

This Section shall be moved behind the Landmark and Heritage Tree Section, and shall completely replace the existing Section.

## **523.6 Woodlands**

Ann Arbor’s trees and Woodlands are genuine pillars of our place and are mighty contributors to our well-being. They provide us with oxygen, harbor a great diversity of terrestrial life, keep us cool, increase humidity and even bring rain. They fight flooding, control pollution, help much to recharge groundwater, they break the speed of the wind, sequester toxins and carbon dioxide. They muffle noise, provide food and shelter to us and to many other life forms. They inspire us, give us a sense of wonder.

The City’s Woodlands are of three types: Naturally regenerating Native Forest Fragments, Planted Urban Woodlands, and Pioneer or Volunteer Woodlands.

### **A. Identification**

#### **1. Native Forest Fragment Woodlands**

Indigenous Anishinaabeg related peoples, who lived here for more than 8000 years prior to Europeans, regularly burned the leaf and forb litter on upland forest floors, which increased the spacing between trees, increased warmth and light to the forest floor and so plant diversity, improved soil chemistry, minimized the number of shrubs, and allowed easier control of deer and apex predator numbers. Their stewardship bequeathed to us an extraordinary diversity of native herbaceous species on the forest floor, under widely spaced, multi-aged, great trees.

When Europeans arrived in Ann Arbor to settle about 1824, our uplands were cloaked mostly with Mixed Oak and Oak Hickory forests arranged often maintained by native Americans as savannas. The original site of “Anns Arbour” was likely a Burr Oak opening (a [Michigan Natural Features Inventory](#) plant community). Some of those trees are still standing in that neighborhood, so it is (will be) mapped as a Native Forest Fragment. The Burr Oak is Ann Arbor’s “namesake” tree, on its logo.

Some of these fragments only have trees remaining, usually among houses in a neighborhood. They have little or no vestige herbaceous, native flora still present. Even so, just these trees are very important to protect since they are likely Heritage Trees, and they provide great opportunity for local neighborhood native plant Restoration work.

Europeans arriving beginning in 1824 proceeded to clear the City of its Woodlands and trees, and did so within the span of a few decades. Those lands were converted for farming and later, urban use. They brought grasses and forbs common to Europe for their animals (some species of which are now our Invasive Species), they began the drainage of our wetlands, and they ended fire management. They killed all deer and many other birds and animals as well. That changed Ann Arbor. It made ours a treeless place, a place with a crashing diversity of species. People living

now would be astonished to see ours as the treeless City it was 100 to 150 years ago.

Flatter uplands became crops and grazing lands and orchards, Steep slopes, wetter lands, back 5 or 10 acre areas, and fence rows were left with less soil disturbance. It is on these areas that a facsimile of our original forest communities regenerated into that which we now call Native Forest Fragments.

Low soil disturbance after clear cutting meant seeds and soil organisms of the pre-settlement forests persisted, allowing them resprout into similar though structurally differing forest communities

- a. Ann Arbor's Native Forest Fragments are Woodland areas that are predominantly composed of native trees that have regrown on areas of the City never or little plowed or developed since the City's near total clear cutting of its original forests, between about 1840 and 1900. These trees are primarily between about 80 and 160 years old. Many or most of these trees are Heritage Trees.
- b. Ann Arbor's Native Forest Fragments can be distinguished from other Woodlands because they are visible on low level aerial photographs which became available beginning in 1940, because they developed on soils never or little cultivated, because there are native and old Heritage Trees present, because some of them have native understory plants present.
- c. Native Forest Fragments have been mapped (ongoing). Maps are (will be) available as layers on the City's Natural Features Web Pages (link).
- d. Some Native Forest Fragments have single or two unit housing constructed on them. Older construction techniques for these buildings meant at least some of the trees survive and thrive.
- e. The most important of these fragments also have a wide array of native understory trees, some shrubs and many herbaceous plants beneath them. Many of these high value Woodlands are the City's Natural Areas, which are protected and are actively managed to Restore and sustain them. These areas serve as the last refuges in the City of native species and native ecosystems. They are our Noah's ark. Were we to Restore our landscapes across the City to similar arrangements, we would achieve the greatest possible level of ecosystem services with the least expenditure of effort and energy (the opposite of lawn mowing, weed killing, watering). The City's Native Forest Fragment mapping has (will have) indications of the relative quality and value of these fragment.
- f. The City Forester shall approve determinations of Native Forest Fragment Boundary Lines and the quality assessments for them. The Site Development Official shall insure that Protected Woodlands and Protected Trees are not injured by the impacts of Development on a Site.

## **2. Urban Woodlands**

- a. Urban Woodlands are areas planted with enough trees to have the density necessary to meet the definition of Woodland. They exist on soils which were once farmed or were otherwise completely changed to urban use. These are not Native Forest Fragments and are not self-sustaining ecosystem associations.
- b. If a Site has an Urban Woodland within which no habitable structures exist and which has at least 30 Landmark or Heritage Trees, it is a Qualified Urban Woodland. Those should be protected from Development.
- c. Groves of planted pines or spruces called pinetums are found in some locations in the City. They were planted in the early years of the 20<sup>th</sup> century along with major efforts to reforest the State after widespread logging of its original forests. These are not Native Forest Fragments and are quite low in the diversity of species living under them.
- d. It is unlikely there were many upland conifers (perhaps Hemlocks and White Cedar on moist north facing slopes or on swamps to the southwest) in 1824. Conifers are pleasing to people, especially for their Winter interest and for the way they can screen views. Some pinetums may be Qualified Urban Woodlands.
- e. Urban Woodlands usually have a wide variety of trees and ornamentals, many not native. Often there are Landmark Trees present. These Woodlands can function as valuable wildlife habitat and do provide great scenic resource, they do positively influence the climate, and they have returned farmed lands to more shaded and interesting landscapes.
- f. The City Forester shall approve determinations of Urban Woodland and Qualified Urban Woodland area Boundary Lines and assessments of their quality. The Site Development Official shall insure Protected Trees and Protected Woodlands are defended from damage on the Site.

## **3. Pioneer Woodlands**

- a. Pioneer Woodlands are those that have the density of trees necessary to meet the definition of a Woodland and which arise on disturbed soils, such as soils which have gone through a period of cultivation, or on soils which have been overturned, moved, or Graded to the extent that seed stocks are destroyed or greatly diminished. These Woodlands have not been intentionally planted. These places are not able to regenerate into high quality native ecosystems in multiple human generations, without significant Restoration effort.
- b. Pioneer Woodlands are usually found on abandoned farm fields or waste sites of various sorts. These Woodlands are often dominated by Invasive Species and have lower overall wildlife value Spring bird migrants appreciate their dense thickets, and Robins have learned to depend upon them for Winter food. These Woodlands are not Native Forest Fragments.

- c. In some cases, Pioneer Woodlands are adjacent to Native Forest Fragments, which are colonizing into what was likely a farmed field. These areas should be treated as Native Forest Fragments and protected from development.

## **B. Protection Priorities**

### **1. Highest concern**

- a. All Native Forest Fragments need to be recognized, understood for what they mean to the residents of the City, and be treated with great respect. The highest quality among, which have not only Heritage Trees but herbaceous native flora under them, must be protected from Development, not built upon. The highest quality of these fragments not already in public ownership should be acquired and retained as public land and managed as Natural Areas. Further fragmentation is not desirable.
- b. Native Forest Fragment Natural Areas or potential Natural Areas (with at least some vestiges of native herbaceous flora that could be Restored to a greater diversity of native species are the most important Sites to protect from Development.
- c. Native Forest Fragments exist on City owned properties, many of these are Natural Areas that are being Restored (identification and assessment, Invasive Species removal, species monitoring and reintroductions, fire management, climate change monitoring and mitigation, and deer management.).
- d. Other Native Forest Fragments exist on University-owned properties, on Township or County-owned properties, and on Public School owned properties. These may or may not have protection from Development, may or may not be receiving Restoration work. The City will work with these community partners to gain greater protections for those Sites.
- e. Native Forest Fragments exist on private lands also, some are still without Development on them. They are the most vulnerable to Development and its impacts. Many have been diminished from their original size as mapped. Some have had housing constructed in them, usually done before construction practices became so deadly to tree roots. Many of those developed sites still have Heritage Trees growing across adjacent properties. Some of those may be Woodlands. Landscape or construction activities on those Sites, replacing structures with larger ones or otherwise adding to footprints will likely threaten or destroy Heritage Trees.
- f. Landmark and especially Heritage Trees must not be lost from Native Forest Fragments or near them by insensitive landscape or structure construction activities, most often as a result of Compacted Soil killing roots and the soil microflora in their CRZ's

- g. Changes in mitigation requirements in this Section and in Section 5.23.5 increase the mitigation costs of removing or damaging Native Forest Fragment Woodlands or Heritage Trees.

**2. Midlevel concern**

- a. Ann Arbor's Urban Woodlands are directly derived from people's planting activities as farmed fields have been converted and developed for urban and suburban uses landscapes with a wide variety of ornamental plantings have been widely installed around Buildings and especially around houses, across the City. Portions of some of these properties now have Landmark and Heritage trees growing in a Woodland, with no structures under them. Some of those meet the criteria of Qualified Urban Woodlands.
- b. As with Native Forest Fragments, there are relatively few Qualified Urban Woodlands extant in the City. Those portions of properties that have them should be protected to the fullest extent possible.

**3. Lowlevel concern**

- a. Pioneer Woodlands have the size and density of a Woodland but are composed of early succession species of trees and shrubs. Usually, these species are fast growing and often weak wooded. They are often dominated by Invasive Species. If there is enough light on the Woodland floor, the flora is usually dominated by European grasses and forbs much present on the farmlands which preceded them.
- b. Landmark or even Heritage Trees can occur on Pioneer Woodlands, especially if the land has been left fallow for some time, or if the farmer retained trees to grow in his fields or planted them quite some time ago. Landmark and Heritage Trees should be protected.

**C. Protection Measures**

It is not just about the trees. It is about sustained stewardship and Restoration of native ecosystems. That means protection of soils and their microflora, return of a native herbaceous species and the fauna they support, nurture for high value native trees, assurance for the next generation of native trees, and mitigation of the impacts of climate change. European mowed grass is the worst thing that can be done in a Native Forest Fragment

- 1. Native Forest Fragment Natural Areas or potential Natural Areas shall be excluded from Development. The City will work to gain sustained protection and stewardship for these Sites, or bring them into public ownership as often as possible.
- 2. All other Native Forest Fragments shall be protected from Development and the impacts of Development to the fullest extent possible.
- 3. Grading, roads, walkways, utility lines and all other aspects of soil disturbance should be minimized to the fullest extent that sound design and public safety will allow in and near Native Forest Fragments.

4. Clearing for Buildings should be strictly minimized to the least area needed to work around Buildings, including even temporary haul routes. Trees not intended to be taken must be protected at their CRZ perimeters on every building Site, including trees on adjacent property whose CRZ's extend onto the Site. Excavated spoils from Basements and other Grading activities may not be stored or spread on the Site, nor stored on or near any Protected Woodland. Those soils may not be left on the surface of a Site in locations not intended to be Impervious. They must be Graded and covered with well drained, fertile topsoil at least 18" deep in all planting areas including grassed areas or removed from the Site and used elsewhere as Fill. Very careful handling of trees to remain near buildings must be undertaken to the fullest extent possible.
5. Qualified Urban Woodlands shall be excluded from Development as much as is possible. These trees are important to the people of Ann Arbor and to neighbors of the property just as much as benefits of Development. The two need to be fit together harmoniously.
6. Protected Woodlands shall have well maintained Barrier Fencing at the Boundary Lines of their outer CRZs. Intrusions inside Barrier Fencing shall be strictly prohibited, unless authorized by the Site Management Official in accordance with Best Management Practices.
7. Grading, Earth Change, Grubbing, Building and all other construction or landscape activities on a Site that could cause Compaction of Soil or Hydrological Changes within or near a Protected Woodland must be avoided, except if done in accordance with the provisions of an approved Site Plan, and the approval and supervision of the Site Management Official, in accordance with a Grading, Building, Soil Erosion, Stormwater or Wetland permit. Best Management Practices must be followed.
8. Any native Landmark or Heritage Tree within a Native Forest Fragment but not included in a Protected Woodland but which is itself to be protected shall be carefully defended from Disturbance during all phases of Site activity, in accordance with Best Management Practices. Unintended loss of these trees must not occur.
9. Any Protected Tree or Protected Woodland determined by the Site Development Official to be dead, dying or severely damaged due to Site construction activities within three years of the issuance of Certificate of Occupancy or final permit approval for Development as authorized by any Site plan, PUD Site plan, or plat or other permit shall be replaced in accordance with the provisions of this Section or Section 5.25.5.
10. Native Forest Fragments have been and are being invaded by Invasive Species of plants (and increasingly by pathogens). They need active stewardship to sustain them. Native trees will not regenerate in the shade of invasive shrubs. Deer are capable of browsing our native forest communities to extinction and some pathogens are destructive to entire species. Work to deal with these problems must be part of a Woodland management plan, approved as part of a Site Plan.

11. The City must work to control White-tailed deer numbers to be at or below numbers that fully stop them from diminishing biological diversity and native tree regeneration on Native Forest Fragments in the City, even of rare and fragile plants.
12. Any Site on which there is a Native Forest Fragment or Qualified Urban Woodland shall have an approved Woodland management plan as part of the Development agreements. These plans shall:
  - a. Identify and assess the status and quality of the Woodland, determine which areas are to be Protected Woodland, which not and why.
  - b. Where management of retained Native Forest Fragments is undertaken, these activities should be conducted in accordance with a Woodland Management plan and in accordance with Best Management Practices. Advice from qualified natural area designers and manager should be sought. A key element should be the removal and control of Invasive Species.
  - c. Set species Restoration, biodiversity, climate resiliency, tree regeneration goals and work plans. They will set goals and work plans to remove and control Invasive Species. Use of non-native grasses on Native Forest Fragments is prohibited.
  - d. Link with Site Plans to ensure that Earth Change, Grading, Soil Compaction, and Hydrological Changes on a Site do not intrude into or near Protected Woodlands and Protected Trees.
  - e. Link to Storm water management plans and to utility infrastructure plans to ensure to ensure provisions included in them will not damage or threaten Protected Woodlands or Protected Trees when constructed.
  - f. Ensure that Best Management Practices are used for work on Protected Woodlands. Advice and assistance from qualified natural area designers and managers should be sought to fashion and implement such Plans.
13. The City shall make all possible effort to gain protection and Restoration efforts on high quality, undeveloped Native Forest Fragments not owned by the City.
14. The City will make all possible effort to gain ownership of high quality, private, undeveloped Native Forest Fragments (potential Natural Areas), to be added to the City's Park system.
15. The City will work to identify, assess, steward and protect high quality Native Forest Fragments on its Greenbelt properties, and to ensure they are defended from deer browsing.

#### **D. Mitigation**

1. If no Native Forest Fragment or Qualified Urban Woodland exists on a Site then the mitigation requirements for trees stipulated in Section 5.23.5 of this Chapter shall apply.
2. If a Native Forest Fragment or Qualified Urban Woodland exists on a Site, if it is fully protected and if it has an approved Woodland management plan in accordance with Best Management Practices, then the replacement requirement for Landmark trees taken from outside the Woodland is reduced to 25%. The replacement requirement for Heritage Trees taken from outside the Native Forest Fragment remains at 100%.
3. If a Native Forest Fragment or Qualified Urban Woodland exists on a Site, and if it is not fully protected, then the replacement tree requirement for Landmark Heritage Trees removed from across the Site is doubled, 100% for Landmark Trees and 200% for Heritage Trees. And all native trees taken from the Native Forest Fragment 8" DBH or larger shall be mitigated at the 200% rate.
4. An intrusion inside a Protected Woodland on a Site, within a Barrier Fence, that disturbs soils or herbaceous plants, in the opinion of the Site Management Official, shall be Restored to conditions prior to the disturbance, in accordance with Best Management Practices.
5. A replacement tree or combination of replacement native trees shall be required equal to a minimum of 200% for any Landmark or Heritage Tree removed from a Site without the approval required by this Chapter or City Code.
6. If a native Landmark or Heritage Tree in a Protected Woodland is missing, damaged, dying, or dead because of construction activities in the opinion of the Site Development Official, within 3 years of the issuance of a certificate of occupancy, replacement trees shall be required at the 200% rate.
7. If the whole Site or much of s Site is a high-quality Native Forest Fragment (has the potential to be a Natural Area), or enough of as Site is Native Forest Fragment so to discourage reasonable (vertical) Development on the balance of the Site, then the City will work to acquire the land for addition to the Park system.
8. All trees within a Protected Woodland are Protected Trees.
9. Older trees, native trees, most especially old Oak trees are the City's most important carbon sinks. Ecosystem services provided by Oaks are by far the most substantial tree species growing in our City. It is simply not acceptable to damage or remove old trees. They must be protected to the fullest extent possible.
10. If Restoration work is part of an approved Woodland management plan on a Native Forest Fragment, then replacement trees should not result in a dense canopy. Ann Arbor's original upland ecosystems were savanna-like, with widely spaced large, trees of many species. Densities of trees on these Woodlands were some to much lower than our current Native Forest

Fragments show (ours have single aged trees much closer together). Replacement tree planting densities should be done in accordance with Best Management Practices, lower density and tree regeneration need to be balanced with good light on the ground for herbaceous species.

11. Best Management Practices may include advice to use as replacement trees those which are known to be species native to the Ozark Mountains in Missouri or those native to the Eastern Mesophytic forests of the Appalachian Mountains, depending upon the community present on a Site. The City shall endeavor to develop a list and a Michigan source of supply of such species of plants. The purpose of this effort is to slowly introduce plants in our communities that will better tolerate the effects of climate change. Information will be found the Best Management Practices Handbook.
12. It is assumed that replacement trees will otherwise fit comfortably on the Site from which trees are removed, in accordance with Best Management Practices, sound planting design, and normal spacing of street trees. If they do not fit, then an alternative mitigation plan must be approved prior to approval of a Site Plan, PUD Plan or Plat or another applicable permit, in accordance with provisions of Section 5.30.2.A of this Chapter.
13. Disturbed areas shall be reestablished with species planted and arranged in a manner characteristic of local native plant community.
14. Determination of the status and relative quality of a Native Forest Fragment, a Natural Area, or of a Qualifying Urban Woodland on a Site shall be made by a person well qualified to do exactly those assessments. Those determinations shall be reviewed and approved by the City Forester.

#### **E. Mitigation Practices**

1. Woodland management plans are important to develop on Sites with Qualified Urban Woodlands and must be developed for Sites with Native Forest Fragments. These should be done in accordance with Best Management Practices and be fully reflective of local native communities.
2. Best Mitigation Practices described for Protected Trees in Section 5.23.5 apply on Sites outside Protected Woodlands. That included provisions for dealing with soils and soil compaction in planting zones.
3. Native Forest Fragment management plans shall involve a practitioner well trained and experienced in natural lands design and management. If a Woodland is partially protected, the protected portion must have a Woodland management plan.
4. Native Forest Fragment management plans must specify the Restoration work required to sustain the fragment's native trees, to add native herbaceous species, to remove and to control Invasive Species, and to protect soils from disturbance. Restoration work must be implemented in accordance with Best Management Practices.