CHAPEL VIEW HOA
CANOPY MANAGEMENT PLAN

A Tool for the Community Environmental Management
Program of Cacapon Institute and the
West Virginia Department of Environmental Protection
Chesapeake Bay Program

By Shawn Walker
Trees 101, LLC

Fall 2014

Contents

Chapel View HOA

Canopy Management Plan

Purpose of Report

Community Environmental Management (CEM) is a program of the West Virginia Chesapeake Bay Program, a collaboration of federal, state, and local officials, NGOs, and volunteers dedicated to protecting the lands and waters of WV's Potomac Basin. Protecting local waters and the Potomac River in turn protects the Chesapeake Bay. CEM benefits communities by educating the public on ways they incorporate green infrastructure to mitigate stormwater runoff pollution, improve public health, and reduce long term maintenance costs. Understanding, protecting, and managing forested lands and individual trees provides many environmental benefits. Trees in urban and suburban settings, because of their close proximity to people, are especially beneficial and have a positive impact on human health. Well managed trees and forests add natural beauty. This Canopy Management Plan was commissioned by the Cacapon Institute to support CEM and the WV Chesapeake Bay Program.

Specifically, this plan is to serve as one of the tools in the CEM program for the Chapel View community and will provide recommendations to help guide the Home Owners Association in its approach to managing trees in its common areas. The focus will be on an increased and healthier tree canopy that will provide benefits such as stormwater control, improved air quality, improved community interactions, shade, wildlife habitat, and increased real estate values. A few comments about trees on private property are also included at the end of this plan.

It is clear that stormwater control is a major concern for the Chapel View community. This plan assumes the beneficial role of trees and shrubs in the interception, slowing and uptake of moisture and the role these plants can play in Chapel View's overall stormwater control strategy. However, this assumption comes with the caveat that hardscape control measures must also be a part of the picture. There may be instances where plants and hardscape do not function well together and that should be taken into consideration before implementing any aspect of this plan.

Overview

The management recommendations in this plan fall into three categories: protecting existing desirable trees; addressing invasive trees, shrubs and vines; and planting new trees and shrubs. Where appropriate one or all of these management approaches will be applied to 11 common areas that are distinguished based on location, use, or type of land. These areas are mapped out in Appendix A.

Management Areas 1 – 11

1. **Slope north of Inspiration Drive**

   Sebastian Donner, Stormwater Specialist at the West Virginia Department of Environmental Protection, noted the rip-rap channel running along the western side of this slope and recommended that this be converted to a series of check-dams. In addition to being more effective in controlling stormwater, Mr. Donner commented that the berms resulting from the construction of the dams can provide locations for tree or shrub plantings. This channel area is a potential tree planting location but any decisions in this regard should wait until after the check-dams are completed.

   There is a young Siberian elm (*Ulmus pumila*) along the channel that should be protected and encouraged. Bark protection along the bottom 4 feet of trunk will protect it from lawn mower, string trimmer or deer damage. A heavy gauge black plastic mesh secured with zip-ties should be used as it can be cut to size, is unobtrusive and does not provide an environment for moisture or pests that can harm the tree. For more information, resources on tree care are provided in Appendix B.

   The eastern half of the slope is a small open area with exposed utility conduits. If water and electric utilities are already installed this could be an ideal location for an HOA community shelter or gazebo. The remaining open area could be allowed to grow as a natural field. This can be designated as an 'intentional' natural area by keeping the perimeter cleanly mowed on a regular basis and by incorporating signage and other community education.

   With the exception of the one Siberian elm along the channel, there are no existing trees to protect on this slope, however the meadow will naturally transition toward early successional forest species unless regularly mowed or burned. If this conversion is allowed, then that would be a low-impact way to let nature provide tree canopy for the community. Those maintaining this zone should learn to identify and select naturally regenerating trees (or planted trees) to nurture and incorporate into the meadow. And they should learn to identify invasive species to be kept in check. Online tree identification resources and invasive plant information can be found in Appendix B.

   If the desire is to convert and maintain this space in herbaceous meadow (wildflowers and grasses) then expert consultation is advised. Contact information for Sustainable Solutions, a local natural resource management group, is provided in Appendix B.

2. **Rocky depression north of Inspiration Drive (main site of 2013/14 fall plantings)**

   While this can be seen as a wet site do not overlook the need for watering any new tree or shrub plantings during extended dry periods in the growing season. Monitor rainfall as well as the presence of standing water in this area and irrigate accordingly. Detailed watering recommendations are included at the end of this plan and resources are listed in Appendix B.

   There are existing young black willows (*Salix nigra*) in this area. As described above, use bark protectors to shield these assets from mowers, string trimmers, deer and other animals.

To encourage tree health and sound structure, structural pruning may be needed for the newly planted trees in the future (usually 3-5 years after planting) but the only pruning that should be done in the meantime is to remove dead/dying/diseased limbs and any sucker growth at the base of trees. Follow the guidelines as indicated in resources such as US Forest Service's *How to Prune* guide (Appendix B) and keep pruning tools sanitized when moving from one tree to the next.

Stakes and ties should be removed from the newly planted trees approximately one year after planting, although some instances may require a second year. Any solid plastic bark protectors should be changed to a sturdy plastic mesh after the stakes and tie are removed. This rule can generally be applied to any new tree planting and is reiterated in the Tree Plantings section on Page 8.

The fall 2014 Chapel View tree planting event included a scattered perimeter of lowland shrubs arranged in concentrated clusters. If this approach proves to be sustainable, it could provide a great way to fill in open areas and diversify plant structure, habitat function and stormwater intercepting/absorbing mass.

3. Creek parallel to Inspiration Drive

There is a mature tree canopy along the creek; a true asset to be appreciated. Species include American sycamore (*Platinus occidentalis*), white oak (*Quercus alba*), chinkapin oak (*Quercus muehlenburgii*), red oak (*Quercus rubra*), eastern red cedar (*Juniperus virginiana*), common hackberry (*Celtis occidentalis*), black walnut (*Juglans* nigra) and boxelder maple (*Acer negundo*). Invasive plants are also in abundance. These include shrubs such as autumn olive (*Eleagnus umbellata*) in large numbers and bush honeysuckle (*Lonicera maackii*). There are numerous vine species, including natives such as Virginia creeper (*Parthenocissus quinquefolia*), wild grapevine (*Vitis spp.*), poison ivy (*Toxicodendron radicans*) as well as some non-native species like Asiatic bittersweet (*Celastrus orbiculatus*) and Japanese honeysuckle (*Lonicera japonica*) that are impacting growth and structure of mature trees and preventing younger trees from advancing into the canopy. Control of these invasive plants is recommended.

Rather than trying to eradicate all invasives, a tenable option is 'tree-focused' invasive management. The simplest approach would be to sever all vines that have worked their way into tree crowns and repeat this on an annual basis. This ignores the problem of invasive shrubs but provides great benefit with little time demand. A more aggressive approach is to sever vines and use a targeted approach to remove only invasive shrubs causing conflict with existing trees. For example, there is a young sycamore on the south side of the creek that is overwhelmed with vines and shrubs. A focused removal of those encroaching plants would be an easy management step, even if it has to be repeated. The key is the focused aspect of this approach making management goals straightforward and achievable.

As described for Area 1 above, an 'intentional' approach could be applied here. The path on south side of creek is overgrown and mostly inaccessible, and the slope where people cross and children play is getting compacted and eroded due to foot traffic. This is currently a great 'wild' place for the kids and there may be limits to managing this, however clearly established pathways and protected zones could

concentrate and therefore limit the damaging effect of soil compaction. (Similar to 'stay on trail' rules in state and national parks.)

There are royal paulownia trees (*Paulownia tomentosa*, also known as the princess tree or dowry tree) planted on private property north of the creek. As this species is known to be invasive, be aware of it and keep an eye out for encroachment into managed areas. Educate homeowners about the benefits of natives and the options for planting them.

Autumn olive shrubs dominate the lower section of the creek. While these are invasive shrubs it may be impractical to attempt removal and eradication. Here their aggressiveness could be seen as a benefit and one can assume they are providing water controlling services. In this location simply managing for woody plants (i.e. allow autumn olive to occupy this space) may be the practical approach, without concern for whether a species is invasive versus non-invasive.

4. Drainage basin north of intersection of Inspiration Drive and Summer Grove Drive

Again, the presence of autumn olive shrubs is concerning but control may not be practical. And the question is raised: Would anything else survive in this location that is often inundated with water? This may be another location to manage with an eye toward encouraging anything woody, regardless of its invasive status.

More expansive and denser tree canopy is recommended. This site, because of the relative wetness of the soil, could be targeted for planting willow cuttings taken from the black willows in Area 2, and would provide a very low cost reforestation option. A willow patch, once established, can become very dense and provide wildlife habitat. These trees have established themselves at the wet location above and may have the capacity to occupy this lower area.

There is an elevated level section parallel to Summer Grove Drive with several shrubs planted during the fall 2013 planting event. These plants were not watered on a regular basis and their failing health is an indicator of that stress. Since these are smaller growing shrubs they may bounce back if irrigated during the growing season. This level section is a potential location for shade tree planting.

5. Drainage basin and field south of intersection of Inspiration Drive and Summer Grove Drive

The existing black locust (*Robinia pseudoacacia*) above the culvert running under Inspiration Drive is stabilizing the steep slope and should be protected and encouraged. In a few years, if certain trees are exhibiting dominance over others in this black locust cluster, removal of smaller trees is an option.

Due to exposed rock and other obstacles to mowing, a meadow is forming on the Summer Grove Drive side (eastern side) of this area. In addition to herbaceous plants, the lack of mowing has allowed black walnut and other early successional native tree species to gain a foothold. The management opportunity here is to allow this succession to take its own course, monitoring for and controlling non-native invasive species.

The remaining mowed section can be kept as is if the Chapel View community benefits from the use of the field. If this use is not needed, the meadow could be widened.

During the fall 2014 planting a handful of trees were planted along the western edge of this field near the bordering private property boundary. Depending on the determined need of the open field space, tree and shrub planting opportunities abound in this area. Lower sections closer to the culvert should be avoided as they are more likely to be inundated with stormwater during heavy rain events.

6. Woods along eastern perimeter

This area is mostly populated with early successional tree species such as eastern red cedar, black locust, black walnut and hackberry. This is especially true at the edge of the woods closest to the homeowner property lines. Non-native invasive trees (mostly tree-of-heaven, *Ailanthus altissima*) and shrubs (autumn olive and bush honeysuckle) have begun to occupy the understory here and will continue to do so. Eradication may not be practical but there are three basic management options:

1. Sever vines climbing into tree crowns.
2. Sever vines and control invasive tree species.
3. Sever vines, control invasive trees, and control invasive shrubs. Control can be done with an aggressive and often repeated regimen of cutting or girdling, or cutting and girdling combined with the use of herbicides. Consult a professional when dealing with large trees or herbicides.

Deeper in the woods toward the HOA boundary there is a slight shift to an early hardwood forest population of ash (*Quercus spp.*), hickory (*Cary spp.*), hackberry and oak species. The invasive species population is similar but sparser. Managing the edge area described above will be an important first step in protecting this zone of distinctive native forest trees.

An immediate concern for this section has to do with the emerald ash borer (*Agrilus* planipennis, EAB). This imported Asian beetle is wiping out entire ash populations in West Virginia's eastern panhandle and a significant proportion of the ash trees in this management area appear to have already been impacted. A prudent step would be to conduct a survey to locate ash trees and assess those that are dead/dying/hazards or those that may be candidates for treatment and protection from EAB.

As mentioned above, invasive trees, shrubs and vines are in less abundance here. However, as the large ash trees occupying the canopy fail and leave sudden gaps, the opportunity for the introduction of invasive species will be great. Please see the resources in Appendix B for more information about EAB, its impacts and how to manage the pest.

7. Woods along southern perimeter

This area has a combination of early successional and early hardwood forest species but is much narrower than Area 6 above so has a great amount of exposed edge. The result is a heavy presence of invasive trees, shrubs and vines. As stated above, eradication is not practical but there are three basic options:

1. Sever vines climbing into tree crowns.
2. Sever vines and control invasive tree species.
3. Sever vines, control invasive trees, and control invasive shrubs. Control can be done with an aggressive and often repeated regimen of cutting or girdling, or cutting and girdling combined with the use of herbicides. Consult a professional when dealing with large trees or herbicides.

Proximity to homes makes awareness of ash trees an important aspect of managing this area.

8. Woods at western corner

This is a young hardwood stand consisting mostly of oak and hickory with some black walnut and hackberry. A great asset, small as it is. Some understory regeneration of these hardwood species was observed as were sub-canopy species like native flowering dogwood (*Cornus* florida) and blackhaw viburnum (*Viburnum prunifolium*), valued for their habitat functions and distinct position in the forest canopy.

Patches of bush honeysuckle and other vines inhabit the exposed edge near Short Road. Eradication may not be practical but the primary management recommendation here is to ensure that these invasives do not encroach into the understory. For the time being, shade from the well-formed canopy is keeping the invasive population at bay, but this can change quickly.

There is a utility line that may come into conflict with some trees in this area. It is recommended that the Chapel View HOA be proactive with the utility company to ensure that they only prune to legally required clearances and do not unduly remove entire trees.

9. Eastern retention pond

There is no existing canopy to manage, although a few autumn olive shrubs have worked their way in. If these do not pose a conflict to the functioning of the pond and can contribute to the control and absorption of stormwater (a question for a hydrologist or stormwater control specialist), this may be another instance where any plant is better than nothing. However, if there is no benefit or if they pose a conflict, their small number would make them easy to eradicate with either repeated cutting back or cutting back and applying herbicide. Please consult a professional before using herbicides; this is especially important in proximity to waterways.

There is potential for planting along the flat elevated rim above the pond but that may impede access for any maintenance or inspections of the pond.

10. Northern retention pond

Similar to Area 9 above. No existing canopy. Autumn olive and other aggressive species may work their way in over time.

There is potential for planting along the flat elevated rim above the pond but that may impede access for any maintenance or inspections of the pond.

11. Common path

Stretches along the common path without fencing could be populated with trees to create some separation between private property and the path, while also adding a sense of definition. Shade tree species are recommended as they provide the greatest benefits. However, the use of smaller growing trees may prevent conflicts over management responsibility as the trees mature.

Other Comments

Tree Plantings

Several potential tree planting locations have been identified. Aggregating the trees, tools and volunteers to get the trees planted can be a monumental challenge in and of itself but where many volunteer tree planting efforts falter is in the follow-up maintenance. Without a viable and comprehensive maintenance plan laid out BEFORE the planting event takes place, the likelihood of success is greatly diminished. Below is a list of things to consider:

Irrigating – A watering plan is top priority for planting success. Depending on the size of the planted tree anywhere from 5 to 20 gallons of water should be applied to each newly planted tree once a week from April to October if there has been less than half an inch of rain during that week. This should be done during the first two growing seasons after planting. Irrigation bags that provide a slow deep watering would be a benefit and take a lot of guess work out of the watering process. Trees should be watered in on the day of planting. Water access is often a deterrent to diligent watering and should be taken into consideration when choosing a tree planting location. Fertilizing is discouraged during the early years of a newly planted tree and need not be included in the short-term maintenance plan.

Mulch – As a standard planting practice, a mulch ring of at least 3 feet in diameter should be installed at the base of newly planted trees. It should be no deeper than 3 inches and should not make contact with the bark of the tree. A 1 inch layer of leaf compost beneath this mulch layer can be a great benefit and can kick start the process of organic matter cycling into the tree's root zone. Each spring, this mulch should be turned over, loosened and supplemented as long as the 3 inch rule is respected. Maintaining a mulch ring through the life of the tree is the optimal scenario but, depending on the location and objectives, this mulching can be abandoned after two or three growing seasons as long as the trees are well established. The Chapel View HOA is aware of the Jefferson County Solid Waste free mulch program and is encouraged to maintain, in an area with good public access, a supply of mulch for community use.

Controlling weeds – Keeping a tree's mulched area free of weeds will limit root zone competition with other plants, prevent vines from climbing the tree, and limit the likelihood of mower or string trimmer damage. If the tree appears well established by the third summer after planting, mulch ring weeding can be abandoned. Again, though, tree health is optimized by maintaining a vigorous mulch ring through the life of the tree.

Staking – Depending on the size and type of tree, different support techniques may be used. Remember that a staking system that allows some movement of the tree encourages better root development and a stronger trunk. If the tree does not need the support or protection of a staking system, it is better to avoid staking altogether. As a rule, stakes and ties should be removed after one year. If special circumstances require that they remain, the ties and stakes should be inspected for strength and to ensure they are not damaging the tree.

Bark protection – New tree plantings should include some form of bark protection in addition to the support system. Any bark protector that may house pests, does not promote air flow or does not allow the penetration of sunlight should be replaced with a heavy duty mesh plastic protector before the third summer after planting. This will allow the trunk to 'breathe' while still protecting the tree's bark from damage. A simplified approach would be to install the heavy duty mesh protectors at the time of planting.

Structural pruning – Three to five years after planting, each tree should be considered for pruning to encourage vitality and structural integrity as the tree matures. As a general rule, newly planted trees should only be pruned to remove suckers as well as dead, dying, diseased, crossing or broken limbs. There are many factors to consider for structural pruning so refer to resources in Appendix B and/or consult an arborist certified by the International Society of Arborists (ISA).

Preserving Existing Trees

Tree planting is a critical part of improving a local tree canopy and will play an important role in the improvements at Chapel View. Often overlooked, however, is the value of the existing mature tree population. These trees have done the hard work of growing to the size that provides true environmental benefits, and these benefits are so hard to replace once lost. They are a pre-existing asset that should not be taken for granted. Any high value mature trees should be inspected on a regular basis (typically every two years) by an ISA-certified arborist.

Private Property

A glance at the Chapel View aerial map in Appendix A shows that a larger proportion of Chapel View's overall greenspace is located on privately owned lots. And a closer look shows that there are few trees or other non-turf vegetation within those lots. This tells us a couple of things regarding Chapel View's tree canopy. First it highlights the fact that active tree planting and management within these zones would have a direct and significant impact on the amount of land covered by tree canopy. Second, it suggests that the planting of trees (and other larger-growing deep rooted plants) would have a significant ameliorative impact on stormwater control and other hydrological challenges faced by the Chapel View community. One of the many benefits trees provide is their capacity to intercept rainfall in their canopy and capture it within their root systems, thus keeping significant amounts of water from funneling into the overtaxed water management system currently in place at Chapel View.

It is a simple concept of watershed dynamics but worth pointing out here: any water captured and held at higher elevations will slow and reduce the flow of water to the lower areas. Rain gardens, rain barrels and other methods have great cumulative affects but the benefit of large shade trees cannot be overlooked. Tens of thousands of gallons of water can be taken up by a single mature tree over the course of a year. Plus a mature tree's ability to capture and slow down the introduction of rainfall into the stormwater mix is dramatic.

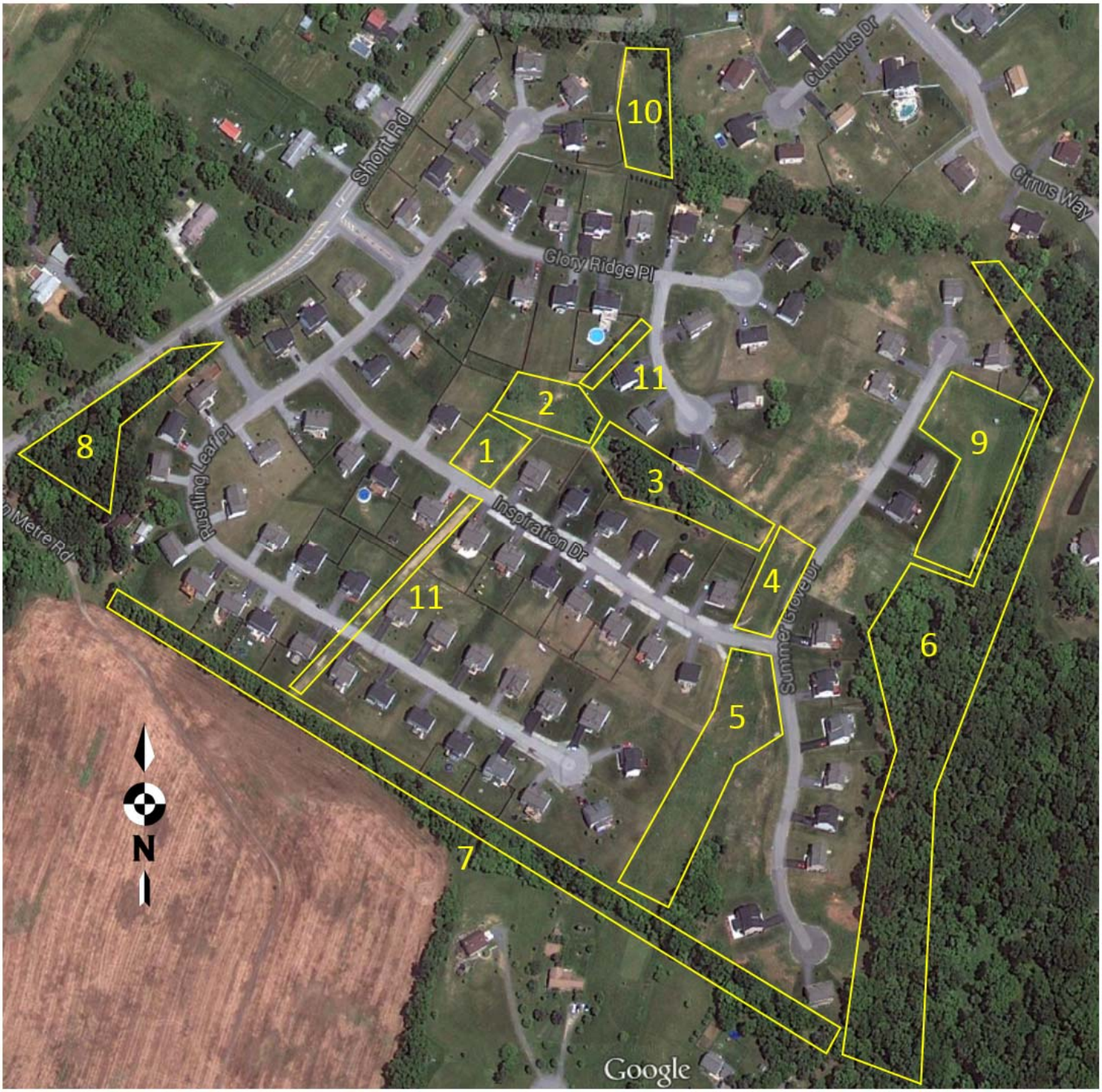
Emerald Ash Borer

A management decision is necessary. This is not like other canopy tree pests (gypsy moth, for example) that can be monitored and managed for over time. Chapel View HOA must assume that all ash trees within their boundaries will perish over the coming few years. Treating and protecting trees in good condition is an option but may not be feasible on a large scale. Selecting a handful of specimen trees or trees in high-use areas and having those treated may be more practical. It is important that all those concerned get to know the nature of this insect and how it works. See the resource in Appendix B for more information.

Conclusion

If implemented, in part or in whole, this plan can play an important role in mitigating the stormwater management challenges experienced by Chapel View residents. Additionally, a larger and healthier tree canopy will benefit Chapel View in a way that boosts other ecosystem services as well as aesthetics and property values. The Chapel View community should be commended for its participation in the Community Environmental Management program and should be proud of the progress they have already made in making their neighborhood a better place. According to the Chesapeake Bay Program, suburban lawn is the fastest growing landcover in the Bay watershed region. Chapel View's interest in planting trees and maintaining a healthy forest canopy is a positive divergence from the norm and will return significant environmental and economic dividends.

APPENDIX A – Chapel View Common Area Management Map



APPENDIX B – Online Resources

Background:
WV Chesapeake Bay Program – http://wvca.us/bay/
WV Urban Forestry – http://www.wvforestry.com
Cacapon Institute – http://www.CacaponInstitute.org/
Opequon Creek Project Team – http://opequoncreek.org/

Planting, Pruning, Maintenance:
Urban Tree Foundation – http://urbantree.org

Casey Trees How-To Guide - http://caseytrees.org/resources/howto/

US Forest Service Tree Owner's Manual (downloadable copy) - http://na.fs.fed.us/urban/treeownersmanual/

US Forest Service How to Prune Guide –
http://na.fs.fed.us/spfo/pubs/howtos/ht_prune/htprune-rev-2012-screen.pdf

Invasive Plants:
The Nature Conservancy of MD/DC – www.nature.org/maryland/invasives

West Virginia DNR Wildlife Resources – www.wvdnr.gov/Wildlife/InvasiveWV.shtm

UMD Extension Tree of Heaven Control -
http://extension.umd.edu/sites/default/files/_docs/programs/woodland-steward/DNR_TreeOfHeaven.pdf

Meadow Conversion:
National Gardening Association How-To Guide - http://www.garden.org/howtos/index.php?q=show&id=2310

Sustainable Solutions (James Remuzzi, President)
4419 Kearneysville Pike
Shepherdstown, WV 25443
(855) 479-7824
www.sustainablesolutionsllc.net

Tree Identification:
Virginia Tech 'multichotomous' leaf and twig identification guide -
http://dendro.cnre.vt.edu/dendrology/idit.htm

University of Connecticut Plant Database - http://hort.uconn.edu/search.php

Emerald Ash Borer:
Multi-agency EAB information – www.emeraldashborer.info