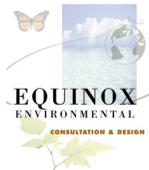


**Invasive Exotic
Plant Management Plan**
For
The Town of Weaverville, NC



Created by



Equinox Environmental Consultation & Design, Inc.

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A. Background

Partners and Roles

The Town of Weaverville, a small community located in the mountains of northern Buncombe County, NC, enjoys a strong community spirit. The Town is committed to creating an environment that is healthy for both people and wildlife – a commitment that is made evident by several Town-sponsored programs. Weaverville has been a participant in the Tree City USA program since 1991, additionally achieving the Growth Award for ten consecutive years. In 1999, Weaverville became only the second community in North Carolina to be designated a Community Wildlife Habitat by the National Wildlife Federation. The Town has established a public space known as the Main Street Nature Park (MSNP), located behind Town Hall and running parallel to Main Street. A Grant Planning Committee (GPC) was formed to manage the space, composed of the MSNP Steering Committee (SC), The Community Wildlife Habitat Team, Weaverville Garden Club members, town residents and town government representatives. The GPC strives to use the park as a demonstration facility for creating natural habitats for flora and fauna.

The North Carolina Forest Service's Community Firewise and Urban Interface Grant Program was created to develop, educate, enhance, implement, and support healthy forest management concepts in Wildland-Urban Interface (WUI) communities by encouraging citizen and community involvement. One major objective of the program is to assist communities with proper forest health management strategies through development of management plans.

Equinox Environmental Consultation & Design, Inc. (Equinox) is an award winning planning and design firm with over ten years of experience controlling invasive exotic plants, developing invasive exotic plant management plans, and coordinating public, private, and non-profit stakeholders and volunteers in the implementation of those plans.

The Problem

International conservation organizations such as the International Union for Conservation of Nature consider invasive exotic (IE) species to be a major threat to native biodiversity, natural ecosystems, and ecosystem services. Because virtually all communities in the United States are beset with this problem, it is a perfect example of the need to "think globally, but act locally." Although leaders in many communities remain under informed about the severity of the invasive species problem, the Town of Weaverville has chosen to step up and take an active role in helping to stem the tide.

There is a wide range of invasive exotic plants occurring throughout the Town; these species damage the Town's environment by making it difficult for native species to compete for resources that they need to grow. Recognizing the problem, the GPC has taken action, applying for and ultimately being awarded a NCFs Community Firewise and Urban Interface Grant in February of 2013. The Town contracted with Equinox to work with Weaverville staff and volunteers from the Community Wildlife Habitat Team to develop a town-wide invasive species management plan and native planting plan that is applicable across public and private lands.

The Plan

The Town of Weaverville Invasive Exotic Plant Management Plan was developed through a series of collaborative meetings among the project partners. As a result of these meetings, the partners successfully established goals and objectives, defined IE plants of concern, and generated a comprehensive outreach and education strategy. This Management Plan serves as a technical guide to identifying, inventorying and controlling IE plants within the Town of Weaverville's jurisdiction. It also contains valuable information on using native plant species within the landscape, including a comprehensive list of Suggested Native Plants. It defines a public outreach and education strategy, and outlines an implementation schedule that provides a framework for achieving success in the future. Finally, the Management Plan documents control efforts that occurred at the MSNP during the grant period, demonstrating effective integrated pest management (IPM) in action.

B. Goals and Objectives

Goals

There are three main goals driving this Management Plan. The initial goal is to manage invasive exotic plants within the Town of Weaverville by inventorying their extent across all public areas within the town limits. Second, we want to prevent the spread of invasive plants into natural areas within the Town by controlling existing infestations manually, chemically, or culturally. Finally, we seek to promote and encourage the use of native plants within public and private landscapes throughout the Town, so as to repair and restore the local ecosystem to a more natural state. These goals will be achieved through careful planning, development of concrete objectives, and implementation of specific activities that target those objectives.

Objectives

Inventory

One of the most important components of a successful invasive exotic plant management plan is the comprehensive inventory of infestations within the management area. The intent of an inventory is to create a baseline record of invasive exotic plant infestations within the Town that can be referenced over time to monitor changes in their size and species composition. First, a list of priority invasive plants and priority management areas must be created; these help to define the extent of the inventory. Next, proper inventory techniques need to be conveyed to volunteers who will conduct inventories. Once an inventory is established, it serves as a reference point for control and future monitoring.



Volunteers use GPS units to capture and record data for IE plants.

Several priority inventory areas exist within the Town of Weaverville. The primary focus is the MSNP, an area that contains an abundance of invasive exotic plant infestations. Secondary priority areas consist of public lands owned by the Town of Weaverville; an inventory has been performed for other publicly-owned parcels and is detailed later in the document. A tertiary and more difficult inventory priority is one that addresses privately owned properties within the town. To inventory these properties requires

voluntary participation by the landowners so it is important to reach out to them and convey the importance of their contribution to this effort.

Prevention

Ultimately, the most important strategy for managing invasive exotic plants in the Town of Weaverville is prevention. This can be highly difficult due to the uncontrollable vectors of seed dispersal (e.g. wildlife, wind, water) that aid in the spread of existing infestations. Thus, the most important component of prevention is the initial removal of priority invasive plants on the public lands, which will halt further invasion to other properties. Subsequent prevention comes in the form of cultural change. We encourage residents to make smart landscaping choices, to avoid popular invasive exotic landscape plants and, instead, select species native to the ecoregion. Also, developing relationships with local interest groups such as landscapers, developers, and homeowners associations, and encouraging them to install native instead of invasive plants will stop infestations before they start. The development of a Unified Development Ordinance (UDO) advocating the use of native plants can also promote responsible landscaping choices. Finally, advocating for the sale of native plants at local nurseries and promoting those nurseries that are already committed to that idea will put native plants in the spotlight and influence consumer choices.

Prevention of invasive exotic plants is a primary priority within all publicly owned spaces throughout the Town of Weaverville. The MSNP is a focal point, as it is the largest contiguous piece of land owned by the Town that has been designated for public use. Control of IE infestations is underway on the northern end of the park, with plans to continue southward. Other municipal lands and road corridors are also top priority. Privately owned properties are secondary priority, although extremely important to the success of the entire plan, as these properties will only be considered for management when landowners show interest on a voluntary basis.



Removing IE plants can be hard work, but is well worth the time an effort to prevent future infestations.

Education

In any IE plant management effort, an educated and informed public is one of the best defenses against future problems. Developing a solid outreach and education strategy involves knowing your audience and what speaks to their interests as individuals and as a community. Proper education helps residents understand the negative impacts of invasive exotic plants on their own property as well as that of the



Workshops are essential for educating the public about the biology and ecology of IE plants.

Town. Workshops on invasive exotic plant identification, ecology, and control teach community members what plants they are targeting, why they should care about them, and how they can manage them properly so that their landscapes aren't contributing to future infestations throughout the Town. Several demonstration workshops and volunteer workdays focusing on control of invasive plant infestations already have been held at the MSNP in order to inform and engage the public.

Educating the public can often be difficult because many of the strategies for managing invasive exotic plants involve some form of investment on their part – it can take time, effort, and money to learn about invasive plants, manage them, and re-establish native plants following management. However, controlling IE plants on your property will save you money in the long run. A brochure detailing priority invasive plants and native alternatives has been developed and is available at the Town Hall for residents to peruse (See Appendix B). It is also necessary to connect the public to local, affordable sources of native plants, and to assist them in selecting native plants that provide a similar landscape aesthetic to the invasive plants they originally intended to purchase.

Restoration

The eventual goal of the Town of Weaverville's invasive exotic plant management plan is to restore its public spaces to a more natural state. This will be achieved through a combination of thorough control and monitoring of priority infestations and subsequent restoration through replanting of native species, as IE plants can quickly become reestablished in controlled areas that are lacking ground cover. It is essential to maintain a healthy dialogue between the GPC and interested parties, including municipal services, private landowners, and volunteer crews. As invasive plants are removed and replaced with natives, the overall natural community structure will be improved - a healthy, intact forest supports increased floral and faunal biodiversity, aids in improving wildlife habitats and movements, and instills pride in the community as well as a sense of duty to maintain public spaces free of invasives for future generations to enjoy.



Large groups of volunteers can make short work when it comes to restoration plantings.

Table 1: Weaverville IE Plant Management Plan - Goals and Objectives

GOALS		Manage invasive exotic plants within the Town of Weaverville			
		Prevent the spread of existing infestations			
		Promote the use of native plants within the landscape			
OBJECTIVES	Inventory	Prevention	Education	Restoration	
	Conduct Town-wide inventories to determine the extent of invasion and to monitor infestations over time	Prevent the spread of existing invasive exotic plants and prevent new infestations within the Town	Increase public awareness of the impacts of invasive exotic plants and encourage the use of native plants	Remove priority infestations and replant native species in controlled areas	
ACTIVITIES	Establish priority invasive plants and priority management areas	Remove priority invasive plants	Develop outreach and education strategy with audience, message, and method of delivery	Remove priority invasive plants	
	Inventory priority areas throughout the town <ul style="list-style-type: none"> • Train residents • Establish neighborhood networks to conduct inventories 	Encourage the use of native plants or noninvasive exotic plants in the Town UDO	Conduct a simple cost/benefit analysis of purchasing native vs. invasive exotic plants considering economic and environmental costs	Replant areas where invasive exotic plants have been removed with native plants in order to restore the site	
	Develop a management plan with species, ecology, control techniques	Reach out to groups to encourage the use of native plants in the landscape <ul style="list-style-type: none"> • Nurseries • Landscapers • Developers • Town Council • Home Owners Associations 	Compile list of native plants suitable for the landscape and identify local sources of affordable native plants	Compile list of native plants suitable for the landscape	
	Monitor priority areas over time	Promote native plant nurseries that sell native plants	Utilize Main Street Nature Park as a demonstration site for invasive exotic plant management Educate residents about the issue of invasive exotic plants <ul style="list-style-type: none"> • Host workshops • Engage neighborhood networks • Through media outlets Engage local organizations in restoration efforts: <ul style="list-style-type: none"> • Use graphic signage (before/after) to feature successful restoration areas within the Town.	Develop a native planting plan	
			Develop 'Native Neighbor' recognition program for residents who do not have invasive exotic plants in their landscape		

C. Invasive Exotic Plants of Concern

Definitions

The term ‘invasive’ refers to the biology and ecology of a plant, more specifically, to its growth and reproductive mechanisms. Most invasive plants display aggressive or explosive growth, are abundant seed-producers, and can produce new growth through root or shoot propagation. When growth and seed formation repeatedly occur, invasive plants can quickly colonize open ground and outcompete surrounding plants; with few natural controls, they will persist over large areas. The term ‘exotic’ refers to the geographic origin of the plant in question. Exotic plants exist outside of their native range; they have been introduced mainly for livestock forage, ornamental use, human consumption, or simply by accident. They usually don’t escape from the landscape, and seldom do they form viable seeds.

Serious ecological problems arise when *exotic* plants exhibit *invasive* habits – these plants, deemed ‘invasive exotic’ species, pose a serious and imminent threat to our native ecosystems. Invasive exotic plants out-complete native plants for space, sunlight, water, and nutrients, causing a decline in biodiversity. They also alter soil and hydrologic conditions, compete for or reduce the number of pollinators, and deter native birds, mammals, and insects, disrupting the food web. Invasive exotic plants will cost you money – they can kill your trees, cause damage to your home, and increase the risk of damaging fire on your property. Additionally, there are the shared costs of IE plant management on the local, state, and national level, a burden borne by all taxpayers. Furthermore, invasive plants do not adhere to boundaries, and so an infested landscape may become a seed source for widespread infestations; conversely, a beautiful native landscape is susceptible to invasion as long as IE infestations persist in the local area.

Species of Concern

A variety of invasive exotic plant species exist throughout the Town of Weaverville. Of those, however, there are several species of concern that are most prevalent and therefore considered a top priority:

- Privet (*Ligustrum* spp.)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Japanese honeysuckle (*Lonicera japonica*)
- Bush honeysuckles (*Lonicera* spp.)
- Japanese knotweed (*Fallopia japonica*)
- Multiflora rose (*Rosa multiflora*)
- English ivy (*Hedera helix*)
- Kudzu (*Pueraria montana* var. *lobata*)

Most of these species occur in varying levels of infestation across public and private properties of the Town. Kudzu is not as prevalent across the Town as other species of concern, but poses an imminent threat if even the smallest occurrences persist without management; therefore it is considered a Priority Species. Several other IE plants are present throughout the Town, listed below in Section D, Known Infestations; they are not considered an immediate priority for management, but should be monitored in order to avoid potential outbreaks.

Invasive Exotic Plant Profiles

The following IE plant profile pages are designed to help the public identify the priority species both visually and botanically; they also detail simple manual, chemical and cultural strategies for controlling the plants, where applicable. Finally, several options of native plants, selected for having similar landscape traits as their invasive counterparts, are suggested for planting instead of or in place of the featured invasive species. A more comprehensive table of control strategies detailing a wide range of management techniques for each IE species of concern can be found in Section E, Control Techniques.

D. Known Infestations

Town-Owned Properties

Properties owned by the Town of Weaverville are shown on Figure 1 (Appendix A). These parcels range from small plots with water towers (some too small to be seen on the map unless it is enlarged) to the 65-acre Public Works Maintenance Facility. Except for Main Street Nature Park, the Public Works Maintenance Facility, and four small parcels along Weaver Boulevard, these plots are completely grassed, fully paved, or virtually lacking invasive exotic plants. For example, the Weaverville Fire Station property on Monticello Road is landscaped mostly with native plants and the only invasive exotic plant is Japanese honeysuckle along a fence on the eastern boundary of the property.

Main Street Nature Park

The Park is approximately 7.5 acres, with a large central area being mowed regularly and a network of trails providing access throughout. The periphery, designated as wildlife habitat, varies in level of infestation with invasive exotic plants. Recent control efforts have mostly been concentrated at the northern end of the Park, with long range plans to apply control methods in a progressive direction to the south. Two cleared areas in the northern portion have been replanted with native shrubs and the Town plans to continue this re-vegetation process as areas are deemed largely free of invasive exotic woody plants. A large patch of Japanese knotweed in the southern part of the Park is largely controlled, but will require continued monitoring and control as needed. The south end has extensive thickets of privet, Japanese honeysuckle, multiflora rose, English ivy, and oriental bittersweet.

Weaverville Public Works Maintenance Facility

This site is comprised of 65 acres, with about 10 acres devoted to the building site, MSD right-of-way, mulch facility, and mowed areas. It extends from west of Lake Louise to west of I-26 (parcels 1576 & 4498). It includes an old quarry and is bounded by Reems Creek on the south side. The site has extensive infestations of invasive exotic plants, although most are shrubs, vines, and perennial herbaceous plants. Only one invasive exotic tree, mimosa (*Albizia julibrissin*) was seen. Notably absent are princess tree (*Paulownia tomentosa*) and tree-of-heaven (*Ailanthus altissima*).

However, there are extensive growths of Oriental bittersweet, privet, and both vine and bush honeysuckle, in addition to several large patches of bamboo (*Phyllostachys* spp.), with one patch exceeding one half-acre in area. Other shrubs and vines present in lesser quantities include porcelain

berry (*Ampelopsis brevipedunculata*), multiflora rose, wineberry (*Rubus phoenicolasius*), Japanese barberry (*Berberis thunbergii*), and three very small areas of Japanese knotweed. Of the smaller or herbaceous plants, there is a large linear patch of periwinkle along the south side of Quarry Rd., as well as lespedeza (*Lespedeza* spp.), Johnsongrass (*Sorghum halepense*), bull thistle (*Cirsium vulgare*), teasel (*Dipsacum* spp.), and giant reed (*Arundo donax*). There is no visible kudzu, although some exists on the south bank of Reems Creek and is likely to eventually spread to the property.

Remaining Public Parcels

The afore-mentioned small parcels along Weaver Boulevard comprise just over one acre in total area. Due to their inaccessibility, these parcels will not be considered management areas for the time being. However, these areas may be considered for management in future years after other, higher-priority infestations are addressed.

Privets (Chinese, European)

(*Ligustrum spp.*)



Evergreen Shrub to 30 feet in height
Flowers: April to June
Fruits: July to March

Ecology

Aggressive and troublesome invasive that often forms dense thickets in both lowland and upland forests and along fences or other edge disturbances. Shade tolerant. Colonizes by root sprouts and spread widely by bird and other animal dispersed seeds. Privet is one of the most widely spread invasives in the South.

Identification

- Evergreen, forming thick shrubs up to 30 feet in height with long leafy branches
- Leaves are waxy to glossy, opposite in two rows at near right angle to stem, ovate to elliptic with rounded tip
- Dense clusters of small white flowers in the spring yield dark purple berries during the fall and winter

Management Strategies

- Do not plant, remove prior plantings, and control sprouts and seedlings
- Treat when plants are young to prevent seed formation
- Cut and bulldoze when seeds are not present

Chemical Control Procedures

- Thoroughly wet all the leaves with one of the following herbicides in water with a surfactant: glyphosate 3% solution (winter), triclopyr 5% solution (summer/fall)
- For stems too tall to spray apply a basal spray of Garlon 4 as a 20% solution in a penetrant
- Treat stump tops with glyphosate 20% solution with surfactant.

Native Plant Alternatives:

American Holly

Viburnums

Carolina Rhododendron

Oriental Bittersweet

(Celastrus orbiculatus)



Deciduous, climbing woody vine

Flowers: May

Fruits: August to January

Ecology

Occurs in a wide range of sites mainly along forest edges, with extensive infestations in forest openings, roadsides, and meadows. Shade tolerant, but grows best along edges and in openings. Colonized by prolific vine growth and seedlings which are spread by bird and other animal dispersed seeds.

Identification

- Climbing woody vine to 60 feet in tree crowns forming thicket and arbor infestations
- Alternate elliptic to rounded leaves
- Stems are woody vines up to 4 inches, with a braided texture and silvery appearance when mature
- Inconspicuous flowers yield dangling clusters of spherical fruits, turning from green to yellow orange then tan. Splits in winter to reveal scarlet berries

Management Strategies

- Do not plant, remove prior plantings, control sprouts and seedlings. Bag and dispose of plants and fruit or burn
- Treat new plants when young to prevent seed formation. Pull, cut, and treat when fruit are not present
- Manually pull new seedlings and tree wench large vines when soil is moist

Chemical Control Procedures

- Thoroughly wet plant leaves with one of the following herbicides with a surfactant (July-October): triclopyr or glyphosate and water in a 3% solution
- Large vines make stem injections using 25% solution triclopyr or glyphosate (in water)
- Cut large stems and treat surface with one of the herbicides mentioned above

Native Plant Alternatives:

American Bittersweet

Virginia Creeper

Crossvine

English Ivy

(*Hedera helix*)



Native Plant Alternatives:

Virginia Creeper

Green-and-Gold

Coral Honeysuckle

Evergreen woody vine climbing to 90ft
Flowers: June to October
Fruits: October to May

Ecology

Thrives in moist open forests, but adaptable to a range of moisture and soil conditions. Shade tolerant allowing early growth under dense stands. Amasses on infested trees, increasing overburden and chance of windthrow. Spreads by bird-dispersed seeds and colonizes by trailing and climbing vines that root at nodes.

Identification

- Thick, waxy dark-green alternating leaves with whitish veins and three to five pointed lobes when juvenile. Mature plants are unlobed.
- Flowers are small, greenish-yellow, occurring in terminal hairy-stemmed umbels.
- Fruits are clusters of spherical drupes, pale green in summer ripening to dark blue to purple in the winter.

Management Strategies

- Do not plant, remove prior plantings, and control sprouts and seedlings. Bag and dispose of plants and fruit in dumpster, burn, or compost when fruit is not present.
- Pull, cut, and treat when fruit not present.
- Repeated cutting and mowing to the ground line can control young infestations.

Chemical Control Procedures

- Cut a 2-5" section out of climbing vines as close to the ground as possible, then immediately apply a 25% solution of triclopyr + water to the cut stem. Best from July-October.
- For infestations on the ground, wet all leaves with one of the following herbicide solutions with added surfactant: 3-5% triclopyr + water and surfactant (before/during flowering); 4% glyphosate + water and surfactant (after flowering).

Japanese (Vine) Honeysuckle

(Lonicera japonica)



Native Plant Alternatives:

Dutchman's Pipe

Coral Honeysuckle

Crossvine

Evergreen woody vine
Flowers: April to August
Fruits: June to March

Ecology

Replaces native flora in all forest types over a wide range of site. Occurs in dense infestations along forest margins and right-of-ways, as well as under dense canopies. Shade tolerant. Persists by large woody root stocks and spreads by rooting at vine nodes and animal dispersed seeds.

Identification

- Semi evergreen to evergreen, climbing woody vine that can reach up to 80 feet. Light, papery bark when mature
- Leaves are opposite and ovate to elliptic in shape. Rounded bases. Blunt-pointed to rounded tips
- Flowers are tubular, white to yellow and fragrant, giving way to spherical, green fruits that ripen to a black, glossy berry

Management Strategies

- Do not plant. Remove prior plantings, and control sprouts and seedlings. Bag and dispose of plants and fruit in a dumpster or burn
- Pull, cut, and treat when seeds are not present. Manually pull seedlings - be sure to remove all root
- Prescribed burning can eliminate ground mats and sever climbers which can increase efficacy of herbicide treatments.

Chemical Control Procedures

- Cut a 2-5" section out of climbing vines as close to the ground as possible, then immediately apply a 25% solution of triclopyr + water to the cut stem. Best from July-October
- Wet all leaves with one of the following herbicide solutions (with added surfactant): 3-5% triclopyr + water (before/during flowering); 2% glyphosate + water (after flowering)

Exotic Bush Honeysuckles

(*Lonicera* spp.)



Native Plant Alternatives:

Silky Dogwood

Northern Bush Honeysuckle

Winterberry

Deciduous Shrub

Flowers: February to June

Fruits: June to February

Ecology

- Often forms dense thickets in open forests, forest edges, abandoned fields, pastures, roadsides, and other open upland habitats
- Relatively shade tolerant. Colonized by root sprouts and spread by abundant bird and other animal-dispersed seeds

Identification

- Tardily deciduous, upright to arching branch shrubs with dark green oval, opposite leaves
- White to yellow with some pink flowers
- Abundant spherical, glossy red berries
- Resembles the woody vine, Japanese honeysuckle

Management Strategies

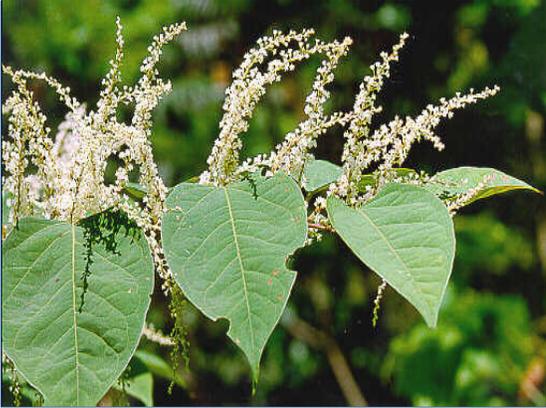
- Do not plant, remove prior plantings, and control sprouts and seedlings
- Bag and dispose of fruit or burn
- Repeated cutting to prevent fruit growth
- Manual pulling
- Burning in spring to kill seedlings

Chemical Control Procedures

- Thoroughly wet all leaves with glyphosate herbicide, Garlon 3A, or Garlon 4 with a surfactant in April - October
- For tall foliar sprays, cut large stems and saplings and treat the stump tops with one of the herbicides mentioned above

Japanese Knotweed

(Fallopia japonica)



Native Plant Alternatives:

Virginia Sweetspire

Mountain Sweet Pepperbush

New England Aster

Tall perennial, cane-like shrub 3-12 ft

Flowers: August to November

Fruits: September to January

Ecology

Perennial shrub that forms dense stands and aggressively outcompetes native vegetation. Has vigorous rhizomes and colonizes roadsides and riparian areas. Seeds are dispersed by water, wind, and human activities. Rhizomes are extremely persistent and long-lived.

Identification

- Perennial shrub reaching 3-12 feet in height with hollow-jointed, reddish stems, similar to bamboo.
- Alternate leaves 4-6 inches long appear in spring on new sprouts. Leaves are ovate with pointed tips and flat bases.
- Tiny white flowers are on drooping clusters which yield abundant tiny winged white to brown winged seeds in fall.

Management Strategies

- Do not plant. Remove prior plantings, and control sprouts and seedlings. Bag and dispose of fruit in dumpster or burn.
- DO NOT DIG - spreads easily through transport of rhizome fragments. Only young infestations can be controlled through repeated cutting and hand-pulling.

Chemical Control Procedures

- Cut all of the stems at the base (using a weed whacker or brush cutter), then immediately apply a 25% solution of triclopyr or glyphosate and water to the stems.
- Wet all leaves with one of the following herbicide solutions (with surfactant): 2% triclopyr+water (before/during flowering); or a mix of 1% triclopyr + 2% glyphosate (in fall). A follow up treatment of 2% glyphosate is necessary to control resprouts. Most effective in the fall.

Multiflora Rose

(Rosa multiflora)



Native Plant Alternatives:

Swamp Rose

Blackberry / Raspberry

Highbush Blueberry

Perennial shrub or vine

Flowers: April to June

Fruits: July to December

Ecology

Form small to large infestations. Widely planted and spreads along right of ways and invades new forests and forest edges. Colonized by prolific sprouting and stems that root, and spread by abundant, animal dispersed seeds.

Identification

- Multi-stemmed shrub, can climb into canopy.
- Leaves are divided into 5-11 sharply-toothed serrate leaflets with bristled margins and a feathered appearance at the leaf base.
- Long arching or climbing stems, with thorns curving towards the stem base.
- Flowers have 5 white petals and can be terminally or axillary branched cluster as well as single flowers.
- Fruit is a fleshy green to yellow rose hip, glossy red when ripe.

Management Strategies

- Do not plant, remove prior plantings, and control sprouts and seedlings.
- Treat new plants when young to prevent seed formation.
- Cut and bulldoze when fruit are not present.
- Manually pull new seedlings ensuring removal of all roots.

Chemical Control Procedures

- Thoroughly wet all leaves with one of the following herbicides plus a surfactant: 4% triclopyr + water at time of flowering, or 3% glyphosate + water, which is less effective, but does not damage surrounding plants.
- For stems too tall for foliar sprays, apply basal sprays using Garlon 4 with a penetrant.

Kudzu

(Pueraria montana var. lobata)



Native Plant Alternatives:

Virginia Creeper

Northern Bush Honeysuckle

Crossvine

Aggressive deciduous woody vine

Flowers: June to September

Fruit: September to January

Ecology

Forms dense infestations along forest and roadside edges, climbing over the ground, debris, shrubs, and mature trees. Colonizes by vines rooting at nodes and spreads by wind, animal, and water dispersed seeds.

Identification

- Deciduous twining, mat-forming, ropelike woody vine, 35 to 100 feet long with alternating, three-leaflet slightly-lobed leaves.
- Leaf stalks and stems yellow green to golden with tiny golden hairs, turning brown in late fall and winter.
- Axillary slender clusters of lavender colored, pea-like flowers in pairs (or threes), bearing elongated bean-like seed pods with short, brown hairs.

Management Strategies

- Do not plant. Remove prior plantings, and control sprouts and seedlings. Bag and dispose of plants and seed pods in a dumpster or burn.
- Treat new plants when young to prevent spread
- Root crowns can be removed, but removal of the tuberous taproot is not required for control.
- Repeated multiyear cutting, prescribed burning in the spring can clear debris and sever vines.

Chemical Control Procedures

- Completely wet all leaves, including those on climbing vines with one of the following herbicides with a surfactant (June-Oct): clopyralid (0.5% solution), or glyphosate (4% solution) during growing season.
- For large vines, make stem injections using a 25% glyphosate or 5% clopyralid herbicide mixture anytime except March-April.

Tree of Heaven

(Ailanthus altissima)



Deciduous Tree

Flowers: April to June

Fruit: July to February

Ecology

Rapid growing, forming thickets and dense stands. Both shade and flood tolerant and allelopathic. Colonized by root sprouts and spread by prolific wind/ water dispersed seeds. Resembles hickories and sumacs.

Identification

- Deciduous tree to 80 feet tall
- Alternate leaves, pinnately compound. Long tapering tips and lobed bases with one or more glands (round dots) beneath each lobe
- Strong peanut/ cashew odor from flower and other parts
- Clusters of wing shaped fruit with single seed
- Flowers are in large terminal clusters to 20 inches. Yellow-green flowers with 5 pedal/sepals

Management Practices

- Do not plant, remove prior plantings and control sprouts and seedlings.
- Bag and dispose of fruit or burn
- Target female seed-producing plants
- Treat when new plants are young to prevent seed formation

Control Procedures

- For large trees, make stem injections and then apply Garlon 3A when safety to surrounding vegetation in desired
- For saplings, apply basal sprays using Garlon 4 in a 20% solution
- Saplings and seedlings can be controlled by thoroughly wetting all leaves with an herbicide aided by a surfactant.

Native Plant Alternatives:

Hickories

Green Ash

Smooth Sumac

E. Control Techniques

Cultural Control Techniques

Mulching

Mulching may be an effective cultural control choice for smaller IE infestations. The method involves covering the entire infestation with several inches of degradable plant material after initial manual control is performed. Shredded or chipped wood, especially any IE biomass that does not contain seeds, may be the best mulch since hay and grass can potentially carry seeds of weeds and other IE plants. When controlling hardier woody species, covering the area with cardboard or newspaper may enhance the effectiveness and longevity of mulching. The mulch should remain in place for at least two growing seasons and may need to be augmented several times as infestations attempt to resprout through or expand beyond the mulch layer. An added benefit of mulching is that it can improve soil structure by increasing the organic contents of the soil.



Newspaper overlain with heavy mulch will suppress hardy IE plants

Solarization

Soil solarization is a cultural method for controlling IE plants using high temperatures produced by capturing radiant energy from the sun. The method involves heating the soil by covering it with a clear plastic tarp for 4 to 6 weeks during a hot period of the year when the soil will receive the most direct



Solarization can be highly effective when targeting IE plants with persistent root systems

sunlight. The plastic helps to trap the sun's radiant energy in the soil, heating it to a maximum depth of 18 inches, which can kill rhizomes of IE plants that persist within the soil. Solarization leaves no chemical residues and is a simple method appropriate for the home gardener, especially when coupled with manual or chemical efforts. It can improve soil structure by increasing the availability of nitrogen and other essential nutrients for growing healthy plants, as well as controlling a range of plants.

Grazing

Certain livestock, mainly goats, have an appetite for a wide variety of plants, including thorny and woody plants that many other animals will not eat. The cultural control method of using goats to repeatedly graze an area will kill most IE plants without using herbicides or mechanical means of control. Grazing of aboveground growth should occur during the hottest months of the summer, when repeated browsing can significantly deplete root stores. Goats are also effective as an initial control method to be followed up with other cultural or chemical control strategies. It should be noted that goats are rather nonselective when grazing and will consume most any woody plant that is available, so it is wise to use grazing only in highly infested areas where damage to native vegetation is not a concern.



Goats readily consume IE plants when contained within an area of infestation.

Manual Control Techniques

Hand Pulling / Digging

Spot occurrences or small infestations of IE plants can be successfully controlled by hand pulling or digging. It is important to ensure the removal of the entire root system and any pieces that may



Volunteers hand pull Japanese stiltgrass before it produces seed

become severed during control efforts, as many IE plants have the ability to resprout from even the smallest root fragments. Once removed, plants should be left in the sun to dry out, then bagged and taken to the landfill in order to eliminate the potential for reintroduction. If seeds are not present, biomass may also be used as compost.

Cutting

Repeated cutting of stems to the ground level can suppress IE plants in the short term and may provide full control over many years after root stocks become depleted. Care should be taken to cleanly cut all stems at their lowest point; cut stems should be removed then bagged and taken to the landfill, or composted if seeds are not present. It is important to understand that after being cut many IE plants exhibit



Cutting IE plants at their lowest possible point can provide good suppression.

explosive vegetative growth from the stump or roots or both, making follow up cutting difficult. It may be most effective when used as an initial treatment then followed by cultural or chemical control methods.

Mechanical Removal

Certain infestations of greater magnitude may warrant the use of auxiliary equipment or heavy machinery to provide adequate control. For instance, large woody stems may require the use of a chainsaw; or dense, clonal infestations may require a track-hoe to excavate the soil and all the rhizomes contained within. Likewise, broad areas of infestation may require repeated mowing or bush-hogging to control IE plants. When utilizing such equipment, it is of the utmost importance to familiarize one's self with the equipment prior to use



Weed wrenches give controllers mechanical advantage over tough root systems

and to follow all associated safety precautions. Also, it is essential to properly clean all equipment associated with management activities to ensure that IE seeds or plant parts are not being transported to new locations from the existing infestation.



Stands of invasive trees can be quickly cleared using a chainsaw

Chemical Control Techniques

Often times IE plants are so persistent that, when employing manual or cultural techniques, one can only achieve suppression over the short term. This drives the need to utilize herbicides to increase the efficacy of control efforts or, in smaller settings, eradicate an IE infestation entirely. Many herbicides listed for treatment are commercially available to the public, but none should be used without first consulting the label to understand the appropriate use of each chemical, safety precautions for the applicator (including safe mixing, use, and disposal techniques), and environmental fate of the formula. Misuse of herbicides can lead to contamination of groundwater, death of nontarget plants and animals, irreversible health conditions for the applicator or any combination of the three.

The following chemical control techniques involve the use of systemic herbicides, ones that remain within the vascular system of the target plant for an extended period of time, providing increased effectiveness. These herbicides are either selective or not – selective herbicides (e.g. triclopyr) are ones that have been formulated for control of a specific range of plants, in this case, for plants with broad leaves (not grasses). Non-selective herbicides (e.g. glyphosate) are designed to control plants of all

types. It is important to understand which type of herbicide should be used in a given situation, because misuse can lead to ineffective control or irreversible damage to nontarget species or both. Finally, surfactants can be added to herbicide mixtures to increase their uptake – surfactants can be spreading, sticking, wetting, penetrating agents, or a combination of these. Following the below chemical treatment methods is Table 2, which outlines prescribed herbicide treatments for each of the target IE species.

Cut Stem

Cut stem treatments involve applying selected herbicide mixtures to the outer circumference of freshly cut woody stems using a spray bottle, brush, sponge dauber, or backpack sprayer. These treatments target the root systems of IE plants to help prevent resprouting. In order to maximize the uptake of herbicides, brush the cut surface clean of sawdust before applying. For smaller stumps, cover the entire surface with the herbicide solution. For larger diameter stems (>3”), apply herbicides to the outermost edge of the stump. Try to apply herbicides within one minute of cutting stems; if quick treatment is not feasible, an oil-based herbicide mixture can be used to provide latent control.



Cut stem freshly treated with herbicides

Foliar

Foliar treatments involve the selective application of various herbicide mixtures to the leaves and green stems of IE plants. This is one of the most cost-effective and ecologically sound methods of controlling IE plants, both on the small scale and en masse, as the applicator has the ability to select which plants to control by directing the



A backpack sprayer is used to apply selective herbicides to a large multiflora rose bush.

spray to target foliage and avoiding desirable native plants. Various tools are used to apply foliar herbicides, the most common being spray bottles and hand and backpack sprayers, with the focus being on thoroughly wetting the leaves of the target plant without allowing runoff. Caution must be taken when applying foliar herbicides in order to minimize off-target drift of herbicides onto desirable plants.



Efforts are made to cover the entire leaf surface with the herbicide solution, but not to the point of run-off.

Basal bark

Basal bark treatments are highly-selective, oil-based herbicide treatments that target large IE stems in situations where cut stem or foliar treatments would be ineffective. The method involves applying an herbicide-oil-penetrant mixture to the lower trunk (12-18" height), root collar, and any exposed roots of IE stems less than 8 inches in diameter. The oil acts as a carrier, transporting the herbicide through the bark and into the vascular system of the target plant. Basal sprays can be applied using hand sprayers or backpack sprayers, and can be very cost-effective if treating a small number of very large stems. Caution must be taken to avoid overspray of basal bark treatments onto desirable native stems, and to refrain from heavy use in areas with abundant native tree roots, as they can uptake the herbicide and be killed or severely damaged



*Fresh basal bark treatment on lower stump of
Tree of heaven*

Table 2 – Specific Chemical Control Methods for Priority IE Plants

	Privet	Multiflora Rose	Japanese Honeysuckle	Bush Honeysuckles	Japanese Knotweed	Oriental Bittersweet	Kudzu	English Ivy
	Chemical							
Cut Stem	Cut the stem at the base (below all branching), then immediately apply a 25% solution of triclopyr+water to the stump.	Cut the stem at the base (below all branching), then immediately apply a 25% solution of triclopyr+water to the stumps.	Cut a 2-5" section out of climbing vines as close to the ground as possible, then immediately apply a 25% solution of triclopyr+water to the cut stem. Best from July-October.	Cut the stem at the base (below all branching), then immediately apply a 25% solution of triclopyr+water to the stump.	Cut all of the stems at the base (using a weed whacker or brush cutter), then immediately apply a 25% solution of triclopyr or glyphosate and water to the stems.	Cut a 2-5" section out of climbing vines as close to the ground as possible, then immediately apply a 25% solution of triclopyr+water to the cut stem. Best from July-October.	Cut a 2-5" section out of climbing vines as close to the ground as possible, then immediately apply a 25% solution of triclopyr+water to the cut stem. Best from July-October.	Cut a 2-5" section out of climbing vines as close to the ground as possible, then immediately apply a 25% solution of triclopyr+water to the cut stem. For ground mats, use a weed whacker or brush cutter to cut stems, then immediately apply a 25% solution of triclopyr or glyphosate and water to the stems. Best from July-October.
Basal Bark*	Apply either a spray of Garlon 4 as a 20% solution within a non-petroleum carrier oil or an undiluted spray of Pathfinder II (RTU). Most effective time is during the dormant season, or in early spring.	Apply either a spray of Garlon 4 as a 20% solution within a non-petroleum carrier oil or an undiluted spray of Pathfinder II (RTU). Most effective time is during the dormant season, or in early spring.	Apply either a spray of Garlon 4 as a 20% solution within a non-petroleum carrier oil or an undiluted spray of Pathfinder II (RTU) to the root crowns and stolons when identified at the soil surface.	Apply either a spray of Garlon 4 as a 20% solution within a non-petroleum carrier oil or an undiluted spray of Pathfinder II (RTU). Most effective time is during the dormant season, or in early spring.	n/a	Apply either a spray of Garlon 4 as a 20% solution within a non-petroleum carrier oil or an undiluted spray of Pathfinder II (RTU) to the base of large twining vines, being careful not to apply to nontarget plant parts.	Apply either a spray of Garlon 4 as a 20% solution within a non-petroleum carrier oil or an undiluted spray of Pathfinder II (RTU) to the base of large twining vines, being careful not to apply to nontarget plant parts.	Apply either a spray of Garlon 4 as a 20% solution within a non-petroleum carrier oil or an undiluted spray of Pathfinder II (RTU) to large vines. Most effective time is during the dormant season, or in early spring.
Foliar	Wet all leaves with one of the following herbicide solutions (add surfactant): triclopyr+water (before/during flowering); glyphosate+water (after flowering); if spraying in or around open water or wetlands, be sure to use an aquatic-safe herbicide.	Wet all leaves with one of the following herbicide solutions (add surfactant): triclopyr+water (before/during flowering); glyphosate+water (after flowering); if spraying in or around open water or wetlands, be sure to use an aquatic-safe herbicide.	Wet all leaves with one of the following herbicide solutions (with added surfactant): 3-5% triclopyr+water (before/during flowering); 2% glyphosate+water (after flowering); if spraying in or around open water or wetlands, be sure to use an aquatic-safe herbicide.	Wet all leaves with one of the following herbicide solutions (with added surfactant): 3-5% triclopyr+water (before/during flowering); 2% glyphosate+water (after flowering); if spraying in or around open water or wetlands, be sure to use an aquatic-safe herbicide.	Wet all leaves with one of the following herbicide solutions (with surfactant): 2% triclopyr+water (before/during flowering); or a mix of 1% triclopyr + 2% glyphosate (in fall). A follow up treatment of 2% glyphosate is necessary to control reprints. Most effective in the fall. If spraying in or around open water or wetlands, be sure to use an aquatic-safe herbicide.	When vines are not climbing, wet all leaves with one of the following herbicide solutions (with added surfactant): 3-5% triclopyr+water (before/during flowering); 2% glyphosate+water (after flowering); if spraying in or around open water or wetlands, be sure to use an aquatic-safe herbicide.	Before flowering, thoroughly wet all leaves with a 1% solution of Transline, which can be applied safely over most hardwoods. Or apply a 5% solution of triclopyr in water to exposed leaves.	Wet all leaves (to the point of runoff) with one of the following herbicide solutions (with added surfactant): 3-5% triclopyr+water (before/during flowering); 4% glyphosate+water (after flowering); if spraying in or around open water or wetlands, be sure to use an aquatic-safe herbicide.

*Not to be used in or around wetlands or the riparian zone of streams.

F. Native Plant Preferences

Definitions

When applied to flora, the term ‘native’ is often difficult to objectively define because of the varying physiographic regions of our continent and the resulting microclimates and growing seasons that are thus generated. For the purposes of this Management Plan, ‘native’ will be defined as plants that are found growing naturally within Buncombe and adjacent Counties as indicated by the University of North Carolina Herbarium (UNC 2013) and the USDA Plants Database (USDA 2013). By more sharply defining the native region, plants that are most optimally suited for the Weaverville area are featured.

Native plants are preferred for a number of reasons. Ecologically, they help maintain the integrity of the ecosystem by providing forage and shelter for native fauna. Economically, native species are a great investment; they are cost-effective, require little maintenance, and do not need chemical fertilizers or pesticides to succeed in the landscape. Furthermore, appropriately selected native plants can create an aesthetically beautiful ecosystem in a variety of landscape settings, providing a range of colors, shapes, and sizes. There is the added benefit of supporting the local economy by patronizing community plant nurseries that propagate and sell native species.

Preferred Native Plant Profiles

The following native plant profiles have been developed as a guide for selecting appropriate native plants based on desired landscape traits; it should be noted that these profiles are a mere sampling of suitable species – many more exist and are detailed in the list of Suggested Native Plants (Appendix A). Information about the biology, ecology, wildlife benefits, landscape suitability and care of the plants are included in each profile. Furthermore, most of the featured native plants can be sourced from local plant nurseries within 30 miles of the Town of Weaverville.

American Bittersweet

(*Celastrus scandens*)



Plant in place of:

Oriental Bittersweet

Bush or Vine Honeysuckle

Kudzu

Biology

- Climbing woody vine
- Flowers: May to June
- Fruits: September to November
- Leaves are deciduous, alternate, and oblong to elliptical.
- No appreciable floral display, but the fruit are beautiful red-orange berries that last most of the winter. Females have attractive fruit.

Ecology

- Native woody vine that grows in thickets, in stands of young trees, along fence rows and streams. Grows well in moist soils, in full sun or shade.
- Leaves, bark, and fruit are considered toxic and should be kept out of the reach of young children and pets.
- Seedlings will average about 50% each, males and females, but you can't tell which till they're old enough to bloom.

Landscape Uses

- American bittersweet is often used to cover unsightly fences and rock piles. It can be trained up arbors, trellises, and even mature trees, but should never be allowed to climb young trees or shrubs because the vine's twisting woody stems can cut off their sap as they grow.
- Bright yellow fall foliage.
- The seeds, although poisonous to humans, seem to do no harm to the birds that eat them in winter.
- The fruit-bearing branches are often harvested for dried winter decorations.

Care Information

- Pruning is needed to limit size, done in late winter or early spring.
- You only need one male to serve as a pollinator for every 6 to 8 females.

American Holly

(*Ilex opaca*)



Plant in place of:

Privets

Multiflora Rose

Bush Honeysuckles

Biology

- Understory shrub, sometimes a tree 15-30 feet high
- Flowers: Small greenish white flowers, April to June.
- Fruits: September to October. Bright red (rarely orange or yellow), globular fruit. The berry-like fruit is about 1/3 inch in diameter, and contains 4 to 9 small seeds.
- The evergreen foliage is stiff and leathery in texture, with large, remotely-spined teeth. The leaves are arranged alternately 2-4 inches long.

Ecology

- It grows best on well drained, sandy soils, but will tolerate those which are somewhat poorly drained.
- This small tree has good shade tolerance, but does best in direct sun.
- Newly established plants will not flower for 4 to 7 years; prior to flowering there is no practical means of determining the gender of a plant.

Landscape Uses

- The attractive evergreen foliage and bright red fruit of this small tree make it a very popular for landscaping.
- The firm bright red berries are consumed by white-tail deer and 18 species of birds. The dense foliage also provides cover and nesting habitat for various songbirds.

Care Information

- When establishing American holly, it is important to plant males as well as females if berry production is desired.
- Establish American holly only where surrounding vegetation or physical barriers protect the plants from harsh winds.
- Holly plants prefer partial shade, with some full sun exposure during the day.

Common Winterberry

(Ilex verticillata)



Plant in place of:

Bush Honeysuckle

Multiflora Rose

Privet

Biology

- Moderate sized deciduous shrub, growing 5-15'.
- Flowers: Greenish to yellow-white flowers bloom April to July.
- Fruits: Scarlet red to orange globular fruit, mature by late summer and remain until mid winter.
- The leaves are simple, smooth, and obovate to oblong; finely toothed foliage.
- In fall leaves turn bright red to maroon colored.

Ecology

- Native to the eastern US and southeastern Canada.
- Recommended for planting in shady moist areas, even though its growth and form are best under open grown conditions.
- The attractive bright red fruit of winterberry is eaten by small mammals and more than 48 species of birds. Deer and rabbits also eat the berries.
- Although this shrub species is a good provider of wildlife food, its fruits are poisonous to humans.

Landscape Uses

- Excellent year round interest, highlighted by the showy display of red leaves in fall and red berries in winter.
- Excellent shrub for moist soils in low spots or along streams and ponds.

Care Information

- Mass or group in hedges, shrub borders, foundations, native plant areas or bird gardens.
- Plants do poorly in neutral to alkaline soils where they are susceptible to chlorosis (yellowing of leaves) and often die.
- Plant both male and females within 40 feet of one another for adequate pollination. For wildlife plantings, it is advantageous to plant higher numbers of females.

Coral Honeysuckle

(Lonicera sempervirens)



Plant in place of:

Japanese Honeysuckle

Nonnative Wisterias

English Ivy

Biology

- High climbing, twining vine, 2-20 feet long.
- Flowers: March to June; Showy, trumpet-shaped flowers, red outside and yellow inside.
- Fruits: Late summer into fall; red berry.
- Leaves ovate to oblong with smooth, rolled down margins and a blunt or short pointed tip.
- Papery, exfoliating brown to tan bark.

Ecology

- Pollinated almost exclusively by hummingbirds.
- Semi-evergreen to evergreen, depending on severity of winter.

Landscape Uses

- Flowers attract hummingbirds, bees, and butterflies.
- Fleshy, red fruits attract birds such as quail, purple finch, goldfinch, hermit thrush, and the American robin.
- Good twining vine with prominent blooms for full sun. Great for arbors.
- Perfect for hanging baskets, trellises, and fences.

Care Information

- As with many vines, some training may be needed to direct growth.
- Flowers best when given more sun.
- Prefers moist soil but tolerates most soils except dry sands.
- Coral honeysuckle requires light, good air circulation, and adequate drainage to prevent powdery mildew.

Crossvine

(Bignonia capreolata)



Plant in place of:

Multiflora Rose

Bush Honeysuckles

Japanese Knotweed

Biology

- Evergreen to semi-evergreen climbing woody vine reaching heights of 70 feet.
- Flowers: March to May. Trumpet-shaped flowers can be a combination of bright red and yellow.
- Fruits: Mid summer into fall. Medium-sized, bean-like green pod, turning brown in fall and splitting open to release seeds.
- Opposite, simple leaves, dark green to purple (in winter), widely-spaced along the vine.

Ecology

- Hummingbirds, bees, and butterflies frequent the trumpet-shaped flowers; deer and beaver may browse during cold winter months.
- Seeds are eaten by small forest mammals and some birds.
- Support the larvae of the Rustic Sphinx Moth.

Landscape Uses

- Quick-growing, climbing and twining, this vine is great for a trellis, fencerow, or arbor.
- Once established, it forms thick ground cover, inhibiting weeds.

Care Information

- Easily propagated from seed collected in the wild.
- Prune in summer after flowers have died.
- Best flower production occurs when placed in full sun, but will grow fine in 1/4 shade.
- Mostly resistant to deer browse, insect damage, and disease.
- Can tolerate a wide variety of soil conditions, including brief flooding and increased acidity.

Mapleleaf Viburnum

(Viburnum acerifolium)



Plant in place of:

Bush Honeysuckles

Japanese Knotweed

Multiflora Rose

Biology

- Deciduous upland shrub that grows 3 to 6 feet high and 2 to 4 feet wide.
- Flowers: May to August; White showy flowers in upright flat clusters.
- Fruits: August to October; Round, berry-like fruit, ripens to dark purple in early fall.
- Maple-like leaves 2-5" long. Opposite and ovate to rounded, coarsely toothed and three lobed.

Ecology

- Occurs in upland forests, hillsides, and ravine slopes.
- The plants will thrive in moist soils and a range of light conditions but they are a good choice for dry soils in deep shade. They can be used along forest edges, stream sides, and lakeshores.
- More shade tolerant than any other species of viburnum.
- Plants will naturalize by suckering, forming colonies.

Landscape Uses

- Deer, rabbits, mice, skunks, ruffed grouse, ring-necked pheasants, wild turkeys, and many species of songbirds eat the fruits of maple-leaf viburnum.
- Relatively low-growing, providing good nesting and escape cover for birds and small mammals.
- Maple-leaf viburnum has long been cultivated for its attractive summer flowers and foliage; then the autumn leaves turn rose-purple and contrast with the mature dark fruits.

Care Information

- Maple-leaf viburnum begins seed production at about 2 years of age and produces abundant fruit every year.
- Can handle periods of sparse rain and will tolerate shade.

Swamp Rose

(Rosa palustris)



Plant in place of:

Multiflora Rose

Bush Honeysuckles

Japanese Knotweed

Biology

- Perennial shrub with prickled stems, up to 7 feet tall and 4 feet wide.
- Flowers: May to June. Strongly fragrant, 1-3 in. wide, 5-petaled, pink flowers. Flowers occur singly or in small clusters.
- Fruits: Late summer into fall. Large rose hip, turns bright green to bright red as it ripens.
- The alternate compound leaves usually consist of 5-7 oddly pinnate leaflets.

Ecology

- Flowers are cross-pollinated by a host of bees and sometimes beetles.
- Seed-filled rose hips are readily consumed and spread by birds. Small mammals, including mice, bear, skunk and raccoons, also consume the fruits.
- Support the larvae of several butterflies and moths.
- Both birds and beavers use stems and woody materials for constructing dams, dens, and nests.

Landscape Uses

- Several upland game birds and small mammals eat the large, bright red rosehips. White-tail deer enjoy the twigs, leaves, and buds.
- This rose pleasant for gardens, tolerating extreme drought/wetness and impoverished soil, unlike most garden varieties.
- Once established, it forms thick ground cover, inhibiting weeds.

Care Information

- It is faster and easier to start plants using cuttings, as seeds are often slow to germinate and develop.
- Requires partial to full sun.
- Can live in standing water, but is also quite drought-resistant.

Silky Dogwood

(*Cornus amomum*)



Plant in place of:

Bush Honeysuckle

Multiflora Rose

Privet

Biology

- Native shrub, 6 to 10 feet in height.
- Flowers: Late spring to early summer. Clusters of yellowish-white flowers.
- Opposite, rounded to elliptical leaves. Leaf and stem surfaces are fine-hairy.
- Fruits: matures in late summer, bluish berry like drupe.

Ecology

- Adapted to live from Michigan and Wisconsin to Maine and south to Georgia, Florida, and Tennessee.
- Performs best in moist soils, moderately acidic to neutral.
- Highly tolerant of shade but not droughty conditions.
- Found in the wild growing extensively along streambanks and in other riparian areas.

Landscape Uses

- Used for field and farm windbreaks and wildlife borders.
- Live stakes are cut and used along with willows for streambank stabilization and protection.
- Other beneficial uses are fish and wildlife habitat improvement, slope stabilization, and ornamental value.
- Berries provide food for a variety of birds and small mammals.

Care Information

- Site must be prepared by reducing weed competition.
- For bare root plants, holes should be dug deep enough to accommodate the entire root system.
- Steep slopes must be graded first to help root stabilization.

Smooth Sumac

(Rhus glabra)



Plant in place of:

Tree of Heaven

Privet

Bush Honeysuckle

Biology

- Smooth sumac is a U.S. native, deciduous, large shrub to small tree, seldom over 10-15 feet tall.
- Flowers: June to July. Compact clusters of greenish yellow flowers.
- Fruits: August to September. The fruiting head is a compact cluster of round, red, hairy fruits, each containing between 100-700 seeds.
- Alternate, compound leaves 14-24 inches long. Narrowed or rounded at the base and sharply pointed at the tip with finely toothed edges.

Ecology

- Smooth sumac is found in open woodlands, prairies, on dry rocky hillsides, and in canyons.
- It is extremely drought resistant and is commonly found in burned areas, on sandy or gravelly soil.
- The germination of sumac seeds is enhanced by their passage through the digestive system of rabbits, ring-necked pheasants, and quail. The presence of fire also encourages increased germination.

Landscape Uses

- Sumac serves primarily as a winter emergency food for wildlife. Ring-necked pheasant, bobwhite quail, wild turkey, grouse, rabbits, deer and songbirds.
- Sumac also makes good ornamental plantings and hedges because of the brilliant red fall foliage.

Care Information

- Sumac stands can best be maintained by eliminating competing vegetation by mowing, chemicals, or fire.
- Fail to compete with invading tree species and are seldom found growing under closed canopy.
- All sumacs are tolerant of slightly acid soil conditions and textures ranging from coarse to fine. Sumacs are not highly shade tolerate and are considered early successional species.

Virginia Creeper

(*Parthenocissus quinquefolia*)



Plant in place of:

English Ivy

Kudzu

Oriental Bittersweet

Biology

- Native, fast-growing, perennial woody vine.
- Flowers: June to August
- Fruits: August to October
- The leaves are compound, containing 5 leaflets with toothed margins.
- In fall leaves turn bright red to maroon-colored.
- Inconspicuous green flowers bloom in spring and give way to bluish-black berry clusters in early summer.

Ecology

- Found throughout southern, midwestern, and eastern half of the United States, in new and old forests and along forest margins.
- Thrives in partial shade to full sun. Prefers acidic soil, but tolerates a wide range of soils.
- The berries of the plants are eaten by many animals, especially birds. Provides great cover for small animals in the dense foliage.

Landscape Uses

- Used to control erosion on slopes and shaded areas.
- Cultivated as an ornamental because of its fall foliage.
- Excellent for covering walls, trellises, arbors, or fences. Can be grown as groundcover as well.

Care Information

- Seeds can be sown in the fall or spring after cold-moist stratification.
- Once well established, it grows quickly. Regular pruning required to ensure it does not get out of control.
- Can handle periods of sparse rain.

G. Outreach and Education Strategy

Due to the importance of Outreach and Education within this and any invasive exotic plant management plan, several brainstorming sessions were held during Grant Planning meetings in order to develop a comprehensive strategy that would be broad-reaching throughout the town. Equinox and GPC members worked together to define the most essential parts of the strategy: the audience, message, and method of delivery. The audiences identified consist of individuals or interest groups that could be influential in spreading the message or assisting with hands-on management activities within the Town, ranging from those who could perform simple volunteer monitoring and control, to groups who have the potential to influence economic and social trends.

The messages are tailored to align with the strengths or provisions of each interest group. It is important for the message to be empowering and not condescending, because ultimately, this entire plan will be implemented on a voluntary basis - if the message is not well packaged, it will fail to reach or influence the targeted audience.

The method of delivery is also quite important to a successful outreach strategy. We must convey our message to a variety of entities using methodical and repeatable techniques. For example, developing and distributing an IE Plant Identification and Management brochure is a great way to reach a broad range of audiences using one simple and concise approach. Likewise, the creation of a Native Plant requirement within the Town's Unified Development Ordinance (UDO) will establish a precedent that the Town of Weaverville strongly encourages using native plants and avoiding IE plantings within developed landscapes. The following table details the outreach and education strategy generated during the planning meetings.

Table 3: Weaverville IE Management Plan – Outreach & Education Strategy (Sheet 1 of 3)

Audience	Message	Method of Delivery
<p>General Audience</p>	<p>What is an invasive exotic plant? What is a native plant? What is the problem with invasive exotic plants? Why should I care? How do they spread? What can I do as an individual?</p>	<p>Workshops at Nature Park Demonstration Site Town newsletter Weaverville Tribune Town website CD of Native Plant Alternatives Do Not Buy pocket guides Brochures with graphics distributed at</p> <ul style="list-style-type: none"> • Library • Tailgate market • Festivals
<p>Town of Weaverville</p> <ul style="list-style-type: none"> • Admin (resources) • Public works (action) • Town gov't (policy) 	<p>Invasive plant control needs to occur on town-owned land</p> <hr/> <p>Landscape with native plants in lieu of invasive exotics</p> <hr/> <p>Consider the cost/benefits of landscaping with native plants</p> <ul style="list-style-type: none"> • Cost of controlling invasive plants (vines, trees, etc) • Infrastructure maintenance due to invasive plants • Cost of watering vs. drought resistant natives <hr/> <p>Encourage town residents to be good stewards of the land by managing invasive exotic plants on their property and planting native plants</p>	<p>Communicate directly with Public Works Department</p> <hr/> <p>Communicate directly with Public Works Department Revise Town Unified Development Ordinance (UDO) CD of Native Plant Alternatives Do Not Buy pocket guides</p> <hr/> <p>Communicate directly with Town Administration and Public Works Presentation to Town Council</p> <hr/> <p>Implement a “Native Neighbor” recognition program to showcase residents with native landscaping Enforce revised UDO</p>
<p>Town Residents</p> <ul style="list-style-type: none"> • Neighborhood Groups • Home Owners Associations • Landowners 	<p>What priority invasive plants should I be concerned about on my property?</p> <hr/> <p>What are the best ways to control invasive exotic plants on my property?</p>	<p>Brochures with graphics “Most Wanted” Posters Town newsletter Weaverville Tribune Town website Workshops at Nature Park Demonstration Site</p> <hr/> <p>Town of Weaverville Invasive Exotic Plant Management Plan Jim Miller book “A Management Guide for Invasive Plants in Southern Forests” Workshops at Nature Park Demonstration Site</p>

Table 3: Weaverville IE Management Plan – Outreach & Education Strategy (Sheet 2 of 3)

Audience	Message	Method of Delivery
Town Residents <ul style="list-style-type: none"> • Neighborhood Groups • Home Owners Associations • Landowners 	Landscape with native plants in lieu of invasive exotics	CD of Native Plant Alternatives Do Not Buy pocket guides Garden Tours of Wildlife Certified Habitats “Native Neighbor” recognition program Town incentives for planting only native
	Invasive exotic plants can spread from your yard by wind, birds, and water to other peoples yards and into forests and other sensitive natural habitats	Brochures with graphics Town newsletter Weaverville Tribune Town website Workshops at Nature Park Demonstration Site Town Inventories/Neighborhood invasive tours
	The initial cost of a native plant purchase may be more, but native landscaping can SAVE you money in the long run: <ul style="list-style-type: none"> • Increase wildlife value • Reduce water consumption • Reduce annual maintenance costs • Create a unique (enviable) landscape • Town incentives 	Brochures with graphics Town newsletter Weaverville Tribune Town website CD of Native Plant Alternatives Do Not Buy pocket guides Garden Tours of Wildlife Certified Habitats “Native Neighbor” recognition program
	Invasive plants can COST you more money in the long run: <ul style="list-style-type: none"> • Decreased property values due to fire hazards, structural damage, damage to desired trees, etc • IEs create habitats that foster pests • Can impair resale value of your home • With inaction, control costs accrue locally, regionally, and nationally; shared cost by taxpayers; 	Brochures with graphics Town newsletter Weaverville Tribune Town website
Local Businesses	Controlling invasive exotic plants can lead to: <ul style="list-style-type: none"> • Increased security • Increased visibility • Decreased structural damage 	Brochures with graphics “Most Wanted” Posters
	Use native plants when landscaping to: <ul style="list-style-type: none"> • Reduce water consumption • Reduce tax burden 	Brochures with graphics CD of Native Plant Alternatives Do Not Buy pocket guides Town incentives for planting only natives
Developers	Consider the cost/benefits of landscaping with native plants <ul style="list-style-type: none"> • Cost of controlling invasive plants (vines, trees, etc) • Infrastructure maintenance due to invasive plants • Cost of watering vs. drought resistant natives 	Enforce revised UDO Provide incentives for planting only native “Native Neighbor” recognition program CD of Native Plant Alternatives Do Not Buy pocket guides Brochures with graphics

Table 3: Weaverville IE Management Plan – Outreach & Education Strategy (Sheet 3 of 3)

Audience	Message	Method of Delivery
Children	Invasive exotic plants have a negative impact on ecology. They out-compete native plants for sunlight, water, nutrients. They do not give wildlife the proper nutrition that they need.	Story hour at library Brochures with graphics
	Native plants are best for the environment	Workshops at Nature Park Demonstration Site
Community Organizations <ul style="list-style-type: none"> • Scouts • Garden Club • Presbyterian Church • Kiwanis 	Help manage invasive exotic plant infestations in Weaverville	Workshops at Nature Park Demonstration Site Town of Weaverville Invasive Exotic Plant Management Plan Volunteer to control invasive plants in public areas
	Landscape with native plants in lieu of invasive exotics	CD of Native Plant Alternatives Do Not Buy pocket guides
	Help educate residents about the impacts of invasive exotic plants	Town of Weaverville Invasive Exotic Plant Management Plan Brochures with graphics “Most Wanted” Posters Workshops at Nature Park Demonstration Site

H. Plan Implementation

Essential to every Management Plan is an implementation strategy – how we are going to achieve our goals and the ways achievement will be measured. Both the grant requirements as well as the project partners drive the process for developing the implementation plan. Certain parts of the plan’s success can be measured quantitatively, such as: planning meeting minutes, volunteer workshop participation, and creation and distribution of educational and promotional materials. Qualitative measurements are more subjective and harder to define, and include assessing changes in consciousness of the Town public towards IE plants. It is essential to develop a schedule for implementation in order to ensure the success of the Plan, as certain goals and objectives become more critical during certain phases of the implementation process.

The following table details the Action Plan, the ‘who, what, when and how much’ of the implementation strategy, and describes how the management actions will be qualitatively measured. Several items within the Action plan for Control reference Management Zones; these areas correspond with Figure 2, (Appendix A). Following the Action Plan are the Implementation Schedules that are designed to guide the coordinator of the Plan through management activities over time. It is important to note that for the majority of the actions listed below, the party responsible for implementation will be the Town of Weaverville and its constituent parts (MSNP Steering Committee, Community Wildlife Habitat Team, Public Works, etc.). Also noteworthy is the fact that funding for implementing the actions will come mainly from the Town. There may exist local, state and Federal funding sources that can be explored if additional funding is needed.

Table 4 – Weaverville IE Plant Management Plan - Action Plan for Control (Sheet 1 of 2)

Management Action	Targets	Schedule for Implementation	Financial Resources	Estimated Total Costs	Potential Funding Sources	Technical Resources Needed	Qualitative Success Indicators
Complete inventory of invasive plants on Town-owned properties	3 parcels, 67 total acres	Complete by Year 1	Volunteer Time	None	n/a	GPS Operation Training	Increased awareness of existing IE infestations
Control invasive plant infestations in Main Street Nature Park: Zone A	1.0 acres	Mid term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE plants within MSNP
Control invasive plant infestations in Main Street Nature Park: Zone B	1.2 acres	Mid term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE plants within MSNP
Control invasive plant infestations in Main Street Nature Park: Zone C	1.1 acres	Mid term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE plants within MSNP
Control invasive plant infestations in Main Street Nature Park: Zone D	0.3 acres	Mid term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE plants within MSNP

Table 4 – Weaverville IE Plant Management Plan - Action Plan for Control (Sheet 2 of 2)

Management Action	Targets	Schedule for Implementation	Financial Resources	Estimated Total Costs	Potential Funding Sources	Technical Resources Needed	Qualitative Success Indicators
Control invasive plant infestations in Main Street Nature Park: Zone E	1.7 acres	Mid term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE plants within MSNP
Control invasive plant infestations in Main Street Nature Park: Zone F	0.6 acres	Mid term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE plants within MSNP
Control invasive plant infestations in Main Street Nature Park: Zone G	0.6 acres	Mid term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE plants within MSNP
Control invasive tree species within Town Public Works Facility	TBD based on inventory	Short term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Removal of IE tree seed sources
Control bamboo infestations within Town Public Works Facility	0.5 acres	Mid to Long Term	Labor, Chemicals	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reclamation of Public Lands
Control remaining infestations within Public Works Facility	TBD based on inventory	Mid to Long Term	Labor, Chemical	TBD based on prescription	n/a	Certified NC Pesticide Applicator	Reduction of IE sources on Public Lands

Table 5 – Weaverville IE Plant Management Plan - Action Plan for Prevention (Sheet 1 of 2)

Management Action	Targets	Schedule for Implementation	Financial Resources	Estimated Total Costs	Potential Funding Sources	Technical Resources Needed	Qualitative Success Indicators
Monitor Town-owned priority infestation areas over time	2 properties, 67 total acres	Ongoing, following initial control efforts	Volunteer time	TBD based on Inventory / Control	Town	GPS Operation Training	Comprehensive knowledge of status of infestations
Hold regular IE plant workshops to train private landowners on ID, inventory and control	20 IE Plant Workshops	Immediate, continuing annually throughout the Plan	n/a	None	Town	Plant Professional Certified	Increased public awareness of and capacity to treat IE plants
Host town-wide inventories/neighborhood invasive plant tours	10 Tours	Annually	n/a	None	Town	GPS Operation Training	Increased public awareness of presence of IE plants within Weaverville
Hold Volunteer Control days within priority areas	30 Volunteer Control Days	Annually	Volunteer time	TBD based on Inventory / Control	Town, Local Agencies	Licensed/ Certified NC Pesticide Applicator	Reduced populations of IE plants on publicly-owned lands

Table 5 – Weaverville IE Plant Management Plan - Action Plan for Prevention (Sheet 2 of 2)

Management Action	Targets	Schedule for Implementation	Financial Resources	Estimated Total Costs	Potential Funding Sources	Technical Resources Needed	Qualitative Success Indicators
Revise UDO to incorporate native plant preferences and planting plans	Adoption of an ordinance for native plant preferences	Initiate in Year 1, revise as needed	n/a	None	n/a	None	Increased use of native plants within the landscape setting, both on the private and commercial levels
Restore native species on successfully controlled Town-owned properties	2 areas, 67 total acres	Long term	Volunteer Time, Plant Material	TBD based on control efforts	Town, Local, and State Agencies; USFS, Local Nurseries	Plant Professional	Improvement of native plant communities

Table 6 – Weaverville IE Plant management Plan - Action Plan for Outreach & Education (Sheet 1 of 3)

Management Action	Targets	Schedule for Implementation	Financial Resources	Estimated Total Costs	Potential Funding Sources	Technical Resources Needed	Qualitative Success Indicators
Distribute educational brochures describing the problem, priority species, and management strategies	5,000 copies of 1 brochure produced and distributed	Immediate, distributed as needed throughout the life of the Plan	11¢/brochure	\$550	Local and State Agencies	Printing Services	Increased public recognition of IE plants
Compose IE plant articles for the Town Newsletter	30 Articles	3x annually throughout the life of the Plan	n/a	None	n/a	None	Increased Public outreach
Distribute “Most Wanted” posters of priority IE plants at public venues (library, park, Town Hall, etc.)	200 Posters distributed/maintained across Town	Annually throughout the life of the Plan	\$2.90/poster	\$580	Town, Local and State Agencies	Graphic Designer/ Printing Services	Increased public recognition of IE plants
Distribute J. Miller’s “A Management Guide for Invasive Plants in Southern Forests”	300 Guides distributed	Immediate, distributed as needed throughout the life of the Plan	n/a	Free publication from USFS	n/a	None	Increased public recognition of IE plants

Table 6 – Weaverville IE Plant management Plan - Action Plan for Outreach & Education (Sheet 2 of 3)

Management Action	Targets	Schedule for Implementation	Financial Resources	Estimated Total Costs	Potential Funding Sources	Technical Resources Needed	Qualitative Success Indicators
Hold Invasive Plant Story Hour at Library	10 Story Hours hosted	Annually throughout the life of the Plan	n/a	None	n/a	Teacher, Librarian	Early education of children in regards to IE plants
Print and distribute “Do Not Buy” Pocket Guides for consumers	3000 guides distributed	Annually throughout the life of the Plan	25¢/guide	\$750	Town, Local and State Agencies	Printing Services	Increased consumer understanding of native vs. IE plants
Promote IE plant awareness using booths/signage at Town-wide events (tailgate markets, festivals, street walks, etc.)	Annually	Initiate in Year 1, continue annually throughout life of Plan	Volunteer Time, Booth Fees	TBD based on venue	n/a	None	Visitation by Public
Update Town website/other social media to include a webpage for IE Plant Management Plan and outreach materials	Establish web page	Immediate, maintain/update throughout Plan	n/a	\$500	Town	Web content, design guidance	Web traffic and website usage maintained/increased

Table 6 – Weaverville IE Plant management Plan - Action Plan for Outreach & Education (Sheet 3 of 3)

Management Action	Targets	Schedule for Implementation	Financial Resources	Estimated Total Costs	Potential Funding Sources	Technical Resources Needed	Qualitative Success Indicators
Produce and distribute CDs of Native Plant Alternatives	250 CDs distributed	Immediate, annually as needed	\$5/CD	\$1,250	Town, Local and State Agencies	CD Burner	Increased landowner understanding of native vs. IE plants
Use tours to feature Wildlife Certified Habitats within the Town	10 Habitats featured	Immediate, once annually	n/a	Wildlife Habitat Team time	n/a	None	Increased awareness of wildlife habitat program
Award “Native Neighbor” Certificate to private landowners committed to planting only natives	2 awards Annually	Develop award by Year 2, recognize annually	n/a	None	n/a	Award design and layout guidance	Increase peer recognition of native plant stewards
Recognize local plant providers that offer native plant species	1 Nursery Annually	Develop program by Year 2, recognize annually	n/a	None	n/a	Program design	Promote the purchase of native plants locally

Table 7 – Weaverville IE Plant Management Plan - Implementation Schedule for Control Actions (Sheet 1 of 2)

Management Action	Year	Short Term		Mid Term			Long Term					Target
		1	2	3	4	5	6	7	8	9	10	
Complete inventory of invasive plants on Town-owned properties	Planned	Completed by Year 2		ongoing as needed (with increase in public lands)								2 sites, 67 total acres
	Actual											
Control invasive exotic tree species infestations within Town Public Works Facility	Planned	Completed by Year 2		follow-up treatments as needed								TBD based on inventory
	Actual											
Control bamboo infestations within Town Public Works Facility	Planned	Completed by Year 5					follow-up treatments as needed					0.5 acres
	Actual											
Control remaining infestations within Town Public Works Facility	Planned						ongoing as needed					TBD based on inventory
	Actual											

Table 7 – Weaverville IE Plant Management Plan - Implementation Schedule for Control Actions (Sheet 2 of 2)

Management Action	Year	Short Term		Mid-Term			Long Term					Target
		1	2	3	4	5	6	7	8	9	10	
Control invasive plant infestations in Main Street Nature Park: Zone A	Planned	Complete by Year 2										1.0 acres
	Actual											
Control invasive plant infestations in Main Street Nature Park: Zone B	Planned	Complete by Year 5										1.2 acres
	Actual											
Control invasive plant infestations in Main Street Nature Park: Zone C	Planned	Complete by Year 3										1.1 acres
	Actual											
Control invasive plant infestations in Main Street Nature Park: Zone D	Planned	Complete by Year 3										0.3 acres
	Actual											
Control invasive plant infestations in Main Street Nature Park: Zone E	Planned	Complete by Year 5										1.7 acres
	Actual											
Control invasive plant infestations in Main Street Nature Park: Zone F	Planned	Complete by Year 3										0.6 acres
	Actual											
Control invasive plant infestations in Main Street Nature Park: Zone G	Planned	Complete by year 5										0.6 acres
	Actual											

Table 8 – Weaverville IE Plant Management Plan - Implementation Schedule for Prevention Actions

Management Action	Year	Short Term		Mid Term			Long Term					Target
		1	2	3	4	5	6	7	8	9	10	
Monitor Town-owned priority infestation areas over time	Planned	(ongoing throughout life of Plan)										2 sites, 67 total acres
	Actual											
Hold IE regular plant workshops to train private landowners on ID, inventory and control	Planned	2	2	2	2	2	2	2	2	2	2	20 workshops held
	Actual											
Host town-wide inventories/neighborhood invasive plant tours	Planned	3	2	1	1	1		1		1		10 inventories/Tours performed
	Actual											
Hold Volunteer Control days within priority areas	Planned	3	3	3	3	3	3	3	3	3	3	30 control days held
	Actual											
Revise UDO to incorporate native plant preferences and planting plans	Planned	(ongoing; revised as Town leadership changes)										90% effective
	Actual											
Restore native species on successfully controlled Town-owned properties	Planned						(ongoing)					69 acres restored with native plantings
	Actual											

Table 9 – Weaverville IE Plant Management Plan - Implementation Schedule for Outreach & Education Actions (Sheet 1 of 2)

Management Action	Year	Short Term		Mid Term			Long Term					Target
		1	2	3	4	5	6	7	8	9	10	
Distribute educational brochures describing the problem, priority species and areas, and solutions	Planned	(ongoing)										5000 Brochures distributed
	Actual											
Compose IE plant articles for the Town Newsletter, 3 per year	Planned	2	2	2	2	2	2	2	2	2	2	20 articles written
	Actual											
Distribute “Most Wanted” posters of priority IE plants at public venues (library, park, Town Hall, etc.)	Planned		5		5		5		5		5	25 posters showcased
	Actual											
Distribute Miller’s “A Management Guide for Invasive Plants in Southern Forests”	Planned	(ongoing)										300 guides distributed
	Actual											
Hold Invasive Plant Story Hour at Library	Planned	1	1	1	1	1	1	1	1	1	1	10 Story Hour sessions held
	Actual											
Print and distribute “Do Not Buy” Pocket Guides for consumers	Planned	(ongoing)										2000 guides distributed
	Actual											

Table 9 – Weaverville IE Plant Management Plan - Implementation Schedule for Outreach & Education Actions (Sheet 2 of 2)

Management Action		Short Term		Mid Term			Long Term					Target
	Year	1	2	3	4	5	6	7	8	9	10	
Promote IE plant awareness using booths/signage at Town-wide events (tailgate markets, festivals, street walks, etc.)	Planned											At least 1 booth annually
	Actual											
Update Town website to include IE Plant Management Plan and strategies	Planned	Created by Year 2		(ongoing)								Webpage constructed by end of Year 2
	Actual											
Produce and distribute CDs of Native Plant Alternatives	Planned	(ongoing)										250 CDs released
	Actual											
Use tours to feature Wildlife Certified Habitats within the Town	Planned	(ongoing)										10 Habitats featured
	Actual											
Award “Native Neighbor” Certificate to private landowners committed to planting only natives	Planned	2	2	2	2	2	2	2	2	2	2	20 certificates awarded
	Actual											
Recognize local plant providers that offer native plant species	Planned	1	1		1		1		1		1	6 local nurseries recognized
	Actual											

Short Term (1-2 years)

In the short term, implementation of Inventory, Restoration, and Education objectives will drive much of the management plan. Further investigation and comprehensive inventory of IE infestations on Weaverville public lands should occur. Also, continued control work will need to occur within MSNP, focusing on the central and southern areas of the park where infestations are most extensive; control should also be initiated on all IE trees existing within the Public Works Facilities. Further education of the public is also essential during the early stages of plan implementation – trained volunteers will be needed to assist in control activities within the MSNP and on other public lands, driving the need to continue to hold educational IE management workshops at the park. The need to inform private landowners during the early stages of plan implementation also is crucial; providing them with avenues to learn about IE plants and control techniques and encouraging the use of native plants within their own landscapes is vital to the success of comprehensive invasive plant management within the Town. It will also be important in the short term to promote the native planting plan to local residents and businesses.

Mid Term (3-5 years)

During the years following initial inventory and restoration, it will be essential to continue focusing on Prevention, Restoration, and Education. Volunteers must monitor infestations that have received control - invasive plants often persist through at least one treatment, and infestations that are not closely watched can quickly become reestablished. Infestations of bamboo existing within the Public Works Facility should be initially treated within the mid-term; control of remaining infestations within the PWF should also commence. Furthermore, continuation of restoration plantings will need to occur within controlled areas so as to inhibit the reestablishment of IE plants. Identification and control workshops will need to be held regularly throughout the mid-term of the Plan in order to continually engage the public and attract support.

Long Term (6-10 years)

In the long term, the focus will be on Prevention and Restoration objectives. As infestations are controlled and restored, they should be showcased to the public in order to highlight the value of IE management. Following the outreach and education strategy, a broad approach to public education should be taken, with the aim of reaching even the smallest interest groups identified in the brainstorming sessions. It will be essential to keep the local nursery industry engaged and informed,

and ensure that they are providing cost effective native plant options as well as appropriate supplies and materials for controlling IE plants on private lands. The Grant Planning Committee and Town government also need to support and enforce a native plant UDO through the long term, so as to maintain a level of IE awareness and prevent infestations from becoming established via public and private landscapes.

I. Inventory and Control Demonstration Site

The Main Street Nature Park is an approximately 8 acre tract preserved by the Town as a public park; the periphery of the park is designated as wildlife habitat, while the central areas contain walking trails, a gardening space, and areas for repose. There is a large area of mowed grass in the northern central portion. Two tributaries flow through the park, converging approximately 500 feet before exiting the park; each supports a small riparian ecosystem that is largely infested with various IE plants. Upland forested areas make up roughly 70% of the land; IE plant control and restoration plantings of native species has occurred in the northern end of the park, whereas those on the southern end remain heavily infested with IE plants. A map of the site and existing infestations can be found in Appendix A.

The MSNP served as the Demonstration site for three invasive exotic plant workshops led by Equinox. The initial workshop, held on June 1, 2013, focused on teaching inventory techniques – 10 volunteers paired up, utilized GPS units and collected data on invasive exotic plant infestations in the southern end of the park. Part of the workshop consisted of making observations of an area along the easternmost tributary within which members of the MSNP Steering Committee had previously performed manual control work. Equinox used the volunteers' data to create a GIS map of the inventoried areas (see Appendix A), which serves as the start of the Baseline Inventory for the southern portion of the park. Further field examination is needed to complete the comprehensive inventory of the park.

The second workshop, held on August 3, 2013, introduced 15 volunteers to both manual and chemical control techniques that they could utilize on their own property to control IE plants. Participants first learned about preparing for control by utilizing appropriate Personal Protective Equipment (PPE). They then practiced proper control methods, including manual removal as well as cut stem application of systemic herbicides. Efforts were focused on continuing control downstream of the previously controlled area. Priority invasive plants controlled include bush and vine honeysuckles, privet, multiflora rose, Japanese knotweed, English ivy, and periwinkle. The third and final workshop was held on September 7, 2013. Eight volunteers continued control along the tributary, clearing invasive plants from within the riparian area. Both manual removal and cut stem application of a systemic herbicide were performed on the above-mentioned invasive plants. Approximately 7,500 square feet of riparian area were treated at the close of the workshops.

Appendix A – Maps and Tables

- **Figure 1: Infested Public Lands in the Town of Weaverville**
- **Figure 2: Main Street Nature Park - Invasive Exotic Plant Inventory**
- **Figure 3: Main Street Nature Park - Management Zones**
- **Table 10: Suggested Native Planting Schedule**

Figure 1: Infested Public Lands in the Town of Weaverville

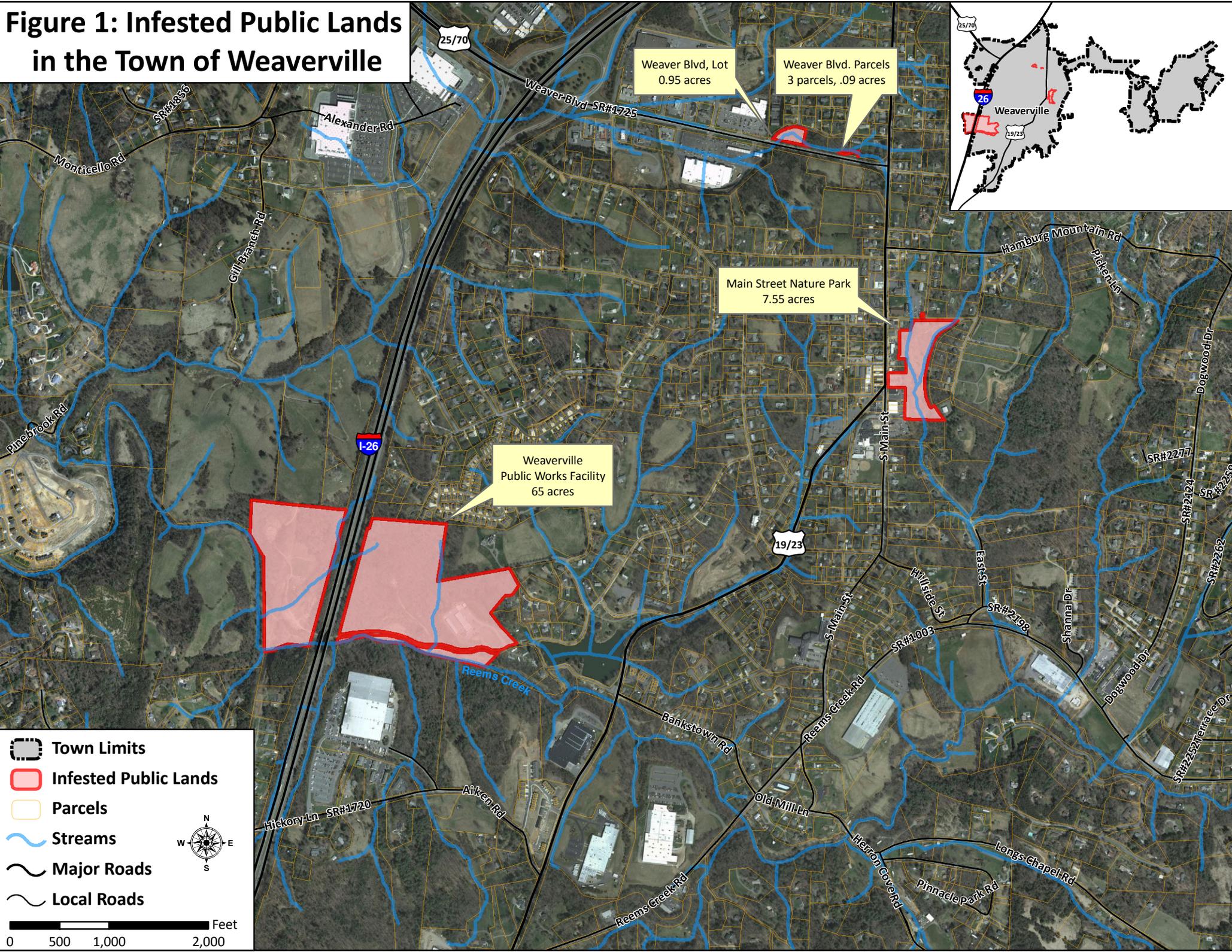


Figure 2: MSNP - Invasive Exotic Plant Inventory

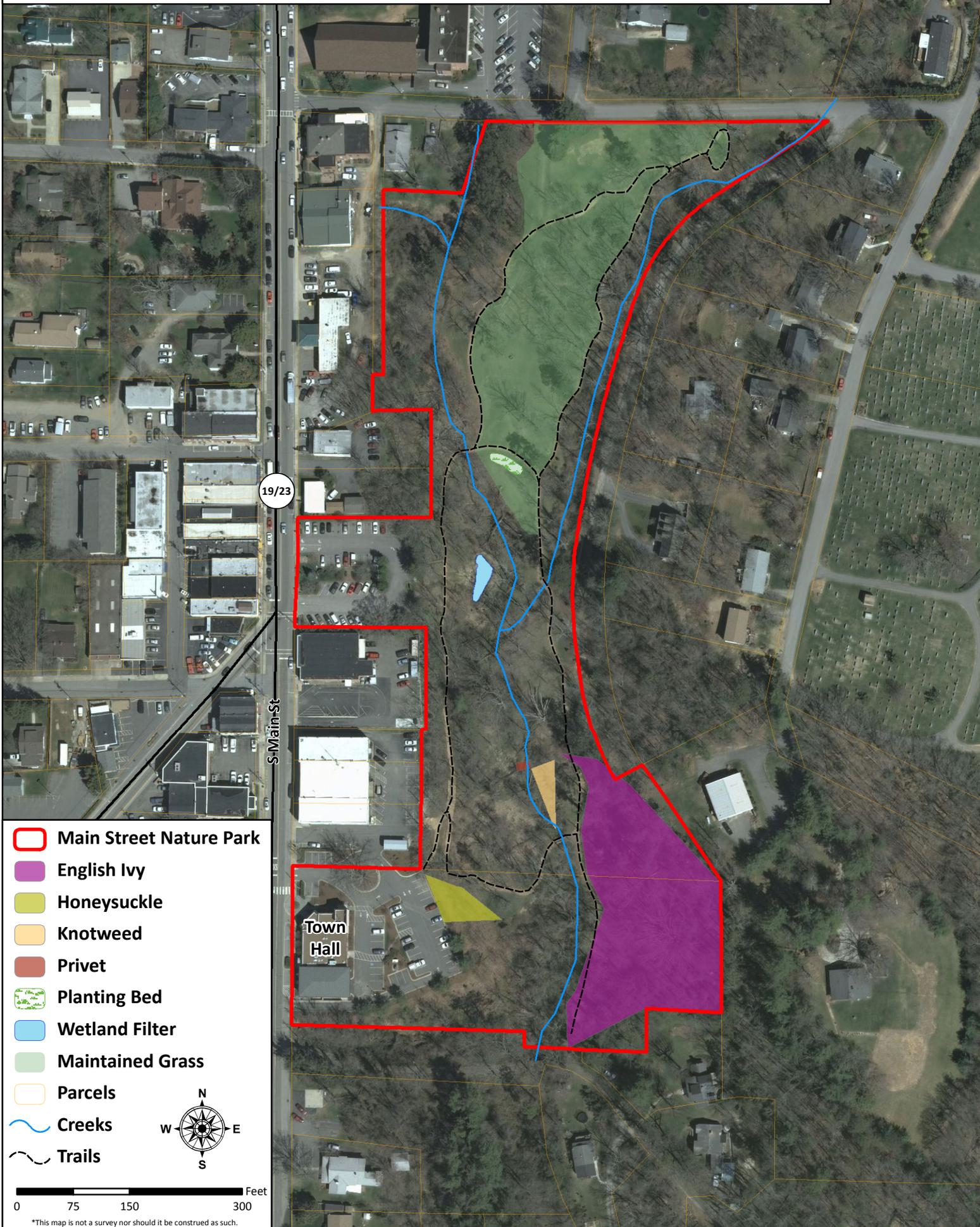


Figure 3: MSNP - Management Zones



Table 10: – Weaverville IE Plant Management Plan – Suggested Native Plants

Common Name	Scientific Name	Characteristics/Habitat	Light	Moisture	Wildlife Value
LARGE EVERGREEN TREES					
American Arborvitae	<i>Thuja occidentalis</i>	Fast growing; pyramidal to columnar in form	Sun	Moist-Well Drained	Birds
American Holly	<i>Ilex opaca</i>	Red berries in winter (pollinator required)	Shade-Sun	Wet-Dry	Birds, squirrel, butterflies
Juniper	<i>Juniperus virginiana</i>	Multiple cultivars; dense growing bluish green	Part Shade-Sun	Well-Drained	Birds/ Deer resistant
White Pine	<i>Pinus strobus</i>	Fast growing; airy form, large	Sun-Part Shade	Dry-Moist	Birds
Eastern Hemlock	<i>Tsuga canadensis</i>	Requires treatment for wooly adelgid pest	Shade-Part Sun	Well-Drained	Birds
Carolina Hemlock	<i>Tsuga caroliniana</i>	Requires treatment for wooly adelgid pest	Shade-Part Sun	Well-Drained	Birds
LARGE DECIDUOUS TREES					
Red Maple	<i>Acer rubrum</i>	FC=Red to orange, wide tolerance	Part Shade-Sun	Wet-Dry	Birds, squirrels, deer, grouse
Sugar Maple	<i>Acer saccharum</i>	FC=Yellow-Orange-Red	Sun-Part Shade	Moist/Well-Drained	Birds, squirrels, deer, grouse
River Birch	<i>Betula nigra</i>	FC=Yellow; Bark, multi-stemmed, ornamental	Full-Sun	Wet-Moist	Birds
Pignut Hickory	<i>Carya glabra</i>	FC=Rich golden yellow, along ridges	Sun-Part Shade	Well-Drained	Deer, turkey
Yellowwood	<i>Cladrastis lutea</i>	FC=Yellow	Part Shade-Sun	Moist	Birds, yellow-bellied sapsucker
White Ash	<i>Fraxinus americana</i>	FC=Yellow ; Ash borer pest	Part Shade-Sun	Well-Drained	Birds
Green Ash	<i>Fraxinus pennsylvanica</i>	FC=Orange-yellow; Ash borer pest	Shade-Sun	Moist-flooding	Birds, butterflies, rabbit, deer, bear
Sweetgum	<i>Liquidambar styraciflua</i>	FC=Red, purple; wide tolerance	Part Shade-Sun	Wet-Dry	Birds, squirrel, chipmunk
Tulip Poplar	<i>Liriodendron tulipifera</i>	FC=Yellow, fast growing	Part Shade-Sun	Moist	Birds, hummingbirds, butterflies, bees
Cucumber Magnolia	<i>Magnolia acuminata</i>	Leaves 4-10" long, FL=White-April	Part Shade	Moist	Birds, red-cockaded woodpecker
Fraser Magnolia	<i>Magnolia fraseri</i>	Leaves 12-24" long, FL=White-May	Shade-Part Shade	Moist	Birds
Umbrella Magnolia	<i>Magnolia tripetala</i>	Leaves 10-24" long, FL=White-May	Part Shade	Moist	Birds, bees
Blackgum	<i>Nyssa sylvatica</i>	FC=Red, thin woods	Part Shade-Sun	Dry	Variety of wildlife
White Oak	<i>Quercus alba</i>	FC= Red, shingled bark, well-branched	Sun	Well-Drained	Birds, turkey, squirrel
Scarlet Oak	<i>Quercus coccinea</i>	FC=Scarlet Red	Sun	Well-Drained	Birds, turkey, squirrel
Chestnut Oak	<i>Quercus montana</i>	Found on rocky dry sites	Sun	Moist	Gray squirrel, black bear, white-tailed deer
Willow Oak	<i>Quercus phellos</i>	Wide tolerance very adaptable	Part Shade-Sun	Wet-Dry	Duck, turkey, woodpeckers, mammals
Northern Red Oak	<i>Quercus rubra</i>	FC=Bright Red	Sun	Well-Drained	Birds, turkey, squirrel
Shumard Red Oak	<i>Quercus shumardii</i>	FC=Red, wide tolerance	Part Shade-Sun	Well-Drained	Birds, turkey, butterfly, mammals
Basswood	<i>Tilia americana</i>	FC=Pale Yellow-July, deep soils	Part Shade	Moist	Bees, butterflies, chipmunks, squirrels
MEDIUM - SMALL DECIDUOUS TREES					
Yellow Buckeye	<i>Aesculus flava</i>	FW=Yellow, Early Spring, ornamental	Part Shade- Sun	Well-Drained	Bees, hummingbirds, squirrels, deer resistant
Common Servicenerry	<i>Amelanchier arborea</i>	FW=White-Early Spring, ornamental, edible blue fruit	Part Shade-Sun	Moist-Dry	Variety of wildlife, bees, humans
Alleghany Serviceberry	<i>Amelanchier laevis</i>	FW=White-Early Spring, ornamental, edible blue fruit	Part Shade-Sun	Moist-Dry	Variety of wildlife, bees, humans
Roundleaf Serviceberry	<i>Amelanchier sanguinea</i>	FW=White-Early Spring, ornamental, edible blue fruit	Part Shade-Sun	Moist-Dry	Variety of wildlife, bees, humans
Ironwood	<i>Carpinus caroliniana</i>	FC=yellow, ornamental bark - smooth muscle like trunk	Shade-Part Shade	Moist-Wet	Birds, duck, butterflies
Redbud	<i>Cercis canadensis</i>	FW=Magenta/purple-Early Spring, ornamental	Part Shade-Sun	Moist-Dry	Birds, bees, deer
Fringetree	<i>Chionanthus virginicus</i>	FW=White-Spring, ornamental	Part Shade-Sun	Dry-Moist	Birds, Mammals
Pagoda Dogwood	<i>Cornus alternifolia</i>	FW=Yellow to white-Spring	Part Shade-Sun	Moist/Well Drained	Birds
Flowering Dogwood	<i>Cornus florida</i>	FW=White-Spring, red fruit, ornamental	Shade-Sun	Moist-Dry	Variety of birds & wildlife
Washington Hawthorne	<i>Crataegus phaenopyrum</i>	FW=White-Summer, berries	Sun-Part Shade	Well-Drained	Birds, bees, mammals
Persimmon	<i>Diospyros virginiana</i>	FW=Yellow, fragrant, edible orange fruit	Part Shade-Sun	Dry-Well Drained	Variety of wildlife, humans
Silverbell	<i>Halesia carolina</i>	FW=White-Spring, ornamental	Shade-Part Shade	Moist	Hummingbirds, bees
Hophornbeam	<i>Ostrya virginiana</i>	FC=yellow, catkins, bark	Shade-Sun	Moist-Dry	Birds
Sourwood	<i>Oxydendrum arboreum</i>	FW=White-Summer, FC=red, ornamental	Part Shade-Sun	Dry-Wet	Variety of wildlife, bees
Winged Sumac	<i>Rhus copallium</i>	Yellow flowers turning to red seedheads		Well-Drained/Dry	Food for many birds and mammals
Smooth Sumac	<i>Rhus glabra</i>	Yellow flowers turning to red seedheads		Well-Drained/Dry	Food for many birds and mammals
Staghorn Sumac	<i>Rhus typhina</i>	FC=Red, Ornamental red seed heads in winter; tolerates black walnut;	Sun-Part Shade	Well-Drained/Dry	Food for many birds and mammals
EVERGREEN SHRUBS					
Carolina Rhododendron	<i>Rhododendron carolinanum</i>	FW=White to Rose-May, acidic soils, medium leaf	Part Shade-Shade	Moist/Well-Drained	Hummingbirds, bees, butterflies/ Deer resistant
Catawba Rhododendron	<i>Rhododendron catawbiense</i>	FW=Lilac/Purple-May, acidic soils, large leaf	Part Shade-Shade	Moist/Well-Drained	Hummingbirds, bees, butterflies/ Deer resistant
Rosebay Rhododendron	<i>Rhododendron maximum</i>	FW=Rose-June, acidic soils, medium leaf	Shade-Part Shade	Moist	Hummingbirds, bees, butterflies/ Deer resistant
Dog Hobble	<i>Leucothoe fontanesiana</i>	FW=White-Spring, spreading	Shade	Moist-Wet	Birds/ Deer resistant
Mountain Laurel	<i>Kalmia latifolia</i>	FW=White-June, acidic soils, small leaf	Shade-Sun	Well Drained/Moist	Hummingbirds, bees, butterflies/ Deer resistant

DECIDUOUS SHRUBS					
Bottlebrush Buckeye	<i>Aesculus parviflora</i>	FW=White-June/July, ornamental; wide growth	Part-Shade-Sun	Well-drained	Hummingbirds
Red Chokeberry	<i>Aronia arbutifolia</i>	FW=White; Red berries; edible	Part Shade-Sun	Wet-Dry	Birds, variety of wildlife
Chokeberry	<i>Aronia melanocarpa</i>	FW=White-Summer; Black berries; edible	Part Shade-Sun	Wet-Dry	Birds, variety of wildlife, humans
Paw Paw	<i>Asimina triloba</i>	Fruit is a yellow berry, edible, fragrant	Shade-Part Sun	Moist	Variety of wildlife
Sweetshrub	<i>Calycanthus floridus</i>	FW=Red-Spring; fragrant, ornamental, shiny leaf	Sun	Average	Pollinators and cover
New Jersey Tea	<i>Ceanothus americanus</i>	FW= White and aromatic, late Spring and Summer	Sun	Average	Pollinators and cover
Buttonbush	<i>Cephalanthus occidentalis</i>	FW= White, Summer	Sun-part shade	Average to moist	Pollinators and cover
Cinamonbark Clethra	<i>Clethra acuminata</i>	FW=White-July, bark tan, ornamental	Sun-Part Shade	Dry	Birds, bees, butterflies
American Filbert	<i>Corylus americana</i>	FW=Yellow-Spring	Sun-Part Shade	Well-Drained	Variety of wildlife
Strawberry Bush	<i>Euonymus americanus</i>	FW=White-Spring, Red ornamental fruit in fall	Shade-Part Shade	Moist-Wet	Turkey, deer, rabbits
Dwarf Fothergilla	<i>Fothergilla gardenii</i>	FW=White-Spring, fragrant; FC ornamental	Part Shade-Sun	Moist-Dry	Birds and mammals
Witchhazel	<i>Hamamelis virginiana</i>	FW=Yellow-Winter, fragrant	Shade-Part Shade	Moist-Dry	Grouse, mammals
Wild Hydrangea	<i>Hydrangea arborescens</i>	FW=White-June, ornamental	Part Shade-Sun	Moist	Birds, bees, butterflies
Bushy St. Johnswort	<i>Hypericum densiflorum</i>	FW= Yellow, Summer	Sun	Average	Pollinators
Golden St. Johnswort	<i>Hypericum fondosum</i>	FW= Yellow, Spint to Summer	Sun to part shade	Average to moist	Pollinators and cover
Shrubby St. Johnswort	<i>Hypericum prolificum</i>	FW=Yellow-Summer	Sun-Part Shade	Dry-heavy Soils	Birds, bees, butterflies
Winterberry	<i>Ilex verticillata</i>	FC=Red, Abundant red berries in fall (pollinator required)	Sun	Moist to average	Birds
Virginia Sweetspire	<i>Itea virginica</i>	FW=White-May, ornamental	Shade-Part Sun	Wet-Dry	Birds, bees, butterflies
Spicebush	<i>Lindera benzoin</i>	FW=Yellow-Spring/fragrant, FC=Yellow	Shade-Sun	Moist-Dry	Birds, bees, butterflies
Pinxterbloom	<i>Rhododendron pericylmenoides</i>	FW= pink, late Spring	Sun to part shade	Average to moist	Pollinators
Sweet Azalea	<i>Rhododendron arborescens</i>	FW= White to pink, late Spring	Sun-Part Shade	Average	Pollinators
Flame Azalea	<i>Rhododendron calendulaceum</i>	FW=Orange/Yellow-Spring, ornamental	Part Shade-Part Sun	Well Drained	Songbirds, bees, butterflies
Carolina rose	<i>Rosa carolina</i>	FW= Pale Pink, late Spring and early Summer	Sun	Average	Wildlife winter food
Swamp Rose	<i>Rosa palustris</i>	FW= Pink, Summer	Sun	Moist to wet	Winter food for wildlife
Elderberry	<i>Sambucus canadensis</i>	FW= White, late Spring	Sun	Moist to average	Birds and mammals
Steeplebush	<i>Spiraea tomentosa</i>	FW= Pink, mid Summer	Sun	Moist to average	Pollinators
Highbush Blueberry	<i>Vaccinium corymbosum</i>	FC=Orange/Red, Blueberries-edible	Sun	Well Drained	Birds and Deer, humans
Maple-leaf Viburnum	<i>Viburnum acerfolium</i>	FC=Red, FW=White-May, ornamental	Part Shade-Shade	Well-Drained/Dry	Birds, bees, butterflies
Witherod Viburnum	<i>Viburnum cassinoides</i>	FC=Red, FW=White-June, blue berries	Sun-Part Shade	Well-Drained	Birds, butterflies, grouse, turkey
Arrowood Viburnum	<i>Viburnum dentatum</i>	FC=Red, FW=White-May, edible fruit	Shade-Sun	Moist	Birds, bees, butterflies, humans
Possumhaw	<i>Viburnum nudum</i>	FW= White	Sun	Average	Pollinators
Blackhaw	<i>Viburnum prunifolium</i>	FW= White	Sun	Average	Pollinators
Rusty Blackhaw	<i>Viburnum rufidulum</i>	FW= White	Sun-part shade	Average	Pollinators
GROUNDCOVERS					
Wild Ginger	<i>Asarum canadense</i>	Good Spreader; heart shaped leaf, edible	Part Shade-Shade	Moist-Well Drained	Butterflies; deer resistant
Heartleaf Ginger	<i>Asarum shuttleworthii</i>	Evergreen; heart shaped leaf	Part Shade-Shade	Wet-Well Drained	Butterflies; deer resistant
Appalachian Sedge	<i>Cares appalachica</i>	Fine green foliage, tops turns golden in fall	Part to full shade	Average	Deer resistant
Seersucker Sedge	<i>Cares plantaginea</i>	Broad green leaves	Shade to part shade	Average	
Blue wood Sedge	<i>Carex flaccosperma</i>	Bluish foliage, may remain evergreen	Shade-part shade	Average	
Oak Sedge	<i>Carex pensylvancia</i>	Green leaves	Part sun to full shade	Average	
Blue satin Sedge	<i>Carex platyphylla</i>	Bluish leaves	Shade to part shade	Average	
Tussock Sedge	<i>Carex stricta</i>	Fine green leaves, good for wet areas and stablization	Sun to shade	Moist to wet	Deer resistant
Green-and-Gold	<i>Chrysogonum virginianum</i>	Evergreen, yellow, spreading	Part Shade-Shade	Moist-Well Drained	Bees
Hay-scented Fern	<i>Dennstaedtia punctilobula</i>	Tends to be evergreen	Sun	Average	Resistant to deer
Galax	<i>Galax urceolata</i>	FW= White, Summer	Shade or semi-shade	Rich soil	
Alumroot	<i>Huechera americana</i>	FW=White, several cultivars	Shade-Sun	Well-Drained/Dry	Variety of wildlife
False Lily-of-the-Valley	<i>Maianthemum canadense</i>	FW= White, Spring	Shade or semi-shade	Rich soil	
Allegheny Spurge	<i>Pachysandra procumbens</i>	FW=White; large leaf, spreading	Shade-Part Sun	Moist-Dry	Variety of wildlife
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	FC=Red; Spreading groundcover, vine	Shade-Sun	Moist-Dry	Birds and rabbit
Mayapple	<i>Podophyllum peltatum</i>	FW=White; tall groundcover, spreading, edible	Shade-Part Shade	Moist-Well Drained	Variety of wildlife
Christmas Fern	<i>Polystichum acrostichoides</i>	Evergreen	Sun-Shade	Moist-Well Drained	Rabbit, deer resistant
Foamflower	<i>Tiarella cordifolia</i>	FW=White, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies

FERNS					
Maidenhair Fern	<i>Adiantum pedatum</i>	Delicate form, whorling appearance, short height	Part Shade-Shade	Wet-Moist	Shelter for amphibians, deer resistant
Southern Lady Fern	<i>Athyrium filix-femina</i>	Large, feathery form	Part Shade-Part Sun	Moist-Well Drained	Shelter for amphibians, rabbit resistant
Marginal Wood Fern	<i>Dryopteris marginalis</i>	Evergreen, vase shaped, non spreading	Part Shade-Shade	Moist-Well Drained	Rabbit resistant
Ostrich Fern	<i>Matteuccia struthiopteris</i>	Showy, arching upright form, can get tall	Part Shade-Shade	Wet-Well Drained	Rabbit resistant
Cinnamon Fern	<i>Osmunda cinnamomea</i>	Distinct fiddlehead in Summer-Fall	Sun-Part Shade	Wet-Moist	Rabbit resistant
Royal Fern	<i>Osmunda regalis</i>	Tall fern, distinct fronds	Part Shade-Shade	Wet-Moist	Shelter for amphibians, rabbit resistant
Christmas Fern	<i>Polystichum acrostichoides</i>	Evergreen	Sun-Shade	Moist-Well Drained	Rabbit, deer resistant
New York Fern	<i>Thelypteris noveboracensis</i>	Small fern, delicate, spreading	Part Shade-Shade	Moist-Well Drained	Shelter for amphibians, Ruffed grouse, rabbit resistant
GRASSES					
Big Bluestem	<i>Andropogon gerardii</i>	Large grass with bluish seed head, FC=bronze	Sun-Part Shade	Well-Drained/Dry	Birds, mammals
Giant Cane	<i>Arundinaria gigantea</i>	Large grass, grows well near water, to 10 feet	Sun	Moist-Well Drained	Birds and insects
Sideoats gramma	<i>Boutela curtipendula</i>	Ornamental seed head, delicate form	Sun-Part Shade	Moist-Well Drained	Birds, mammals
Appalachian Sedge	<i>Carex appalachica</i>	Fine green foliage, tops turns golden in fall	Part to full shade	Average	Deer resistant
Blue wood Sedge	<i>Carex flaccosperma</i>	Bluish foliage, may remain evergreen	Shade-part shade	Average	
Oak Sedge	<i>Carex pensylvanica</i>	Green leaves	Part sun to full shade	Average	
Seersucker Sedge	<i>Carex plantaginea</i>	Broad green leaves	Shade to part shade	Average	
Blue satin Sedge	<i>Carex plattphylla</i>	Bluish leaves	Shade to part shade	Average	
Tussock Sedge	<i>Carex stricta</i>	Fine green leaves, good for wet areas and stablization	Sun to shade	Moist to wet	Deer resistant
River oats	<i>Chasmanthium latifolium</i>	Ornamental seed heads, spreading	Sun-Shade	Wet-Well Drained	Birds, mammals
Tufted Hair Grass	<i>Deschampsia caespitosa</i>	Short height, evergreen, mounding groundcover	Sun-Part Shade	Moist-Well Drained	Birds, mammals
Muhly Grass	<i>Muhlenbergia capillaris</i>	FC=Pink/white blooms in late summer, fall	Sun-Part Shade	Moist-Well Drained	Birds, mammals
Switchgrass	<i>Panicum virgatum</i>	Medium height, airy seed heads, multiple cultivars	Sun-Part Shade	Wet-Well Drained	Birds, mammals
Giant Plume Grass	<i>Saccharum giganteum</i>	Grows to 8 feet, large reddish seed heads	Sun to part shade	Average	Birds, mammals, insects
Little Bluestem	<i>Schizachyrium scoparium</i>	Vertical grass with bluish seed head, FC=bronze	Sun-Part Shade	Well-Drained/Dry	Birds, mammals
Indian Grass	<i>Sorghastrum nutans</i>	Tall grass, FC=bronze orange	Sun-Part Shade	Moist-Well Drained	Birds, mammals
Prairie Dropseed	<i>Sporobolus heterolepis</i>	Low growing, clumping grass, groundcover	Sun	Dry-Well Drained	Birds, mammals
Purple Top	<i>Tridens flavus</i>	Ornamental bunch grass with purplish seedheads	sun		Birds and mammal cover and food
VINES					
Cross Vine	<i>Bignonia capreolata</i>	FW= maroon and yellow, generally evergreen	Sun	Average to Moist	Hummingbirds, and insect pollinators
Trumpet Flower	<i>Campsis radicans</i>	FW=Red, orange; woody climber requires structure	Sun-Part Shade	Moist-Well Drained	Birds, hummingbirds, bees, butterflies; Deer resistant
Clematis (Virgin's Bower)	<i>Clematis virginiana</i>	FW=White, fragrant; tolerates black walnut	Sun-Part Shade	Wet-Well Drained	Birds, bees, butterflies; Deer resistant
Climbing Hydrangea	<i>Decumaria barbara</i>	FC=White; woody climber with glossy leaves	Shade-Sun	Moist-Well Drained	Birds, bees, butterflies
Carolina Jessamine	<i>Gelsemium sempervirens</i>	FW=Yellow, fragrant, Feb-April; evergreen	Full Sun	Moist-Well Drained	Birds, hummingbirds, bees, butterflies
Coral Honeysuckle	<i>Lonicera sempervirens</i>	FW=Red, orange, yellow, fragrant; tolerates black walnut	Sun-Part Shade	Moist-Well Drained	Birds, hummingbirds, bees, butterflies
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	FC=Red; Spreading groundcover, vine	Shade-Sun	Moist-Dry	Birds and rabbits
Wisteria	<i>Wisteria frutescens</i>	FW=Purple, fragrant, showy; woody vine needs pruning	Sun-Part Shade	Moist-Well Drained	Birds, bees, butterflies; Deer resistant
PERENNIALS					
Eastern Blue Star	<i>Amsonia tabernaemontana</i>	FW= Blue, Spring	Sun	Average	
Columbine	<i>Aquilegia canadensis</i>	FW=Yellow & Red, Spring-Summer	Part Sun-Shade	Moist-Well Drained	Bees, hummingbirds, butterflies
Jack-in-the-pulpit	<i>Arisaema triphyllum</i>	FW= Green and purple, Spring	Shade	Moist	
Goat's beard	<i>Arunucus dioicus</i>	FW=White, Summer; Tall form with feathery flower	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Wild Ginger	<i>Asarum canadensis</i>	FW= Small and brown, Spring	Shade	Rich and moist	
Poke Milkweed	<i>Asclepias exaltata</i>	FW= White, Summer	Sun	Average	Bees, butterflies
Swamp Milkweed	<i>Asclepias incarnata</i>	FW= Pink to purple, Summer	Sun	Moist	Bees, butterflies
Common Milkweed	<i>Asclepias syriaca</i>	FW= Purple, Summer	Sun	Average	Bees, butterflies
Butterfly Weed	<i>Asclepias tuberosa</i>	FW= Orange, Summer	Sun	Average	Bees, butterflies
Whorled Milkweed	<i>Asclepias verticillata</i>	FW= White, Summer	Sun	Average	Bees, butterflies
Wood Aster	<i>Aster divaricatus</i>	FW=White, Summer-Fall	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
New England Aster	<i>Aster novae-angliae</i>	FW=Purple, Summer-Fall	Sun	Wet-Well Drained	Birds, bees, butterflies
False Goatsbeard	<i>Astilbe spp.</i>	FW=Multiple colors, Summer	Sun-Shade	Moist-Dry	Birds, bees, butterflies
White Indigo	<i>Baptisia alba</i>	FW= White, Spring	Sun-Part Shade	Average	
Wild Blue Indigo	<i>Baptisia australis</i>	FW= Blue, Spring	Sun-Part Shade	Average	
Yellow Indigo	<i>Baptisia tinctoria</i>	FW= Yellow, Summer	Sun-Part Shade	Average	

Bluebells	<i>Campanula rotundifolia</i>	FW= Light Blue, Summer	Sun-Part Shade	Average	
Black Cohosh	<i>Cimicifuga racemosa</i>	FW=White, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Spring Beauty	<i>Claytonia virginica</i>	FW= pink and white, Spring	Shade	Rich and moist	
Clinton's Lily	<i>Clintonia umbellulata</i>	FW=White, Spring,	Shade	Rich and moist	
Citronella	<i>Collinsonia canadensis</i>	FW= Yellow, Summer	Shade	Rich and moist	
Lobed-Tickseed	<i>Coreopsis auriculata</i>	FW= Yellow, Summer	Sun	Average	Insect Pollinators
Lance-leaved Tickseed	<i>Coreopsis lacneolata</i>	FW= Yellow, Summer	Sun	Average	Insect Pollinators
Whorled Coreopsis	<i>Coreopsis major</i>	FW = Yellow, Summer	Sun	Average	Insect Pollinators
Garden Coreopsis	<i>Coreopsis tinctoria</i>	FW = Yellow, Summer	Sun	Average	Insect Pollinators
Tall Coreopsis	<i>Coreopsis triperis</i>	FW = Yellow, Summer	Sun	Average	Insect Pollinators
Larkspur	<i>Delphinium exaltatum</i>	FW= Blue, Summer	Sun-Part Shade	Rich soil	
Larkspur	<i>Delphinium tricorne</i>	FW= Blue, Spring	Shade	Rich soil	
Dutchman's Breeches	<i>Dicentra cucullaria</i>	FW= White, Spring	Shade	Rich	
Bleeding Heart	<i>Dicentra eximia</i>	FW=White to Pink, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Shooting Star	<i>Dodecatheon meadia</i>	FW=White-Pink, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Shooting Star	<i>Dodecatheon media</i>	FW= White, Late Spring and early summer	Shade or semi shade	Rich soil	
Pale purple Coneflower	<i>Echinacea pallida</i>	FW= Light purple, Summer	Sun	Average to poor	
Purple Coneflower	<i>Echinacea purpurea</i>	FW=Pink, Summer	Sun-Part Sun	Wet-Dry	Birds, bees, butterflies
Rattlesnake Master	<i>Eryngium yuccafolium</i>	FW= White, Summer	Sun	Average to poor	
Trout Lily	<i>Erythronium americanum</i>	FW=Yellow, Spring-Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Joe-Pye Weed	<i>Eupatorium fistulosum</i>	FW=Pink, Summer; Tall form	Sun	Wet-Dry	Birds, bees, butterflies
Boneset	<i>Eupatorium perfoliatum</i>	FW=White, Summer	Sun	Moist-Well Drained	Bees, butterflies
Galax	<i>Galax urceolata</i>	FW= White, Summer	Shade or semi-shade	Rich soil	
Wild Geranium	<i>Geranium maculatum</i>	FW=Lavender, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Woodland Sunflower	<i>Helianthus divaricatus</i>	FW=Yellow, Summer	Sun-Part Shade	Moist-Well Drained	Birds, bees, butterflies, mammals
False Sunflower	<i>Heliopsis helianthoides</i>	FW=Yellow, Summer	Sun	Average to moist	
Round-lobed Hepatica	<i>Hepatica americana</i>	FW=White, bluish purple; distinct leaf	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Coral Bells	<i>Heuchera americana</i>	FW=white; Variety of leaf colors, ornamental	Part Sun-Shade	Moist-Well Drained	Hummingbirds, bees, butterflies
Little Brown Jug	<i>Hexastylus arifolia</i>	FW= Brown, Spring	Shade	Rich soil	
Swamp Rose Mallow	<i>Hibiscus palustris</i>	FW=Rose/Pink/White, Summer	Sun	Wet-Well Drained	Bees, butterflies
Dwarf Iris	<i>Iris cristata</i>	FW=Pale blue, Spring; Groundcover	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Dwarf Iris	<i>Iris verna</i>	FW= Dark blue, Spring	Sun-part shade	Average	
Blue Flag Iris	<i>Iris virginica</i>	FW=Blue, Spring; Distinct vertical leaves	Sun-Shade	Wet-Well Drained	Bees, butterflies
Rough Blazing Star	<i>Liatris aspersa</i>	FW=Pink/lavender, Summer	Sun	Moist-dry	Pollinators
Small-headed Blazing Star	<i>Liatris microcephala</i>	FW= Lavender, Summer	Sun	Dry	Pollinators
Northern Blazing Star	<i>Liatris scariosa</i>	FW = Purple, Summer	Sun	Moist-Dry	Pollinators
Dense Blazing Star	<i>Liatris spicata</i>	FW = Purple, Summer	Sun	Moist to dry	Pollinators
Scaly Blazing Star	<i>Liatris squarrosa</i>	FW = Purple, Summer	Sun	Dry	Pollinators
Southern Blazing Star	<i>Liatris squarrolosa</i>	FW = Purple, Summer	Sun	Dry	Pollinators
Turk's Cap Lily	<i>Lillium superbum</i>	FW+ Orange, Summer	Sun to Part Shade	Rich / moist	
Cardinal Flower	<i>Lobelia cardinalis</i>	FW=Red, Summer	Sun-Shade	Wet-Well Drained	Bees, hummingbirds, butterflies
Great Blue Lobelia	<i>Lobelia siphilitica</i>	FW=Blue, Summer	Sun-shade	Wet-Well Drained	Bees, butterflies
False Lily-of-the-Valley	<i>Maianthemum canadensis</i>	FW= White, Spring	Shade or semi-shade	Rich soil	
Virginia Blue Bells	<i>Mertensia virginica</i>	FW=Bluish purple; bell flower; tolerates black walnut	Part Sun-shade	Moist-Well Drained	Bees, butterflies; deer resistant
Allegheny Monkey Flower	<i>Mimulus ringens</i>	FW= Blue, Fall	Sun to Part Shade	Rich/moist	
Crimson Beebalm (Oswego Tea)	<i>Monarda didyma</i>	FW=purple/red, fragrant, Summer	Sun-Part Shade	Wet-Dry	Birds, hummingbirds, bees, butterflies
Wild Bergamot	<i>Monarda fistulosa</i>	FW= Lavender, Summer	Sun to Part Shade	Average to moist	
Sundrops	<i>Oenothera fruticosa</i>	FW= Yellow, Summer	Sun	Average	
Foxglove Beardtongue	<i>Penstemon digitalis</i>	FW=White, Summer	Sun-Part Sun	Moist-Dry	Bees, butterflies
Small's Penstemon	<i>Penstemon smallii</i>	FW=Lavender and white, Spring-Summer	Sun to part shade	Average	
Wood Phlox	<i>Phlox divaricata</i>	FW=Blue to Lavender, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Wild Sweet William	<i>Phlox maculata</i>	FW = Red to purple, Summer	Sun to Part Shade	Moist to Average	Bees, butterflies
Creeping (Moss) Phlox	<i>Phlox stolonifera</i>	FW=Blue, Pink, White; Spring-Summer; Spreading	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Moss Phlox	<i>Phlox subulata</i>	FW = White to purple, Spring	Part Sun- Shade	Moist-Well Drained	Bees, butterflies
Pink Turtlehead	<i>Chelone lyonii</i>	FW=Pink, late summer to Fall	Shade to part sun	Average and moist	

Jacob's Ladder	<i>Polemonium reptans</i>	FW=Blue, Spring	Part Shade to Shade	Average	
Solomon Seal	<i>Polygonatum biflorum</i>	FW=White, Summer; Distinct tall arching form	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Orange Coneflower	<i>Rudbeckia fulgida</i>	FW= Yellow, Summer	Sun- Part Shade	Moist to dry	Bees, butterflies
Black-eyed Susan	<i>Rudbeckia hirta</i>	FW= Yellow, Summer	Sun	Wet to Dry	Birds, Bees, butterflies
Cutleaf Coneflower	<i>Rudbeckia laciniata</i>	FW = Yellow, Summer	Sun	Wet to Dry	Birds, Bees, butterflies
Brown-eyed Susan	<i>Rudbeckia triloba</i>	FW = Yellow, Summer	Sun	Moist to Dry	Birds, Bees, butterflies
Bloodroot	<i>Sanguinaria canadensis</i>	FW= White, Spring	Shade or semi-shade	Average to rich soil	
Heart-shaped Skullcap	<i>Scutellaria ovata</i>	FW= Blue, Summer	Shade or semi-shade	Average soil	
Woodland Stonecrop	<i>Sedum ternatum</i>	FW= White, Spring	Shade or semi-shade	Average	
Wild Pink	<i>Silene caroliniana</i>	FW=Pink-Red, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Blue-eyed Grass	<i>Sisyrinchium angustifolium</i>	FW= Blue, Summer	Sun to Part Shade	Average	
False Solomon Seal	<i>Smilacina racemosa</i>	FW=White, Summer; Distinct tall arching form	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
ZigZag Goldenrod	<i>Solidago flexicaulis</i>	FW = Yellow, Late Summer to Fall	Sun	Moist to dry	Insects
Erect Goldenrod	<i>Solidago erecta</i>	FW = Yellow, Late Summer to Fall	Sun	Moist to dry	Insects
Giant (Late) Goldenrod	<i>Solidago gigantea</i>	FW = Yellow, Late Summer to Fall	Sun	Moist to dry	Insects
Roan Mountain Goldenrod	<i>Solidago roanensis</i>	FW = Yellow, Late Summer to Fall	Sun	Moist to dry	Insects
Showy Goldenrod	<i>Solidago speciosa</i>	FW = Yellow, Late Summer to Fall	Sun	Moist to dry	Insects
Woodland (Celandine) Poppy	<i>Stylophorum diphyllum</i>	FW=Yellow, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Windflower/Rue	<i>Thalictrum thalictroides</i>	FW=White, Spring-Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Carolina Bush Pea	<i>Thermopsis villosa</i>	FW=Yellow, late Spring	Sun to Part Shade	Average	
Foamflower	<i>Tiarella cordiformis</i>	FW=White, Summer	Part Sun-Shade	Moist-Well Drained	Bees, butterflies
Bluejacket Spiderwort	<i>Tradescantia ohiensis</i>	FW=Blue to Lavender, Summer	Sun- Part Shade	Moist-Well Drained	Bees, butterflies
ZigZag Spiderwort	<i>Tradescantia subaspera</i>	FW=Blue to Lavender, Summer	Sun- Part Shade	Moist-Well Drained	Bees, butterflies
Sweet Betsy	<i>Trillium cuneatum</i>	FW= Maroon, Spring	Part Shade to Shade	Moist	Insects
Red Trillium	<i>Trillium erectum</i>	FW= Maroon or white, Spring	Part Shade to Shade	Moist	Insects
White (Bent) Trillium	<i>Trillium flexipes</i>	FW= White, Spring	Part Shade to Shade	Moist	Insects
Large-flowered Trillium	<i>Trillium grandiflorum</i>	FW= White, turning pink with age, Spring	Part Shade to Shade	Moist	Insects
Yellow Trillium	<i>Trillium luteum</i>	FW= Yellow (smells like lemon), Spring	Part Shade to Shade	Moist	Insects
Vasey's Trillium	<i>Trillium vaseyi</i>	FW= Maroon, Spring	Part Sun-Shade	Moist-Well Drained	Insects
Painted Trillium	<i>Trillium undulatum</i>	FW= White with pink center, Spring	Part Shade to Shade	Moist	Insects
Big Merrybells	<i>Uvularia grandiflora</i>	FW= Yellow, Spring	Semi-shade	Average	
Bellwort	<i>Uvularia perfolia</i>	FW= Yellow, Spring	Semi-shade	Average	
Little Merrybells	<i>Uvularia sessifolia</i>	FW= Yellow, Spring	Semi-shade	Average	
Ironweed	<i>Vernonia spp.</i>	FW=Purple, Summer-Fall; Tall form	Sun	Moist-Dry	Birds, bees, butterflies
Culver's Root	<i>Veronicastrum virginicum</i>	FW=White, Summer-Fall; Tall form with spike flower	Sun-Part Sun	Wet-Well Drained	Bees, butterflies
Sweet White Violet	<i>Viola blanda</i>	FW= White, Spring	Shade or semi-shade	Average to rich soil	Butterflies
Canada Violet	<i>Viola canadensis</i>	FW= White, Spring	Shade or semi-shade	Average to rich soil	Butterflies
Birdsfoot Violet	<i>Viola pedata</i>	FW+= Blue, Spring to Summer	Sun	Dry soil	Butterflies
Smooth Yellow Violet	<i>Viola pubescens</i>	FW= Yellow, Spring	Shade or semi-shade	Average to rich soil	Butterflies
Yellow roundleaf Violet	<i>Viola rotundifolia</i>	Fw= Yellow, Spring	Shade or semi-shade	Average to rich soil	Butterflies
Cream Violet	<i>Viola striata</i>	FW= White, Spring	Shade or semi-shade	Average to rich soil	Butterflies
Chelone glabra	<i>White turtlehead</i>	FW= White, late Summer and Fall	Shade to part sun	Average and moist	Butterflies
Golden Alexanders	<i>Zizia aurea</i>	FW=Yellow, Summer-Fall	Sun-Shade	Moist-Dry	Birds, bees, butterflies
FW: Flower Color					
FC: Fall Color					

Appendix B - Brochure

- **Brochure**