

# Cowan Lake State Park



## Natural Resource Management Plan

2009 - 2013

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## Foreword:

The Natural Resource Management Plan (NRMP) is a collection of the best available data on the natural, cultural, and historical resources of the Cowan Lake area. It will serve as a guide for making informed natural resource management decisions. This document is intended to grow and evolve as more information becomes available and or changes.

## Goals:

The primary goal of this natural resource management plan is to deal with Cowan Lake's four main problems. The four main problems are invasive plants, tree decline, the lake, and animal habitat. These issues are described in great detail in the following pages. Due to possible financial restraints, some areas in the park will be of higher priority than others. However, all four issues should be addressed in some fashion.

## Timeframe:

2009 through 2013

Cowan Lake State Park- 1750 Osborn Road Wilmington, Ohio 45177

Activity	Facilities	Quantity
Resource	Land, acres	1,075
	Water, acres	700
Activity	Fishing	yes
	Hunting	yes
	Hiking Trail	5.5 miles
	Mountain Bike Trail	1 mile
	Picnicking	yes
	Picnic Shelters, #	2
	Swimming Beach	1,000 feet
	Beach Concession	yes
	Nature Programs	yes, summer
	Miniature Golf	yes
Boating	Boat Rental	yes
	Fuel for Sale	yes
	Dock Rental, #	440
	Launch Ramps, #	4
Winter	Sledding	yes
	Cross-Country Skiing	yes
Resort	Family Cottages, #	27
Camping	Non-electric sites	17

Campsites w/ Elec., #	237
Pets Permitted	yes
Campground beach	yes
Showers	yes
Flush Toilets	yes
Dump station	yes
Camp Commissary	yes

Educational Resources:

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## **The Main Problems:**

**Forest Invasives:** There are at least thirty one invasive species inside of Cowan Lake State Park. One serious invasive species is part of a group known as the lumbricid earthworms. These European earthworms have eliminated the entire leaf litter layer in many locations throughout the park. An absence of leaf litter makes it difficult for many species of small mammals, such as shrews, to survive. On top of that, many species of insects are unable to survive.

Moreover, the absence of leaf litter has left the topsoil exposed to the elements. This seems to have accelerated the process of soil erosion around Cowan Lake. Up to a foot of land appears to have been lost in some areas. Fortunately, lumbricid earthworms do not consume the leaves of beeches, oaks, and pines very rapidly. In locations where these trees exist, the leaf litter remains intact. For this reason, large amounts of these trees should be planted wherever and whenever possible. It may be possible to transplant seedlings in order to accomplish this. It should be noted, that evergreens and deciduous trees may not grow well together in a fifty-fifty mix. They will need to be planted separately.

Invasive plants such as honeysuckles, autumn olive, garlic mustard, and multiflora rose have damaged many areas of the park by outgrowing the native plants. The areas that have been completely destroyed are colored red on map number two. It may not be economical to control these plants in the red areas. However, there are areas where the invasives are not well established. These locations are colored green on map number two. Control may be economical in these areas. It is absolutely imperative that the invasive plants within these green zones be eliminated, before it is too late to do anything. Protecting the green zones, should be the highest priority of the natural resource management plan.

The only effective means of eliminating these pests is to use herbicides. Simply cutting them will make these pests grow back in even thicker than before. Uprooting them will only damage the soil, thus creating the perfect habitat for garlic mustard and other invasives. The use of herbicides may have some environmental impact but nowhere near the impact of simply allowing the invasive plants to spread and destroy everything in their path.

For most of these pests, foliar applications of herbicides should be sufficient. Field King backpack sprayers would be best suited for such applications. They cost \$85 apiece. Birchmier backpacks would be best for cut stump applications when dealing with tree of heaven, large honeysuckles, or large autumn olives. Birchmiers cost \$200 apiece, however it is unlikely that anymore than 2 of each of these backpacks would be needed.

For foliar applications, a mixture of water and 5-10% roundup or glypro should be highly effective in destroying honeysuckles, autumn olive, multiflora rose, Asian bittersweet, and Canada thistle. The larger armur honeysuckles and the larger autumn olives will have to be cut down and their stumps will have to be sprayed with 30 to 50% roundup or glypro within 2 hours after cutting. A variety of herbicides should be used so plants do not develop immunity to a particular type. The best time to spray would be in the fall when the bees are less active and most of the native plants are dormant. Armur honeysuckle is best sprayed between October 16 and November 25, or at a time when it is still green. Spraying during wet weather should be avoided if it is possible. If the hunting season makes spraying certain areas impossible during the fall, then those areas can be sprayed in the late summer.

Some invasive plants will defy this prescription. Garlic mustard, cut leaved teasel, white sweet clover and yellow sweet clover are best sprayed with only 3-5% roundup or glypro in the

late fall. If the garlic mustard is dormant during the fall, it should be sprayed in the spring or early summer.

Plants such as periwinkle and English ivy may need to be sprayed with a sticking agent, such as surfactant, during the fall. Their waxy leaves will repel other herbicides.

The tree of heaven will need to be cut down. Within 2 hours after cutting, the stumps will have to be sprayed with 30-50% roundup, glypro, or garlon 3A. A small amount of tordon K will make the Garlon more effective. This can be done in summer or fall.

Reed canary grass can be sprayed with 20 to 30% Glypro when the water level is down during the summer. However, there is an enormous risk that this could harm the water lotuses nearby. Cutting the grass and or covering it with black plastic tarps are better options. There is a large amount of reed canary grass in tract 60B.

There are very few infestations of periwinkle, Japanese barberry, daffodils, daylilies, English ivy, and tree of heaven. It will be important to eliminate these invasives before they become well established.

On top of all of this, it will become important to inform the residents of surrounding suburban areas of the dangers of planting non native plants in their yards and educate them about the alternatives to common garden plants. Many of the invasives inside of the park have come directly out of peoples backyards.

**Tree Decline:** Dutch elm disease has already done significant damage at Cowan Lake State Park. All of the saw timber size elms are either dead or dying. However, healthy understory poles, saplings and seedlings still persist. In the future, the introduction of hybrid elms may be worthy of discussion and debate.

A leaf disease, known as dogwood Anthracnose also appears to be present. A large number of flowering dogwoods are either dead or dying. Fortunately, dogwood anthracnose is thought not to be as deadly as the Dutch elm disease. Dogwood anthracnose spreads readily through moist, shady forests but cannot survive exposure to summer heat or dry foliage. Planting large numbers of flowering dogwood trees of good genetic stock on the lawns in partially shaded areas is a good solution. Two exposed flowering dogwoods have already been planted near the old amphitheater and are doing well. Planting more will not only help the dogwoods survive but will also add to the scenic beauty of the park.

White pines are also declining. It is particularly bad in tract 30B. According to the division of forestry, this has been caused by the droughts of 1988 and 1991, along with moisture extremes in the late 1990's. Stress dependent insects took advantage of the trees weakened states and killed many of them. Planting more may not be practical.

The emerald ash borer is the newest threat. The white ash is the most common tree around Cowan Lake. Almost all of the tracts, including the beech/maple areas, contain ash. When this insect arrives it will create not one disaster, but a whole series of disasters. The death of all the ash trees will open up the canopy, let in more sunlight, and cause invasive plants to spread more quickly. Large amounts of dead ash may increase the risk of fire. Also, dead trees everywhere will degrade the appearance of the park and could result in a loss of business. Many areas may need to be reforested. It will be important to plant mostly red oaks, pines and beeches to deal with the lumbricid earthworm problem. Beech trees can be planted in the shade of trees that are still standing. Saving a few male and female ash trees by pre-treating them is an option worth considering.

In areas such as the campground and tract 29B, fast growing trees such as yellow poplar and red maple can be planted as shade trees after the dead ash trees are cut down. Bur oaks can also be planted because they are resistant to summer drought. Growing these trees from seeds or transplanting seedlings is within the realm of possibility. A large number of red maple and yellow poplar seedlings can be found behind the maintenance building.

**The Lake:** Historically, Cowan Lake has been drained several feet every winter in order to prevent ice from damaging the docks. The draining of the lake has a variety of negative effects. Adult bullfrogs and green frogs are only occasionally heard at Cowan. So far, no bullfrog or green frog tadpoles have been observed. Draining the lake undoubtedly kills them. Instead, there are large numbers of small frogs such as spring peepers and cricket frogs. Freshwater mussels also die in considerable numbers when the lake is drained. It is hard on much of the wildlife.

While the logical solution to this problem would be to keep the water level up year round, there would be a serious disadvantage in doing so. In a natural lake, many of the sediments that enter the lake will remain suspended at the surface and will exit via a natural stream. In a reservoir such as Cowan Lake, the water will often exit the lake through a filter near the bottom of the lake. In addition, only during the spring and fall does the water regularly go over the spillway. The result is that reservoirs will silt in very rapidly. Seasonally, they have to be drained so that the water is channeled and the excess sediments get flushed out of the lake. If the water level at Cowan Lake were to remain constant year round, it would improve the habitat but it would also drastically reduce the life expectancy of the lake. Much silt is already piling up in the coves as well as in the eastern tip of Cowan Lake. For these reasons, Cowan Lake should be continued to be drained several feet every winter unless there is an urgent need to improve the habitat. More focus should instead be placed on fish structures if they are not already present.

It will be more important to deal with invasive species. Narrow leaved cattails have established monocultures in the eastern tip of the lake. These can be sprayed with a mixture of water and 20-30% accord, rodeo, or glypro early in the growing season before flowering. There is a plant growing in the lake that strongly resembles lesser naiad. It may be lesser naiad. Some effective herbicides for this include cutrine, weedtrine, aquathol K, and diquat. Great care should be taken to avoid harming the lotuses, which make Cowan Lake unique. If harm to these lotuses cannot be avoided, then mechanical means of controlling aquatic invasives should be used. There is a small possibility that the lotuses may be keeping the lesser naiad in check. Another good reason to drain Cowan Lake every winter is because keeping the water level up in the lake year round could cause invasives to spread more rapidly than before.

One plant to be on the lookout for is purple loosestrife. Its arrival inside of Cowan Lake may only be a matter of time. Herbicides such as 5-10% glypro, accord, or rodeo are options worth considering. Uprooting these plants will do more harm than good because new loosestrife plants will form from the individual root fragments left in the soil.

**Animal Habitat:** One thing that will help the ecosystem around Cowan Lake would be to increase the amount of available animal habitat. Kestrels and bluebirds could use boosts in their populations. Tract 23B is a good site for a kestrel nesting box. Tracts 66A, 84A, and 86A are good places to set up bluebird nesting boxes. Some have already been set up and need to be maintained.

Northern flicker nesting boxes and living brush piles for rabbits would be good. Snags could be created in some areas by chainsaw girdling specific trees. The lake might need some

fish structures and felled trees between tracts 15A and 23A. The possibilities are only limited to the imagination. Most of these projects could be done by volunteers under the supervision of the naturalist. Simple projects might only involve creating dead brush piles to provide shelter for wildlife. Brush piles could even be put into the lake to provide shelter for tadpoles and small fish. It may be a good idea to avoid putting brush in the lake that is made up of invasives that are treated with herbicides.

### **Rare and Unique Species:**

Red Headed Woodpecker- This species is quite fond of tract 81A. (The pet campground) There are plans to cut down some trees in this area in order to let in some sunlight and allow the grass to grow. It will be important to avoid cutting down too many trees. It would be best to cut only the ash trees since they are likely to die and become a safety hazard anyway.

American Lotus- These can be found on the eastern end of the lake as well as the largest northern cove. Great care should be taken to avoid harming these plants with herbicides or boats.

Bluebird- This species could use a boost in its population. They are found on tract 60A and tract 93A. As mentioned previously, it is a good idea to set up nesting boxes for this species.

American Kestrel – This is another species that could use a boost in its population. The only practical place to place a kestrel nesting box would be in tract 23B. A strip of grass can be mowed to provide easy hunting ground for these birds.

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## **Understanding the Maps:**

There are two vegetation maps of Cowan Lake State Park. Both of them are vital to understanding and implementing the natural resource management plan.

Map number one is a map of the various forest types around Cowan Lake. It also includes the vegetation within the waters of Cowan Lake. Most of the areas that are colored green and light green are sections of beech/ sugar maple and oak/ hickory forest. These areas have the highest wildlife value and are the least damaged by invasive plants. These are also the oldest woodlots in the park. They are the late successional areas. The reason why they have not been damaged by invasive plants is because the canopy in these areas is much thicker than in other areas and less sunlight reaches the forest floor. On top of that, lumbricid earthworms have not heavily damaged the leaf litter in these areas because they do not like the leaves produced by the beeches and oaks. As mentioned before, it is very important to protect these areas from invasive plants.

The sections colored red and orange are sections of ash and elm/ash/red maple forest. They are mostly mid successional areas, so these are some of the youngest woodlots in the park. They are the most heavily damaged by invasive plants. Lumbricid earthworms and Dutch elm disease have also taken a toll. They are so far damaged that habitat improvement may not be economical. To make matters even worse, the emerald ash borer will utterly devastate these areas. It may become desirable to reforest these areas by creating oak, pine, and oak/beech forest.

Various other forest types are represented in map number one and vary in wildlife value. The cattail flats, represented by brown dots, are composed of the invasive narrow leaved cattails. These must be destroyed without harming the lotuses, which are represented by green dots.

Map number two is a map of the invasive plant infestations around Cowan Lake. The areas labeled red, have been virtually destroyed by large numbers of invasive plants. As mentioned previously, treatment of these areas may not be economical. The areas labeled in yellow, have invasive plants well established within them but have not yet been seriously damaged. The areas that are light green contain only a few invasives. Removing the invasives from in and around these green areas will be extremely important.



Amur Honeysuckle: The Most Invasive Plant at Cowan Lake State Park  
(Source: Ohio Invasive Plants Council)

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### **Scenic Resources:**

By far, the most unique feature of Cowan Lake is its water lotuses. It is very rare to find a lake as far inland as Cowan Lake that contains these plants. Large fields of them are located in the shallows of the eastern tip of the lake. Additional fields of water lotuses are growing in the shallows of the lake's largest northern cove. They are in bloom during the summer and their yellow flowers contribute greatly to the scenery of the lake.

In general, any high point that gives visitors a good view of the lake has a great deal of scenic value. Some excellent locations to view the lake include the dam, the South Shore Marina, the cottages, the lookout point behind the commissary, the beach on the south shore of the lake, and especially Austin Island. The fact that Cowan Lake is now surrounded by woodland is what makes this lake good to look at. In the 1950's, much of the land around the lake was abandoned farmland. The improvement in scenery, over the past 59 years has been significant. Sadly, when the emerald ash borers arrive they will begin to ruin the scenery. Half the trees surrounding the lake are ash trees. When they die, they will act as a constant reminder to people of just how fragile our natural resources really are.

Fortunately, Cowan Lake State Park has some fine patches of mature beech/maple forest that are in fairly good condition. These are the most beautiful areas surrounding the lake. The Emerald Woods Trail, the Dogwood Trail, the Beechnut Trail, and parts of the Lakeview Trail run through these stands. During the springtime, these areas are especially beautiful because a variety of wildflowers are in bloom. Some of the wildflowers are trillium, toadshade trillium, mayapple, Dutchman's breeches, squirrel corn, yellow trout lily, spring beauty, and cut leaf toothwort. In the future, these flowers will be threatened by invasive plants. Luckily, this can be prevented with the proper use of herbicides.

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### **Natural History of the Area:**

Roughly 500 to 570 million years ago, Cowan Lake State Park was beneath the warm and shallow water of the Ordovician Sea. Primitive invertebrates such as trilobites, cephalopods, crinoids, brachiopods, bryozoans, gastropods lived there. The fossils of these sea creatures can be found today in the area below Cowan Lake's dam and spillway. Like many areas around Cincinnati, this is one of the most famous fossil hunting fields in the world.

Much of the natural history that occurred after this period remains unknown. However, it is known that over a million years ago the landscape around this area was still very different. It contained a 70 square mile valley, surrounded by large hills and small mountains. In the center of the valley, was a river about the size of the Little Miami River. The landscape was not unlike southeastern Ohio.

The climate at this time was subtropical and in the area below the dam there are a few plant fossils from this period. Giant mammals also roamed the region. Beavers the size of bears, porcupines the size of deer, giant oxen, and mastodons are examples of some of the mammals. Their remains have mostly been found several miles away from Cowan Lake State Park.

This warm period did not last. The ice age soon began and at least 2 glaciers plowed through the area, flattening the hills. The Illinoian glacier was the first and traveled as far south as Kentucky then receded about 60,000 years ago. The second glacier was the Wisconsinan. Its edge covered most of Cowan Lake State Park. It receded between 30,000 and 15,000 years ago. Once the ice age was over, much of this area became rolling hills and forestland.

In 1797, settlers began clearing the forests. Much of the area outside the park property remained cleared ever since. However, the area inside the park has been allowed to convert back into forest again.

## **Human History of the Area:**

The first known people to arrive in Southern Ohio were the Adena Indians. According to the Ohio Historical Society, they arrived around 800 B.C. and disappeared in 100 A.D. These Indians are well known for burying their dead in earthen mounds. One such mound was excavated on park property in the summer of 1949, by the archeologist Raymond S. Baby. This mound was located on what is now the bottom of Cowan Lake. A total of 17 skeletons were found within the mound. Below the mound, an 18<sup>th</sup> skeleton was found in a special burial chamber. It was the best preserved Adena skeleton ever found at the time and was probably a chief or a leader of a family.

Also, a posthole pattern of an Adena house was found under the mound. This was found along with some pumpkin seeds, pumpkin rinds, and charcoal. Apparently, the house deliberately burned down and the burial mound was built directly on top of the remains. The pumpkin seeds are considered evidence that the Adenas were not just hunter gatherers, but were farmers as well.

Not far from the mound, was a circular enclosure that was used for ceremonial rituals and possibly defense. Tom Bagford, a former assistant of Mr. Baby, was interviewed in 2003 about the excavation. According to Mr. Bagford, there were on the order of 20 more burial mounds in the area. Due to the fact that the lakebed was already filling with water, there was no opportunity to excavate these mounds. These burial mounds are now under the water of Cowan Lake.

Also, according to the interview with Mr. Bagford, as well as several 1949 newspaper articles, the mound that was excavated dated back to 700 A.D. or 900 A.D. According to the Ohio Historical Society, the Adena were gone by 100 A.D. The exact reason for this contradiction of information is unknown.

Eventually, the Cowan Lake region became a stronghold of the Miami and Shawnee Indians. They were defeated by General Anthony Wayne, at the Battle of Fallen Timbers in 1794. Once the Indians were displaced, settlement began here. In 1797, the first settler in the area, William Smalley, began clearing land for his home along Cowan Creek. Cowan Lake itself is named after John Cowan, the area's first surveyor. He owned a large area of land where Cowan Creek enters Todd Fork Creek.

The Austin Family helped start the community of Mt. Pleasant in 1814. A church, a school, and a cemetery were built. The Austin family was the last family to leave the area, but not before a court battle over their land. All that remains today is the old cemetery. It is on the southern end of the lake, near Yankee Road. The island in the middle of the Cowan Lake was named Austin Island in honor of this family.

In 1868, the wealthy Reverend James Villars built the Villars Chapel. It was built to be occupied by Christians of all denominations. It is still standing today at the intersection of State Route 350 and State Route 730. It is currently used by the Methodists.

Prior to 1950, much of the area was heavily farmed. What is now the lakebed was good land for growing corn. Wheat, sheep, cattle, hogs, and apples were also produced. Only a few patches of woodland existed around the area.

On August 25, 1933 an artificial lake had been proposed in Vernon Township. After that the planning stage for Cowan Lake had begun. The plan for the dam structure was originally drawn up as part of a flood control plan by the U.S. Engineers Office. Due to tight money and World War II, the whole project was put on hold.

Then in July of 1945, the Ohio General Assembly completed legislation appropriating \$350,000 for a recreational project on Cowan Creek. On July 1, 1946 the first track of land was purchased for Cowan Lake State Park. The contract for the dam was awarded to the Fisher Construction Company in November of 1947. The dam was completed in May of 1949, just before the excavation of the Adena burial mound. Water finally began flowing over the spillway on January 17, 1950 and Cowan Lake became a state park.

From the early 1950's to 1971, some of the land outside the park property was part of Clinton County Air Force Base. What is today, a facility for the handicapped, was a set of barracks for a nearby missile silo. The remains of this missile silo still exist off of Ogden Road. The air force base closed in 1971.

Contrary to popular myth, the island in the middle of the lake was never bombed with blank rounds by Wright Patterson Air Force Base. It was simply required on training missions, that pilots achieve a target lock on the island before returning to base.

Today, most of the old farmland within the park boundaries has converted into elm/ash/maple/yellow poplar woodlots. Much of it has been damaged by invasive plants. Most of the land around the park property is still farmed. However, most of what is now grown consists of corn and soybeans. A few smaller private campgrounds surround the area. There is the Beechwood Acres Campground, the Shady Oaks Campground, and the Quaker Knoll Church Camp. A few suburban areas are near the property lines as well.

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## **Hydrology of the Area:**

Most of the park property is taken up by Cowan Lake. It is a 692 acre lake, with a total of 17 miles of shoreline. It is roughly 3 miles long and half a mile wide at its widest point. For its size, it is not particularly deep. The average depth is only about 20 feet. Near the spillway, it is about 35 feet deep. On the eastern half of the lake the water is very shallow. The depth ranges from 3 to 10 feet and many plants grow there.

Cowan Lake is fed by Cowan Creek, which empties itself into the eastern half of the lake. Cowan Creek exits the lake at the spillway on the western half of the lake. This creek then flows into Todd Fork Creek, which then empties into the Little Miami River. In addition, numerous ravines, gullies, and runoff channels also empty into the lake. However, these are dry most of the year and are not a significant part of the hydrology. Many of these gullies and runoff channels are the result of severe erosion.

From time to time the water quality has varied. Once, a coal train de-railed above Cowan Creek and coal pollution entered the lake. Garbage and other pollutants have been known to wash into the lake from Cowan Creek from time to time. Little can be done about this. A water treatment plant is also on the north shore of the lake.

The most common macroinvertebrates collected, are crayfish and damselflies. This tends to indicate a medium level of water quality. Cowan Lake, like most lake in the region, is very

turbid. However, a variety of snails are also found. This indicates that the water quality is somewhat better than medium.

The ground is more saturated with water on the south side of the lake than on the north side. Many wet and swampy woodlots are on the south side. A few vernal pools also exist around tract 60B. This may be important if herbicides are used around the lake. In contrast, the northern half of the lake is more highly elevated, and much drier.

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## **Geology of the Area:**

The bedrock of the area consists of Ordovician bedrock. It consists primarily of thin alternate layers of limestone and soft, calcareous, bedded shale. Fossils are present in this bedrock and much of the bedrock is exposed in the area below the spillway. This is on the western tip of the lake.

The Illinoian glacier left debris behind in the immediate area. These consist mostly of clay and pebbles. The Wisconsinan glacier left a layer of debris on top of the Illinoian debris. The debris from the Wisconsinan glacier is made up mostly of clay and till.

Most of the debris and soils were eventually covered by windblown material, known as loess. The majority of the soils that exist at Cowan Lake today are formed from the loess. The main order of soil in Ohio and in the immediate area is known as an Alfisol. This soil order is known for having a subsoil accumulation of silicate clay. This can be easily observed by digging a few feet into the ground with a shovel.

There are specific types of soils called series. The three most common series of soil in the area are Xenia series, the Miamian series, and the Russell series. They are all very deep soils that are well to moderately well drained and silty. These soil types are good for growing food. However, they are susceptible to erosion, surface compaction, frost action, and surface crusting. They also have high clay content, limited available water capacity, and a root restrictive layer. There is already a good deal of erosion here and the root restrictive layer might interfere with the growth of certain plants.

On the western end of the lake, the most common soil series are the Hickory series, the Jonesboro series, and the Sligo series. These are also very deep soils. They are well drained to moderately well drained and silty. Major uses for this soil include cropland, pastureland, and woodland. However, they are susceptible to erosion, surface compaction, surface crusting, frost action, flooding, groundwater pollution, and have low soil strength. They also have high clay content. This may be important to know when using herbicides to spray for invasives.

## **Cowan Lake State Park Invasives:**

Ailanthus- *Ailanthus altissima*  
Amur Honeysuckle- *Lonicera maackii*  
Morrow Honeysuckle- *Lonicera morrowii*  
Japanese Honeysuckle- *Lonicera japonica*  
Autumn Olive- *Elaeagnus umbellata*  
Burning Bush- *Euonymus alatus*  
Multiflora Rose- *Rosa multiflora*  
Chinese Privet- *Ligustrum sinense*  
Japanese Barberry- *Berberis thunbergii*  
Canada Thistle- *Cirsium arvense*  
Common Teasle- *Dipsacus fullonum*  
Crown Vetch- *Coronilla varia*  
Yellow Sweet Clover- *Melilotus officinalis*  
White Sweet Clover- *Melilotus alba*  
Garlic Mustard- *Alliaria petiolata*  
Common Mullein- *Verbascum thapsus*  
Poison Hemlock- *Conium maculatum*  
Oriental Bittersweet- *Celastrus orbiculatus*  
Periwinkle- *Vinca minor*  
English Ivy- *Hedera helix*  
Daffodils- *Narcissus spp.*  
Daylilies- *Hemerocallis fulva*  
Common Blackberry- *Rubus fruticosus*  
Lumbricid Earthworms- *Lumbricidae spp.*  
Narrow Leaved Cattail- *Typha angustifolia*  
Reed Canary Grass- *Phalaris arundinacea*  
Lesser Naiad- *Najas minor*  
Carp- *Cyprinus carpio*  
Feral Housecats- *Felis silvestris catus*

#### **Foreign Diseases**

Dutch Elm Disease- *Ophiostoma novo-ulmi*  
Dogwood Anthracnose- *Discula destructiva*

#### **Foreign Diseases & Pests to Watch For**

Emerald Ash Borer- *Agrilus planipennis*  
Beech Bark Disease- *Cryptococcus fagisuga*, *Nectria coccinea*, and *Nectria galligena*  
White Pine Blister Rust- *Cronartium ribicola*  
Sudden Oak Death Syndrome- *Phytophthora ramorum*  
Oak Wilt disease- *Ceratocystis fagacearum*  
Gypsy Moths- *Lymantria dispar*  
Purple Loosestrife- *Lythrum salicaria*  
Callery Pear- *Pyrus calleryana*

#### **Nuisance Animals:**

Canada Goose- *Branta canadensis*  
Raccoon- *Procyon lotor*

#### **Global Warming:**

Effects Unknown

## **Cowan Lake State Park Trees:**

Eastern White Pine- <i>Pinus strobus</i>	Hawthorns – <i>Crataegus spp.</i>
Red Mulberry – <i>Morus rubra</i>	Black Willow – <i>Salix nigra</i>
Eastern Red Cedar- <i>Juniperus virginiana</i>	Black Maple – <i>Acer nigrum</i>
White Oak – <i>Quercus alba</i>	American Holly – <i>Ilex opaca</i>
Red Maple – <i>Acer rubrum</i>	Hedgeapple – <i>Maclura pomifera</i>
Boxelder – <i>Acer negundo</i>	Common Apple – <i>Malus pumila</i>
Red Pine- <i>Pinus resinosa</i>	Sassafras – <i>Sassafras albidum</i>
Paw Paw – <i>Asimina triloba</i>	Pin Oak – <i>Quercus palustris</i>
Black Oak – <i>Quercus velutina</i>	Pignut Hickory – <i>Carya glabra</i>
Bur Oak – <i>Quercus macrocarpa</i>	Black Walnut – <i>Juglans nigra</i>
Northern Red Oak – <i>Quercus rubra</i>	Slippery Elm – <i>Ulmus rubra</i>
American Elm – <i>Ulmus americana</i>	
Blackhaw – <i>Viburnum prunifolium</i>	
Red Osier Dogwood – <i>Cornus stolonifera</i>	
Northern Catalpa – <i>Catalpa speciosa</i>	
Baldcypress – <i>Taxodium distichum</i>	
American Beech – <i>Fagus gradifolia</i>	
Chinkapin Oak – <i>Quercus muehlenbergii</i>	
Shingle Oak – <i>Quercus imbricaria</i>	
Norway Spruce (European Native) – <i>Picea abies</i>	
Scotch Pine (European Native) – <i>Pinus sylvestris</i>	
Chinese Chestnut (Asian Native) – <i>Castanea mollissima</i>	
Austrian Pine (European Native) – <i>Pinus nigra</i>	
Shagbark Hickory – <i>Carya ovata</i>	
Bitternut Hickory – <i>Carya cordiformis</i>	
Ohio Buckeye – <i>Aesculus glabra</i>	
Hackberry – <i>Celtis occidentalis</i>	
Green Ash- <i>Fraxinus pennsylvanica</i>	
White Ash- <i>Fraxinus americana</i>	
Ironwood – <i>Ostrya virginiana</i>	
Musclewood – <i>Carpinus caroliniana</i>	
Eastern Redbud – <i>Cercis canadensis</i>	
Black Locust – <i>Robinia pseudoacacia</i>	
Honey Locust – <i>Gleditsia tricanthos</i>	
Flowering Dogwood – <i>Cornus florida</i>	
American Basswood – <i>Tilia americana</i>	
Black Cherry – <i>Prunus serotina</i>	
American Sycamore – <i>Platanus occidentalis</i>	
Sweet Gum – <i>Liquidambar styraciflua</i>	
Tulip Tree – <i>Liriodendron tulipifera</i>	
Big Tooth Aspen – <i>Populus grandidentata</i>	
Eastern Cottonwood – <i>Populus deltoides</i>	
Staghorn Sumac – <i>Rhus typhina</i>	
Sugar Maple – <i>Acer saccharum</i>	

## **COWAN LAKE STATE PARK FOREST FLOOR PLANTS:**

Christmas Fern- *Polystichum acrostichoides*  
Beech Drops- *Epifagus virginiana*  
Squawroot- *Conopholis americana*  
Large Flowered Trillium- *Trillium grandiflorum*  
Toadshade- *Trillium sessile*  
Mayapple- *Podophyllum peltatum*  
Bloodroot- *Sanguinaria canadensis*  
Twinleaf- *Jeffersonia diphylla*  
Spring Beauty- *Claytonia virginica*  
Cut Leaved Toothwort- *Dentaria laciniata*  
Dwarf Larkspur- *Delphinium tricorne*  
Purple Cress- *Cardamine douglassii*  
Spring Cress- *Cardamine bulbosa*  
Yellow Trout Lily- *Erythronium americanum*  
White Trout Lily- *Erythronium albidum*  
Dutchman's Breeches- *Dicentra cucullaria*  
Squirrel Corn- *Dicentra canadensis*  
Round Lobed Hepatica- *Hepatica americana*  
Sharp Lobed Hepatica- *Hepatica acutiloba*  
Wild Leek- *Allium tricoccum*  
Virginia Bluebells- *Mertensia virginica*  
False Solomon's Seal- *Smilacina racemosa*  
Hairy Solomon's Seal- *Polygonatum pubescens*  
Bellwort- *Uvularia perfoliata*  
Wild Geranium- *Geranium maculatum*  
Jack in the Pulpit- *Arisaema atrorubens*  
Wild Ginger- *Asarum canadense*  
Common Blue Violet- *Viola papilionacea*  
Northern White Violet- *Viola pallens*  
Smooth Yellow Violet- *Viola pennsylvanica*  
Rue Anemone – *Anemonella thalictroides*  
Blue Cohosh- *Caulophyllum thalictroides*  
White Baneberry- *Actaea pachypoda*  
Large Leaved Waterleaf- *Hydrophyllum macrophyllum*  
Broad Leaved Waterleaf- *Hydrophyllum canadense*  
Cloudberry- *Rubus chamaemorus*  
Fire Pink- *Silene virginica*  
Sweet Cicely- *Osmorhiza claytoni*  
Round Leaved Ragwort- *Senecio obovatus*  
Clustered Snakeroot- *Sanicula gregaria*  
Stinging Nettle- *Urtica dioica*  
Wood Nettle- *Laportea canadensis*  
Ground Pine- *Lycopodium spp.*  
Bedstraw- *Galium spp.*  
White Snakeroot- *Eupatorium rugosum*  
Oswego Tea- *Monarda didyma*  
Common Burdock- *Arctium minus*  
Cleavers- *Galium aparine*  
Blackhaw- *Viburnum prunifolium*  
Spicebush- *Lindera benzoin*  
Bladdernut- *Staphylea trifolia*  
Buttonbush- *Cephalanthus occidentalis*  
Elderberry- *Sambucus canadensis*  
Wild Hydrangea- *Hydrangea arborescens*  
Red Osier Dogwood- *Cornus stolonifera*

## **COWAN LAKE STATE PARK MISCELLANEOUS PLANTS:**

### **Common Field Plants**

Poison Hemlock- *Conium maculatum*  
Queen Anne's Lace- *Daucus carota*  
Teasel- *Dipsacus sylvestris*  
Chicory- *Cichorium intybus*  
Canada Thistle- *Cirsium arvense*  
Common Ragweed- *Ambrosia artemisiifolia*  
Great Ragweed- *Ambrosia trifida*  
Oxeye Daisy- *Chrysanthemum leucanthemum*  
Dogbanes- *Apocynum spp.*  
Black-eyed Susan- *Rudbeckia serotina*  
Purple Coneflower- *Echinacea purpurea*  
Gray Goldenrod- *Solidago nemoralis*  
Lance-Leaved Goldenrod- *Solidago graminifolia*  
Red Clover- *Trifolium pratense*  
Pokeweed- *Phytolacca americana*  
English Plantain- *Plantago lanceolata*  
Common Plantain- *Plantago major*  
Bedstraws- *Galium spp.*  
Common Milkweed- *Asclepias syriaca*  
Jewelweed- *Impatiens capensis*  
Crown Vetch- *Coronilla varia*  
Small-flowered Agrimony- *Agrimonia parviflora*  
Wood Strawberry- *Fragaria vesca*  
Creeping Wood Sorrel- *Oxalis corniculata*  
Self Heal- *Prunella vulgaris*  
Tall Ironweed- *Vernonia altissima*  
Elderberry- *Sambucus canadensis*  
Fescue- *Festuca arundinacea*

### **Vines:**

Poison Ivy- *Rhus radicans*  
Virginia Creeper- *Parthenocissus quinquefolia*  
Canada Moonseed- *Menispermum canadense*  
Wild Grapes- *Vitis spp.*  
Greenbrier- *Smilax rotundifolia*  
Bristly Greenbrier- *Smilax tamnoides*  
Trumpet Creeper- *Campsis radicans*

### **Aquatic Plants:**

Green Algae- *Archaeplastida spp.*  
Lesser Naiad- *Najas minor*  
Water Lotus- *Nelumbo lutea*  
Water Plantain- *Alisma plantago-aquatica*  
Lesser Duckweed- *Lemna minor*  
Duck Potato- *Sagittaria latifolia*  
Narrow Leaved Cattail- *Typha angustifolia*  
Blue Iris- *Iris versicolor*  
Reed Canary Grass- *Phalaris arundinacea*  
Swamp Milkweed- *Asclepias syriaca*

## COMMON FAUNA OF COWAN LAKE STATE PARK:

### **Birds**

Great Blue Heron- *Ardea herodias*  
Canada Goose- *Branta canadensis*  
Mallard- *Anas platyrhynchos*  
Wood Duck- *Aix sponsa*  
Pied-Billed Grebe- *Podilymbus podiceps*  
American Coot- *Fulica americana*  
Belted Kingfisher- *Ceryle alcyon*  
Turkey Vulture- *Cathartes aura*  
Red- Tailed Hawk- *Buteo jamaicensis*  
Red-Shouldered Hawk- *Buteo lineatus*  
Osprey- *Pandion haliaetus*  
American Kestrel- *Falco sparverius*  
Wild Turkey- *Meleagris gallopavo*  
Killdeer- *Charadrius vociferus*  
Mourning Dove- *Zenaida macroura*  
Yellow-Billed Cuckoo- *Coccyzus americanus*  
Great Horned Owl- *Bubo virginianus*  
Barred Owl- *Strix varia*  
Ruby-Throated Hummingbird- *Archilochus colubris*  
Pileated Woodpecker- *Dryocopus pileatus*  
Red-Headed Woodpecker- *Melanerpes erythrocephalus*  
Red-Bellied Woodpecker- *Melanerpes carolinus*  
Northern Flicker- *Colaptes auratus*  
Yellow-Bellied Sapsucker- *Sphyrapicus varius*  
Downy Woodpecker- *Picoides pubescens*  
Eastern Wood Pewee- *Contopus virens*  
Barn Swallow- *Hirundo rustica*  
Tree Swallow- *Tachycineta bicolor*  
Chimney Swift- *Chaetura pelagica*  
Carolina Chickadee- *Poecile carolinensis*  
Tufted Titmouse- *Baeolophus bicolor*  
White-Breasted Nuthatch- *Sitta carolinensis*  
Eastern Bluebird- *Sialia sialis*  
American Robin- *Turdus migratorius*  
Wood Thrush- *Hylocichla mustelina*  
Brown Thrasher- *Toxostoma rufum*  
Gray Catbird- *Dumetella carolinensis*  
Northern Mockingbird- *Mimus polyglottos*  
Blue Jay- *Cyanocitta cristata*  
American Crow- *Corvus brachyrhynchos*  
Cedar Waxwing- *Bombycilla cedrorum*  
Red-Eyed Vireo- *Vireo olivaceus*  
Prothonotary Warbler- *Protonotaria citrea*

### **Mammals**

Opossum- *Didelphis virginiana*  
Short Tailed Shrew- *Blarina brevicauda*  
Eastern Mole- *Scalopus aquaticus*  
Little Brown Bat- *Myotis lucifugus*  
Cottontail Rabbit- *Sylvilagus floridanus*  
Eastern Chipmunk- *Tamias striatus*  
Woodchuck- *Marmota monax*  
Gray Squirrel- *Sciurus carolinensis*  
Meadow Jumping Mouse- *Zapus hudsonius*  
Raccoon- *Procyon lotor*  
Striped Skunk- *Mephitis mephitis*  
White Tailed Deer- *Odocoileus virginianus*

Common Yellowthroat- *Geothlypis trichas*  
Scarlet Tanager- *Piranga olivacea*  
Northern Cardinal- *Cardinalis cardinalis*  
Eastern Towhee- *Pipilo erythrophthalmus*  
American Goldfinch- *Carduelis tristis*  
Chipping Sparrow- *Spizella passerina*  
Field Sparrow- *Spizella pusilla*  
Common Grackle- *Quiscalus quiscula*  
Red-Winged Blackbird- *Agelaius phoeniceus*  
Brown-Headed Cowbird- *Molothrus ater*  
Orchard Oriole- *Icterus spurius*

### **Reptiles and Amphibians**

Bullfrog (rare)- *Rana catesbeiana*  
Green Frog (rare)- *Rana clamitans*  
Cricket Frog- *Acris crepitans*  
Spring Peeper- *Hyla crucifer*  
American Toad- *Bufo americanus*  
Eastern Box Turtle- *Terrapene carolina*  
Milk Snake- *Lampropeltis triangulum*  
Common Water Snake- *Nerodia sipedon*  
Black Rat Snake- *Elaphe obsoleta*  
Garter Snake- *Thamnophis sirtalis*  
Five-lined Skink- *Eumeces fasciatus*

### **Fish**

Carp- *Cyprinus carpio*  
Green Sunfish- *Lepomis cyanellus*  
Bluegill- *Lepomis macrochirus*  
Longear Sunfish- *Lepomis megalotis*  
Largemouth Bass- *Micropterus salmoides*  
White Crappie- *Pomoxis annularis*  
Black Crappie- *Pomoxis nigromaculatus*  
Muskellunge- *Esox masquinongy*  
Yellow Bullhead- *Ictalurus natalis*  
Channel Catfish- *Ictalurus punctatus*  
Flathead Catfish- *Pylodictis olivaris*  
Saugeye- *Sander vitreus* X *Sander canadense*  
Gizzard Shad- *Dorosoma cepedianum*  
White Bass- *Morone chrysops*  
Johnny Darter- *Etheostoma nigrum*

## Noteworthy Insects and Miscellaneous Animals:

Large Whirligig Beetle- *Dineutus spp.*  
Feroocious Water Bug- *Abedus spp.*  
Wheel Bug- *Arilus cristatus*  
Green Stink Bug- *Acrosternum spp.*  
Fireflies- *Photinus spp.*  
Green Tiger Beetle- *Cicindela sexguttata*  
Japanese Beetle- *Popilla japonica*  
Field Cricket- *Gryllus pennsylvanicus*  
Dogday Harvestfly- *Tibicen canicularis*  
Cicada Killer- *Sphecius speciosus*  
Green Darner- *Anax junius*  
Robber Fly- *Tolmerus spp.*  
American Horse Fly- *Tabanus americanus*  
Crane Fly- *Tipula spp.*  
Bald-Faced Hornet- *Vespula maculata*  
Yellow Jacket- *Vespula spp.*  
Honeybee- *Apis mellifera*  
Eastern Tent Caterpillar- *Malacosoma americanum*  
Monarch Butterfly- *Danaus plexippus*  
Eastern Tiger Swallowtail- *Papilio glaucus*  
Cabbage White- *Pieris rapae*  
Hackberry Butterfly- *Asterocampa celtis*  
Eastern Crayfish- *Cambarus bartoni*  
Chimney Crayfish- *Cambarus diogenes*  
Fresh Water Mussels- *Unionacea spp.*

## Recommendations for Cowan Lake: North Shore:

### Forest Type

### Recommendations

Tract 1A. Elm (little)Ash/Maple

*Low Priority:* Contains multiflora rose, garlic mustard, amur honeysuckle, and lumbricid earthworm damage. Treatment of this area may not be economical. However, when the emerald ash borer devastates this area, it may become desirable to reforest it. American beech can be planted in the shade of trees that are still standing. Red oak, white oak, cedar, and white pine can be planted everywhere else to deal with the lumbricid earthworm problem. The invasives will have to be destroyed before any of this is possible. Spray them with herbicides during the fall or when their leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Spray during dry weather only. Foliar applications of water and 5-10% roundup or glypro will be sufficient for everything except the garlic mustard. The garlic mustard will have to be sprayed with 3-5% roundup or glypro in the fall or early summer. It may be important to inform the nearby residents about the problems caused by invasive plants and the importance of native gardening.

Tract 2A.Oak/Hickory

*Highest Priority:* Contains multiflora rose, autumn olive, and light lumbricid earthworm damage. These plants must be destroyed with herbicides in the fall or when their leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. The honeysuckle and autumn olive can be effectively destroyed with water and 5-10% roundup or glypro. Spray during dry weather only. In addition, the sugar maples in the understory should be cut down so the area does not become dominated by sugar maples in the future. Brush piles can be made from the sugar maples to provide shelter for wildlife.

Tract 3A. Mixed Forest

*Highest Priority:* Contains some lumbricid earthworm damage. The large ash trees should be chainsaw girdled or cut down to slow the spread of the emerald ash borer. Beech trees and red oaks should be planted in place of the ash trees to deal with the lumbricid earthworm problem. A few brush piles should be established in order to provide shelter for wildlife. These brush piles should not be placed on the hillsides because the largest population of bellworts in the entire park grows on the hillsides. Also, any invasive plants that enter this tract should be sprayed with herbicides during the fall or when their

leaves are still green. Spray during dry weather only.

Tract 4A. Elm/Ash/Maple

*High Priority:* Contains multiflora rose, garlic mustard, amur honeysuckle, Chinese privet, Japanese honeysuckle, periwinkle, and lumbricid earthworm damage. The periwinkle must be destroyed with surfactant as soon as possible. The rest of the invasives are lower priorities. When this tract is devastated by the emerald ash borer it may be desirable to reforest it. The recommendations for tract 1A will work well for this tract.

Tract 5A. Field

*Medium Priority:* Spray any autumn olive, crow vetch, yellow sweet clover, white sweet clover, cut leaved teasel, and Canada thistle that is in this tract. Most of these plants can be sprayed with water and 3-5% roundup or glypro. The autumn olive and Canada thistle will need to be sprayed with 5-10% roundup or glypro.

Tract 6A. Mixed Forest

*Low Priority:* Contains amur honeysuckle, multiflora rose, Chinese privet, Japanese honeysuckle, garlic mustard, autumn olive, and morrow honeysuckle. Treatment of this area may not be economical.

Tract 7A. Mixed Forest/Field

*High Priority:* Contains autumn olive, cut-leaved teasel, multiflora rose, amur honeysuckle, morrow honeysuckle,

Chinese privet, and tree of heaven. Treatment of most of these invasives may not be economical. However, the tree of heaven must be cut down and the stumps must be treated with 30-50% roundup or glypro.

Tract 8A. Bottomland Forest

*Low Priority:* Contains amur honeysuckle, multiflora rose, and burning bush. Treatment of this area may not be economical. It is important that people keep a respectful distance from the heron nesting site.

Tract 9A. Oak/Hickory

*High Priority:* Contains amur honeysuckle, multiflora rose, autumn olive, Japanese honeysuckle, garlic mustard, and moderate lumbricid earthworm damage. This area should be protected because it contains some of the only wild geraniums in the entire park. The recommendations for this area are the same as those of tract 2A, except the garlic mustard must be sprayed with 3-5% roundup or glypro during the fall or early summer.

Tract 10A. Field/Lawn

*Low Priority:* Contains amur honeysuckle, autumn olive, multiflora rose, Japanese honeysuckle, crow vetch, cut leaved teasel, and morrow honeysuckle. Treatment of the field may not be economical. However,

dogwood trees can be planted near the parking lots and there is a dead elm tree that needs to be removed.

Tract 11A. Oak/Hickory

*Highest Priority:* Contains amur honeysuckle, multiflora rose, autumn olive, Japanese honeysuckle, and Chinese privet. The recommendations for this tract are the same as those of tract 2A.

Tract 12A. Elm/Ash/Maple

*Low Priority:* Contains Japanese honeysuckle, multiflora rose, autumn olive, Chinese privet, burning bush, amur honeysuckle, morrow honeysuckle, and lumbricid earthworm damage. Recommendations for this area are the same as those for tract 1A except there is no garlic mustard to deal with.

Tract 13A Field

*Low Priority:* Contains crow vetch, multiflora rose, autumn olive, amur honeysuckle, and cut leaved teasel. Treatment of this area may not be economical.

Tract 14A. Elm/Ash/Maple

*Low Priority:* Contains amur honeysuckle, multiflora rose, Japanese honeysuckle, autumn olive, garlic mustard, and lumbricid earthworm damage. The recommendations for this tract are identical to those of tract 1A. The restoration of native prairie grasses is also an option worth considering.

Tract 15A. Yellow Poplar/Ash/Maple

*Low Priority:* Contains autumn olive, multiflora rose, amur honeysuckle, Japanese honeysuckle, Chinese privet, and Japanese barberry. The recommendations for this area are the same as those of tract 1A and 14A.

Tract 16A. Elm(none)/Ash/Maple

*Low Priority:* Contains Japanese honeysuckle, burning bush, amur honeysuckle, multiflora rose, and autumn olive. Recommendations for this area are the same as those for tract 1A except there are no nearby residents and no garlic mustard plants.

Tract 17A Oak/Hickory

*Medium Priority:* Contains amur honeysuckle, multiflora rose, and Japanese honeysuckle. The recommendations for this tract are identical to those of tract 2A except the cutting of sugar maples and establishment of brush piles is too dangerous. A person could fall into the lake very easily.

Tract 18A. Ash/Yellow Poplar/Elm

*Low Priority:* Contains amur honeysuckle, multiflora rose, oriental bittersweet, autumn olive, burning bush, Chinese privet, Japanese barberry, Japanese honeysuckle, and lumbricid earthworm damage. Treatment of this area may not be economical. The recommendations for this tract are similar to those of tract 1A. In addition, it may be desirable to fell ash trees into the lake to provide shelter for crappie and other fish. Fish

structures should be placed offshore if none already exist.

Tract 19A. Red Pine

*Medium Priority:* Contains autumn olive, amur honeysuckle, morrow honeysuckle, and multiflora rose. The recommendations for this tract are similar to the recommendations of tract 18A except a pine tree can be felled instead of ash trees.

Tract 20A. Oak/Maple

*High Priority:* Contains amur honeysuckle, multiflora rose, burning bush, and moderate lumbricid earthworm damage. The recommendations for this tract are identical to those of tract 2A. In addition, beech trees should be planted to deal with the lumbricid earthworm problem.

Tract 21A. Red Pine

*Medium priority:* Contains Japanese honeysuckle, amur honeysuckle, multiflora rose, autumn olive, and Chinese privet. The recommendations are the same as those of tract 19A.

Tract 22A. Mixed Forest

*Medium Priority:* Contains amur honeysuckle, Japanese honeysuckle, multiflora rose, and lumbricid earthworm damage. The invasive plants can be sprayed with water and 5-10% roundup or glypro. Ash trees can be felled into the water to provide shelter for crappie and other fish.

Tract 23A. Oak/Beech

*Highest Priority:* Contains small amounts of amur honeysuckle, multiflora rose, and garlic mustard. These plants must be destroyed with herbicides in the fall or when their leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Foliar applications of 5-10% roundup or glypro should be effective against the amur honeysuckle and multiflora rose. However, the garlic mustard will have to be sprayed with only 3-5% roundup or glypro in the fall or early summer. Avoid spraying significant amounts of herbicide into the lake. Spray during dry weather only. The large ash trees should be chainsaw girdled to slow the spread of the emerald ash borer. Brush piles should be established on land and in the lake to provide shelter for wildlife. A maple tree or an ash tree can be felled into the water to provide shelter for crappie and other fish. In addition, fish structures and an osprey nesting platforms can be placed offshore.

Tract 24A. Red Pine

*High Priority:* Contains a small amount of autumn olive. It should be destroyed with 5-10% roundup or glypro. It will be important to regularly thin out the ash, red maple, and yellow poplar so this area one day converts to beech/maple.

Tract 25 A. Red Pine	<i>Low Priority:</i> Contains autumn olive, amur honeysuckle, and multiflora rose. Treatment of this area may not be economical.
Tract 26A. Oak/Beech	<u><i>Highest Priority:</i></u> Contains multiflora rose, autumn olive, minor lumbricid earthworm damage, and amur honeysuckle. The recommendations for this tract are similar to those of tract 23A, except there is little garlic mustard to worry about and the recommendations involving the lake do not apply.
Tract 27A. Yellow Poplar/Ash/Maple	<i>Low Priority:</i> Contains autumn olive, multiflora rose, burning bush, oriental bittersweet, Japanese barberry, Japanese honeysuckle, and amur honeysuckle. Treatment of this area may not be economical.
Tract 28A. Oak/Beech	<u><i>Highest Priority:</i></u> Contains garlic mustard, amur honeysuckle, multiflora rose, and autumn olive in small amounts. The center of this tract is invasive free. The recommendations for this tract are identical to those of tract 23A, except that the recommendations involving the lake do not apply.
Tract 29A. Oak/Hickory	<u><i>Highest Priority:</i></u> Contains amur honeysuckle, and multiflora rose. The recommendations for this area are similar to those of tract 23A except there is little garlic mustard to worry about and the recommendations involving the lake do not apply.
Tract 30A. Yellow Poplar/Ash/Elm	<i>Low Priority:</i> Contains large amounts of amur honeysuckle, multiflora rose, Japanese honeysuckle, autumn olive, and lumbricid earthworm damage. Treatment of this area may not be economical.
Tract 31A. Oak/Beech	<u><i>Highest Priority:</i></u> Invasive free. Spray any invasives that enter this tract with herbicides. Avoid spraying herbicides into the lake. Spray during dry weather only. Establish brush piles on the land and in the lake to provide shelter for wildlife.
Tract 32A. Sugar Maple/Ash/Locust	<i>Low Priority:</i> Contains multiflora rose, amur honeysuckle, and lumbricid earthworm damage. Treatment of this area may not be economical.
Tract 33A. Red Pine	<i>Low Priority:</i> Contains autumn olive, amur honeysuckle, and morrow honeysuckle. Treatment of this area may not be economical.
Tract 34A. Yellow Poplar/Ash/Maple	<i>Low Priority:</i> Contains large amounts of oriental bittersweet, Japanese honeysuckle, and multiflora rose. This area also contains autumn

olive, and lumbricid earthworm damage.  
Treatment of this area may not be economical.

Tract 35A. Mixed Forest

*High Priority:* Contains amur honeysuckle, multiflora rose, Japanese honeysuckle, Japanese barberry, and oriental bittersweet. The recommendations for this area are similar to those of tract 23A, except there is little garlic mustard or ash trees to worry about. There is no need for an osprey nesting platform either.

Tract 36A. Mixed Forest.

*Low Priority:* Contains Japanese honeysuckle, amur honeysuckle, multiflora rose, autumn olive, and moderate lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 37A. Mixed Forest

*Low Priority:* Contains huge amounts of Japanese honeysuckle and multiflora rose. Also contains amur honeysuckle, autumn olive, and moderate lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 38A. Yellow Poplar/Ash

*Low Priority:* Contains large amounts of autumn olive, and multiflora rose. It also contains Japanese honeysuckle, oriental bittersweet, Chinese privet, and lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 39A. Mixed Forest

*Low Priority:* Contains large amounts of autumn olive, multiflora rose, amur honeysuckle, and Japanese honeysuckle. This area also contains some burning bush. Treatment of this area may not be economical.

Tract 40A. Mixed Forest

*Low Priority:* Contains Japanese honeysuckle, multiflora rose, and amur honeysuckle. Treatment of this area may not be economical.

Tract 41A. Oak/Beech

*Highest Priority:* Contains a small amount of amur honeysuckle and multiflora rose. The recommendations for this tract are similar to those of tract 23A, except there is little garlic mustard and no need for fish strictures. An osprey nesting platform is not necessary.

Tract 42A. Yellow Poplar/Ash/Maple

*Low Priority:* Contains large amounts of Japanese honeysuckle, multiflora rose, autumn olive, and amur honeysuckle. It also contains oriental bittersweet, morrow honeysuckle, burning bush, and lumbricid earthworm damage. The recommendations for this tract are similar to those of tract 1A, except there is no garlic mustard and no nearby residents to worry about.

Tract 43A. Oak/Beech	<i>Highest Priority:</i> Contains amur honeysuckle, Japanese honeysuckle and multiflora rose. The recommendations for this tract are identical to those of tract 41A.
Tract 44. Beech/Maple	<i>Highest Priority:</i> Other than a few grasses, this area is invasive free. The recommendations for this tract are identical to those of tract 31A.
Tract 45A. Red Pine	No Recommendations
Tract 46A. Mixed Forest	<i>Low Priority:</i> Contains multiflora rose and amur honeysuckle. Treatment of this area may not be economical.
Tract 47A. Yellow Poplar/Ash	<i>Low Priority:</i> Contains large amounts of amur honeysuckle, autumn olive, and multiflora rose. It also contains Japanese honeysuckle, oriental bittersweet, and lumbricid earthworm damage. Treatment of this area may not be economical.
Tract 48A. Beech/Maple	<i>Highest Priority:</i> Contains a small amount of multiflora rose and amur honeysuckle. The recommendations for this tract are similar to those of tract 23A, except the recommendations involving the lake and garlic mustard do not apply.
Tract 49A. Mixed Forest	<i>Low Priority:</i> Contains large amounts of amur honeysuckle and multiflora rose. It also contains garlic mustard and lumbricid damage Treatment of this area may not be economical.
Tract 50A. Oak/Hickory	<i>Medium Priority:</i> Contains Japanese honeysuckle, amur honeysuckle, multiflora rose, and autumn olive. Spray these invasives with water and 5-10% roundup or glypro.
Tract 51A Elm/Ash/Maple	<i>Low Priority:</i> Contains large amounts of amur honeysuckle, multiflora rose, and Japanese honeysuckle. It also contains garlic mustard, autumn olive, oriental bittersweet, morrow honeysuckle, Chinese privet, and lumbricid earthworm damage. The recommendations for this tract are identical to those of tract 1A.
Tract 52A. Sugar Maple	<i>Low Priority:</i> Contains a large amount of amur honeysuckle, multiflora rose, and lumbricid earthworm damage. Treatment of this area may not be economical. If this area does become a priority it will be important to establish beech trees in the understory to deal with the lumbricid earthworm problem.
Tract 53A. Grass Flat	<i>Low Priority:</i> Dominated by an unknown marsh plant that may be invasive. It also contains some amur honeysuckle. If the

unknown marsh plants are determined to be invasive, then they must be sprayed with herbicides that are safe for aquatic environments. It must also be done without harming the water lotuses. The honeysuckle should be sprayed as well.

Tract 54A Ash/Walnut/Bottomland

Highest Priority: Contains multiflora rose, reed canary grass, amur honeysuckle, and morrow honeysuckle. It also contains 2 plant species found nowhere else around Cowan Lake. They are the buttonbush and oswego tea. The honeysuckles and the muliflora rose should be sprayed with water and 5-10% roundup or glypro. The reed canary grass will have to be sprayed with 20 to 30% glypro. It will be very important to spray during the fall or when the plant's leaves are still green. Also it will be important to avoid spraying during wet weather and avoid spraying large amounts of herbicide into the lake. Honeysuckles are best sprayed between October 16 and November 25 or when its leaves are still green. Brush piles should be established on land and in the lake to provide shelter for wildlife.

Tract 55A. Mixed Forest

Highest Priority: Contains amur honeysuckle, multiflora rose, garlic mustard, and some lumbricid earthworm damage. The recommendations for this tract are similar to those of tract 23A, except the recommendations involving the lake do not apply.

Tract 56A. Beech/Maple

Highest Priority: Contains amur honeysuckle, multiflora rose, and garlic mustard. The recommendations for this tract are similar to those of tract 23A, except the recommendations involving the lake do not apply This may be a good area for a screech owl nesting box.

Tract 57A. Walnut

High Priority: Contains amur honeysuckle, morrow honeysuckle, Japanese honeysuckle, and garlic mustard. The honeysuckles should be sprayed with water and 5-10% roundup or glypro during the fall or when their leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Garlic mustard should be sprayed with only 3-5% roundup or glypro in the fall or early summer.

Tract 58A. Sugar Maple/Ash

Low Priority: Contains garlic mustard, multiflora rose, amur honeysuckle, and severe lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 59A. Sugar Maple/Ash	<i>Low Priority:</i> Same as tract 58A.
Tract 60A. Ash (Non Pet Campground)	<i>Highest Priority:</i> Remove all ash trees and replace them with yellow poplar, red maple, and flowering dogwood. Oaks, beeches, white pines, and cedars can be planted here as well. It will be important to avoid removing any of the non- ash species from this area. The non ash species are either evergreens or are marked with green paint. There are some dead trees that must be removed as well.
Tract 61A Bottomland Forest	<i>Low Priority:</i> Contains multiflora rose, garlic mustard, amur honeysuckle, autumn olive, and lumbricid earthworm damage. Treatment of this area may not be economical.
Tract 62A Walnut	<i>Low Priority:</i> Contains multiflora rose, amur honeysuckle, morrow honeysuckle, garlic mustard, and autumn olive. Treatment of this area may not be economical.
Tract 63A. Ash/.Walnut	<i>Low Priority:</i> Contains a large amount of amur honeysuckle. It also contains multiflora rose, garlic mustard, Chinese privet, autumn olive, and lumbricid earthworm damage. The recommendations for this tract are the same as those of tract 1A. The restoration of native prairie plants is also an option worth considering.
Tract 64A. Field	<i>Medium Priority:</i> Contains white sweet clover, autumn olive, multiflora rose, and Chinese privet. Spray the white sweet clover with water and 3-5% roundup or glypro. Spray all of the other invasives with water and 5-10% roundup or glypro. Spray these plants during the fall or when their leaves are still green. Avoid spraying during wet weather. Establish brush piles to provide shelter for wildlife.
Tract 65A. Yellow Poplar/Ash	<i>Low Priority:</i> Contains amur honeysuckle, multiflora rose, garlic mustard, Japanese honeysuckle, autumn olive, and lumbricid earthworm damage. Treatment of this area may not be economical.
Tract 66A. Field	<i>High Priority:</i> Contains autumn olive and teasel. Spray the teasel with water and 3-5% roundup or glypro. Spray the autumn olive with 5-10% roundup or glypro. Establish brush piles to provide shelter for wildlife. Inform the nearby residents about the dangers of planting non native plants and the importance of native gardening. This area may also be a good location for a bluebird nesting box.
Tract 67A. Field	<i>Medium Priority:</i> Contains autumn olive,

amur honeysuckle, and multiflora rose. Spray these invasives with water and 5-10% roundup or glypro during the fall or when the leaves are still green. Avoid spraying during wet weather.

Tract 68A. Overgrown Field:

*High Priority:* Contains Chinese privet, Japanese honeysuckle, amur honeysuckle, morrow honeysuckle, multiflora rose, garlic mustard, autumn olive, teasel, tree of heaven, and lumbricid earthworm damage. Treatment of most of these invasives may not be economical. However the tree of heaven must be cut down and the stumps must be sprayed with 30 to 50% roundup or glypro. The best time to do this is in the summer or fall. Be careful not to confuse tree of heaven with the staghorn sumac!

Tract 69A. Overgrown Field

*Low Priority:* Contains garlic mustard, poison hemlock, amur honeysuckle, narrow leaved cattail, multiflora rose, Canada thistle, and teasel. Treatment of this area may not be economical.

Tract 70A. Mixed Forest/Tree of Heaven

*High Priority:* Contains English ivy, amur honeysuckle, multiflora rose, morrow honeysuckle, autumn olive, garlic mustard, and tree of heaven. Treatment of most of these invasives may not be economical. However, the tree of heaven and the English ivy must be destroyed as soon as possible. The English ivy must be sprayed with a sticking agent, such as surfactant. The tree of heaven must be cut down and the stumps must be sprayed with water and 30-50% roundup or glypro. It may be best to do this during the summer. Also, it will be important to notify the nearby residents about the dangers of planting non native plants and the importance of native gardening.

Tract 71A. Oak/.Hickory

*Highest Priority:* Contains autumn olive, amur honeysuckle, morrow honeysuckle, multiflora rose, Japanese honeysuckle, and soil erosion. Spray these invasives with water and 5-10% roundup or glypro during the fall or when their leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Avoid spraying significant amounts of herbicide into the lake and spray only during dry weather. Foliar applications should be sufficient. Something may have to be done about the soil erosion as well. Establish a bush pile or two in order to provide shelter for wildlife.

Tract 72A. Yellow Poplar/Ash

*Low Priority:* Contains autumn olive, multiflora rose, amur honeysuckle, Japanese

honeysuckle, morrow honeysuckle, burning bush, garlic mustard, and lumbricid earthworm damage. The recommendations for this area are the same as those of tract 1A.

Tract 73A. Beech/Maple

*Highest Priority:* Contains small amounts of amur honeysuckle and multiflora rose. The recommendations for this area are similar to those of tract 23A., except the recommendations involving the lake do not apply, and there is little garlic mustard to worry about.

Tract 74A. Yellow Poplar/Ash

*Low Priority:* Contains large amounts of autumn olive and morrow honeysuckle. It also contains amur honeysuckle, multiflora rose, garlic mustard, Chinese privet, Japanese honeysuckle, lumbricid earthworm damage, and severe trail erosion. The recommendations for this area are the same as those of tract 1A. Also, the trails need to be repaired and re-blazed. They must be re-blazed so they travel downhill in an S-shaped fashion rather than just straight downhill.

Tract 75A. Sugar Maple/Ash

*Low Priority:* Contains garlic mustard, amur honeysuckle, morrow honeysuckle, autumn olive, multiflora rose, Japanese honeysuckle, severe lumbricid earthworm damage, and erosion. Something may have to be done about the erosion, but overall, treatment of this area may not be economical.

Tract 76A. Beech/Maple

*Highest Priority:* Contains amur honeysuckle, autumn olive, garlic mustard, morrow honeysuckle, multiflora rose, burning bush, Japanese honeysuckle, and severe trail erosion. The recommendations for this tract are the same as those of tract 23A., except there is no need for fish structures or osprey platforms. Also the trails will need to be repaired and re-blazed. They must be re-blazed so they travel downhill in an S-shaped fashion rather than just straight downhill.

Tract 77A. Mixed Forest

*High Priority:* Contains amur honeysuckle, morrow honeysuckle, Japanese honeysuckle, multiflora rose, garlic mustard, autumn olive, tree of heaven, and lumbricid earthworm damage. These plants should be destroyed with herbicides during the fall or when the leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Foliar application of water and 5-10% roundup or glypro should work on everything except the garlic mustard. The garlic mustard will only need a 3-5% dose during

the fall or early summer. Avoid spraying during wet weather. The tree of heaven will need to be cut down. The stumps will then need to be sprayed with 30-50% roundup or glypro. This can be done in the summer.

Tract 78A. Ash/Walnut/Yellow Poplar

*High Priority:* Contains amur honeysuckle, garlic mustard, multiflora rose, morrow honeysuckle, tree of heaven, and lumbricid earthworm damage. Treatment of most of these invasives may not be economical. However, the tree of heaven must be cut down and the stumps must be sprayed with 30-50% roundup or glypro. Some of the the smaller tree of heaven may need foliar

applications of only 5-10% roundup or glypro.

Tract 79A. Ash

*Low Priority:* Contains amur honeysuckle, garlic mustard, multiflora rose, autumn olive, morrow honeysuckle, Japanese honeysuckle, and severe lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 80A. Beech/Maple

*Highest Priority:* Contains amur honeysuckle, burning bush, multiflora rose, garlic mustard, tree of heaven seedlings, and lumbricid earthworm damage. These invasives must be destroyed with herbicides during the fall or when their leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Foliar applications of water and 5-10% roundup or glypro should work well on everything except for the garlic mustard. The garlic mustard will only need a 3-5% dose during the fall or early summer. Avoid spraying during wet weather. The large ash trees should be chainsaw girdled to slow the spread of emerald ash borer. The redundant side trails should be closed so the native plant life can regenerate.

Tract 81A. Mixed Forest (Pet Campground)

*Highest Priority:* Contains some large tree of heaven. Remove all of the ash trees to let in sunlight and restore the lawn. It is important to be careful not to cut down too many non- ash trees. Red-headed woodpeckers are fond of this area and taking too many trees may negatively affect them.

Tract 82A. Sugar Maple/Ash

*High Priority:* Contains garlic mustard, amur honeysuckle, multiflora rose, autumn olive, English ivy, tree of heaven, daylilies, and lumbricid earthworm damage. The recommendations for this tract are the same as those for tract 70A except the daylilies will have to be destroyed as well.

Tract 83A. Mixed Forest

*Highest Priority:* Contains amur honeysuckle, multiflora rose, Japanese honeysuckle, tree of heaven, burning bush, garlic mustard, and some lumbricid earthworm damage. The recommendations for this tract are the same as those of tract 80A.

Tract 84A. Field

*High Priority:* Contains Canada thistle, poison hemlock, teasel, autumn olive, yellow sweet clover, Austrian pine, and multiflora rose. Spray the Canada thistle, poison hemlock, multiflora rose, and autumn olive with water and 5-10% roundup or glypro. Spray the teasel and yellow sweet clover with only 3-5% glypro or roundup. Spray these plants during the fall or when their leaves are still green. Avoid spraying during wet weather. Establish brush piles to provide shelter for wildlife. It may be desirable to cut down the Austrian pine since it is non native but it may not be necessary. Also, this is a good location for some bluebird nesting boxes.

Tract 85A. Lawn

*Highest Priority:* Contains some Norway spruce. Remove any ash trees that begin to die from emerald ash borer infestations and replace them with red maple, flowering dogwood, and yellow poplar. It may be desirable to remove the Norway spruce since it is non native but it may not be necessary.

Tract 86A. Field

*High Priority:* Contains yellow sweet clover, white sweet clover, Canada thistle, teasel, autumn olive, amur honeysuckle, morrow honeysuckle, and tree of heaven. Spray the Canada thistle, autumn olive, amur honeysuckle, and morrow honeysuckle with 5-10% roundup or glypro. Spray the yellow sweet clover, white sweet clover and teasel with only 3-5% roundup or glypro. Spray these plants during the fall or when their leaves are still green. Avoid spraying during wet weather. The tree of heaven will have to be cut down and the stumps will have to be sprayed with 30-50% roundup or glypro. Establish a living brush pile from some of the small trees to provide shelter for rabbits. Also this is a good location for some bluebird nesting boxes.

Tract 87A. Sugar Maple

*High Priority:* Contains multiflora rose, amur honeysuckle, tree of heaven, and severe lumbricid earthworm damage. Treatment of most of these invasives may not be economical. However, the tree of heaven will have to be cut down and the stumps will have to be sprayed with 30-

-50% roundup or glypro. This can be done in the summer during dry weather.

Tract 88A. Ash. Yellow Poplar

*High Priority:* Contains autumn olive, scotch pine, amur honeysuckle, tree of heaven, multiflora rose, teasel, morrow honeysuckle, Japanese honeysuckle, Canada thistle, garlic mustard, Chinese privet, and lumbricid earthworm damage. The recommendations for this area are the same as those of tract 1A. If anything is done at all, the tree of heaven will have to be cut down and the stumps will have to be sprayed with 30-50% roundup or glypro. This can be done in the summer during dry weather.

Tract 89A. Ash/Yellow Poplar

*Low Priority:* Contains Japanese honey-suckle, amur honeysuckle, autumn olive, multiflora rose, garlic mustard, and lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 90A. Oak/Maple

*Highest Priority:* Contains garlic mustard, autumn olive, amur honeysuckle, and multiflora rose. The recommendations for this tract are the same as those of tract 23A., except there are few ash trees and the recommendations involving the lake do not apply.

Tract 91A. Ash/Sugar Maple

*Low Priority:* Contains garlic mustard, amur honeysuckle, autumn olive, morrow honeysuckle, multiflora rose, Japanese honeysuckle, and lumbricid earthworm damage. Treatment of this area may not be economical. It may be a good idea to close down the trail here to stop the erosion.

Tract 92A. Mixed Forest

*High Priority:* Contains huge amounts of amur honeysuckle and garlic mustard. It also contains, Japanese honeysuckle, tree of heaven, multiflora rose, morrow honey-suckle, and severe lumbricid earthworm damage. Treatment of most of these invasives may not be economical. However, the tree of heaven will have to be cut down and the stumps will have to be sprayed with 30- 50% roundup or glypro. This can be done in the summer during dry weather.

Tract 93A. Lawn

*Highest Priority:* Remove any ash trees that die from emerald ash borer infestations and replace them with red maple, yellow poplar, and flowering dogwood. It may also be desirable to plant red oak, white pine, and cedar as well.

Tract 94A. Overgrown Field

*Low Priority:* Contains autumn olive, amur honeysuckle, morrow honeysuckle, Japanese honeysuckle, teasel, white sweet

clover, reed canary grass, erosion, and multiflora rose. Treatment of this area may not be economical.

Tract 95A. Elm/Ash/Maple

*Low Priority:* Contains large amounts of Japanese honeysuckle. It also contains autumn olive, amur honeysuckle, morrow honeysuckle, oriental bittersweet, garlic mustard, multiflora rose and lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 96A. Oak/Hickory

*Low Priority:* Contains large amounts of Japanese honeysuckle. It also contains amur honeysuckle, autumn olive, multiflora rose, morrow honeysuckle, garlic mustard,

lumbricid earthworm damage, and shoreline erosion. Treatment of this area may not be economical.

Tract 97A. Overgrown Field

*Low Priority:* Contains Canada thistle, autumn olive, morrow honeysuckle, amur honeysuckle, garlic mustard, and tree of heaven. Treatment of this area may not be economical. The naturalist has destroyed most of the tree of heaven.

Tract 98A. Ash/Walnut

*Low Priority:* Contains a large amount of amur honeysuckle. It also contains autumn olive, lots of Japanese honeysuckle, morrow honeysuckle, multiflora rose, burning bush, and lumbricid earthworm damage. The recommendations for this area are the same as those of tract 1A.

Tract 99A. Sugar Maple

*Low Priority:* Contains autumn olive, Japanese honeysuckle, multiflora rose, and severe lumbricid earthworm damage. Treatment of this area may not be economical. If this area does become a priority it will be important to plant beech trees in the understory to restore the leaf litter. Tract 100A. Oak/Hickory

Tract 100A. Oak/Hickory

*Highest Priority:* Contains a small amount of autumn olive, Japanese honeysuckle and minor lumbricid earthworm damage. Spray the invasives with water and 5-10% roundup or glypro. Spray during the fall or when the leaves are still green. Avoid spraying during wet weather or spraying significant amounts of herbicide into the lake. Establish brush piles on the land and in the lake to provide shelter for wildlife.

Tract 101A. Beech/Maple

*Highest Priority:* Contains multiflora rose, autumn olive, amur honeysuckle, morrow honeysuckle, and garlic mustard in small amounts. The recommendations for this tract are the same as those of tract 23A, except the recommendations involving the

lake do not apply. Instead, close down the walking paths and allow the plants to regenerate.

Tract 102A. Beech/Maple

Highest Priority: Contains garlic mustard, multiflora rose, and amur honeysuckle in small amounts. The recommendations for this area are the same as those of tract 101A.

Tract 103A. Oak/Hickory

Highest Priority: Contains amur honey-suckle, multiflora rose, and garlic mustard in small amounts. There is also a massive amount of gully erosion. The recommendations for this tract are the same as those of tract 101A. There may not be much that can be done to stop the gully erosion.

Tract 104A. Oak/Hickory

No Recommendations. The steep banks will make management of this area too dangerous.

Tract 105A. Beech/Maple

Highest Priority: Contains multiflora rose, amur honeysuckle, burning bush, Japanese honeysuckle, garlic mustard, tree of heaven seedlings, and mild lumbricid earthworm damage. Spray the multiflora rose, honey-suckle, burning bush, and tree of heaven seedlings with water and 5-10% roundup or glypro. Spray the garlic mustard with only 3-5% roundup or glypro in the early summer or fall. Spray mostly during the fall and avoid spraying during wet weather. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. This tract contains a honeybee tree, so this makes it very important to spray mostly during the fall.

Tract 106A. Lawn

Highest Priority: Contains Austrian pine and Scotch pine. Remove any ash trees that die from emerald ash borer infestations and replace them with yellow poplar, red maple, flowering dogwood, red oak, white pine, or cedar. It may be desirable to remove the Scotch pine and Austrian pine because they are not native. It may not be necessary.

Tract 107A. Mixed Forest/Tree of Heaven.

High Priority: Contains tree of heaven, amur honeysuckle, autumn olive, garlic mustard, and multiflora rose. Treatment of these invasives may not be economical, but the tree of heaven must be cut down. The stumps must be sprayed with 30-50% glypro or roundup. This can be done in the summer. Avoid spraying during wet weather.

Tract 108A. Ash

Low Priority: Contains large amounts of amur honeysuckle. It also contains multiflora rose, lots of Japanese honey-suckle, and lumbricid earthworm damage.

Treatment of this area may not be economical.

Tract 109A. Ash/Walnut

*High Priority:* Contains garlic mustard, poison hemlock, amur honeysuckle, Japanese honeysuckle, tree of heaven, and lumbricid earthworm damage. The recommendations for this tract are the same as those of tract 107A.

Tract 110A. Yellow Poplar/Ash

*Low Priority:* Contains Scotch pine, a large amount of amur honeysuckle, lots of Japanese honeysuckle, multiflora rose, autumn olive, and morrow honeysuckle. Treatment of this area may not be economical.

Tract 111A. Wet Field

*Low Priority:* Contains reed canary grass. Treatment of this area may not be economical. Herbicides could run into the the lake and poison wildlife. The grass could be cut and smothered with black plastic tarps.

Tract 112A. Beech/Oak

*Highest Priority:* Contains erosion, some amur honeysuckle, multiflora rose, and a few tree of heaven seedlings. All of these invasives can be sprayed with foliar applications of water and 5-10% roundup or glypro. Spray during the fall or when the leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Establish brush piles to provide shelter for wildlife.

Tract 113A. Mixed Forest

*Highest Priority:* Contains garlic mustard, amur honeysuckle, multiflora rose, autumn olive, Chinese privet, Japanese honeysuckle, Japanese barberry, tree of heaven, and moderate lumbricid earthworm damage. Some dead short tailed shrews were found in this area. Whether or not this was the result of lumbricid earthworm damage remains unknown. The recommendations for this tract are the same as those of tract 23A., except the recommendations involving the lake do not apply. In addition, the tree of heaven must be cut down and the stumps must be sprayed with 30-50% roundup or glypro. This can be done in the summer.

Tract 114A Elm/Ash/Maple/Yellow Poplar

*Low Priority:* Contains a large amount of Japanese honeysuckle and multiflora rose. It also contains autumn olive, amur honey-suckle, and lumbricid earthworm damage. Treatment of this area may not be Economical.

## Recommendations for Cowan Lake: South Shore

### Forest Type

### Recommendations

Tract 1B. Oak/Hickory

*High Priority:* Spray any invasives that enter this zone in fall or when leaves are still green. Spray only in dry weather. Try to keep herbicides out of the lake. A rock barrier along the shoreline may hold back the erosion. Brush piles can be placed in the water to provide shelter for amphibians.

Tract 2B. Cedar

No Recommendations

Tract 3B. Red/White Pine

*High Priority:* Spray all multiflora rose bushes with herbicides during the late summer or fall. Foliar applications of water and 5-10% roundup or glypro should be sufficient. Spray only in dry weather.

Tract 4B. Elm/Ash/Maple

*Low Priority:* There is a large amount of amur honeysuckle, multiflora rose, autumn olive, and lumbricid earthworm damage. Destroying these invasive plants with herbicides may not be economical. It may also pollute the lake. However, when the emerald ash borer devastates this tract it may become desirable to reforest it. Pin oak should be planted near the shoreline because pin oaks prefer moist conditions. American beech can be planted in the shade of trees that are still standing. Cedar, white pine, and red oak should go everywhere else in order to deal with the lumbricid earthworm problem. The invasives will have to be destroyed before this becomes possible. They should be sprayed in the fall or late summer when their leaves are still green. Amur honeysuckle should be sprayed between October 16 and November 25 when its leaves are still green. Spray only during dry weather. Foliar applications of water and 5-10% glypro or roundup should be sufficient. It may be desirable to fell ash trees into the lake to provide shelter for crappie and other fish.

Tract 5B. Elm/Ash/Maple

*Low Priority:* There is a large amount of autumn olive, multiflora rose, and lumbricid earthworm damage. Destroying these plants with herbicides may not be economical. However, when the emerald ash borer devastates this tract, it may be desirable to reforest it. American beech can be planted in the shade of trees that are still standing. Red oak and pine can be planted everywhere else to deal with the lumbricid earthworm problem. Restoration of native tall grass prairie is also an option worth considering in this tract. The invasives will have to be destroyed before any of this is possible. They should be sprayed in the fall or when their leaves are still green. Foliar applications of water and 5-10% glypro

or roundup should work well.

Tract 6B. Elm/Ash/Maple

*High Priority:* This tract contains large amounts of amur honeysuckle, autumn olive, periwinkle, lumbricid earthworm damage, and a small amount of daffodils. The periwinkle must be destroyed with surfactant as soon as possible. The daffodils can be must be eliminated quickly as well. The amur honeysuckle and autumn olive are lower priorities. When this tract is devastated by the emerald ash borer it may be desirable to reforest it. American beech can be planted in the shade of trees that are still standing. Red oak and white pine can be planted elsewhere to deal with the lumbricid earthworm problem. Restoration of native tall grass prairie is also an option worth considering. The invasives will have to be destroyed to make this possible. They should be sprayed in the fall or when their leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 when its leaves are still green. Spray only when the weather is dry. Foliar applications of water and 5-10% glypro or roundup should be sufficient.

Tract 7B. Red Pine

*High Priority:* Spray any invasive plants that enter this tract during the fall or when their leaves are still green. Spray during dry weather only. Establish brush piles to provide shelter for wildlife.

Tract 8B. Sugar Maple

*Low Priority:* This area contains a great deal of amur honeysuckle, multiflora rose, and lumbricid earthworm damage. Destroying these invasives may not be economical. If this area does become a priority it will be important to plant American beech in the understory. Also, inform nearby residents about the problems caused by invasive plants and the importance of native gardening. The invasives can be sprayed as in tract 4B.

Tract 9 B Elm/Ash/Maple

*Low Priority:* Contains massive amounts of amur honeysuckle, lumbricid earthworm damage, and multiflora rose. Spraying all of it may not be economical. However, when the emerald ash borer devastates this area it may be desirable to reforest it. American beech can be planted in the shade of trees that are still standing. Red oak, white oak, cedar, and white pine can be planted everywhere else to deal with the lumbricid earthworm problem. Invasives will have to be destroyed before any of this is possible. Spray during the fall or when the leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Spray during dry weather only. Foliar applications of water and 5-10% glypro or roundup should be sufficient.

Tract 10B Elm/Ash/Maple	<i>Low Priority:</i> Same as tract 9B
Tract 11B Red Pine/ Elm/Ash/Maple	<i>High Priority:</i> Eliminate the Japanese honeysuckle with herbicides. Precautions should be taken to avoid spraying chemicals into the lake. Spray only during dry weather during the fall. The same chemicals recommended for tract 9B can be used here as well. Establish brush piles to provide shelter for wildlife. Also close down the walking path so it can regenerate. Felling a pine tree into the lake to provide shelter for fish may be desirable.
Tract 12B Elm/Ash/Maple	<i>Low Priority:</i> Same as tract 9B
Tract 13B Red Pine	<i>Low Priority:</i> Spray all Japanese honeysuckle, amur honeysuckle, and multiflora rose with herbicides during the fall or when the leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. The same herbicides recommended for tract 9B can be used here as well. Establish brush piles to provide shelter for wildlife.
Tract 14B Elm/Ash/Maple	<i>Low Priority:</i> Same as tract 9B
Tract 15B Elm/Ash/Maple	<i>Low Priority:</i> Contains massive amounts of amur honeysuckle. Recommendations are the same as tract 9B. On top of that, the large ash trees in this tract should be chainsaw girdled to slow the movement of the emerald ash borer.
Tract 16B Field/Lawn	<i>Low Priority:</i> Spray all autumn olive with 5-10% roundup or glypro during the fall or when its leaves are still green. Establish brush piles to provide shelter for wildlife. Also plant flowering dogwood on the lawn and remove ash trees as needed. Planting hybrid elms may someday be an option in this area.
Tract 17B Mixed Forest	<i>Low Priority:</i> This tract contains amur Honeysuckle, multiflora rose, and lumbricid earthworm damage. Spraying all of these invasives may not be economical. Reforestation will not be necessary
Tract 18B Cedar/Dogwood	<i>Low Priority:</i> This area contains autumn olive and lumbricid earthworm damage. It may not be economical to spray the autumn olive. Reforestation will not be necessary.
Tract 19B Elm/Ash/Red Maple	<i>Low Priority:</i> Contains amur honeysuckle and lumbricid earthworm damage. Recommendations are identical to tract 9B. Restoration of native prairie grasses is also an option worth considering.
Tract 20B Beech/Maple	<i>Highest Priority:</i> Contains small amounts of

amur honeysuckle and English ivy. These plants must be destroyed with herbicides in the fall. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. The English ivy will have to be killed with surfactant. The amur honeysuckle can be effectively destroyed with water and 5-10% roundup or glypro. Avoid spraying significant amounts of herbicides into the lake. Spray during dry weather only. The people of Beechwood Acres must be informed of the problems caused by invasive plants and the importance of native gardening. The large ash trees should be chainsaw girdled to slow the emerald ash borer down. In addition, brush piles should be established on land and in the lake to provide shelter for wildlife.

Tract 21B Mixed Forest

*Highest Priority:* Recommendations are the same as tract 20B.

Tract 22B Ash

*Low Priority:* This area contains some multiflora rose. Spray it during the fall or when its leaves are still green. Spray just as in tract 3B. This may be a good area to plant hybrid elms in the future.

Tract 23B Field

*High Priority:* Native prairie grasses along with milkweed can be planted here but it is not a high priority. This is however, the best possible location in Cowan Lake State Park for a kestrel nesting box. It should be placed on a 20 ft pole, away from the road. A narrow strip should be mowed from the road to the nesting box. This will provide conveniently close hunting ground for the kestrels. Brush piles should be established as shelter for mice.

Tract 24B Sugar Maple/Ash

*Low Priority:* This tract contains some amur honeysuckle. It is best to spray it between October 16 and November 25 or when the leaves are still green. The same chemicals recommended for tract 9B can be used here.

Tract 25 B Ash

*Low Priority:* Contains multiflora rose and Japanese honeysuckle. Spraying these invasives may not be economical. However, when the emerald ash borer arrives it may be desirable to reforest this area. Red oaks, white pines, and cedars can be planted to deal with the lumbricid earthworms. Pin oaks should be planted near the shore because they prefer damp areas. American beech can be planted in the understory when the other trees are larger. These invasives will have to be removed before any of this is possible. Spray during the fall or late summer when the leaves are still green. Avoid spraying too close to the lake or during wet weather. The same chemicals recommended for tract 9B can be used here.

	Ash trees can be felled into the lake to provide shelter for fish.
Tract 26B Elm (none)/Ash/Maple	<i>Low Priority:</i> Contains multiflora rose and amur honeysuckle. Recommendations are basically the same as in tract 25B. Amur is best sprayed between October 16 and November 25 or when the leaves are still green.
Tract 27B Mixed Forest	<i>Low Priority:</i> Contains amur honeysuckle and lumbricid earthworm damage. Recommendations are identical to tract 26 B. Pin oaks are already present.
Tract 28B Elm (none)/Ash/Maple	<i>Low Priority:</i> Recommendations are identical to tract 26B
Tract 29B Ash/Lawn	<i>Highest Priority:</i> Remove all ash trees and replace them with yellow poplar, red maple, and flowering dogwood. Oaks, beeches, white pines, and cedars can be planted as well.
Tract 30B Lawn	<i>High Priority:</i> Remove all ash trees and replace with yellow poplar, flowering dogwood, and red maple. Remove all dead elms and dead white pines. Plant milkweed and native prairie grasses in the areas labeled as natural areas.
Tract 31B Elm/Ash/Maple	<i>Low Priority:</i> Contains amur honeysuckle, garlic mustard, Chinese privet, multiflora rose, and lumbricid earthworm damage. Recommendations are the same as in tract 9B except the garlic mustard will have to be sprayed with 3-5% roundup or glypro in the early summer or fall. Restoration of native prairie grasses is also an option worth considering.
Tract 32B Mixed Forest	<i>Low Priority:</i> Contains amur honeysuckle, Chinese privet, burning bush, and lumbricid earthworm damage. Recommendations are the same as in tract 9B.
Tract 33B Elm/Ash/Maple	<i>Low Priority:</i> Contains amur honeysuckle, multiflora rose, and lumbricid earthworm damage. Recommendations are identical to those of tract 9B.
Tract 34B Elm/Ash/Maple	<i>Low Priority:</i> Identical to 9B.
Tract 35B Elm/Ash/Maple	<i>High Priority:</i> Contains amur honeysuckle, multiflora rose, and periwinkle. The recommendations are basically the same as tract 9B but the periwinkle must be destroyed surfactant as soon as possible before it spreads into other areas.
Tract 36B Elm/Ash/Maple	<i>High Priority:</i> Contains amur honeysuckle, multiflora rose, autumn olive, and periwinkle. Recommendations are the same as tract 35B. This is a very swampy area that is very close to the lake. Herbicide use should be kept to a minimum. Hybrid elms could be introduced here.

Tract 37B Elm/Ash/Maple	<p><i>High Priority:</i> Contains tree of heaven and lumbricid earthworm damage. The tree of heaven must be cut down and the stumps must be treated with water and 30-50% roundup or glypro. This can be done in the summer before seeds ripen. When the emerald ash borer arrives it will devastate this tract. It may be desirable to reforest it. Red oak, white pine, and cedar are good trees to plant in order to deal with the lumbricid earthworm problem. Beech trees can be planted in the shade of standing trees. Restoration of native prairie is also an option.</p>
Tract 38B Parking Lot/Waste Area	<p><i>High Priority:</i> Contains Amur honeysuckle, garlic mustard, autumn olive, tree of heaven, and common mullein. It is highly important to get rid of the tree of heaven and mullein. The tree of heaven can be cut down and its stumps can be sprayed during the summer. The stumps can be sprayed with 30-50% glypro or roundup. The mullein can either be sprayed or uprooted. Spraying the rest may not be economical.</p>
Tract 39B Elm/Ash/Maple	<p><i>High Priority:</i> Contains amur honeysuckle, multiflora rose, garlic mustard, garden flowers, lumbricid earthworm damage, tree of heaven, and periwinkle. Recommendations are identical to those of tract 9B along with the addition of the following. The tree of heaven must be cut down and the stumps must be treated with 30-50% glypro or roundup. The flowers from people's yards should also be sprayed. The periwinkle must be destroyed with surfactant as soon as possible. The restoration of native prairie is also an option worth considering.</p>
Tract 40B Mixed Forest	<p><i>Low Priority:</i> Contains large amounts of amur honeysuckle and lumbricid earthworm damage. Destroying these invasives with herbicides may not be economical.</p>
Tract 41B Mixed Forest	<p><i>High Priority:</i> Contains amur honeysuckle, garlic mustard, mulitflora rose, tree of heaven, and lumbricid earthworm damage. Treatment of most of these invasives may not be economical. However, the tree of heaven should be cut and the stumps should be treated with 30-50% glypro or roundup.</p>
Tract 42B Mixed Forest	<p><i>High Priority:</i> Contains amur honeysuckle, multiflora rose, and Norway spruce. Remove all Norway spruce and remove the ash as needed.</p>
Tract 43B Lawn	<p><i>High Priority:</i> Remove all ash and replace some of the ash with yellow poplar, red maple, and flowering dogwood.</p>
Tract 44B Walnuts	<p><i>High Priority:</i> Contains garlic mustard, lumbricid earthworm damage, and tree of heaven. Treatment of most of these invasives may not be economical. However, the tree of heaven must be cut down and the stumps must be treated with 30-50% roundup or glypro.</p>

Tract 45B Elm/Ash/Walnut	<i>High Priority:</i> Contains garlic mustard, multiflora rose, amur honeysuckle, tree of heaven, and lumbricid earthworm damage. Recommendations are the same as those of tract 44B.
Tract 46B Lawn	<i>High Priority:</i> Same as tract 43B
Tract 47B Elm/Ash/Maple	<i>High Priority:</i> Contains amur honeysuckle, garlic mustard, tree of heaven, and lumbricid earthworm damage. Recommendations are the same as in tract 44B.
Tract 48B Elm/Ash/Maple	<i>Low Priority:</i> Contains amur honeysuckle, garlic mustard, multiflora rose, and lumbricid earthworm damage. Treatment of these invasives may not be economical.
Tract 49B Ash/Walnut	<i>High Priority:</i> Contains amur honeysuckle, garlic mustard, multiflora rose, autumn olive, lumbricid earthworm damage, and tree of heaven. Treatment of these invasives may not be economical. However the tree of heaven must be cut down and the stumps must be treated with 30-50% roundup or glypro.
Tract 50B Mixed Forest	<i>Low Priority:</i> Contains lumbricid earthworm damage. Since this area has a beech/maple understory, there is no need to manage this area.
Tract 51B Elm/Ash/Maple	<i>Low Priority:</i> Contains amur honeysuckle, multiflora rose, garlic mustard, and lumbricid earthworm damage. Recommendations for this area are the same as those in tract 9B except the garlic mustard may have to be sprayed with 3-5% roundup or glypro during the early summer or fall.
Tract 52B Beech/Maple	<i>Highest Priority:</i> Contains amur honeysuckle, burning bush, Chinese privet, garlic mustard, and moderate lumbricid earthworm damage. These plants must be destroyed with herbicides during the fall or when the leaves are still green. Amur honeysuckle is best sprayed between October 16 and November 25 or when its leaves are still green. Foliar applications of water and 5-10% roundup or glypro should work on everything except the garlic mustard. The garlic mustard will need only a 3-5% dose during the fall or early summer. Avoid spraying during wet weather. The people in the nearby houses must be informed of the problems caused by invasive plants and the importance of native gardening. The enormous ash trees must be chainsaw girdled to slow the spread of the emerald ash borer. In addition, brush piles should be established to provide shelter for wildlife.
Tract 53B Mixed Forest	<i>Highest Priority:</i> The recommendations for this tract are identical to those of tract 52B.
Tract 54B Red Pine	<i>Low Priority:</i> Contains garlic mustard and thick growths of blackberry. Treatment of this area may not be economical.
Tract 55B Elm/Ash/Maple	<i>Low Priority:</i> Contains amur honeysuckle, garlic

	<p>mustard, burning bush, multiflora rose, autumn olive, reed canary grass, and severe lumbricid earthworm damage. Treatment of these invasives may not be economical. The recommendations for this tract are identical to those in tract 9B except the garlic mustard may have to be sprayed with 3-5% roundup or glypro in the fall or early summer.</p>
Tract 56B Beech/Maple	<p><i>Highest Priority:</i> Contains amur honeysuckle, burning bush, multiflora rose, garlic mustard, and minor lumbricid earthworm damage. The recommendations for this tract are identical to those of tract 52B.</p>
Tract 57B Elm/Ash/Maple	<p><i>Low Priority:</i> Contains large amounts of multiflora rose, amur honeysuckle, autumn olive, garlic mustard, Chinese privet, and lumbricid earthworm damage. Treatment of this area may not be economical.</p>
Tract 58B Plowed Field	<p>No Recommendations</p>
Tract 59B Mixed Forest	<p><i>Low Priority:</i> Contains amur honeysuckle, Japanese honeysuckle, multiflora rose, autumn olive, and reed canary grass. Treatment of this area may not be economical. It may be wise to kill the reed canary grass with a dose of water and 20-30% glypro.</p>
Tract 60B Wet Field	<p><i>Low Priority:</i> Contains a monoculture of reed canary grass. Treatment of this area may not be economical. The only fast way to treat this area is to spray by helicopter. Herbicides could run into the lake and kill water lotuses. Another option is to cut the grass down and smother it with black plastic tarps.</p>
Tract 61B Elm/Ash/Maple	<p><i>Low Priority:</i> Contains large amounts of multiflora rose, amur honeysuckle, autumn olive, Chinese privet, Japanese honeysuckle, periwinkle, and severe lumbricid, earthworm damage. Recommendations for this tract are identical to those of tract 4B. However, the periwinkle will have to be sprayed with surfactant.</p>
Tract 62B Mixed Forest	<p><i>High Priority:</i> Contains small amounts of amur honeysuckle, multiflora rose, garlic mustard, and moderate lumbricid earthworm damage. The recommendations for this tract are similar to those of tract 52B. However there are no nearby residents and it may be necessary to plant American beech. This may someday restore the leaf litter.</p>
Tract 63B Mixed Forest	<p><i>High Priority:</i> Contains garlic mustard, amur honeysuckle, multiflora rose, and lumbricid earthworm damage. Recommendations for this tract are identical to those of tract 62B.</p>
Tract 64B Mixed Forest	<p><i>Low Priority:</i> Contains amur honeysuckle, multiflora rose, garlic mustard, autumn olive, Chinese privet, and lumbricid earthworm damage. Treatment of this area may not be economical.</p>
Tract 65B Mixed Forest	<p><i>Low Priority:</i> Contains autumn olive, amur honeysuckle, multiflora rose, garlic mustard, Japanese honeysuckle, Chinese privet, and</p>

lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 66B Swamp

*Low Priority:* As long as this area is seasonally flooded, invasive plants should not be a problem. Brush piles for amphibians may be a good thing for this area.

Tract 67B Elm (little)/Ash/Maple

*Low Priority:* This area contains lots of multiflora rose, amur honeysuckle, autumn olive, garlic mustard, Chinese privet, and lumbricid earthworm damage. Treatment of this area may not be economical.

Tract 68B Bottomland Forest

*Medium Priority:* Contains garlic mustard, poison hemlock, amur honeysuckle, multiflora rose, and Chinese privet. Treatment of this area may not be economical. This may be a good location to set up bat boxes.

Tract 69B Mixed Forest:

*Medium Priority:* Contains English ivy, periwinkle, amur honeysuckle, garlic mustard, multiflora rose, and lumbricid earthworm damage. Treatment of this area may not be economical, but the English ivy and periwinkle must be destroyed with surfactant as soon as possible.

Tract 70B Bottomland Forest

*Low Priority:* Contains poison hemlock, garlic mustard, amur honeysuckle, and multiflora rose. Treatment of this area may not be economical.

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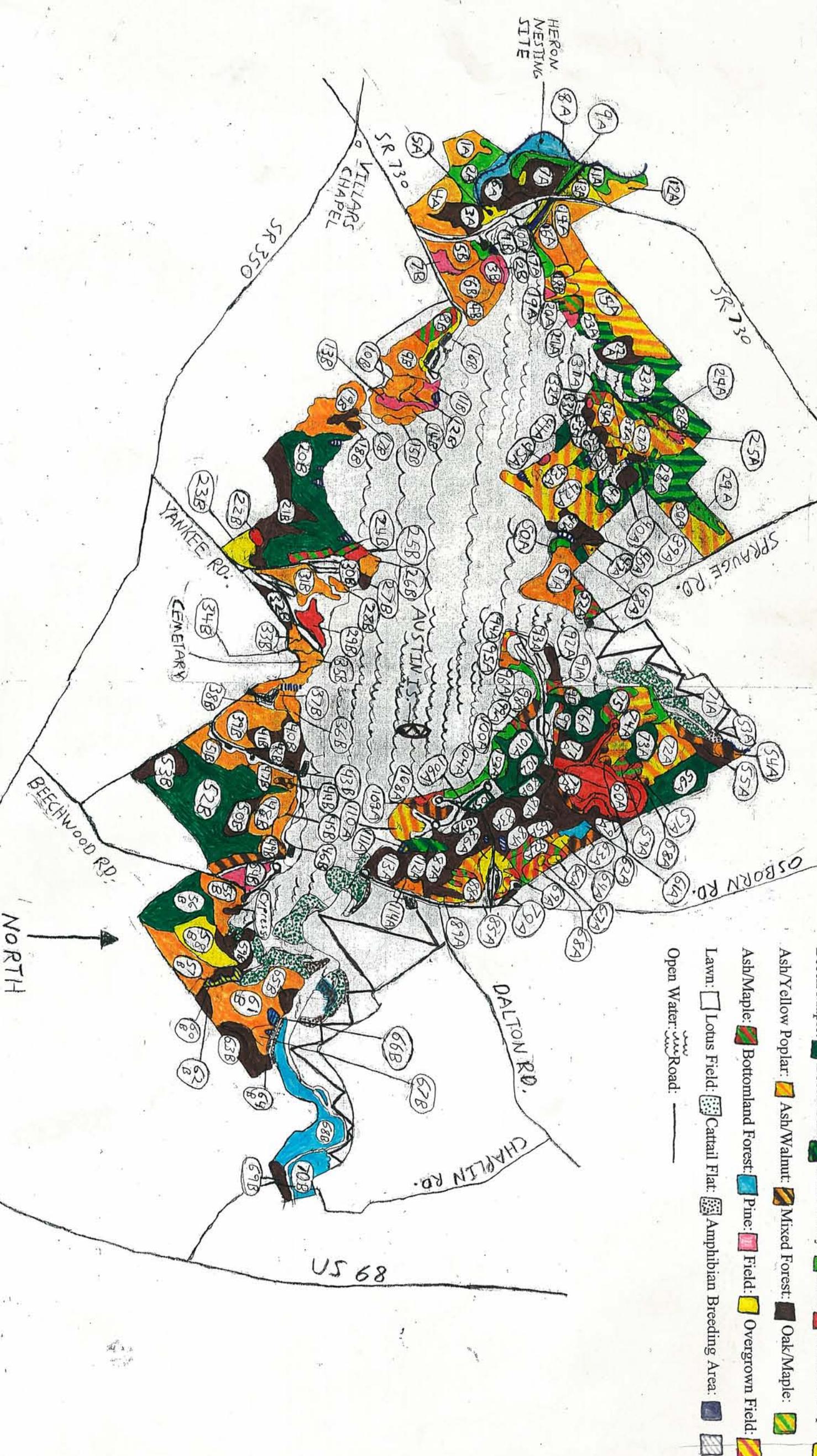
Written and conceived by: Kevin L. Reichling, Naturalist.

Maps drawn by: Kevin L. Reichling, Naturalist

# COWAN LAKE VEGETATION ZONES

## KEY

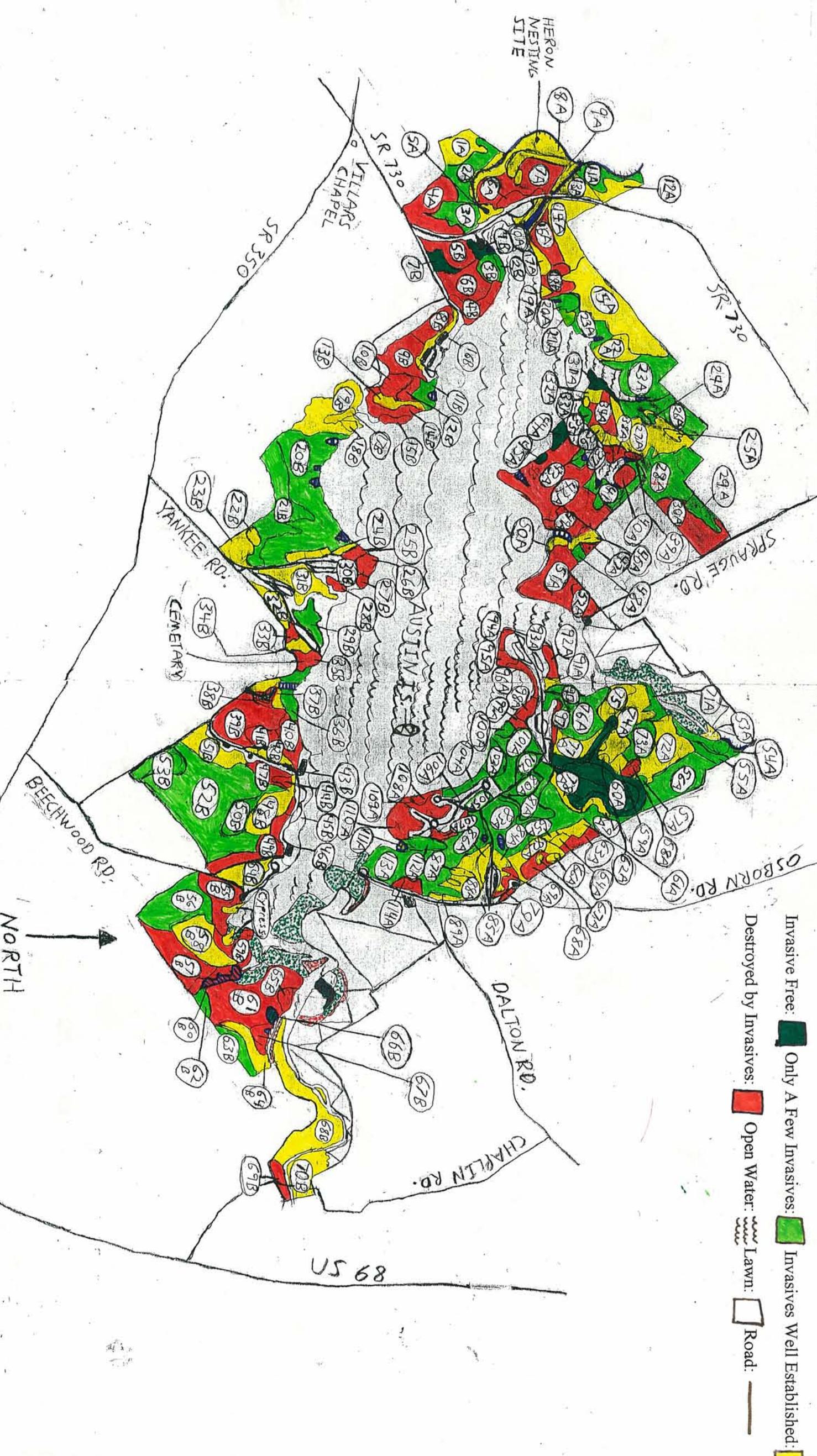
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- Ash/Yellow Poplar:  Ash/Walnut:  Mixed Forest:  Oak/Maple: 
- Ash/Maple:  Bottomland Forest:  Pine:  Field:  Overgrown Field: 
- Lawn:  Lotus Field:  Cattail Flat:  Amphibian Breeding Area: 
- Open Water:  Road: 



# COWAN LAKE INVASIVES

## KEY

- Invasive Free:
- Only A Few Invasives:
- Invasives Well Established:
- Destroyed by Invasives:
- Open Water:
- Lawn:
- Road:



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