given the diversity of invasive species in the natural areas at White Horticultural Park, and the current and potential damage it poses to natural and cultural resources, the FCPA should consider developing an Integrated Pest Management (IPM) program. The IPM concept is based on combined strategies for pest management. Such a program would involve collaboration on the part of natural resource specialists such as biologists and ecologists, and experts from state and federal institutions to compile the most up-to-date scientific data for managing invasive species.

The recommended approach to developing an IPM program is as follows:

Identification and Monitoring

- Utilize the GIS database created for this project to identify and further detail the location, density, and type of invasive species populations prior to control and removal efforts in order to create a baseline of information for future evaluation of efforts. The attribute data contained in the GIS database can be adapted by adding new fields to record treatment actions, results, and track removal progress.

⁸ Plant Conservation Alliance, *Alien Plant Invaders of Natural Resources*, available at <http://www.nps.gov/plants/alien/fact.htm> and *The Nature Conservancy, The Invasive Species Initiative* available at <http://tncweeds.ucdavis.edu/esadocs.html> (accessed on September, 2004).

⁹ *Nonnative Invasive Plants of Southern Forests, A Field Guide for Identification and Control*, available at <http://www.invasive.org/eastern/srs/> and *A Handbook for Forest Vegetation Management in Recreation and Historic Parks*, available at <http://www.ext.vt.edu/pubs/forestry/420-143/420-143.html#L31> (accessed on September, 2004).

¹⁰ Virginia Department of Conservation and Recreation, *Managing Invasive Alien Plants in Natural Areas, Parks, and Small Woodlands*, available <http://www.dcr.virginia.gov/dnh/mnginv.pdf> (accessed on September, 2004).

Degree of Infestation

- Utilize the Resource Inventory and the Condition Assessment contained within this report to understand baseline species populations and their likely impact upon the park's ecological health and its natural and cultural resources.
- Consult references like VDCR's *Invasive Alien Plant Species of Virginia* for further information on the invasiveness of a species in Virginia, the threat level it poses, and the degree of difficulty to manage it.¹¹

Treatment

- Prior to treatment, consult with natural resource specialists on-site to determine the most effective and sensitive method available to address each specific invasive species population. Typical removal options include chemical (herbicides), mechanical (cutting, mowing), and prescribed burning, although biological control means may also be effective for some species. Recommended removal techniques for invasive species identified within the park are identified at the end of this section.
- Consider that Mrs. White does not advocate the use of chemicals at the property, including herbicides, when determining pest management strategies.¹² As such, the chemical removal measures outlined below are provided as general information, and should be tailored to future FCPA management goals and objectives for use at this property.
- Prioritize the application of control measures based on species and populations that pose the greatest threat to natural and cultural resources.
- Educate personnel who will remove invasive species to identify and differentiate these from native species and horticultural resources, and train them in appropriate methods for removal/treatment.
- Use ecologically sound removal techniques that will not cause damage to resources or assess potential impacts on resources to ensure that treatment benefits outweigh negative effects.
- Remove invasive plant species in such a way as to minimize ground disturbance and damage to native vegetation. Removal should be undertaken only after surrounding landscape features and resources have been protected. Hand-treat or remove by hand invasive plants in sensitive natural or cultural resource areas.
- If necessary, repair damage to resources and mitigate any impacts of removal, such as the potential for soil erosion on steep slopes.

¹¹ Virginia Department of Conservation and Recreation, *Invasive Alien Plant Species of Virginia*, available at <http://www.dcr.virginia.gov/dnh/invlist.pdf> (accessed on September, 2004).

¹² Margaret K. White, field observations, July 22, 2004.

- Consider revegetating cleared areas with appropriate native plant species to prevent re-infestation and erosion problems.

Evaluation

- Monitor and document all control and removal activities in order to evaluate the effectiveness of various measures.
- The attribute data contained in the GIS database can be adapted by adding new fields to record treatment actions, results, and track removal progress.

Education

- Educate personnel to identify invasive species and to take action before problems develop.

The following considerations and recommendations are provided for the predominant invasive species found within the park. *Invasive Alien Plant Species of Virginia* produced by VDCR was referenced to determine invasive species status in Virginia and level of threat.¹³ They are listed in order of threat to the park's horticultural and natural resources.



English ivy growing up tree trunks (718).

Source: John Milner Associates, Inc., 2004.

English ivy (*Hedera helix*) is an aggressive vine that poses a threat due to its dense growth. English ivy has the ability to scramble over trees and shrubs, limiting their intake of air and water, and adding cumbersome weight to the plant that renders them more susceptible to being blown over. English ivy spreads by vegetative means as well as by seed. Control methods range from mechanical to chemical means, or a combination of both. Mechanical means are labor intensive, and any root material left in the soil has the ability to regenerate new vines. The following methods can be effective:

- Consider pulling vines by hand, and properly disposing of them in plastic bags in a landfill.
- Remove vines growing on trees by cutting through the stems at waist height, and pulling the rooted portions from the ground.

¹³ VDCR, *Invasive Alien Plant Species of Virginia*, available <http://www.dcr.virginia.gov/dnh/invlist.pdf> (accessed on September, 2004).

- Where possible, wound or scarify ivy by using mechanical means like cutting or mowing. Follow up mechanical cutting with the controlled use of systemic herbicide, such as glyphosate, applied in concentrated form to the cut areas.
- Cited literature recommends foliar or basal bark applications of triclopyr to evergreen leaves during appropriate warm spells when deciduous species are not in leaf, taking care to avoid herbicidal contact with desirable plants. However, this method is not recommended for the park because this herbicide can remain active in the soil and may damage surrounding horticulture resources.
- As with all invasive alien plants, repeat applications and follow-up monitoring will be required to ensure that control methods do not increase the vigor of the stand by promoting root growth.



Japanese stilt grass within the garden bed (707).

Source: John Milner Associates, Inc., 2004

Microstegium or Japanese stilt grass (*Microstegium vimineum*) is a summer annual grass that occurs primarily in moist, shady areas. It is very invasive and will dominate suitable habitats, crowding out native herbaceous vegetation. Because it is an annual, it propagates strictly by seed and spreads opportunistically, following disturbance to form dense patches and displacing native wetland and forest vegetation as the patch expands.

- Whenever possible, prevent the introduction of Japanese stilt grass by avoiding disturbance to vegetation and soil.
- Remove mechanically by hand-pulling. Pull by hand at any time. Summer pulling may result in germination of stored stilt grass seed in newly disturbed soil. Hand-pulling will need to be repeated and continued for many seasons.

Control by mowing. Mow in late summer (September) when plants are in peak bloom but before seed is produced. Use a mower or string-trimmer.



Honeysuckle shrub.

Source: Plant Conservation Alliance, Exotic Bush Honeysuckle, <http://www.nps.gov/plants/alien/fact/loni1.htm> (accessed January 2006).

Honeysuckle (*Lonicera* spp.) rapidly invades and overtakes a site by forming a dense shrub or vine layer that crowds and shades out native plant species. There are both vine and shrub species of honeysuckle that can be invasive. Honeysuckle decreases light availability, depletes soil moisture and nutrients, and may release toxic chemicals that prevent other plant species from growing in their vicinity. Recommendations for the control of honeysuckle include:

- In shaded forest habitats, repeated cutting of the stems to ground level during the growing season may show positive results. Cutting must be repeated at least once a year because honeysuckle cut once and left to grow often forms stands that are more dense and productive than they were prior to cutting.
- Removal of seedlings or small plants by hand can be effective for light infestations. The same methods used for hand removal of privet are applicable for honeysuckle. Care should be taken, as much as feasible, to minimize soil disturbance.
- Systemic herbicides, such as glyphosate, are also effective in controlling honeysuckle. Seedlings can be controlled by application of glyphosate sprayed onto foliage. Well-established stands of honeysuckle are best managed by cutting stems to the ground and immediately applying concentrated glyphosate to the cut ends.
- Install trees, shrubs, and vines that are native, part of the local flora, and suited to the cultural requirements of the areas where honeysuckle is removed. Examples of suitable vine replacements might include trumpet creeper, crossvine, or false jasmine.



Privet.

Source: J.S. Peterson @ USDA-NRCS PLANTS Database (accessed January 2006).

Privet (*Ligustrum* spp.) dominates the shrub layer and alters the native species composition and natural community structure of an invaded habitat by crowding out native shrub species and shading out most herbaceous species. The resulting lack of vegetative groundcover often results in erosion, and therefore loss of water quality, in surrounding streams.

- Remove privet less than one inch in diameter, by hand pulling the plants, working to ensure that the entire root is removed. This is the most effective method for controlling privet, but also the most labor intensive. Specialized tools, such as the Weed Wrench can be used to speed and ease the removal process. Care should be taken, as much as feasible, to minimize soil disturbance.
- Cut privet using mechanical means where accessible by heavy equipment. Follow up mechanical cutting with the controlled use of systemic herbicides, such as glyphosate, applied in concentrated form to the cut stumps. If follow-up does not occur, cutting or plowing privet can lead to increased populations.
- Chinese privet leaves are evergreen to semi-deciduous. Application of diluted glyphosate to privet foliage in late summer or early fall after adjacent deciduous native plants have dropped their leaves can also be used to kill the plants. A combination of cutting followed immediately by application of glyphosate to the stump is reported to be the most effective in ensuring control.
- Install trees and shrubs that are native, part of the local flora, and suited to the cultural requirements of the areas where privet is removed.



Vinca groundcover.

Source: William S. Justice @ USDA-NRCS PLANTS Database (accessed January 2006).

Vinca or periwinkle (*Vinca* spp.) is a perennial, evergreen groundcover that poses a moderate threat to native plant species. It is problematic in areas where it is competing with native flora because once established, it forms a dense blanket crowding out native herbaceous vegetation. Standard chemical control methods may not be effective on vinca due to the waxy cuticle on the leaves that make chemical penetration difficult. Any chemical method should be applied in a small test area first to determine success.

- Remove mechanically by pulling by hand. In areas where only vinca is present, the runners can be raked, mowed, and then removed by hand.
- Cut or wound vinca using mechanical means. Follow up mechanical cutting with the controlled use of systemic herbicides, such as glyphosate, applied in concentrated form to the cut areas.



Wisteria trunk and leaves (662).

Source: John Milner Associates, Inc., 2004

Wisteria (*Wisteria* spp.) both Chinese and Japanese, are aggressive woody ornamental vines that grow vigorously, climbing trees and other structures. It is very hardy and successfully strangles or shades out native shrubs and trees and can kill sizeable trees.¹⁴

- Remove small initial populations of wisteria, by hand pulling the plants, working to ensure that the entire root is removed. Specialized tools, such as the Weed Wrench can be used to speed and ease the removal process. Care should be taken, as much as feasible, to minimize soil disturbance. All plant parts should be bagged and disposed of off site to prevent reestablishment.
- Another mechanical mean involves cutting wisteria close to the root collar early in the

¹⁴ Plant Conservation Alliance, *Exotic Wisterias*, <http://www.nps.gov/plants/alien/fact/wist1.htm> (accessed August 24, 2004).

growing season. Continue to cut new sprouts as wisteria will continue to re-sprout until its root stores are exhausted. Cutting will control existing growth and prevent seed production. Vines wrapped around trees should be removed or partially cut to prevent the vine from girdling the tree. This is a labor intensive procedure and best suited for small populations or where chemical treatment is not desirable.

- Cut wisteria as close to the ground as possible and follow up with the controlled use of systemic herbicide, such as glyphosate, applied in concentrated form to the cut stumps. Vines wrapped around trees should be removed or partially cut to prevent the vine from girdling the tree.
- Foliar application of systemic herbicides, such as glyphosate, is also effective in controlling wisteria. Well-established wisteria may be managed by preceding foliar applications with a cut stump treatment (described above).



Multiflora rose leaves and flowers.

Source: Plant Conservation Alliance, Multiflora Rose, <http://www.nps.gov/plants/alien/fact/romu1.htm> (accessed January 2006).

Multiflora rose (*Rosa multiflora*) is extremely prolific. It spreads through suckering, seed, and the establishment of new plants where stems touch the ground and root. It can quickly form impenetrable thickets to the exclusion of all other plant species. This plant invades open woodlands, forest edges, successional fields, savannas, and prairies that have experienced disturbance.

- The most effective method for controlling multiflora rose involves frequent, repeated cutting or mowing at the rate of three to six times per growing season for two to four years. In high-quality native communities, cutting of individual plants is preferred to site mowing in order to minimize habitat disturbance.
- Systemic herbicides, such as glyphosate, can also be used. However, due to long-lived seed stores in the soil, follow-up treatments are often necessary. A combination of cutting, followed

immediately by application of concentrated glyphosate to the cut ends, and then spraying re-growth with glyphosate may be highly effective, especially if conducted late in the growing season.

- Install trees and shrubs that are native, part of the local flora, and suited to the cultural requirements of the areas where multiflora rose is removed.

The following invasive species may not be a significant threat at the park currently, but are included here to provide awareness and guidance to prevent future infestation.



Burning bush.

Source: USDA Forest Service, Northeastern Area, Slide 49, *Euonymus alata*, <http://www.na.fs.fed.us/spfo/pubs/uf/uts/section2/sect2-slide49.htm> (accessed January 2006).

Burning bush (*Euonymus alatus*) is a shrub with bright red fall foliage. Popular as an ornamental shrub, burning bush can be problematic as it can easily escape cultivation. *E. alatus* is a threat to woodlands and fields because it outcompetes native species. This plant can be difficult to control because it produces an abundance of seeds.

- Hand pulling young seedlings is effective, but labor intensive. Seedlings are best pulled after a rain when the soil is loose. The entire root must be removed to avoid re-sprouting. Larger plants and their root systems can be dug out with a spading fork or pulled with a weed wrench.
- Larger shrubs can be cut, and stump ground or re-growth can be clipped.
- Foliar applications of glyphosate are possible in stands not intermixed with desirable plants. This is most effective in early summer.
- Cut burning bush close to the ground and follow up with the controlled use of systemic herbicides, such as glyphosate, applied in concentrated form to the cut stumps.
- An extremely labor intensive measure is to trim off all the flowers.
- Planting of areas where large colonies of invasive plants have been removed should occur

in conjunction with invasive species eradication to ensure that desirable species are given an opportunity to replace the undesirable species. Install trees and shrubs that are native, part of the local flora, and suited to the cultural requirements of the areas where burning bush is removed. Potential replacements include strawberry bush (*E. americanus*), maple-leaf viburnum, highbush blueberry, or native red chokeberry.



Mimosa leaves and flowers.

Source: Plant Conservation Alliance, Silk Tree, <http://www.nps.gov/plants/alien/fact/alju1.htm> (accessed January 2006).

Mimosa (*Albizia julibrissin*) is a small to medium tree that can reach twenty to forty feet tall. Because mimosas grow in a variety of soils, produce large seed crops, and re-sprout when damaged, they are strong competitors to native trees and shrubs in open areas or forest edges because they reproduce both vegetatively and by seed. Their seeds can remain dormant for years before sprouting. They also re-sprout quickly and sprouts can grow rapidly. Mimosa can be controlled using a variety of mechanical and chemical controls.¹⁵

- Hand-pulling young saplings is effective, but labor intensive. Plants should be pulled as soon as they are large enough to grasp, but before they are mature enough to flower. Seedlings are best pulled after a rain when the soil is loose. The entire root must be removed to avoid re-sprouting.
- Cut saplings prior to mid-spring flowering period. Because mimosa sprouts from its rootstock, repeated cutting, and/or application of a systemic herbicide will be required after cutting.
- Foliar applications of glyphosate are possible in stands where there are not other plants to be retained.
- Where mimosa occurs within a stand of natives, mechanical removal of the tree, and direct

¹⁵ Plant Conservation Alliance, *Silk Tree*, <http://www.nps.gov/plants/alien/fact/alju1.htm> (accessed September 2004).

application of a systemic herbicide to the cut stump is recommended.

- Girdling is effective on large trees where the use of herbicides is impractical. Cut through the bark encircling the base of the tree, approximately six inches above the ground. This method will kill the top of the tree but re-sprouts are common and may require a follow-up treatment with a foliar herbicide.
- Planting of areas where large colonies of invasive plants have been removed should occur in conjunction with invasive species eradication to ensure that desirable species are given an opportunity to replace the undesirable species. Install trees and shrubs that are native, part of the local flora, and suited to the cultural requirements of the areas where mimosa is removed. Potential replacements for mimosa stands include serviceberry, redbud, flowering dogwood, American holly, spicebush, and sassafras.



Princess tree leaves.

Source: Plant Conservation Alliance, Princess Tree, <http://www.nps.gov/plants/alien/fact/pato1.htm> (accessed January 2006).

Princess Tree (*Paulownia tomentosa*) has the ability to spread rapidly through both seed and root sprouts. It is particularly aggressive in disturbed areas, is tolerant of dry, infertile, and rocky conditions, and will quickly colonize disrupted sites and burned areas. The plant's ability to prolifically produce seed, beginning at a young age, contributes to its ability to spread aggressively and outcompete other plants. Management strategies should include both chemical and mechanical control methods, including:

- Hand-pulling young saplings is effective, but labor intensive.
- Cut saplings prior to mid-spring flowering period. Because princess tree sprouts from its rootstock, repeated cutting, and/or application of a systemic herbicide will be required after cutting.
- Foliar applications of glyphosate are possible in stands where there are not other plants to be retained.

- Planting of areas where large colonies of invasive plants have been removed should occur in conjunction with invasive species eradication to ensure that desirable species are given an opportunity to replace the undesirable species. Install trees and shrubs that are native, part of the local flora, and suited to the cultural requirements of the areas where princess tree is removed. Potential replacements for princess tree stands include serviceberry, redbud, flowering dogwood, American holly, spicebush, and sassafras.
- Where princess tree occurs within a stand of natives, mechanical removal of the tree, and direct application of a systemic herbicide to the cut stump is recommended.



Tree-of-heaven

Source: Plant Conservation Alliance, Tree-of-Heaven, <http://www.nps.gov/plants/alien/fact/ai11.htm> (accessed January 2006).

Tree-of-heaven (*Ailanthus altissima*) is a prolific seed producer, grows rapidly, and can overrun native vegetation. Once established, the plant can form impenetrable thickets. Tree-of-heaven produces toxins that may inhibit the growth of surrounding plant species. The root system is aggressive enough to cause damage to sewers and foundations.

- The most effective method of controlling tree-of-heaven is the use of systemic herbicides, such as glyphosate. Herbicides can be applied to foliage, basal bark, cut stumps, or using a “hack-and-squirt” treatment. Along with the aboveground portion of the tree, the root system must be seriously damaged to prevent or limit stump sprouting and root suckering.
- Cutting is typically counter-productive due to the proliferation of stump sprouts and root suckers, although repeated cutting may exhaust plant reserves over several years, provided it stands in heavy shade. The initial cutting should be done in early summer. Attempt to cut large, seed-producing females to temporarily reduce the spread of seed.
- Install trees and shrubs that are native, part of

the local flora, and suited to the cultural requirements of the areas where tree-of-heaven is removed. Species might include staghorn and smooth sumac, boxelder, fringetree, ash, and black walnut.



Autumn olive.

Source: J.S. Peterson @ USDA-NRCS PLANTS Database (accessed January 2006).

Elaeagnus (*Elaeagnus* spp.) is a shrub or small tree that spreads primarily by seed. It can out-compete native vegetation and interfere with natural plant selection. Autumn Olive (*Elaeagnus umbellata*) is considered highly invasive by VDCR while Russian Olive (*Elaeagnus angustifolia*) and Thorny elaeagnus (*Elaeagnus pungens*) are considered occasionally invasive. All elaeagnus should be inventoried and monitored to determine threat level.

- Cutting shrubs and removing cut material may be the most effective method for eradication.
- Foliar applications of glyphosate are possible in stands where there are not other plants to be retained.