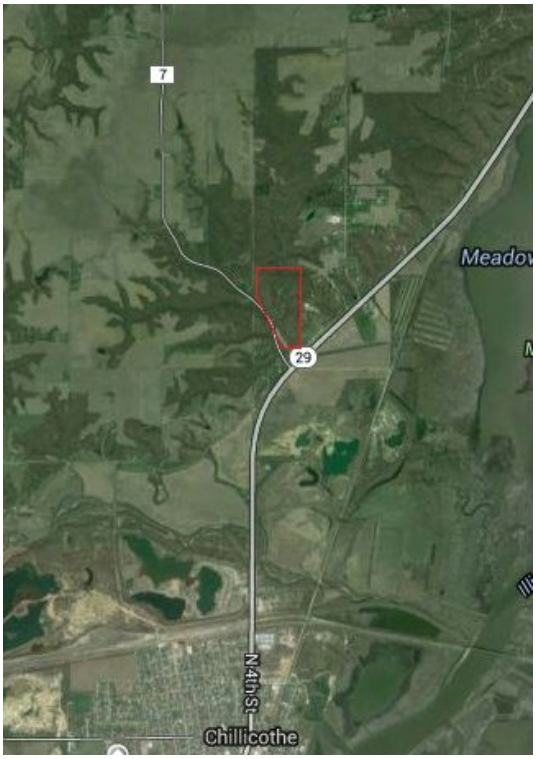
1. Introduction
    a. The objective of this document is to detail the actions needed to develop Coal Hollow park into a low maintenance nature park.
    b. Coal Hollow Park's primary role will be to integrate into the Chillicothe park district portfolio of parks as a walking trail and nature park. There will be minimal physical development of the park however there will be extensive effort to monitor and maintain native flora and fauna
2. Background
    a. History
        i. Coal Hollow Park was acquired by the Chillicothe Park District in 2007. The area was purchased from the Neighborhood House of Peoria with help from local philanthropist Joe Boyer and the Caterpillar Foundation. This forty eight acre facility is intended to have a variety of recreational opportunities to include a small pavilion for picnics and family gatherings, walking trails, outdoor education, and open recreation areas. The park was last used as a summer camp. The facilities at the park included cabins, swimming pool, pavilion and main office cabin. All of these facilities have been removed There is a unpaved road leading back to the location of main office building. There are also power lines parallel to this road. There is a well on the southwest corner and a water tank in the middle of the property. There is a steel rope bridge across a creek that has collapsed.

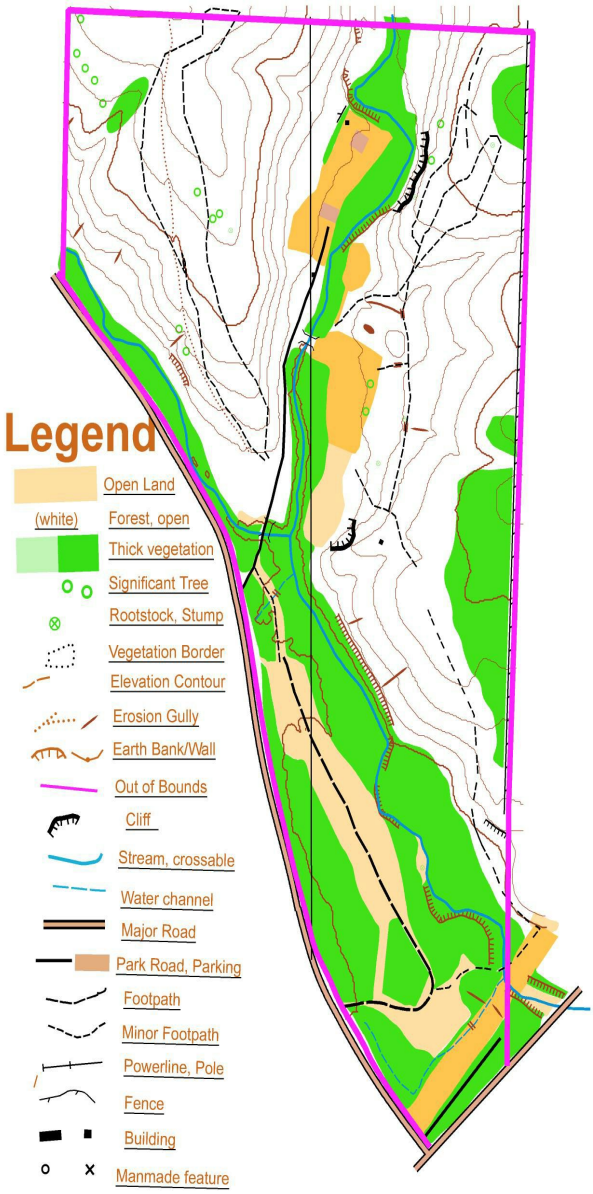


b. Background

Coal Hollow is a 48 acre facility on the west river bluff of the Illinois River. The park has two creeks flowing through the property. One of the creeks crosses the Northern park boundary and flows North to South. The second creek flows under Route 7 (Yankee Lane) and enters the park on the western boundary. These two creeks join within the park and flow Southeastward into the Illinois River.

Between the two creeks is a spur of the river bluff that raises almost 150 feet above the creek bed (far left orange cone). This spur occupies the northwest quadrant of the park. Of note on this spur is a possible wagon road. (shown as brown line) A second spur is on the east side of the North-South creek(Top right yellow cone). The creek has cut a 90 foot cliff into this spur. At the base of the spur are two slag heaps from mining done on the site (two small brown circles). West of this spur is a 2 acre flat area that was used for the cabins and pool(yellow oval). To the east of this flat area is another spur that runs down the eastern boundary of the park(bottom right Cone).

There is a road that leads to the location of the demolished main cabin. It parallels the north south creek on the west side. There are power lines along the road. There are two bridges across the creeks (Red Arrows point to bridges). Both bridges are in poor repair and are no longer suitable for vehicular traffic. The first bridge crosses the West-East creek just north of Route 7(Yankee lane). The second bridge crosses the North-South creek onto the 2 acre flat area on the east side of the creek.
The south-east quadrant of the park is a 4 acre flat area between the Southeastern flowing creek and Route 7 (Yankee Lane). This area has a large grassy area in the center.



This map shows the park in it's present state. The green areas indicates areas of invasive non native species. These areas are dominated by Bush Honeysuckle. Amur Honeysuckle or Bush Honeysuckle (*Lonicera maackii*) is a species of honeysuckle in the family Caprifoliaceae, native to temperate Asia. Other non native invasive species include autumn olive (*Elaeagnus umbellata*) and Garlic Mustard (*Alliaria petiolata*) The tan and beige areas are non native grasses. These areas were planted to have grass areas for activities while the park was a camp. The white areas are forest and have a large number of native hardwood trees. However, the forest areas do have a high density of native invasive or low value trees such as Black locust (*Robinia pseudoacacia)* and Maples (*Acer …).* The trails indicated have not been maintained and are not clear to the casual observer. The trail on the south east of the park crosses into private property.

3. Review of Park
    a. Strengths
        i. Park is an excellent example of the topography, flora and fauna of the Illinois river bluff. Forest Park Nature Center in Peoria has a similar topography, flora and fauna. However, Coal Hollow while slightly smaller has a much better example of the Illinois river watershed, higher quality alluvial areas and more dramatic bluffs.
        ii. The cliff in the north side of the park is spectacular.
        iii. Possible wagon trail on western spur.
        iv. Coal seam visible at multiple locations
        v. large number of high value, old native hardwood trees
        vi. Recent fire events have kept low value trees at moderate levels
        vii. Easy access from Illinois route 7.
        viii. Close proximity to Chillicothe.
        ix. Well on site
    b. Weakness
        i. Non Native invasive species have established themselves only the creek bed and around the mowed lawn areas.
        ii. Mowed lawn areas dominate the alluvial areas around the creeks.
        iii. low value fast growing soft wood trees (*Acer …)* are starting to dominate the forest areas
        iv. Areas where buildings were removed are reverting to nonnative invasive species.
    c. Opportunities
        i. The southwestern slopes of the spurs will provide good opportunities for hillside prairies.
        ii. Invasive species can be easily managed by cutting and controlled burns.
        iii. Numerous agencies will provide financial and technical assistance.
        iv. Eager volunteer willing to manage the restoration

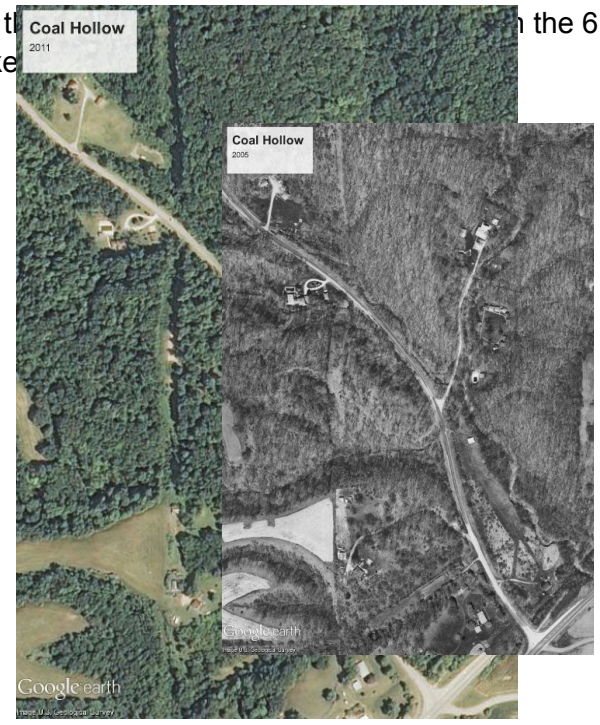
    d. Threats
        i. Management of non native species requires extensive manpower for initial control.
        ii. Cost of restoration efforts may exceed park budget.

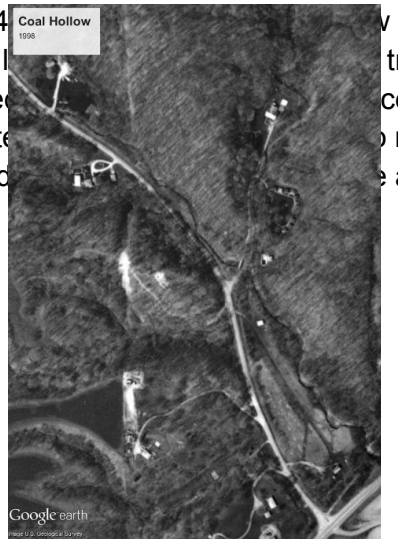
Long term commitment

iii.

4. Historical Perspective

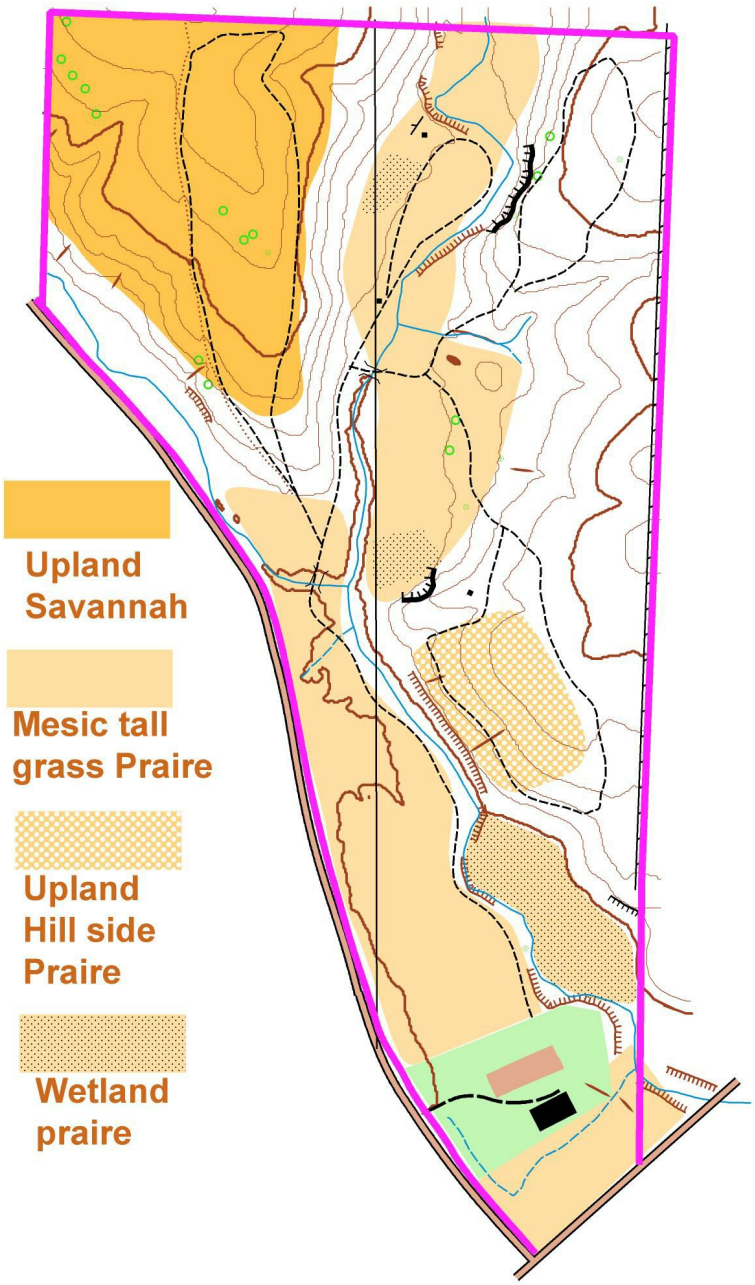
These two images are both of coal Hollow park. The image on the right was taken in 2011. There are more up to date images but this is the clearest recent image. The image on the left was taken in 1940. As you can see there is not significant tree cover in the 1940 image. The grass area along Yankee Lane is completely free of trees but does not appear to be in cultivation. The rest of the property has scattered trees but is mainly grass or forbs. I found the image on the left after I had developed this plan. I found it interesting that my plan very closely matches the state of the property in the 1940 image. In fact my plan is not bold enough in scope. After we have realized the plan as outlined further effort should be taken to return more of the woodland to savannah and hillside prairie.





5. Proposal
a. Develop Coal Hollow park as an example of a illinois river bluff environment.
    i. Areas will include
        - Hillside prairie
        - Upland savannah
        - Mesic tallgrass prairie
        - Wet mesic prairie
        - woodland

b. Develop historical aspects of coal mining, coal seam and Wagon trail
c. Develop trail system with varying difficulty levels.



6. Detailed Plan
a. Upland Savanna
    i. A savanna or savannah is a grassland ecosystem characterised by the trees being sufficiently widely spaced so that the canopy does not close. The open canopy allows sufficient light to reach the ground to support an unbroken herbaceous layer consisting primarily of grasses. (http://en.wikipedia.org/wiki/Savanna)

ii. Savannas characteristically are dry and have poor soil. Therefore, the grasses and forbs tend to be smaller than plants in the tallgrass prairie. The image below shows an area of Robinson park that is representative of a savanna. The dog is also Savannah!

iii. The spur in the Northwest section of the park appears to be a degraded savanna. It has several significant Bur oak. There appears to be some growth of grasses in a few areas. This area also has experienced a fire event in the last 20 years. Restoration of this area will focus on removing understory trees through gridling and cutting and fires to suppress addition seedling growth. Some removal of understory trees was done a few years ago and it has made some difference. However, it will take a much larger commitment over an extended period to open up the canopy to allow for grass and form growth. The area will need to be seeded after the canopy has been opened up. This will not be for 3-4 years.

b. Upland HillSide Prairie
   i. Hillside prairie is a grassland or savanna community that occurs on moderate to steep exposed slopes and crests of hills associated with river valleys, streams, or kettle lakes, surrounded by oak forest or oak savanna. This natural community is almost always found on south- to west-facing slopes,

where exposure to sunlight is highest. Soils are typically strongly acid to neutral loamy sand or sandy loam, and often mixed with gravel. Due to the specific combination of slope, aspect, and soil type, hillside prairie occurrences are local and of very small size. (http://mnfi.anr.msu.edu/communities/community.cfm?id=10709)

The area on the south eastern spur appears to be a degraded hillside prairie. It has a has a southwest exposure, is fairly steep and has poor soil. it is showing signs of slumping which is also another indicator. tree growth is fairly recent and non native invasives have only recently started to appear. Restoration in this area will require removal of all trees through gridling and cutting, fire and brush removal. This area is in fairly good shape and should not take long to restore. It should be a high priority. Seeding should also be done in this area. Since the clearly will not take more than a season or two, we should be seeding this in a year or two. This area should be very visible from Illinois Route 7 and will be a show stopper!

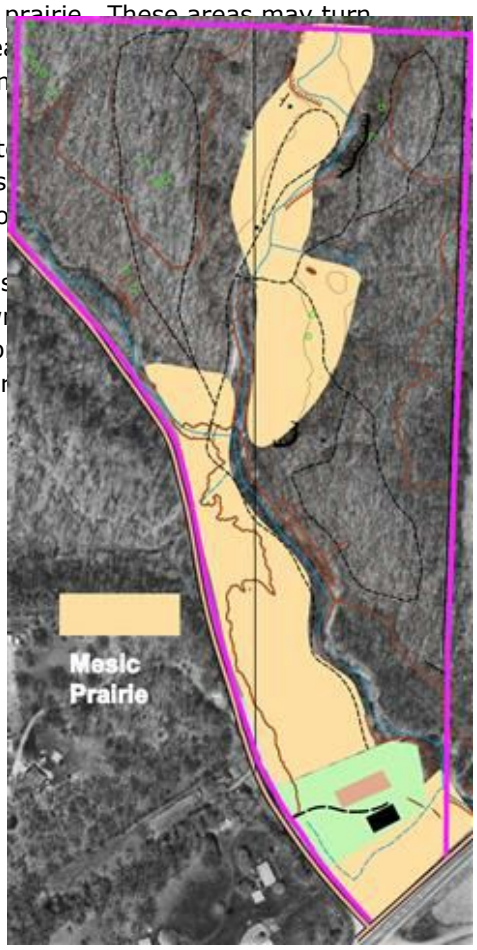
ii.

c. Wet Mesic Prairie
    i. Wet-mesic prairie is a native lowland grassland occurring on moist, occasionally inundated stream and river floodplains, lake margins, and isolated depressions. It is typically found on outwash plains and channels near moraines. Soils are primarily loam or silt loam with neutral pH and high organic content. (http://mnfi.anr.msu.edu/communities/community.cfm?id=10674)

    ii. There are several areas that are suitable for a wet mesic prairie. Two smaller areas, one between where the main cabin and the pavilion was located and one behind where the pool was located, have been created by blocking the natural drainage from the surrounding hillsides. These areas trap water and are wetter than the surrounding area. Another area to the southwest is a flood plain for the creek. However, a significant invasion by exoti honeysuckle has started to transform this area. Restoration in the two smaller areas will only require burning. The area on the southeast will require an extensive brush removal effort. The two smaller areas should be reseeded within a year of two. The large region to the southeast needs to be seeded after the brush removal.

iii.

d. Mesic Prairie
    i. Mesic prairie is a native grassland community dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and Indian grass (*Sorghastrum nutans*). It occurs on loam, sandy loam or silt loam soils on level or slightly undulating glacial outwash. Historically, mesic prairie dominated large portions of the Midwest ranging from Iowa and southern Minnesota east into southwestern Michigan and northern Ohio. Mesic prairie occurs almost exclusively on glacial outwash on nearly level to slightly undulating sites. (http://mnfi.anr.msu.edu/communities/community.cfm?id=10697)
    ii. The flat areas surrounding the two creeks are good candidates for the tallgrass prairie that most people think of when you say prairie. These areas may turn out to be slightly wetter than typical prairie area influence the type of forbs and grasses that don focus on Indian grass and Big Bluestem we will oats gamma and switch grass. These are short more diverse fauna. Restoration in these areas trees by gridling or cutting, fire and brush remo require seeding. The disturbed area where the need to be seeded this season. The other areas areas are cleared. Areas that are currently lawn native grasses and forbs. The lawn grass will p and can be removed by annual burns. These ar fall/winter.

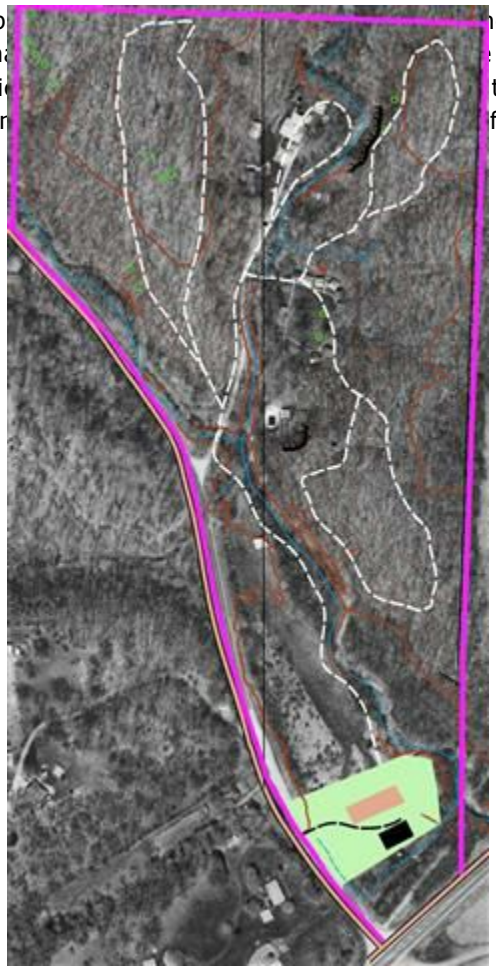


e. Woodland

i. Woodland is a fire-dependent, oak or oak-hickory forest type on generally dry-mesic sites. Frequent fires maintain semi-open conditions, promoting oak regeneration and ground and shrub layer diversity. (http://mnfi.anr.msu.edu/communities/community.cfm?id=10685). Woodlands have less canopy cover than forest regions. Maples and shrubs are controlled by frequency fires.

ii. The remaining area of the par will be managed as woodland. Restoration in these areas will be removal of a signif cutting, fire and brush removal. Thes natural processes. These areas will b maintain them in the current conditio

f. Trail system
    i. The trail system is designed to showcase the restoration areas and the historical areas of the park. All the trails are looped and interconnected. They are design to use the existing bridges and not require additional bridges. Minor foot bridges may be required in a few locations.
    ii. All the trails start in the southern p…e existing road. The existing road m… southernmost bridge, an informati… to take advantage of the coal seam on… f the bridge.
    iii. Just past the bridge the first trail breaks off to the west. This trail will follow the wagon trail and then loop through the savanna. We need to research the wagon trail to determine if it is a wagon trail and its history. An information sign would placed on the trail. An overlook will be placed on the trail on the east side of the spur. This trail will be called the Savanna Trail
    iv. The main trail will continue straight and follow the current road to the large cliff. After the cliff the trail will loop around past the wet mesic prairie and return to the road. This trail will be called the cliff trail
        - This trail would be an excellent candidate for a handicap accessible trail. The presents of the road and parking lot would allow us to provide a handicap accessible path back to the cliff and the prairie.



Off the main trail, the trail will break to the east across the northernmost bridge. This trail will then split into two trails. The northern trail will go up into the woodland and will have a scenic overlook over the cliff. This trail will be called the woodland trail. The southern trail will loop around the hillside prairie. This will be called the Hillside Prairie trail.

v.

g. Planning
    i. The park is in a degraded condition. There are a significant amount of non-native invasive plants and the lack of fire has allowed woodland canopy to close and prevent the growth of native grasses and forbs. The primary focus should be to remove the invasive species, reduce the canopy cover and reintroduce fire to the park. Removal for the invasive species and reduction of the canopy cover will required a large amount of manhours. Therefore, we either need a large budget or significant number of volunteer hours. Burning will need to be done in small areas. Therefore, we need to do many small burns rather than one massive burn. The burns should be done in both the fall and the spring. Seeding should be done in the fall or late winter. Brush cutting needs to be done in the fall and winter. Brush spraying should be done in the early spring prior to emergence of native species. Tree gridling and cutting can be done year round.

Restoration is labor and material intensive. Seed mixes will cost ~$1000 per acre. The amount of seed required can be reduced if mechanical means are used to plant the seed, however, the cost savings may be lost due to the cost of the labor. The park is 48 acres so to seed the entire park would be $50K +. However, We will not be seeding the entire park. Also, we will be staging the seeding as we clear land. We should be able to collect seed from existing plantings. We may also be able to get seed from nearby prairie plantings such as Caterpillar Technical center and Jubilee park. Professional removal of invasive species will cost $1000-$3000 per acre. Invasive species removal is very labor intensive. However, certain areas of the park lend themselves to volunteer efforts. Therefore reducing the overall cost. Some areas need to be professionally restored. It will be a balancing act between budget and timing.

ii.

1. 2 year plan
    a. 2015
        i. The goal in 2015 will be prepare for a fall planting in the area where the power house and pavilion were removed and to remove vegetation from the main prairie along Yankee lane. Tree girdling and invasive removal in the hillside prairie will be done if the volunteer mix is better suited for this type of work.
        ii. Winter
            1. Remove remaining structures from site
                a. behind main lodge,
            2. brush cutting Yankee Lane
            3. burn grass areas
        iii. Spring
            1. communicate plans for park
            2. solicit community support/schedule fall work days
            3. tree girdling in Savanna
            4. brush cutting Yankee Lane
            5. prepare for Prairie planting on demolition site
            6. spray brush in woodland
        iv. Summer
            1. tree girdling in Savanna
            2. brush cutting Yankee Lane
            3. Prepare for Prairie planting on demolition site
        v. Fall
            1. brush cutting along creek
            2. regular scheduled work days
            3. clear and burn hillside prairie
            4. Burn wood piles
            5. Plant mesic prairie in demolition area
    b.
        i. 2016
            1. Winter
                a. brush cutting along creek
                b. burn grass areas
                c. seed small wet mesic prairies
                d. tree girdling in Savanna
            2. Spring
                a. spray brush in woodland
                b. spray bush in wet mesic prairie
                c. tree girdling in Savanna
                d. pull out brush along creek
            3. Summer
                a. tree girdling in Savanna
                b. tree girdling in Woodland
                c. Plan trail development
            4. Fall
                a. brush cutting along creek
                b. regular scheduled work days
                c. burn woodland
                d. burn Wet mesic prairie
                e. develop a plan for parking area and pavilion