

Hayden's Preserve Subdivision

CONSERVATION MANAGEMENT PLAN

AMES, IOWA

Prepared For **Hayden's Preserve, LLC**



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Sustainable Environmental Solutions

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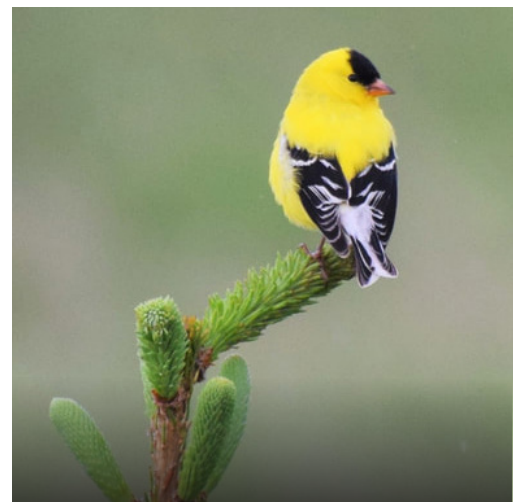
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1.0 INTRODUCTION

1.1 GOAL OF THIS PLAN

The goal of this document is to establish guidelines for establishment of natural areas, long-term maintenance, and public outreach and education for the Hayden's Preserve Subdivision located at west of Hyde Avenue, south of W 190th Street, and east of the Chicago and Northwestern Railroad in Ames, Iowa.

The objective of this document is to serve as a general guide to residents and contractors to preserve the unique natural features of the site, such as prairie, woodlands, stream buffers and corridors, drainage ways, and wetlands, during construction. Furthermore, this document serves as a tool for enhancing natural resources in both public and private land within the subdivision.



2.0 CONSERVATION SUBDIVISION ORDINANCE

2.1 PURPOSE

Conservation subdivisions are defined as, by City ordinance, an alternative set of design objectives and standards for residential development. The intent of a conservation subdivision is to “preserve the existing natural features of the site, to preserve the natural drainage features and hydrologic characteristics of the landscape, and to reduce the impacts of development on the landscape” (Division VI. Section 23.602). Furthermore, the ordinance seeks to restore environmentally sensitive areas, improve biological diversity, provide scenic quality for residents, and minimize disturbances to existing soils and vegetation.

2.2 APPLICABILITY

The City of Ames’ requires conservation design standards for land developed Ada Hayden Watershed north of Bloomington Road, which applies to Hayden’s Preserve subdivision (Ord No. 4042, 8-10-10).

2.3 GENERAL REQUIREMENTS

The Conservation Subdivision ordinance includes the following provisions as general requirements (Division VI. Section 23.603-605). This list is not exhaustive of all the requirements prescribed by the ordinance.

- Eighty percent of residential lots shall abut a conservation area or open space.
- Residential units shall be designed in cluster groups to limit the scale of land disturbance and shall avoid or mitigate for directly disturbing existing native prairie, woodlands, wetlands, and other natural features.
- Dependent on the stream order classification of the waterway, a fifty-foot native vegetative buffer shall be maintained around open water area.
- Minimization of storm sewer piping and maximization of the use of swales.
- Use of curb cuts in lieu of storm sewer intakes when appropriate to divert stormwater to a treatment system.
- All conservation areas shall be part of a larger continuous and integrated system, except for areas that are naturally isolated from other conservation areas.
- Healthy natural features (i.e., woodlands, prairie, wetlands, and streambanks) shall be maintained in their natural condition.
- Conservation areas shall be distributed throughout the development and shall comprise at least twenty-five percent of the total area of the subdivision.
- An accessible and interconnected shared use path shall be developed to connect residents with open spaces and conservation areas.
- Traditional landscaping areas shall preserve existing, native and non-invasive vegetation; desirable trees shall be retained; and informal and natural placement of vegetation, trees, and buffers is preferred.
- Land management practices that minimize the impact of excess shall be used (i.e., minimal fertilization of lawns, using phosphorus-free fertilizers).
- Creation of a Conservation Area Management Plan to focus on the long-term management of conservation areas. This plan serves to meet this objective.

Following final plat approval, this conservation plan shall be updated to include copies of conservation easements, ownership designation for conservation areas and common facilities, maintenance contacts and responsibilities, insurance requirements for maintenance contractors, and cost estimates for corrective actions Division VI. Section 23.605. (3).

3.0 EXISTING NATURAL CONDITIONS

3.1 NATURAL AREAS

A tributary to the South Skunk River flows from north to south through the Phase 1 development area, and is the primary water resource to Ada Hayden Lake, within the Ada Hayden Preserve, located to the east and south of the development. The tributary has a narrow riparian corridor that is likely dominated by monocultures of invasive reed canary grass (*Phalaris arundinacea*) that severely limit or eliminate native species diversity and provide some, though minimal, riparian habitat value. A narrow woodland component is present along portions of the riparian area and consists mostly of early successional species that are typically less desirable. Tree canopy provides riparian shading that encourages micro-habitats which support more diverse native assemblages.

The remainder, and majority of the development area consists of intensive row-crop agriculture and associated drainages.

3.2 HISTORIC & SCENIC AREAS

The majority of the development area has been consistently utilized for intensive row-crop agricultural production from the early 20th century to present. A central portion of this area appears to have been utilized for high intensity grazing during a 10 year period, roughly 2004 through 2013, and was subsequently returned to row-crop agriculture.

A narrow riparian corridor along a tributary to the South Skunk River was historically preserved from intensive agricultural activities and has the potential to harbor some rare native species, however, invasion by common aggressive non-native species or hybrids such as reed canary grass (*Phalaris arundinacea*) is extremely common and expected in these areas.



3.3 PROPOSED CONSERVATION MEASURES

In accordance with Division VI. Section 23.603. (1)(e), lot design at Hayden's Preserve in Ames will follow a cluster layout to avoid uprooting native vegetation. The preliminary plat identifies the preservation of as much vegetation along the creek as possible. Exhibit A clearly illustrates how the greenway along the creek –adjacent to stormwater wetlands, drainage swales, native prairies established in outlying areas, and existing and planned trees – is integrated into the larger network of the planned stormwater treatment train. Numerous conservation areas directly abut or are located across from the public right-of-way.

The City of Ames' conservation subdivision ordinance also requires that eighty percent of lots abut conservation areas (Division VI. Section 23.603. (1)(d)). As demonstrated in Exhibit B, nearly all lots identified in Phase I are located adjacent to a stormwater wetland, open space along the riparian stream corridor, or an out lot that is planned to have a native prairie or grove of trees established.



While certainly near natural areas, lots thirteen through twenty-three are the only lots in Phase I not immediately adjacent to a conservation area. The eighty-percent requirement is achieved with these eleven lots not directly abutting a conservation area.

Similarly, the ordinance requires at least twenty five percent of the total subdivision area to be maintained or established as conservation areas (Division

VI. Section 23.603. (2)((e)(vii)). A basic map, Exhibit C, demonstrates that open space in Phase I of Hayden's Preserve is greater than twenty-five of the total land area. This percentage is confirmed and explained in greater detail in the subdivision's Master Plan.

4.0 NATURAL AREAS ESTABLISHMENT

4.1 PRE-CONSTRUCTION TREE ASSESSMENT

Before any construction begins, a tree assessment should be completed by an arborist or forester. The arborist will investigate all existing trees relative to future construction (Division VI. Section 23.604. (2)(f)(i)). Qualitative and quantitative data should be collected regarding stand dynamics, and ideally would be digitized for geographic information systems (GIS) analysis.

Based on the results from the tree assessment, remove undesirable trees by cutting and treating the stumps with glyphosate or triclopyr. Or, if accessible, mechanically grind out stumps. Do not use Tordon at the site. Desirable native species, such as select hackberries and healthy oak trees should be left untouched, while weedy species such as box elder, silver or soft maple, mulberry, and honeysuckle should be removed as they can re-seed prolifically.



4.2 GENERAL NATURAL LANDSCAPING PARAMETERS

Landscaping in a conservation subdivision does not follow traditional landscaping parameters characteristic of typical subdivisions. While strategically designed and within pre-defined areas, “natural” landscaping grows irregularly. Native prairies feature a diverse mix of forbs and grasses that are suitable to soil, moisture, and sunlight conditions in Iowa. Likewise, woodlands in a conservation subdivision are diverse and resistant to widespread disease infestations. Various popular non-native and invasive landscaping shrubs and flowers (i.e., burning bush (*Euonymus alatus*), dame’s rocket *Hesperis matronalis*, Japanese knotweed *Reynoutria japonica*) are discouraged in a conservation subdivision. Woodland invasive species like honeysuckle, barberry, and oriental bittersweet, many of which are typically planted in common subdivisions, must be avoided at Hayden’s Preserve. Varietals of these species should be equally discouraged.

These landscaping parameters provide a multitude of social, economic, and environmental benefits in comparison to typical subdivision development. Conservation areas provide ample opportunities for residents to interact with nature and wildlife. The majority of lots in a conservation subdivision are directly adjacent to a natural feature. An abundance of research exists demonstrating that proximity to nature increases a home’s value. Economic and social benefits are second, however, to the primary purpose for a conservation subdivision, protection, and enhancement of natural resources. A successful conservation development will support a diverse and resilient assemblage of species, become a haven for birds and animals, attract Monarchs and other pollinators, recharge groundwater through enhanced rainwater infiltration, and sequester carbon at a greater rate.



4.3 PRAIRIE AREAS

Prairie areas offer a unique set of rewarding recreational experiences but also require some effort to maximize diverse species establishment and health. The combination of woodland and prairie habitat offers homeowners living in conservation subdivisions with exceptional opportunities to view wildlife and a constantly changing landscape brought on by the change of seasons.

4.3.1 OUTLYING VS. INTERNAL AREAS

To establish prairie in outlying area (non-residential, public spaces including out lots), it is recommended to hand-broadcast seeds or use a specifically designed native seed drill with an appropriate seed mix. It is important to target areas outer edges, property boundaries, areas near walkways and roads where salt is commonly applied in the winter months. A high-density seed mix prairie species containing flowering species with a wide range of blooming times should be applied around walkways. Areas under tree cover should be seeded with a savanna species mix, again emphasizing flowering species but maintaining diversity and high plant density.

Internal areas (within individual developable parcels) should have shorter vegetation in comparison to the outlying border areas. It is recommended that a variety of showy native flowering species be

seeded at the first appropriate seasonal window, as soon as heavy equipment is off the internal area. For establishing native prairie species, seeding should NOT occur during July through October in this region. A temporary cover crop of the non-weedy annual species of seed oats, winter wheat, or similar, may be needed to stabilize and cover construction areas until the next appropriate native seeding period occurs. Immediate vegetation establishment is important in keeping weeds from germinating after construction, and in preventing erosion.

4.3.2 SITE PREPARATION

Site preparation must include identification and appropriate removal of invasive plants and to the extent possible, and dormant seed bank. Agricultural weeds or old field conditions should receive a minimum of two broadcast herbicide applications followed by a third spot spray application where needed. If significant seed bank is present, a third and even a fourth broadcast herbicide

application of suitable chemical should be applied. Timing between applications must be sufficient to allow for new growth as well as consideration of environmental condition conducive or nonconductive to seed bank germination. All seed should be locally sourced to the extent possible to utilize local ecotype advantages and should be from the previous year's harvest. A reputable and established seed source is critical.



4.3.3 YEAR 1

Application of native prairie seed to a prepared field must maximize seed/soil contact, however, many native seed cannot be planted more than 1/8" deep into the soil as some species rely on photo-germination. A highly fluffed seed bed may result in rapid dry-out, however, therefore the seed bed should be rolled or cultipacked appropriately. A native seed no-till drill is often the preferred method of seed delivery, however, if the conditions are correct, broadcast seeding is also a highly effective method. Application of seed can be conducted during late fall to early winter, allowing for cold stratification to increase first year germination rates, or in the spring to early Summer, no later than July 1st.

During the first growing season, it is common for weeds to sprout. Consistent monitoring and the removal of weeds is necessary to prevent significant shade from forming on desirable species. In larger areas and areas where a



diversity of native plants is desired, mowing should occur regularly throughout the first season. Mowing must be conducted regularly to avoid a buildup of mowed thatch material that will hinder perennial plant establishment. For small and/or limited diversity areas, weed management through hand weeding may be desirable for maintaining an abundance of flowering plants for an attractive landscape. Vegetation management should be conducted by qualified technicians familiar with both native plant and weed species identification. Monitor the seeded area for invasive species such as alfalfa, bird's foot trefoil, quackgrass, brome, etc. and treat with herbicide as needed.

4.3.4 YEAR 2

In the early spring, mow all seeded areas and continue to monitor for weeds and damage. Targeted spot-mowing and spot-treatment with appropriate herbicide in areas as needed. For any high-diversity prairie establishment, mowing throughout the second growing season is commonly conducted by qualified prairie establishment technicians. General mowing must be height-adjusted to avoid any thatch buildup. Areas that have been damaged or are not developing as expected should be evaluated and re-seeded. Continued monitoring and removal of tree seedlings is encouraged.

4.3.5 YEAR 3

Controlled burning of prairies is an excellent tool for managing weeds and promoting native plant growth. Burning may be appropriate within the natural areas of Hayden's Preserve subdivision and can safely be conducted near residences by qualified professionals. If a prescribed burn is necessary, which can be determined by a qualified environmental professional, ensure that only experienced

crews with National Wildfire Coordinating Group (NWCG) training conduct the burn. The contracting group must have all relevant insurance policies and permits in place prior to burning.



Following the 3-year establishment period, prairies should be regularly evaluated by a knowledgeable individual for weed encroachment, erosion, or other issues so that any maintenance needs can be completed early, rapidly, and

efficiently; non-native weed species can overrun an established prairie in a matter of 1 season if not identified and managed early.

A well-established native prairie will feature a diverse mix of species. Plants will be present in irregular spacing and have a showy mix of yellow, orange, purple, and light blue hues. A diverse mix of species will attract a variety of insects and pollinators, provide water quality and other ecosystem services, and can be maintained at a fraction of the cost of large turf areas.

4.4 WOODLAND AREAS

It is highly recommended that only native tree species are planted on the site (Division VI. Section 23.603. (1)(f)(v)). Native tree species feed into the native landscape story for this subdivision and aid habitat establishment. Planting trees in prairie areas is discouraged because it will lead to ongoing increased management through the need for tree seedling removal. Recommended tree and shrub species are bur oak, white oak, swamp white oak, hazelnut, eastern wahoo, and service berry. When planting trees in Hayden's Preserve, ensure that trees are planting in an informal, irregular pattern (Division VI. Section 23.603. (2)(f)(vi)). This avoids the typical urban appearance that regular spacing evokes. A grove of native trees is proposed to the east of Lot 7 near the crest of a natural hill.

Desirable tree species should be hand planted using a hydraulic auger or hand-shoveled for soil preparation. Larger sized "root pruned" grown saplings will be used vs bare root stock whenever possible for deer and rabbit control. Tree tubes primarily, but in addition to wire fencing where appropriate, should be implemented to minimize tree destruction through herbivory or deer rubbing. Weed competition and burrowing animal damage can be reduced through ring applications of broad-spectrum herbicide around each tree/shrub during early years of establishment.

Weed fabric is not recommended, but mulching can be completed in high visibility areas in conjunction with ring applications. Planting timing is also a critical factor; dormant fall or dormant early spring plantings are highly recommended to maximize root set during early spring wet periods.

Undesirable tree species, or species that can re-seed profusely and dominate a landscape, should be avoided. Examples of these species are amur maple, flowering pear and bradford pear, Norway maple, tartarian maple, sugar maple, and little leaf linden. It is also recommended to avoid crabapples, ginkgo, and Hornbeam.



A healthy woodland area will be free of undesirable trees and shrubs. Once leaves have fallen for the season, the understory should be virtually colorless; remaining green vegetation is likely an invasive species. There should be sufficient oak leaf component to initiate a successful prescribed burn along the floor of the woodland area to promote a native savanna ecosystem. A thriving woodland provides excellent habitat for many birds, deer, and other small animals.

4.5 WETLANDS & DRAINAGE AREAS VEGETATION

Stormwater ponds are designed to help hold stormwater runoff while filtering out sediments and contaminants in the water before discharging it into a natural water body or stream. They also aid in the prevention of flooding and help protect adjacent water, streams, lakes, or rivers from nutrient and sediment contamination.

Due to increasing urbanization, more impervious surfaces are created, such as rooftops, parking lots, and sidewalks. These surfaces allow stormwater, often laden with chemicals, hydrocarbons,

and excess nutrients, to runoff the landscape quickly instead of infiltrating into the ground. This creates the need for stormwater management practices.

The conservation subdivision ordinance for the City of Ames requires minimizing impervious surface coverage where applicable. Not including lawn areas, which are generally considered permeable surfaces if adequate soil preparation is completed prior to laying sod. Hayden's Preserve will feature an abundance of open, pervious areas in the form of riparian corridors, native prairies, stormwater wetland, drainage swales, and woodland areas. By meeting the ordinance's requirement of at least twenty-five percent open space in the entire subdivision, impervious surfaces are dramatically reduced. Additionally, homeowners are encouraged to install stormwater best management practices on their own property to further reduce impervious surface runoff. Permeable pavers should be encouraged instead of concrete for driveways and patios where feasible. In areas with a high-water table, permeable pavers may not function well and generate stormwater runoff equally in comparison to traditional concrete driveways.



Hayden's Preserve will manage stormwater meticulously; stormwater shedding off an individual lot will collect in a drainage swale before eventually being routed to one of many stormwater wetlands. This process, known as a stormwater treatment train, enables stormwater to be purified in the process of conveyance. The stormwater wetlands will release cleaner water into the storm sewer system at a controlled rate, which prevents flash flooding.



Stormwater wetlands and drainage areas are often planted with appropriate species that encourage rainwater infiltration and promote habitat and vegetation diversity. Within the required fifty-foot native vegetative buffer around open water areas (Division VI. Section 23.603. (2)(a)), selecting species that are tolerant to standing water and highly adapted to wet soils is key to lasting success of vegetation in these areas. Consult an urban conservationist or native landscape professional with experience in wetland plantings to protect investments regarding native or non-native species planted in wetlands or drainage areas.

4.6 ESTABLISHMENT DURING CONSTRUCTION

While the timing of establishment of prairie or wetland vegetation may seem most logical as construction is actively occurring, establishment may be inhibited without careful attention to sediment and erosion controls and soil compaction. As a rule of thumb, it is recommended that existing vegetation in the subdivision remains intact until necessary, or not disturbed at all, in the



development process (Division VI. Section 23.604. (2)(f)(i)). Leaving soil undisturbed will decrease erosion and sedimentation of stormwater wetlands and drainage areas and can lessen environmental impacts to newly seeded prairies if they are downstream of construction activities. Existing natural features, including trees, prairie plants, wetlands, or riparian vegetation, that are deemed to be appropriate and healthy

by a conservation professional must be maintained in their present condition (Division VI. Section 23.603. (2)(e)(v)). Soil compaction must be avoided within the dripline of any trees that are to be preserved.

Any stormwater wetland, drainage area, or newly established prairie should be protected by a silt fence or straw wattle during construction. Too much rainwater and sediment runoff can dramatically increase the attrition rate of plant plugs and decreases the density and coverage of a seeded area in the following growing season. Weekly inspection and maintenance of erosion and sediment controls is necessary to keep fragile vegetation protected. If any practice appears damaged or not functioning properly, consult the general contractor immediately. In Iowa, all sediment and erosion controls are required on all construction sites greater than 1 acre, or if development of the lot is part of a subdivision that is greater than 1 acre in total. This is case for Hayden's Preserve.

Similar to erosion and sediment control maintenance, weed control will be required throughout the construction process. Not continuously managing for weeds during this time with lead to a longer and less physically attractive environmental feature, which creates considerably more management and labor expense.

4.7 ESTABLISHMENT POST CONSTRUCTION

Establishing a natural prairie landscape post-construction is considerably different than allowing lawn growth and seed to establish during construction and then managing using broad-leaf pesticides. In establishing a prairie habitat, weeds in the area must be kept under control with mowing or spraying treatments occurring as construction develops. Using a broad-leaf herbicide to spot spray for weeds will damage prairie species amongst the weedy species, so use caution to avoid spraying native species. Applicators should be able to identify weeds versus native species that were intentionally planted or seeded.

For newly planted trees, either open or woodland understory areas, supplemental watering may be warranted and recommended for any larger plantings (ball and burlap) or non-native varietals, or plantings conducted during spring or summer periods. Slow-release tree water bags are recommended for these situations, particularly during dry periods. For water conservation, homeowners in the Hayden's Preserve subdivision should consider water cisterns for collection from down spouts where appropriate. These must be disconnected, drained, and taken "off-line" during fall and winter periods to avoid freeze damage.

Most plantings in Iowa are extremely likely to incur deer browsing, rubbing, or other rodent or animal damage. For these reasons, 60" or taller tree tubes with bird netting are recommended on all tree plantings. Tubes may or may not be appropriate for shrub species depending on growth habitat. Wire caging is an acceptable, though higher-maintenance, alternative. To decrease rodent damage and competition in sunny areas, 1 to 2 ring spray applications of a broad-spectrum herbicide is recommended surrounding the tree tube until trees are 60" or greater in height.

5.0 LONG-TERM MAINTENANCE

5.1 PURPOSE

Long-term management is essential for the health of the prairie, wetland, and woodland areas located at the Hayden's Preserve subdivision. Once established, all natural areas should receive an annual habitat assessment by an ecologist to ensure that invasive species, weeds, tree species, mowing, and tree growth are being managed appropriately and resources for maintaining natural areas are consistent in perpetuity (Division VI. Section 23.6045 (2)(a)(v)).

5.2 PRAIRIE AREAS

A healthy prairie should have minimal weed encroachment. A prairie may have tree seedlings encroaching on the habitat. An annual initiative to remove shrub seedlings and tree seedlings should be inspected and facilitated by a natural resource specialist, biologist, or ecologist. The encroaching seedlings can be removed by hand, mechanically, or in the form of a prescribed fire burn. Prescribed burns are typically conducted on a three-year rotation, usually in early spring, but fall is also acceptable if weather conditions permit.

Any areas of bare or sparsely populated ground should be re-seeded with a prairie-specific seed mix or planted with live prairie plugs or plants that are native to the region, as recommended by a landscape architect, natural resource specialist, biologist, or ecologist.



5.3 WOODLAND AREAS

During or after construction, invasive tree species can be removed in a variety of methods dependent on the level of infestation. Timber Stand Improvement (TSI) is an umbrella term used for a wide variety of applied ecological practices that benefit the health, vigor, composition, regeneration, mast production, and aesthetics of a forested stand. The following methods are recommended for improving woodland areas: basal bark herbicide application, girdling, mechanical mastication/mulching, and noncommercial thinning.

In the understory of the woodland savanna areas, mowing may be performed annually if a prescribed fire burn has not been administered. In general, mowing should occur in late spring to allow winter cover to remain in place for animal benefit and to provide more physically appealing landscape during the dormant season. Identification and removal of invasive woodland understory plants should be conducted annually by a qualified arborist, forester, or conservation professional. This activity becomes critical for woodland health if annual mowing or burning is not conducted.

5.4 WETLANDS & DRAINAGE AREAS

Areas along edges of stormwater detention ponds will need long-term maintenance as well. A regular maintenance program can be implemented and used to ensure the ponds continue to function properly. For those residing in the subdivision, it would be advisable to schedule an annual meeting with neighbors and discuss the importance of maintenance of the stormwater pond.

Use native species with a broad moisture tolerance to encourage drainage and overpower weeds in drainage areas. Having vegetation on a broad range of moisture regimes across the site will lead to better habitat establishment because many animal species require a variety of habitat through growing season.



A successful stormwater wetland provides continual treatment of pollutants through a slow settling process over time. While sedimentation of the wetland is inevitable in the long-term, there are proven methods for slowing down the rate of sediment entering and filling the waterbody. A pre-treatment forebay should be considered, which is designed to capture the heaviest sediment load as water enters the system. If dredging is

needed to improve the function of the wetland, dredging only the forebay is easier and more cost effective. Stormwater wetlands should be surrounded with a buffer of native vegetation. This buffer serves to uptake nutrients before they enter the wetland. Dense vegetation surrounding the wetland will also detract geese from utilizing the pond. Excess nutrients in the wetland can also spur harmful algae blooms. Algae blooms prohibit light from entering the surface and removes oxygen from the water, which can impact aquatic life and strangle aquatic vegetation.

5.5 RESIDENTIAL LAWN AREAS

Hayden's Preserve is a conservation subdivision that calls for enhanced environmental features in all areas, including on the lawns of private landowners. Homeowners can add to the overall conservation of natural resources in the subdivision in a variety of ways. Stormwater practices such as rain gardens or native plant gardens are low-cost, easy ways of incorporating conservation at the residential lot level (Division VI, Section 23.604, (2)(c)(v)). Where appropriate, a curb can be cut to divert stormwater into the drainage swale or rain garden to minimize the use of the storm sewer

system (Division VI. Section 23.603. (1)(c)(i-ii)).

Some homeowners will want some area of open, maintained lawn around the home. A common misconception is that all turf grass used for lawns are the same. Ideally, lawns in Hayden's Preserve should be planted with a rhizomatous tall fescue, also known as RTF. Ensure the correct RTF variety is used for lawn areas, as some varieties can outperform others in terms of root growth and water infiltration. Proper RTF seeding and resulting maintenance (e.g., mowing) can result in less over-seeding, fewer weed problems over time, and decreased clumps of wide-leafed grasses.



Conservation also entails conserving water, especially high-quality potable water. RTF's will require substantially less water than bluegrass or rye lawns because of a deeper root system. RTF's extensive root system can draw moisture from a deep soil profile, which helps it use less water and makes it adaptable in a wide range of soils. This hybrid variety of fescue has excellent heat and drought tolerance, with less irrigation. Finally, RTF's require little, if any, added nitrogen, potash, or phosphorus to remain vigorous. Fewer weeds, less water, and minimal nutrient application will result in less herbicides (Division VI. Section 23.603. (1)(f)(xii) citing Ord No. 4042, 8-10-10), irrigation runoff, and nutrients in stormwater detention ponds and the entire watershed.

Another stormwater management practice to reduce runoff and improve infiltration on residential lawns is soil quality restoration (SQR), which effectively decreases the imperviousness of the lawn. SQR is the process of restoring the natural infiltration of a soil profile through deep-core aeration, overseeding, and applying high-quality compost to the entire lawn area. This process opens up the soil profile and increases available organic matter in the soil. A healthy lawn with high microbial activity requires less water for irrigation and less fertilizer for establishing a weed-free landscape. The City of Ames' Stormwater Program incentivizes residents to complete SQR on their property by offering cost-share for this practice.

5.6 COORDINATION WITH LAWN CARE PROVIDERS

Prairie and woodland management are highly specialized skills that are not common amongst most commercial lawn care providers. This commonly leads to issues with herbicide overspray during broadleaf weed 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 that minor penalties can be (and have been) seen as less expensive of a cost than taking time to mow carefully. Placing physical borders near lawn-prairie interfaces is one of the most effective methods of preventing mowing damage and requires much

less maintenance than fencing.

5.7 LANDSCAPING BORDERS

Research has shown that paved edges, fencing, signage, etc. silently send a message that the landscape is designed and intentional, not just a case of someone neglecting to maintain an area.

This Plan recommends that the internal prairie areas between parallel lots be delineated by spaced landscaping, such as large field stones or boulders. Boulders serve as a type of zero maintenance “fencing”, can be spaced broadly apart, bring the historical “glacial erratic” narrative to the site, allows seating for the watching of birds and butterflies, prevents the accidental mowing of the prairie ecosystem, and are heavy enough to prevent re-location. Other types of “natural” landscaping borders could include rows of fast-growing native shrubs or simply a four- to six-foot mowed buffer around prairie areas. A clean, mowed border along the shared use path system (Division VI. Section 23.603. (2)(d)(i)) is desirable.

Landscaping borders can aid in “lot creep”, which is a phenomenon where parcel boundaries encroach into neighboring conservation areas over time. Solutions to preventing lot creep can include decorative fences, as described previously, monuments, or other hardscaping elements. In many of the proposed lots in Hayden’s Preserve, twenty-five to over thirty percent grade slopes are planned, which can establish a parcel line sufficient to prevent lot creep. A bi-annual survey of parcel boundaries via a geographic information system (GIS) aerial imagery can also be completed to observe encroaching boundaries. Imagery required for this procedure can be easily obtained using a small, unmanned aircraft system (SUAS), otherwise known as a drone.

6.0 PUBLIC OUTREACH & EDUCATION

6.1 PURPOSE

People who are unfamiliar with native landscapes often have a negative reaction to what can appear weedy when compared to traditional lawn landscaping. This reaction is especially present during establishment years. In addition, some people simply 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 an accurate and realistic interpretation of these natural areas, the outreach and education recommendations in the subsequent subsections should be considered along with information available on the Hayden’s Preserve Subdivision website (www.haydenspreserve.com).

6.2 EDUCATION

Signage should be present onsite, with temporary explanations during establishment and more permanent once the site is developed. Educational signage should also include a QR code for access to the conservation subdivision website and the GIS learning tool.



It is encouraged that the signs highlight the natural landscape as historic, and in scarce supply, such as in the case of milkweed for a butterfly garden. A sign with phrasing such as “during establishment of prairies, first year they sleep, second year they creep, third year they leap” convey the public need for patience. Education continues to be important through the multi-year process. This is when patience can wane in those unaccustomed to the timeframe needed to establish a 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.

Conservation subdivisions require that all conservation areas must be part of a continuous and integrated system of open space, which is commonly referred to as a greenway (Division VI. Section 23.603. (1)(e)(iii)). Greenways make excellent locations for interpretive signage along multi-use trails that connect the subdivision to the larger trail network in Ames.

6.3 PUBLIC OUTREACH

It is also important to invite residents and community members to the physical space by holding onsite meetings. These meetings should be advertised to both the public and the new homeowners to provide opportunity for questions and comments.

Once prairie is established, schedule walking tours around the natural areas with a knowledgeable ecologist. Inform those in attendance of the Hayden’s Preserve Area website and other social media news sources that contain current information updates and access to deeper explanation of the best practices for managing the conservation areas.



Consider interviewing previous landowners for an oral history of the site and to gain a historic perspective and include this information on education signage and/or on the website and social media accounts. Old photos could be useful for website development.

Sometimes invasive species management through sheer numbers is a good approach, as is the case with garlic mustard. Easy to identify and easy to pull, utilizing the public to assist in control of garlic mustard before its populations overwhelms native understories can be satisfying and productive. Weedy brush management prior to herbicide application can also be a good opportunity for public engagement.

An official Education and Outreach plan for the Hayden’s Preserve is required once the final plat has been approved (Division VI. Section 23.604. (2)). Routine updates as to the progress of the subdivision can be monitored at www.haydenspreserve.com.

Exhibit A - Phase I

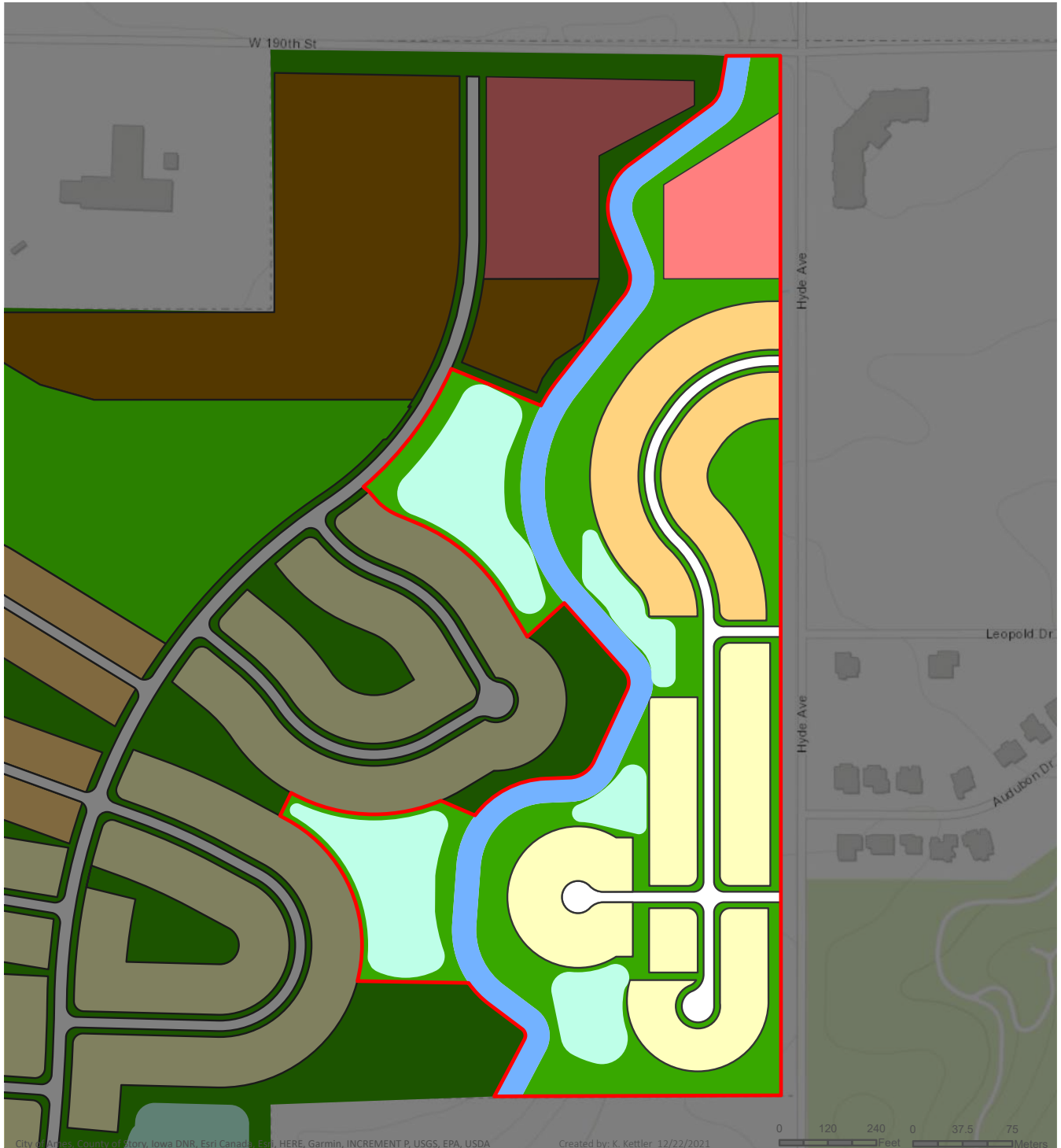


Exhibit A
Phase I
Hayden's Preserve
 Ames, Iowa

Management Areas			
 Phase 1	 Creek With Vegetation Buffer	 General Service	
 Stormwater Wetland	 Single Family Detached	 Single Family Attached	
 Open Space			



Exhibit B - Phase I Lots

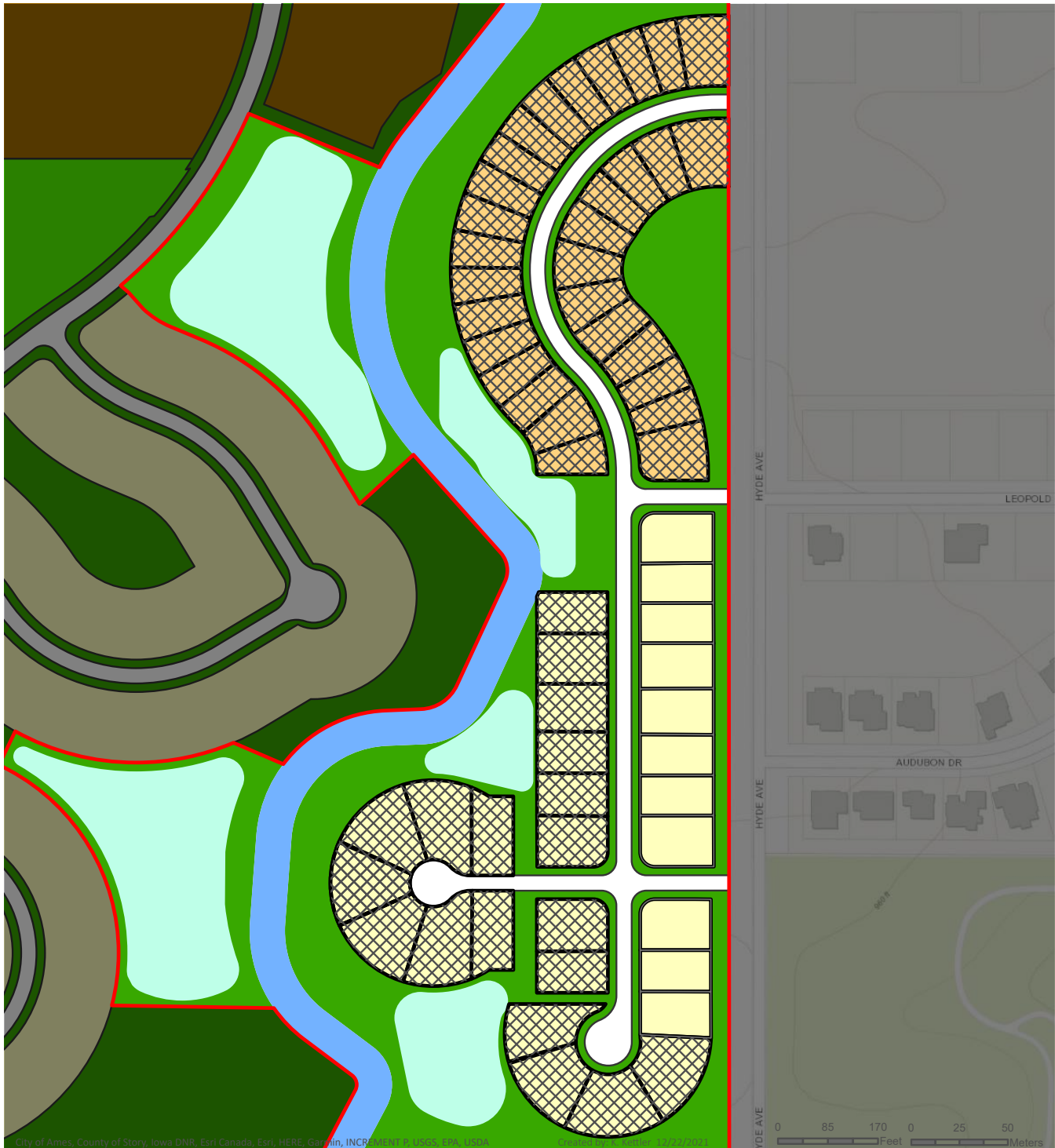


Exhibit B
Phase I Lots
Hayden's Preserve
 Ames, Iowa

 Phase 1	Management Areas	 Single Family Detached
 Creek With Vegetation Buffer		 Single Family Attached
 Stormwater Wetland		 Lot Abutting Conservation Area
 Open Space		



Exhibit C - Phase I Acreage

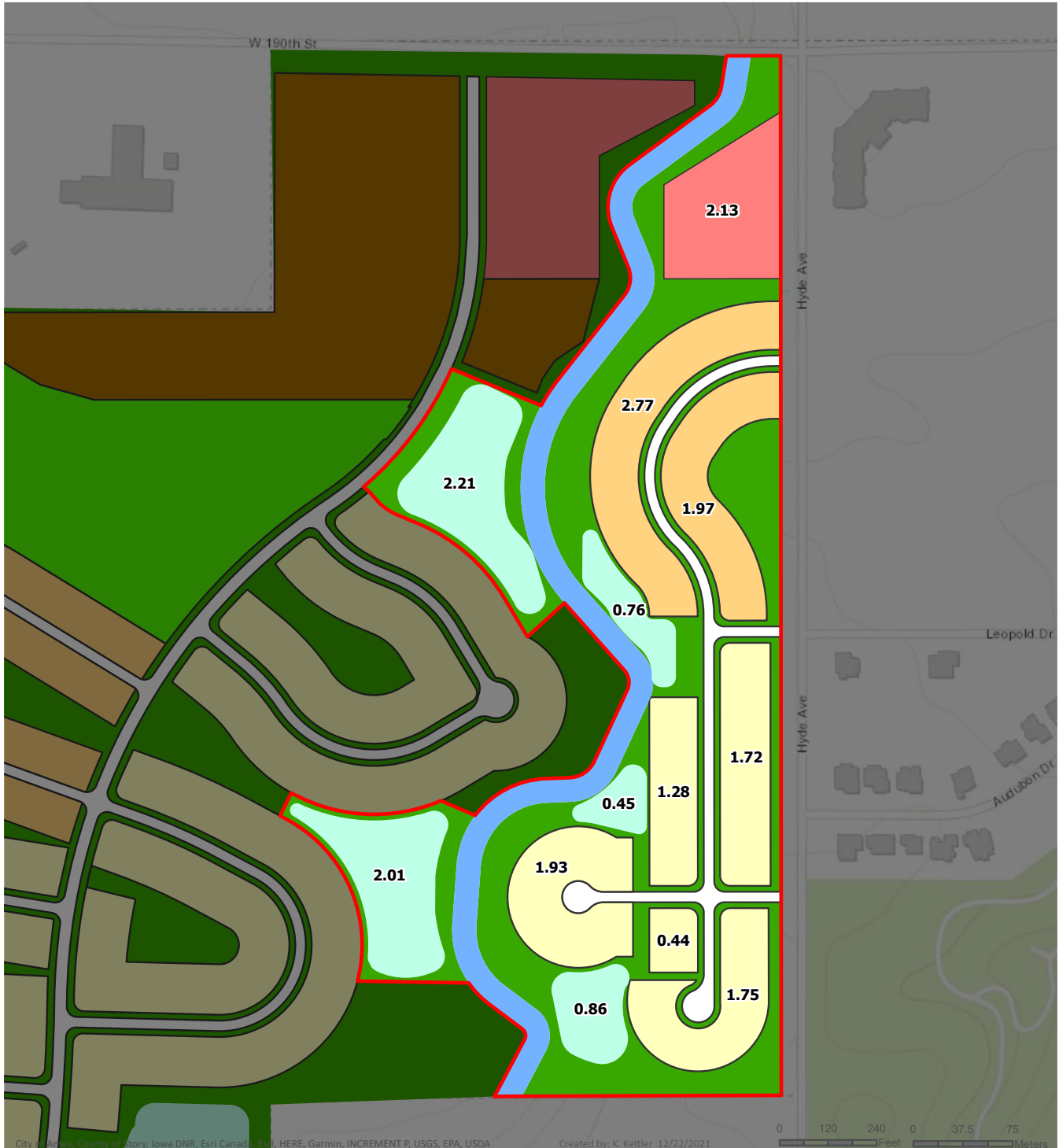


Exhibit A

Phase I
Hayden's Preserve
Ames, Iowa

Management Areas (Acres)			
 Phase 1	 Creek With Vegetation Buffer	 General Service (2.13)	
 Stormwater Wetland (6.29)	 Single Family Detached (7.12)		
 Open Space (11.98)	 Single Family Attached (4.74)		





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