

# Guidance for Establishment & Management of Prairie and Woodland Areas

## Quarry Estates, Ames Iowa

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### 1. Long-Term Maintenance:

- This section is listed first to underscore the essential need for long-term management planning for maintenance of the prairie, wetland and woodland areas. Activities directed at keeping all natural areas in good condition should be considered on *the same level of importance as planning for lawn care and snow removal*. Furthermore, routine maintenance of established natural areas, performed by knowledgeable and experienced staff, will not only keep the needed labor and inputs to a minimum, it will also be less costly per acre than traditional lawn management and result in a considerably more ecologically desirable setting.
- Once established, all natural areas should receive, at a minimum, an annual assessment by an ecologist experienced in management of such areas. This includes inspection of all relevant landscapes for environmental (invasive species entry, weeds or tree seedlings, drought effects etc.) and mechanical damage (mowing damage, herbicide overspray, vandalism) issues. Areas in need of repair or restoration should be addressed promptly.
- An annual sweep to remove shrub and tree seedlings should be expected. This can be in the form of prescribed fire or mechanical removal by hand.
  - A healthy prairie area will have few new weeds but surrounding unmanaged areas may serve as a seed source.
  - Introduction of trees near prairie areas for landscaping purposes should be seen as increasing prairie management needs due to increased need to remove encroaching tree seedlings.
- All prairie and woodland understory areas should be mowed annually if a prescribed fire has not been administered.
  - Generally mowing is done late spring to allow winter cover to remain in place for animal benefit and leave a more interesting landscape during the dormant season.
  - Prescribed fire is usually done on a three-year rotation, usually in early spring but fall burns are also acceptable. This activity in particular should only be performed by experienced crews with National Wildfire Coordinating Group (NWCG) training and all relevant insurance policies and permits.
- After periods of unusually dry or wet weather some reduction of desirable prairie species may occur. In such cases the annual inspection should especially include recommendations that address any significant areas of bare or sparsely populated ground. These areas should be re-seeded with appropriate seed mix or planted with live plants rather than allowed to become weedy and leading to larger problems.

## **2. Prairie and Woodland Understory Establishment:**

### **Site Preparation (establishing new prairie area)**

- Existing tree assessment:
  - Careful evaluation of existing trees with emphasis on preservation of existing desirable species
  - Weedy maples (box elder and silver/soft maple), mulberry and honeysuckle should be removed. These species re-seed prolifically, leading to increased annual maintenance.
    - Remove by cutting and treating the stumps with glyphosate or triclopyr
      - No use of Tordon should be allowed onsite
      - If near a water body herbicide should be compatible with water usage
    - Consider leaving larger stumps for signage, art installations, and/or casual seating.
- Existing lawn grass and hayfield to be converted to prairie and woodland understory:
  - Mow in normal cycle until herbicide treatment begins
  - Spray with glyphosate (grass) and aminopyralid (areas with clover, alfalfa, bird's foot trefoil)
    - Repeated inspections and additional treatments as green-up occurs
    - No tilling or soil disturbance
      - *Seed will be broadcast directly onto killed grass so no erosion control needed*

### **Prairie Establishment- Seeding**

- all areas with treated vegetation should be seeded by hand-broadcasting
  - areas closer to walkways to be seeded with a high density mix of somewhat shorter species, emphasizing flowering species with a wide range of blooming times
  - areas under trees to be seeded with a savanna species mix, again emphasizing attractive species but maintaining diversity and high plant density
  - areas receiving stormwater runoff and sump pump flow will be seeded with species that tolerate periodic wet conditions

### **Prairie Establishment – First three years**

- Seeded areas monitored approximately every two weeks for weed growth
  - if weed growth is sufficient to cause significant shade on desirable seedlings: weed or mow
  - weeding to be done by hand in areas not too dense with weeds
  - if necessary spot mow or use mechanical trimmer on weedy areas.
    - This sets back weeds and favors growth of native species, but *does reduce flowering and lead to a less attractive stand during establishment.*
    - Desirable to maximize flower display to improve public and new landowner reception, therefore hand weeding is preferred where possible
  - Monitor for Canada thistle, alfalfa, bird's foot trefoil, quackgrass, brome etc. and treat with appropriate herbicide as needed
- Areas that have been damaged or not developing as expected should be evaluated and re-seeded
  - Care to be taken to use species that germinate readily during any warm season seeding
- Continued monitoring and removal of maple seedlings, honeysuckle, cedars, mulberry etc.

### **Prairie Establishment – Mature stand**

- Annual early spring mowing of all seeded areas if no prescribed burn conducted
  - Coordinate with Ada Hayden HP staff and Ames Fire Department if prescribed fire is appropriate
- Continued iterative maintenance: monitor for weeds and damage, treat as needed

### **3. Site-wide Management during construction:**

It is important to understand the impact of letting a weedy stand of vegetation develop during construction:

- In traditional post-construction landscaping either sod or lawn grass seed is established.
  - Sod and seeded lawns can be managed for weeds by use of broad-leaf herbicides (and the weed-smothering effect of sod).
- *Establishing a natural prairie landscape post-construction is considerably different:*
  - Broad-leaf herbicides will damage prairie species along with the weedy species, and there is no sod to smother weed seeds.
  - Furthermore, the weed seeds will contaminate the border areas being prepared for seeding
  - For these reasons it is strongly recommended that weeds in the areas to be developed are kept well under control, to a larger degree than with typical construction, with mowing or spraying treatments as construction goes on. *Not following thru with this recommendation will lead to a longer (unattractive) establishment period and considerably more management labor expense.*

### **4. Public Outreach and Education:**

- People who are not familiar with native landscapes (or have seen failed attempts at establishing such areas) are often put off by what can be a weedy appearance when compared to traditional park-like landscaping.
  - This is especially true during establishment years, and even more so during establishment on weedy sites.
    - Again, emphasis on benefits of preventing weeds from setting seed during construction phase
  - There will always be some people that prefer a traditional high maintenance, controlled landscape, but with education and exposure to healthy natural landscapes many people will enthusiastically embrace a more natural appearance and the benefits offered.
- To help people have accurate and realistic interpretations of these natural areas the following outreach and education is recommended:
  - Education:
    - Signage onsite, both temporary explanations during establishment and more permanent once the site is well underway. This should include QR codes for access to websites with broader information than that immediately available onsite.
      - Especially useful to point out the natural landscape as historic, and in scarce supply
      - Emphasis can be placed on the often underappreciated benefits to water quality and stormwater management concerns that are derived from native landscapes
      - Today many people are interested in milkweeds for butterfly gardens, this is great but useful to argue many less showy species benefit from a broad prairie matrix – not just butterflies
        - *emphasis on habitat establishment is generally well received*
      - phrasing like “During establishment of prairies, first year they sleep, second year they creep, third year they leap” conveys need for patience
      - Know that education in the second growing season after seeding is important – this is when patience can wane in those unaccustomed to the timeframe needed to establish prairie. Keeping residents and other interested parties updated with progress during this time period can prevent many frustrations on both the part of managers and those waiting to see a mature stand.

- Hold onsite meetings advertised to both the public and new homeowners to provide opportunity for questions and comments (see comment directly above).
- Once established, scheduled walking tours around the natural areas with knowledgeable ecologist
- Provide website and other social media with current information updates and access to deeper explanations
- *Consider interviewing previous landowners* for oral history of site, historic perspective on century farm as part of education signage. Old photos could be useful for website development.
- Borders:
  - Research has shown that a paved edge, fencing, signage etc. silently send a *message that the landscaping is designed and intentional*, not just a case of someone not bothering to mow or otherwise maintain the area
  - Recommend that the *internal prairie areas between parallel lots be delineated by spaced boulders or fence posts*
    - Zero maintenance “fencing”
    - Spacing can be fairly broad
    - Brings in the “glacial erratic” story to the historic landscapes educational piece
    - Allows some seating for watching birds and butterflies
    - Lawnmowers prevented from cutting into prairie areas to turn etc.
    - Heavy enough to prevent creative re-location

## **5. Lawn Care:**

**Coordination with Lawn Care Providers:** Typically lawn care companies do not understand prairie management and often don't appreciate prairie vegetation and the problems caused by their actions. This commonly leads to issues with herbicide overspray during dandelion treatments, mowing damage and other issues. Any contract with a lawn care provider should include specific language to address potential damage and significant financial penalties when such occurs. *Note, minor penalties can be (and have been) seen as cheaper than taking time to mow and spray carefully.*

Placement of boulders near lawn-prairie interfaces is one of the most effective methods of preventing mowing damage, and requires much less maintenance than fencing. Additionally, can be used for casual seating.

**Recommendations for lawn care at homes within Quarry Estates:** Low-environmental impact lawn care is one of the easiest and most important ways homeowners can help the local environment. There are many ways to reduce the fertilize/irrigate/mow/repeat cycle. Some information and recommendations:

- **Run-off** – anything applied to a lawn has the potential to move off the lawn onto down slope areas.
  - Any herbicides that contact adjacent vegetation (via drift during application or as run-off during rainfall) will have an impact. The most common herbicides are “broad leaf” herbicides – selected to kill dandelions and other weeds in the grass. The majority of plants in the conservation areas and in the Ada Hayden Heritage Park prairies are also broadleaf species, will also be killed or damaged by lawn care herbicides.
    - It's therefore important to use extreme care during application, and using the minimum amount of chemical necessary
    - Corn gluten can be used as a more natural way of preventing weed seed germination. Considerable information is available on the internet about this agricultural by-product.
  - Fertilizers are also prone to traveling downhill to adjacent vegetation. The surrounding conservation areas are negatively impacted by fertilizers. Water bodies grow unhealthy and unattractive “blooms” of

algae and scum, and natural areas are impacted with weed populations increasing in response to fertilization.

- Reducing fertilizer use has many important benefits - less damage to surrounding vegetation via run-off, and slowed lawn growth allowing fewer mowing cycles and less thatch buildup.
  - Using low/no phosphate fertilizers in place of traditional fertilizers is essential to protect downstream water bodies; most algal blooms are the direct result of phosphorus contamination from upstream sources. Furthermore, current research shows that established lawns do not need phosphorus fertilizers - application to mature sod just leads to faster grass growth and more mowing cycles. The detrimental effects of phosphorus runoff on downstream water bodies are severe enough that its use is prohibited on all grounds in Quarry Estates, both conservation areas and homeowner lots. Only non-phosphorus fertilizers are allowed; these will have a zero in the NPK listing (example: an NPK of 22-0-15 would contain 22% nitrogen (N), 0% phosphorus (P) and 15% potassium (K).
  - High nitrogen fertilizers also have negative downstream effects similar to phosphorus runoff. Use of slow-release nitrogen sources reduces potential runoff damage while providing the lawn with enough nitrogen to remain green and healthy.
- Insecticides are potent chemicals with a higher chance of impacting humans and wildlife than other common lawn care chemicals (fertilizers and herbicides). Considerable caution should be used when deciding to use an insecticide. It is estimated that over 95% of common lawn insects are not pests, and do not need to be killed. Pest insects are often in higher concentrations in lawns that have lush growth due to high inputs of fertilizers, so reducing fertilizers also reduces insect concerns without use of insecticides.
- Mowing: Lawn mowers engines are far less efficient than car engines, and can damage lawns if not used optimally. Lawns that are healthy require less irrigation, herbicides, and pesticides.
  - Mowing grass so that at least 3.5" of blade remains helps keep the grass healthy (keep in mind a grass plant "wants" to grow 12-18" tall, so keeping it short really stresses the plant)
    - This also slows the rate of soil drying.
  - Cutting off 1/3 of the grass blade at most leads to healthier lawns
  - Using a mulching mower allows the grass clippings to return to the soil as a natural fertilizer, and does not lead to thatch build-up. Additionally, lawn clippings are not taken off site.
  - Mowing when rain is predicted in the next 24 hours leads to healthier grass
  - Keeping mower blades sharp helps reduce mowing stress to the lawn
- Irrigation: reduced lawn irrigation leads to reduced runoff potential, reduced use of water purified for human use, and lower maintenance costs.
  - Consider using low water-use "eco-grass" (grass seed mixes that are slower, low-growing plants that don't need to be mowed routinely) in backyard areas that are not used frequently or are otherwise hard to maintain traditional lawns. These do not require irrigation.
  - Irrigate only in the early AM. More water is used if irrigation is done during late AM and afternoon hours. Late day irrigation can lead to disease problems in a lawn that is damp all night.
  - Irrigating deeply but less frequently is better for the lawn and uses less water. Having an irrigation system that is simple to turn off after rain events leads to healthier lawns, less run-off, and less water use.
- Commercial lawn care: if you hire a company to mow and "treat" your lawn you should inquire what their treatments are, why they are doing them, when they do them, and what chemicals are applied. You can request

that they limit the use of chemicals or use alternatives that are less damaging to the natural areas surrounding Quarry Estates.

## **6. Trees to be planted:**

- Use only native species, *this feeds into the native landscapes story for this subdivision and aids habitat establishment.*
  - Planting trees in prairie areas will lead to ongoing increased management via the need for tree seedling removal
  - Recommend adding Bur oak, White oak, swamp white oak, hazelnut, eastern wahoo, service berry, honey locust, shagbark hickory, KY coffeetree, hackberry and native hawthornes to list
    - Other species to be recommended for specific locations
  - Some comments on current tree list:
    - Avoid invasive species or those that re-seed profusely (leading to increased management needs):
      - *Amur maple should be actively avoided:*
        - <http://www.dnr.state.mn.us/invasives/terrestrialplants/woody/amurmaple.html>
        - <http://dnr.wi.gov/topic/Invasives/fact/AmurMaple.html>
      - Flowering pear: includes the very invasive Bradford pear:
        - <http://mdc.mo.gov/newsroom/avoid-invasive-trees-such-bradford-pear-landscape-plantings>
        - <http://caseytrees.org/blog/invasive-tree-week-bradford-pear/>
      - Norway maple: not native to the US and considered invasive
        - <http://www.nps.gov/plants/alien/pubs/midatlantic/acpl.htm>
        - <http://www.dnr.state.mn.us/invasives/terrestrialplants/woody/norwaymaple.html>
- Maples:
- Invasive Norway & Amur maples covered under Invasive heading
  - Tartarian maple: Not as invasive as Amur maple but not native to our area
  - Sugar maple:
    - we are west of its range. This species struggles here unless very well sited.
    - <http://maple.dnr.cornell.edu/pubs/trees.htm>
    - [http://www.na.fs.fed.us/pubs/silvics\\_manual/volume\\_2/acer/saccharum.htm](http://www.na.fs.fed.us/pubs/silvics_manual/volume_2/acer/saccharum.htm)
  - Black Maple: does much better in our area than sugar maple.
    - [http://www.na.fs.fed.us/pubs/silvics\\_manual/volume\\_2/acer/nigrum.htm](http://www.na.fs.fed.us/pubs/silvics_manual/volume_2/acer/nigrum.htm)
- Lindens:
    - Littleleaf linden:
      - *native to Europe:* <http://www.plantmaps.com/nrm/tilia-cordata-small-leaved-lime-little-leaf-linden-native-range-map.php>
    - American Linden is native, preferred: [http://www.na.fs.fed.us/pubs/silvics\\_manual/volume\\_2/tilia/americana.htm](http://www.na.fs.fed.us/pubs/silvics_manual/volume_2/tilia/americana.htm)
  - Crabapples: showy for short period then very prone to losing leaves, dropping fruit, and generally unattractive look
  - Ginko: native to China
  - Hornbeam vs Hophornbeam
    - Both species also called ironwood, possibility for confusion amongst suppliers is high
    - Hornbeam (*Carpinus caroliniana*) similar to issues w/Sugar maple = we are west of its native range so specimens must be very carefully sited with expectations of only short term survival
    - Hophornbeam = ironwood (*Ostrya virginiana*), understory tree genuinely native to central IA

