# Dairy-McKay Confluence Natural Area

## Approvals for Site Conservation Plan

Date routed for final signatures:

*Please return to Lori Hennings (Primary Metro staff: Elaine Stewart)*

**Jonathan Soll**

Signature _____ _____ Date 6-4-2020_____

**Justin Takkunen**

Signature _____ Date 6/16/20

**Rod Wojtanik**

Signature _____ _____ Date _____May 22, 2020_____

**Dan Moeller**

Signature__ Date ____June 2, 2020_____

**SITE CONSERVATION PLAN**

# Dairy-McKay Confluence Natural Area



October 2019

Metro

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## TABLE OF CONTENTS



**Maps**



**Appendices**

# DAIRY-MCKAY CONFLUENCE NATURAL AREA

## INTRODUCTION

The Dairy-McKay Confluence Natural Area covers approximately 100 acres at the confluence of Dairy Creek and McKay Creek in Washington County (Map 1). This site conservation plan (SCP) lays the conceptual groundwork for the long-term restoration and management vision for the Dairy-McKay Confluence Natural Area. It describes historic conditions, existing conditions, key ecological attributes, conservation targets, threats and stresses, and management priorities for a 10-year time frame. The SCP also considers the planning area relative to surrounding lands and adjacent conservation properties.

The vision for the Dairy-McKay Confluence Natural Area is a diverse, mature floodplain and riparian forest dominated by large native trees. The property will provide ecological and hydrologic functions such as shade for stream temperature control; foraging, breeding, and wintering habitat for wildlife; migration and nesting habitat for songbirds; flow attenuation and storage; and enhancement and maintenance of biodiversity in the Dairy Creek watershed. Native plants will dominate the site's vegetation communities. Invasive species will be such that they do not interfere with achieving goals for conservation targets. Riparian vegetation will provide organic matter and natural wood recruitment for the stream. Oregon white oak trees will co-occur in the riparian habitat and upland areas. Stream channel conditions will be dynamically stable (i.e., without excessive erosion or degradation but subject to natural changes in morphology) and sufficiently complex to provide floodplain connectivity, flood attenuation, and high-quality aquatic habitat. Seasonal ponds that may form on the floodplain will provide habitat for native insects, birds, amphibians, and possibly turtles. These conditions will be enhanced wherever feasible.

The site currently provides valuable migration corridor for salmonids and other native fishes. In the future, artificial drainage installed for agriculture will have been disrupted, reinstating a longer hydroperiod and the ability of floodwaters to restore groundwater reserves.

To achieve this vision, the SCP establishes the following priority goals:

- Enhance and restore floodplain and riparian forest conditions that reflect stable plant communities currently existing on the site and in the surrounding landscape.
- Maintain floodplain connectivity with both Dairy and McKay Creeks.

### Metro–Clean Water Services Restoration Partnership

The SCP describes the overall goals of enhancement and stewardship efforts at the Dairy-McKay Confluence Natural Area to be implemented by Metro in partnership with Clean Water Services (CWS). This partnership was created when Metro granted CWS rights to the site for ecological enhancement, particularly CWS' riparian program. The grant of rights is recorded with Washington County and legally establishes that both partners are able to participate in ongoing work at the Dairy-McKay Confluence Natural Area.

See CWS's ecological enhancement plan (EEP) for the Dairy-McKay Confluence Natural Area for specific management activities planned for the natural area (CWS 2019). The EEP guides CWS' future work for the life of the agreement between CWS and Metro and provides detailed management actions, timing, and costs for habitat enhancement activities conducted by CWS. Aspects of both the SCP and the EEP for the Dairy-McKay Confluence Natural Area have been written as adaptive. For example, although the SCP and EEP provide acreages for conservation targets (riparian forest and bottomland forest), the size of these target habitats may change over time. This SCP establishes goals and strategies for the next 10 years.

**CONTEXT**

The approximately 100-acre Dairy-McKay Confluence Natural Area is located north of State Route 8 between the cities of Cornelius and Hillsboro. The landscape surrounding the natural area is a mix of urban development, agricultural land, and open space. A rare break in the Urban Growth Boundary lies immediately south of Dairy-McKay (Map 1). The thin greenspace between Cornelius and Hillsboro provides perhaps the best north-south open space connection left through the UGB. This area, linking Jackson Bottom Wetlands to the Metro holdings and farmland to the north, may be critical for maintaining wildlife movement through the urbanizing area in the future.

Dairy-McKay and other sites in this target area provide a buffer between urban Cornelius and farmland to the north. The limits of residential development associated with Hillsboro are approximately 0.25 mile to the east and residences on the outskirts of Cornelius are 0.25 mile to the west (Maps 1 and 2). Farmland is located north of the natural area. An old railroad corridor crosses Dairy Creek just south of the confluence of Dairy and McKay Creeks; a multi-use trail is planned for the former rail corridor. The McKay Creek Golf Course borders the natural area to the east and the Killarney West Golf Course is located on the west side of Dairy Creek in the northwest portion of the site. Other adjacent parcels are a Port of Portland mitigation site, rural residential and agricultural land. The nearest U.S. Geological Survey station is at river mile 2.0 on the main stem of Dairy Creek. This gauging station is approximately 1.75 miles from the site.

The Dairy-McKay Confluence Natural Area lies within the southern portion of the Dairy-McKay watershed, which drains 231 square miles in the northern part of the Tualatin River basin (Hawksworth 1999). The lowest elevation in the watershed is 115 feet where Dairy Creek joins the Tualatin River at river mile 44.7, about 1.5 miles south of the site. Mountainous terrain covers the watershed's northern portion, which reaches an elevation of 2,265 feet. Approximately 20 percent of the mountainous terrain in the upper watershed has slopes that exceed 30 percent (Hawksworth 1999).

Major streams that drain the Dairy-McKay watershed include Dairy Creek, West Fork Dairy Creek, East Fork Dairy Creek, and McKay Creek. Dairy Creek is formed north of Hillsboro where the east and west forks join; Council Creek is a major tributary. McKay Creek originates north of North Plains and is fed by Neil Creek, Jackson Creek, Storey Creek, and several unnamed tributaries. McKay Creek joins Dairy Creek at the southern end of the site.

## PLANNING AREA

The Dairy-McKay Confluence Natural Area is the largest Site in this target area. It consists of the Wetter Trust parcel, acquired in 2007, and the Hoyle parcel, acquired in 2016 (Table 1). Metro completed a small lot-line adjustment along the eastern boundary of the natural area in 2016. Most of the site has been leased for agriculture and farmed for annual crops. The lease ended in December 2019.

Dominant current cover types on the natural area include farmland, fallow fields, and sparse riparian forest.

**Table 1: Properties composing the Dairy-McKay Confluence Natural Area**

| PROPERTY NAME | APPROXIMATE ACREAGE (DATE OF ACQUISITION) |
|---|---|
| Wetter Trust parcels | 89 acres (2007) |
| Hoyle property | 14 acres (2016) |

The primary access point to the Dairy-McKay Confluence Natural Area is from NW Cavens Lane at the northeast end of the site.

## KEY METRO STAFF

- Elaine Stewart, scientist
- Nathaniel Marquiss, natural resource technician
- Marsha Holt-Kingsley, native plant materials scientist
- Olena Turula, parks and nature planner

## KEY PARTNERS

- Clean Water Services - Robert Emanuel, Water Resources Project Manager

## KEY PRIVATE LANDOWNERS

- Dan and Marybeth Self: (503) 642-9180

## EXISTING PLANNING DOCUMENTS

The following documents inform this plan:

- Target Area Assessment for Dairy-McKay Creeks Confluence
- Natural Areas Acquisition Refinement Plan for the Dairy and McKay Creeks Confluence Target Area (Metro 2007)
- Wetter Parcel Stabilization Report, 2007
- McKay Creek Property, Phase I Environmental Site Assessment, 2012
- Hoyle Parcel Stabilization Report, 2016
- Parks and Nature Portfolio Report, 2011
- Parks and Nature System Plan, 2016

## EXISTING CONDITIONS

### PHYSICAL ENVIRONMENT

The Dairy-McKay Confluence Natural Area consists primarily of a flat to undulating floodplain at the confluence of Dairy Creek and McKay Creek. Elevations on-site range from 130 feet above sea level at the south-central portion of the site to 180 feet at the north end.

#### Geology

The geology of the Tualatin Valley, including low-lying plains such as the Dairy-McKay Confluence Natural Area, consists of Columbia River basalt with alluvial fill. The natural area is situated on a broad floodplain underlain by recent flood deposits.

#### Hydrology

The Dairy-McKay watershed is a wet region, with precipitation in a normal year ranging between 39 and 51 inches (NRCS 2019). Dairy Creek, which runs along the entire length of the western border of the natural area from approximately river mile 2.2 to river mile 3.1 (4,700 feet), is a low-gradient, sinuous stream with a longitudinal slope of approximately 1 to 2 percent. McKay Creek, which flows along the southern border of the natural area for approximately 250 feet, is also a low-gradient, highly sinuous stream. Both Dairy Creek and McKay Creek are single-thread streams with steep banks and cohesive soils.

Historical vegetation maps (Maps 3 and 4) and the presence of hydric soils across the site (Map 5) confirm riparian and floodplain hydrology. Portions of the site are flooded for several weeks during the winter, and sometimes exhibit waterlogged soils long into the mid-summer. Signatures of saturated soils are visible on aerial imagery in the south-central portion of the site, where poorly drained soils are mapped (Cove silty clay loam and Wapato silty clay loam) (Google Earth 1994–2019). Floodwaters typically back into the site from the confluence or occasionally overtop the banks of Dairy Creek.

Lower Dairy Creek (river miles 0 through 10.1) is water quality limited for several parameters: temperature, biological criteria, chlorophyll a, heavy metals, toxic substances, and *E. coli* (ODEQ 2012). Analysis from water quality samples at the U.S. Geological Survey station at river mile 2 indicates that total maximum daily loads for iron and lead are needed. Total maximum daily loads for *E. coli*, ammonia, phosphorus, and temperature have been approved for Dairy Creek (ODEQ 2012). The organic fluvial deposits along Dairy and McKay Creeks have high phosphorus content (Hawksworth 1999); therefore, the phosphorus is likely naturally occurring. Upstream land management practices and conditions such as agricultural uses, residential septic systems, road runoff, and reduced forest cover likely contribute to water quality exceedances.

## Soils

Soils are fine-grained, primarily silt and clay, and fluvially deposited. Mapped soil units are described in Table 2 (NRCS 2019) and are shown in Map 5 in Appendix A.

**Table 2: Mapped soil units and general descriptions for the Dairy-McKay Confluence Natural Area.**

| MAP SOIL SYMBOL | MAP UNIT NAME | DESCRIPTION | ACRES IN NATURAL AREA |
|---|---|---|---|
| 9 | Chehalis silty clay loam, occasional overflow | Well-drained soil on floodplains | 53 |
| 13 | Cove silty clay loam | Poorly drained soil on floodplains | 14 |
| 14 | Cove clay | Poorly drained soil on floodplains | 9 |
| 30 | McBee silty clay loam | Moderately well-drained soil on floodplains | 1 |
| 37B | Quatama loam, 3 to 7 percent slopes | Moderately well-drained soil on terraces | 1.5 |
| 43 | Wapato silt loam | Poorly drained soil on floodplains | 15 |
| 44B | Willamette silt loam, 3 to 7 percent slopes | Well-drained soil on terraces | 1 |
| 44D | Willamette silt loam, 12 to 20 percent slopes | Well-drained soil on terraces | 4 |
| | | **TOTAL** | **99** |

## MAJOR HABITAT TYPES

Current plant communities at the Dairy-McKay Confluence Natural Area include riparian forest, forested wetland, cultivated lands, degraded wetland, and formerly developed areas (Table 3).

**Table 3: Existing Plant Communities**

| PLANT COMMUNITY | DESCRIPTION | SIZE (ACRES) |
|---|---|---|
| Riparian forest | Includes a small amount of forested habitat in the southeast portion of the site not adjacent to a waterway | 9.4 |
| Bottomland hardwood forest | Oregon ash wetland along the western base of the knob | 9.4 |
| Agricultural | Actively farmed through 2019 | 65.7 |
| Agricultural | Fallow (wetland—degraded) | 13.6 |
| Formerly developed/upland grassland | Hoyle property | 1.0 |
| | **TOTAL** | **99.1** |

### Riparian forest

Riparian forest is present on-site along Dairy Creek, along a short segment of McKay Creek, and in a noncontiguous section of forested habitat. Because of past agricultural practices, riparian habitat along the streams has been diminished and ranges in width from approximately 20 feet to 50 feet. Dominant canopy trees include big-leaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), and Oregon white oak (*Quercus garryana*) with occasional red alder (*Alnus rubra*) and Douglas fir (*Pseudotsuga menziesii*). The understory is disturbed and consists of a mix of native and non-native species: thimbleberry (*Rubus parviflorus*), red-osier dogwood (*Cornus sericea*), common snowberry (*Symphoricarpos albus*), rose (*Rosa* spp.), and Himalayan blackberry and a few English holly saplings.

### Bottomland hardwood forests

A narrow band of forested ash wetland borders the noncontiguous section of riparian forest in the southeast portion of the site. Dominant species include Oregon ash and Pacific willow (*Salix lasiandra*) over a sparse understory of ash saplings and sparse ground cover of grasses and recently planted slough sedge. Douglas spiraea (*Spiraea douglasii*) is present in a few areas. Snags and down wood are limited. The standing dead trees and down wood that are present are small, short, and of low density.

### Emergent wetland

About 9 acres is mixed reed canarygrass (*Phalaris arundinacea*), rice cutgrass (*Leersia oryzoides*), sedges (*Carex* spp.) and other herbaceous plants. The rice cutgrass is abundant and an unusual component of emergent wetlands on unrestored Metro property, particularly in Washington County.

### Agricultural land

Agricultural land covers a majority of the site and includes wheat and other grasses grown for seed or hay. During a summer 2019 field visit, the wheat adjacent to the forested wetland in the southeastern portion of the site was noticeably stunted, likely because of prolonged saturation. This plant community also includes the fallow field in the northeastern portion of the site that was recently planted with native sedges and forbs. The fallow field is a mix of degraded wetland and degraded upland grassland.

### Previously developed land (Hoyle Property)

This parcel in the northeast corner of the site consists of weedy upland grasses and forbs. Dominant species are naturalized pasture grasses such as tall fescue (*Schedonorus arundinaceus*), orchard grass (*Dactylis glomerata*) and bentgrass (*Agrostis* spp.) with thistles (*Cirsium*), Queen Anne's lace (*Daucus carota*), Italian arum (*Arum italicum*), lesser celandine (*Ranunculus ficaria*), and other weeds. The latter two species are being managed.

## VEGETATION AND WILDLIFE

### Historical vegetation and land use

Historical vegetation maps compiled by Christy et al. (2011) and from General Land Office land survey documents describe indigenous Willamette Valley vegetation at the time of colonization. The Atfalati people actively managed the landscape with fire and played an important role in maintaining its features before the area was colonized. The General Land Office surveys indicate that pre-settlement vegetation at the Dairy-McKay Confluence Natural Area consisted of closed riparian forest and forested wetland with a small portion of closed upland forest at the northern end of the natural area. No archaeological surveys have been conducted on the site.

### Invasive plants

In addition to species listed above, invasive species present on-site include *Rubus armeniacus* (Armenian blackberry), *Ilex aquifolium* (English holly), *Hedera helix* (English ivy), and *Phalaris arundinacea* (reed canarygrass). Himalayan blackberry dominates portions of the Dairy Creek riparian forest and is found along McKay Creek as well.

### Wildlife

Waterfowl are frequently observed on site once the floodplain becomes inundated during the winter months. Species include tundra swans, Canada geese, and ruddy, teal, and pintail ducks. Other wildlife sightings include red-tailed hawk, deer, great blue heron, kingfisher, and muskrat.

During a June 2019 site visit, signs of beaver were evident in the noncontiguous forested area that abuts the golf course.

Forested riparian buffers support foraging, breeding, loafing, and movement for numerous species of birds, mammals, amphibians, and reptiles.

## RECENT MANAGEMENT HISTORY

Table 4 summarizes the management activities that have been completed or are ongoing.

**Table 4: Summary of past and ongoing management actions.**

| ITEM | ACTION | LOCATION | TIMELINE |
|---|---|---|---|
| Oak release | Girdle adjacent competing trees. | Along Dairy Creek | 2008 |
| | Monitor for re-treatment needs. | Same as above | Periodically |
| Reforestation | Plant native trees. | 2-acre field, previously farmed | 2009, winter |
| | Monitor and maintain. | Same as above | Ongoing |
| Weed control and revegetation | Mow/cut and spot-spray reed canarygrass that is competing with spiraea. | South end of Wetter Trust | 2008, spring–summer |
| | Cut and spray weed patches. | Riparian area, terrace forests | 2008, summer–fall |
| | Spray Italian arum and revegetate with native grasses (*Agrostis exarata, Deschampsia elongata, Danthonia californica,* and *Elymus glaucus).* | Hoyle property, uplands | 2016–2019 |
| | Cut, spray, and repeat-spray Himalayan blackberry. | Hoyle property, floodplain portion | 2016–2017 |
| | Cut and stump-treat exotic trees and shrubs. | Hoyle property | 2016–2017 |
| | Spray, mow, and re-treat reed canarygrass as needed. | 4 acres, Hoyle property | 2016–2017 |
| | Remove weeds from the understory and plant 625 containers and 10,000 plugs of *Carex obnupta, Cornus sericea, Rubus spectabilis, Symphoricarpos albus,* and *Thuja plicata.* | 5-acre portion of the ash-forested wetland | Fall 2017 |

## NATURAL RESOURCES OF SPECIAL INTEREST

Natural resources of special interest at the Dairy-McKay Confluence Natural Area include stands of Oregon white oak trees and emergent wetland plants such as rice cutgrass and sedges. Oak woodlands are relatively scarce in the Tualatin River basin and provide habitat for a variety of wildlife.

Dairy Creek provides habitat for steelhead trout, which migrate past Dairy-McKay and spawn in upper reaches and tributaries. Cutthroat trout and lamprey also occur in the watershed. Riparian and floodplain vegetation improvements will contribute shade and wood to Dairy Creek. Improved hydroperiods will recharge groundwater on which summer flows depend.

Special-status amphibian species associated with riparian and wetland habitats in the Dairy-McKay watershed include red-legged frog *(Rana aurora)*, tailed frog (*Ascaphus truei*), Cope's giant salamander (*Dicamptodon copei*), and Columbia torrent salamander (*Rhyacottriton kezeri*)

(Hawksworth 1999). Red-legged frogs are known to occur in the watershed and have been seen in the East Fork Dairy Creek and McKay Creek (Hawksworth 1999).

Sensitive avian species including pileated woodpecker and northern saw-whet owl are known to occur in the Dairy-McKay watershed (Hawksworth 1999).

## CONSERVATION

### CONSERVATION TARGETS

Conservation targets are composed of species, suites of species (guilds), communities, and ecological systems that represent and encompass the full array of native biodiversity of the site, reflect local and regional conservation goals, and are viable or at least feasibly restorable (The Nature Conservancy 2007).

Conservation targets for the Dairy-McKay Confluence Natural Area are listed below. These targets roughly conform to soil and elevation parameters and remnant or existing plant communities.

1. Riparian forest, including a nested target of upland habitat (approximately 5 acres)
2. Bottomland forest
3. Emergent wetland

Table 5 summarizes the current conditions and desired future conditions for each conservation target. Table 6 lists the current cover, conservation targets and status, and stewardship types in the natural area.

**Table 5: Nontechnical status and desired future conditions of conservation targets.**

| TARGET | CURRENT CONDITION | DESIRED FUTURE CONDITION |
|---|---|---|
| Riparian forest | Generally poor to fair, with a diminished band of mature trees along Dairy Creek. Habitat complexity is limited because of the narrow corridor. | Widen the existing riparian corridor and establish a diverse, mature riparian forest with pockets of Oregon white oak stands. Trees adjacent to the Oregon white oaks would be managed to prevent overcrowding or shading of the oaks. Upland forest habitat with oaks, Ponderosa pine and madrone; diverse shrub and herbaceous layer. |
| Bottomland forest | Bottomland forest is largely absent as a result of agricultural practices that have dominated the floodplain through the 2019 growing season. | An extensive, heterogeneous bottomland forest is envisioned for establishment in the floodplain with seasonal ponds and shrub-dominated areas. |
| Emergent wetland | Degraded and dominated with reed canarygrass. | Native-dominated wetland with sedges and rice cutgrass. |

**Table 6: Summary of current cover, conservation targets and status, and stewardship type**

| CURRENT COVER | ACRES |
|---|---|
| Agriculture | 65.7 |
| Developed (pervious/nonagricultural) | 1.0 |
| Emergent wetland (farmed) | 13.6 |
| Riparian forest | 9.4 |
| Bottomland hardwood forest | 9.4 |
| **Total** | **99.1** |

| CONSERVATION TARGET | ACRES |
|---|---|
| Riparian forest (with a 5-acre oak savanna/woodland) | 33.7 |
| Bottomland hardwood forest | 56.2 |
| Emergent wetland | 9.2 |
| **Total** | **99.1** |

| STEWARDSHIP TYPE | ACRES |
|---|---|
| Riparian forest | 28.7 |
| Wetlands (emergent and forested) | 65.4 |
| Oak savanna/woodland | 5.0 |
| **Total** | **99.1** |

| MANAGEMENT STATUS | ACRES |
|---|---|
| 0: Pre-initiation | 79.3 |
| 1: Initiation | 10.5 |
| 2: Establishment | |
| 3: Consolidation | 6.2 |
| 4: Refinement and maintenance | 3.1 |
| 9: No targets (developed) | |
| **Total** | **99.1** |

## KEY ECOLOGICAL ATTRIBUTES

Key ecological attributes (KEAs) are the features that define aspects of a conservation target's biology or ecology that, if missing or altered, would lead to the loss of that target over time (The Nature Conservancy 2007). KEAs define the conservation target's viability. They are the biological or ecological components that most clearly define or characterize the conservation target, limit its distribution, or determine its variation over space and time. They are the most critical components of biological composition, structure, interactions and processes, and landscape configuration that sustain a target's viability or ecological integrity. KEAs are rated as poor, fair, good, or very good. The rating helps establish the restoration goals and guide Metro in the development of restoration actions for the conservation targets. Tables 7a and 7b describe KEAs and their ratings.

## THREATS

An effective conservation strategy requires an understanding of threats (stresses) to targets and the sources of those threats. Adjacent development and subsequent disruption of natural systems place stress on the resource and its inhabitants and threaten the health of the greater ecosystem.

Numerous stressors influence current conditions at the Dairy-McKay Confluence Natural Area and threaten the long-term ecological health and viability of restoration treatments (Table 8). Persistent stressors are ongoing, including those derived from historical land conversion, clearing of riparian vegetation, invasive species, and residential and agricultural development on neighboring lands.

**Table 7a: Key Ecological Attributes for Riparian Forest at the Dairy-McKay Confluence Natural Area**

| CATEGORY | KEA | INDICATOR | ---------- INDICATOR RATING ---------- | | | | CURRENT RATING | DFC FOR THIS SCP | LONG-TERM DFC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | POOR | FAIR | GOOD | VERY GOOD | | | | |
| Condition | Vegetation structure | Percentage native shrub cover | Less than 10% cover | 10% to 25% cover | 25% to 50% cover | More than 50% cover | Poor | Very Good | Good | Overall, the understory is disturbed and dominated by weedy species. A few pockets of native shrubs are present: red osier dogwood, thimble berry, and common snowberry. |
| Condition | Vegetation structure | Percentage native tree canopy cover | Less than 20% cover | 20% to 30% cover | 30% to 40% cover | 40% or more | Poor | Good | Very Good | Current condition (2019) includes ash, maple, and oaks over a disturbed understory. |
| Condition | Native tree and shrub richness | Number of native tree and shrub species per 0.4 hectare (1 acre) | Fewer than five species | Five to 10 species | 10–15 species | More than 15 species | Fair | Very Good | Very Good | Add oaks to area identified as upland savanna/woodland (5 acres). |
| Condition | Standing and downed dead trees | Average number of snags and downed wood per acre; large log or snag = 20 inches in dbh | One or fewer snags of any size and less than 5% downed wood | Two to four snags 10 inches or more in dbh and 5% to 10% downed wood, including four log piles with six to eight small logs each (typically first thinning) | Average five to 17 snags 10 inches or more in dbh and 10% to 20% downed wood (any size) and one or more large logs per acre, with at least one large log per 6 acres (typically second thinning) | 18 or more snags 20 inches or more in dbh and more than 20% cover downed wood in a good variety of size and age classes | Poor to Fair | Fair | Very Good | Snags and downed wood are currently limited. The size and density of snags and downed wood are a relatively good indicator of suitable habitat for avian breeding habitat (cavity nesters) and for amphibians and fish. |

Notes: dbh = diameter at breast height; DFC = desired future condition; KEA = key ecological attribute; SCP = site conservation plan

**Table 7b: Key Ecological Attributes for Bottomland Forest at the Dairy-McKay Confluence Natural Area**

| CATEGORY | KEA | INDICATOR | ---------- INDICATOR RATING ---------- | | | | CURRENT RATING | DFC FOR THIS SCP | LONG-TERM DFC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | POOR | FAIR | GOOD | VERY GOOD | | | | |
| Condition | Vegetation structure: tree layer | Percentage native tree canopy cover | Less than 20% cover | 20% to 30% cover | 30% to 40% cover | 40% or more | Poor | Fair | Very good | A majority of the area proposed for restoration as bottomland forest has been farmed. A narrow band of bottomland forest (forested wetland) exists at the base of the knob adjacent to the golf course. |
| Condition | Vegetation structure: other layers | Percentage native cover | Less than 30% cover | 30% to 60% cover | 60% to 90% cover | 90% or more | Poor | Good | Fair | The long-term DFC is projected to be fair because of eventual shading of the herbaceous layer. The short-term condition is anticipated to be good because shade will be less of a factor. Pond-breeding amphibians are a target species for bottomland forest, where seasonal ponds are expected to establish among tree stands. Long-term, shading from the forest will make habitat less suitable for pond-breeding amphibians. |

**Table 7c: Key Ecological Attributes for Emergent Wetland at the Dairy-McKay Confluence Natural Area**

| CATEGORY | KEA | INDICATOR | ---------- INDICATOR RATING ---------- | | | | CURRENT RATING | DFC FOR THIS SCP | LONG-TERM DFC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | POOR | FAIR | GOOD | VERY GOOD | | | | |
| **Condition** | Native wetland plant cover in emergent area | Dominance of native herbaceous plants characteristic of the region's wetlands | <25% cover of vegetated areas | 25-50% cover of vegetated areas | 50-75% cover of vegetated areas | >75% cover of vegetated areas | Poor | Fair | Good | Estimate based on site walk. Based on page 44 in the Division of State Lands HGM-based assessment guidebook (Adamus and Field 2001). |

**Table 8: Summary of Threats at the Dairy-McKay Confluence Natural Area**

| CONSERVATION TARGET | THREAT (STRESS) | SEVERITY | SCOPE | OVERALL STRESS RANK | SOURCE | CONTRIBUTION | IRREVERSIBILITY | OVERALL SOURCE RANK | OVERALL THREAT RANK | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| Riparian forest | Reduced percent cover native shrubs | Very High | Very High | Very High | Conversion to agriculture | Very High | Low | High | Very High | Only a narrow band of riparian vegetation remains, but it can be revegetated. |
| Riparian forest | Reduced percent cover native trees | Very High | Very High | Very High | Conversion to agriculture | Very High | Low | High | Very High | Only a narrow band of riparian vegetation remains, but it can be revegetated. |
| Riparian forest | Reduced native tree and shrub richness | High | Very High | High | Conversion to agriculture | Very High | Low | High | High | Only a narrow band of riparian vegetation remains, but it can be revegetated. |
| Riparian forest | Lack of snags and down wood | High | High | High | Conversion to agriculture | Very High | Low | High | High | It will take many years to grow the trees that will become snags and down wood. |
| Bottomland forest | Lack of native tree canopy cover | Very High | Very High | Very High | Conversion to agriculture | Very High | Low | High | Very High | There is a small area of healthy forest, but most was in agriculture and will be planted. |
| Bottomland forest | Lack of native cover in other layers | Very High | Very High | Very High | Conversion to agriculture | Very High | Low | High | Very High | There is a small area of healthy forest, but most was in agriculture and will be planted. |
| Emergent wetland | Reduced native wetland plant cover in emergent area | High | Very High | High | Invasive plants | Very High | Medium | High | High | Control of reed canarygrass will be focused in later years after adjacent bottomland forest has been established; this will reduce subsequent re-invasion. |

Note: CWS = Clean Water Services

## CLIMATE CHANGE CONSIDERATIONS

Climate change will likely affect summer temperatures and the availability of water in summer, resulting in even drier summers than our historic Mediterranean climate. Storm events are predicted to be increasingly intense, and they may increase erosion in riparian areas. Other indirect effects of climate change may include shifts in the ranges of plants and animals—some native to North America and some not—and increased competition by these species. Climate change may touch every key ecological attribute, although effects on some KEAs may be more important than others.

### Direct effects that may occur

- Increased summer temperatures.
- Increased severity of winter rain events.
- Decreased water availability in summer.
- Decreased soil moisture on the site, leading to increased drought stress and fire danger.

### Indirect effects that may occur

- Increased risk of wildfire in hotter, dryer summers.
- Range shifts by undesirable plants, increasing competition.
- Disease introductions and/or increased vulnerability to disease.
- Loss of synchronicity of plant reproduction and pollinators.
- Loss of synchronicity of resident and migratory animals and food sources (e.g., insect hatches).
- Increased erosion in streams caused by the flashier winter rain events.
- In upland forests, reduced plant growth and survival as a result of increased summer temperatures and reduced water availability in summer.

Dairy-McKay Confluence Natural Area may provide a stepping stone and habitat for organisms that must shift their ranges in response to climate change. As an anchor site on one of the only north-south breaks in the UGB between the Coast Range and the Cascade Mountains, its role in supporting plant and animal movement may increase in the future.

The greatest management challenge at the site relates to controlling invasive species and establishing plants in the wettest portions of the site. The summary of threats and sources (**Table 9**) can be used to prioritize restoration actions and future management of the site.

**Table 9: Threats and actions for the key ecological attributes of important targets affected by climate change.**

| CONSERVATION TARGET | KEY ECOLOGICAL ATTRIBUTE | THREAT | ACTION(S) | NOTES |
|---|---|---|---|---|
| Riparian forest | Vegetation structure | Reduced percent cover native shrubs | Install plants and establish a diverse riparian zone | |
| Riparian forest | Vegetation structure | Reduced percent cover native trees | Install plants and establish a diverse riparian zone | Emerald ash borer may threaten the ash component |
| Riparian forest | Native tree and shrub richness | Reduced native tree and shrub richness | Install plants and establish a diverse riparian zone | |
| Riparian forest | Standing and downed dead trees | Lack of snags and down wood | Ensure sufficient stocking of trees to support snag and down wood creation | Summer drought may accelerate die-off |
| Bottomland forest | Vegetation structure: tree layer | Lack of native tree canopy cover | Install woody plants and establish a diverse floodplain forest | Emerald ash borer may threaten the ash component |
| Bottomland forest | Vegetation structure: other layers | Lack of native cover in other layers | Install woody plants and establish a diverse floodplain forest | |
| Emergent wetland | Native wetland plant cover in emergent area | Reduced native wetland plant cover in emergent area | Collect *Leersia* seed for use in revegetating; control reed canarygrass | |

## MANAGEMENT ACTIONS

### NATURAL RESOURCE STRATEGIES

This SCP outlines and prioritizes strategic actions to be carried out at the Dairy-McKay Confluence Natural Area over the next 10 years. They are based on the short- and long-term goals for the conservation targets. The strategic actions described here are general courses of action to achieve these objectives, rather than highly prescriptive courses of action. Specific prescriptions and projects will be developed collaboratively by Metro and CWS to address site-specific conditions encountered in the areas targeted for restoration action. Strategies have been ranked high, medium, and low based on a combination of overall threat rank, ease, and cost of implementation and regional importance of the conservation target.

#### High-Priority Strategies

- Establish bottomland forest and riparian forest in the previously farmed areas on-site to address resilience, reduce edge effects, increase species diversity and density.
    - Conduct site preparation to reduce weed cover and ready the areas for planting.
    - Install trees and shrubs.
    - Maintain plantings until free to grow.
- Expand the riparian forest
    - Conduct site preparation to reduce weed cover and ready the areas for planting.
    - Plant bare-root shrubs and trees in the riparian habitat to increase its width to approximately 200 feet and shade invasive plants.
    - Establish herbaceous understory of grasses and forbs at a density that will not compete with woody plant establishment.
    - Spot spray to maintain high native cover and prevent invasive cover increases that would threaten survival of woody plants.

#### Medium-Priority Strategies

- Establish approximately 5 acres of mixed upland savanna/oak woodland including Oregon white oak trees at the north end of the natural area (nested target within the riparian forest).
- Informally monitor the *Leersia* population and identify and monitor the native *Carex* species, collecting seed as appropriate for use in planting the emergent wetland following reed canarygrass control.

#### Lower-Priority Strategies

- Not applicable.

**Table 10. List of proposed strategies.**

| STRATEGY | SOURCES OF STRESS ADDRESSED | FOCAL CONSERVATION TARGETS/KEAS AFFECTED | WHY IMPORTANT AND TIMING ISSUES | MEASURE(S) OF SUCCESS | RANK* |
|---|---|---|---|---|---|
| Establish bottomland forest and expand riparian forest | Conversion to agriculture | Bottomland forest: native tree and shrub cover<br><br>Riparian forest: native shrub and tree cover | Near-total loss of canopy cover in ag field makes this the most urgent priority and spans both conservation targets | More than 50% native cover by end of 10-year SCP lifespan | High |
| Establish savanna/woodland on highest elevations | Conversion to agriculture | Riparian forest: nested target oak savanna or woodland | | | Medium |
| Control reed canarygrass and other invasive plants, collect and re-seed natives | Invasive plants | Emergent wetland: native plant cover | Monitoring and seed collection are needed to ensure longevity of *Leersia* population. | 25-50% cover of native plants for the life of this SCP | Medium |

***High:** Must do within 5 years to protect target viability.

**Medium:** Target will persist without it but will degrade over 5-10 years or require additional future management.

**Low:** Addresses a non-critical threat or one that is unlikely to threaten target viability within 10 years.

**Table 11. Specific actions to implement strategies.**

| STRATEGY | TARGET | PRIORITY | SPECIFIC TASKS | ESTIMATED COST** |
|---|---|---|---|---|
| Expand riparian forest | Riparian forest | High priority: Fall 2020 (October) | Plant bare-root shrubs and trees to expand the riparian habitat to nearly 29 acres and a width of 200 feet for much of its length. | $175,000 |
| Establish bottomland forest | Bottomland forest | High priority: fiscal year 2021 if site preparation is complete | Install flood-tolerant trees and shrubs at about 2,000 – 2,200 plants per acre over 56 acres | $225,000 |
| Establish savanna/woodland on highest elevations | Riparian forest (nested) | Medium priority: fiscal year 2021 if site preparation is complete | Plant approximately 5 acres of oak, pine, madrone, upland shrubs and pollinator forage plants. | $25,000 |
| Control reed canarygrass and other invasive plants, collect and re-seed natives | Emergent wetland | Medium priority: start in next two years | Begin seed collection of Leersia; identify Carex spp. and collect seed as needed. Develop strategy for canarygrass control and re-establishment of native graminoids. | $10,000 |
| | | | | **Total: $435,000** |

** Costs estimated over a 5-year period (2019-2024) for riparian forest done by CWS; costs for remaining targets are life of SCP (next 10 years). Costs for bottomland forest, oak area and emergent wetland may be shared by CWS and Metro.

## MONITORING PLAN

Monitoring will be conducted to evaluate the progress toward achieving benchmarks for conservation targets for the life of this SCP.

The monitoring plan may change over time.

Monitoring for KEAs associated with the conservation targets is shown below.

**Table 12. Monitoring**

| TARGET KEA(S) | INDICATOR | METHOD | THRESHOLD FOR ACTION? | FREQUENCY |
|---|---|---|---|---|
| Riparian forest: shrubs | Percentage native shrub cover | CWS Vegetation Monitoring Protocol applied biennially | Shrub cover below 80% of expected stems per acre | Every 2 years |
| Riparian forest: trees | Percentage native tree canopy cover | CWS Vegetation Monitoring Protocol applied biennially | Tree cover below 80% of expected stems per acre | Every 2 years |
| Riparian forest: diversity | Number of native tree and shrub species per 0.4 hectare (1 acre) | CWS Vegetation Monitoring Protocol applied biennially | Richness is less than 5 after 6 years (after approximately 3 monitoring cycles) | Every 2 years |
| Riparian forest: snags and down wood | Average number of snags and downed wood per acre; large log or snag = 20 inches in dbh | UAS monitoring and qualitative monitoring applied on 10 year intervals | Snags below 5 per acre after maturing forest is detected 20 years. | Every 10 years |
| Riparian forest: snags and down wood | Snags or downed wood pieces at or above 5 per acre | Visual inspection | Threshold reached or exceeded. | Every 5 years |
| Bottomland forest: shrubs | Percentage native shrub cover | Visual inspection | Mortality of installed plants that threatens development of sufficient cover | Every year |
| Bottomland forest: trees | Percentage native tree cover | Visual inspection | Mortality of saplings that threatens development of sufficient cover | Every year |
| Emergent wetland: native herbaceous | Percentage native plant cover | Visual inspection | Much work on this KEA will occur after the lifespan of this SCP | Every 2 years |

## ACCESS AND RECREATION

### PUBLIC ACCESS

The Dairy-McKay Confluence is designated as a regional habitat preserve in the Parks and Nature System Plan (2016). The System Plan defines public access to regional habitat preserves as limited to occasional guided tours and other specialized activities. Previously, *Metro's portfolio of natural areas, parks and trails: opportunities and challenges (2011)* also identified the site as a habitat preserve. No informal trails are evident on site. Neighbors may occasionally walk or paddle on the site, but Metro is not aware of any frequent use by them or others.

Metro's Regional Trails Map shows a planned multi-use trail on the railroad alignment between Dairy-McKay and Highway 8. No trails are planned to or across Dairy-McKay.

### PETS

Metro's Title ten pet policy is enforced on the site consistent with all other Metro natural areas. One of the most difficult management issues for Metro sites is the introduction of dogs by visitors. Although Dairy-McKay is not improved for public access, neighbors may visit the site with their dogs informally. Perceived as predators by wildlife, the zone of influence of a dog, even on leash, can be several hundred feet to either side. Because of the potential disturbance to wildlife and wildlife habitat, dogs are not allowed within Dairy-McKay.

### SIGNAGE

Any future signs developed for Dairy-McKay should utilize Metro's signage standards manual.

### PROGRAMMATIC ACCESS (EDUCATION AND VOLUNTEERS)

Volunteer seed scouts and wildlife monitors may work on the site in the future.

### ARCHAEOLOGICAL RESOURCES

If during any site investigation, alteration or improvement an archaeological resource is discovered, Metro shall work with the State Historic Preservation Office to address the find sensitively. If any damage or unlawful use is identified, Metro will partner with the Washington County Sheriff to investigate.

### ACCESS FOR MANAGEMENT

The access to the Dairy-McKay Confluence Natural Area is from NW Cavens Lane at the northeast end of the site. A cable gate and modest gravel pad are located at the site entrance. The terrain drops steeply and is unsuitable for vehicle traffic. Metro has an 18-foot-wide perpetual easement across the north edge of the Self property which would allow vehicle access if necessary.

## COORDINATION

### EDUCATION AND VOLUNTEERS

Metro's regional parks and natural areas were created to give residents in the region opportunities to enjoy, experience, participate in, and understand the natural world. Conservation education staff at Metro work with schools, civic organizations, and the general public to provide nature programs that thoughtfully connect people to Metro's parks and natural areas. With limited access and parking, Dairy-McKay is unlikely to support education activities that require more than one or two vehicles.

No education and/or volunteer efforts are planned at the site at this time, although collecting rice cutgrass seed in the emergent wetland may provide volunteer opportunities in the future.

### POTENTIAL PARTNERS

- Tualatin Soil and Water Conservation District
- Tualatin River Watershed Council
- Centro Cultural
- Indigenous communities

## REFERENCES


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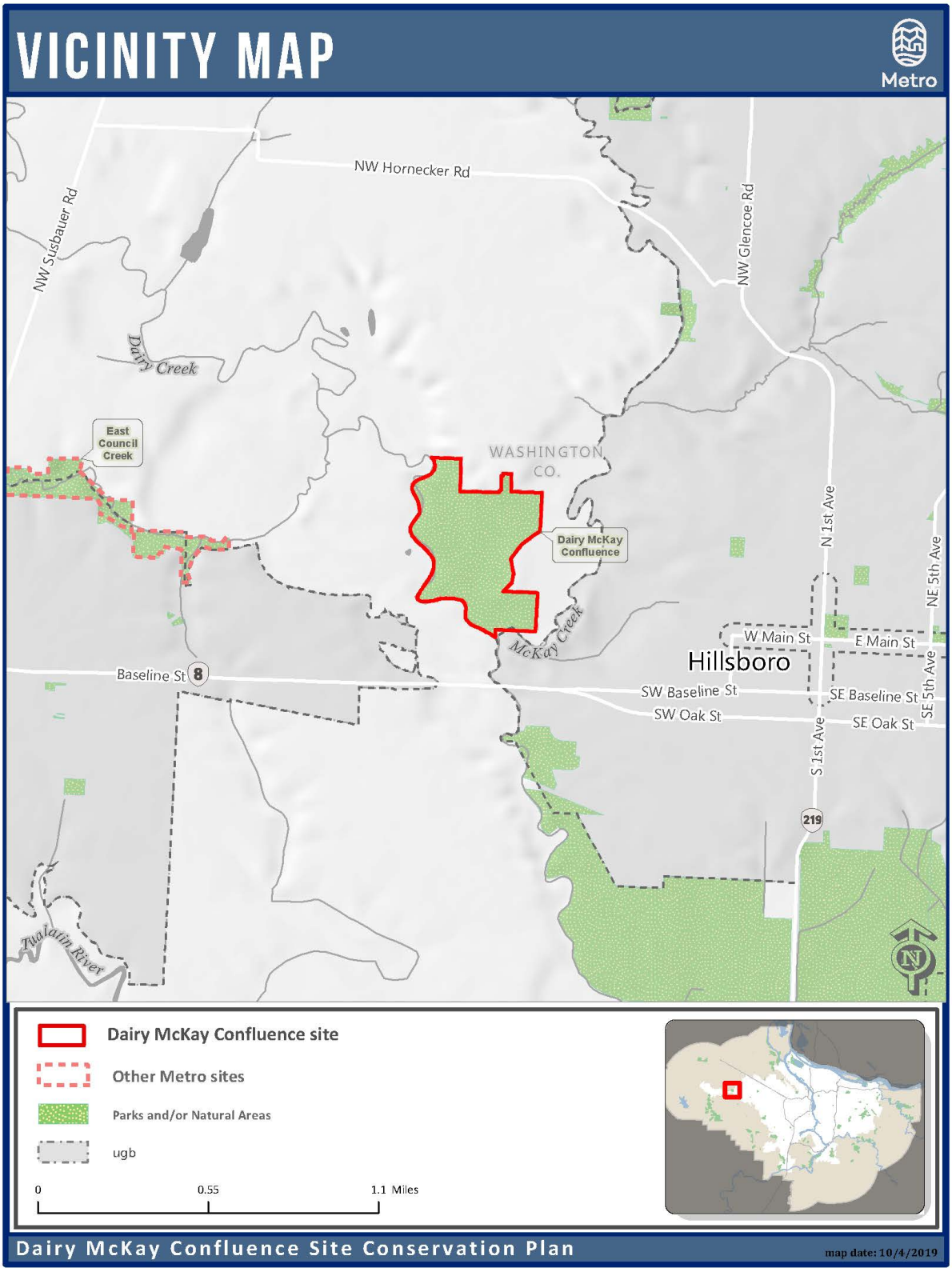
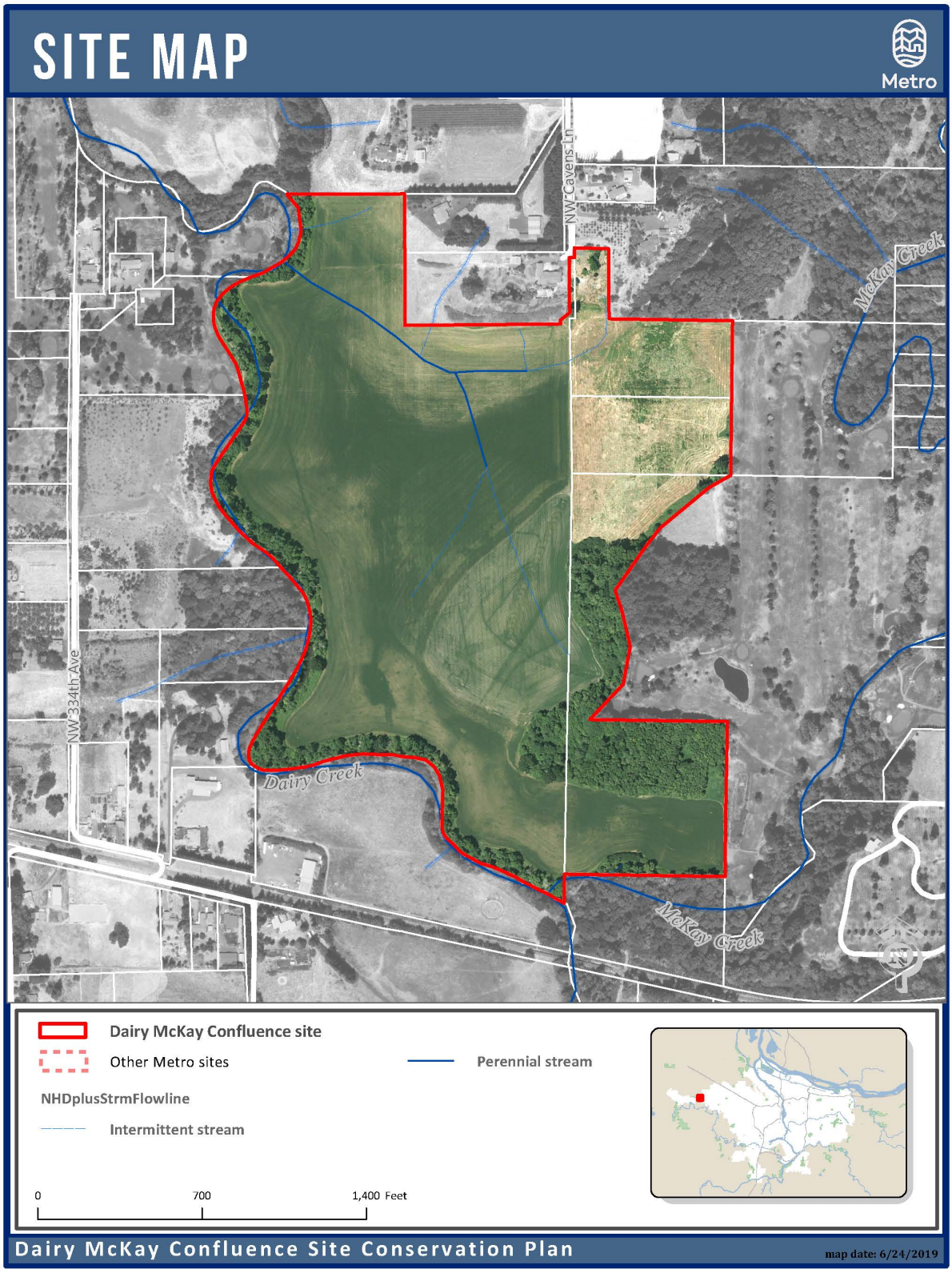
## APPENDIX A: MAPS

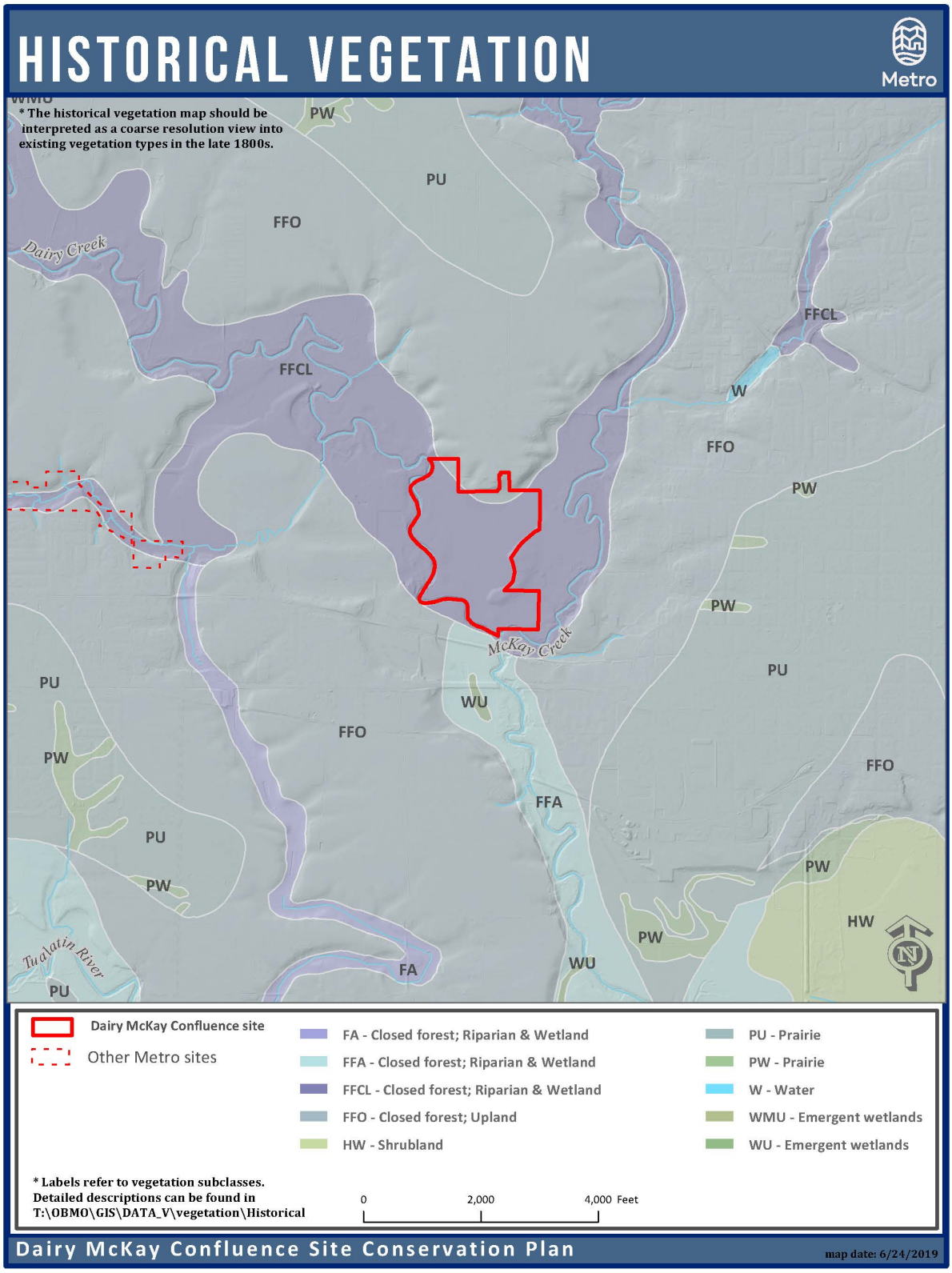
**MAP 1**


VICINITY MAP
Metro
NW Hornecker Rd
NW Susbauer Rd
NW Glencoe Rd
Dairy Creek
East Council Creek
WASHINGTON CO.
Dairy McKay Confluence
McKay Creek
N 1st Ave
NE 5th Ave
W Main St
E Main St
Hillsboro
Baseline St
8
SW Baseline St
SE Baseline St
SW Oak St
SE Oak St
SE 5th Ave
S 1st Ave
219
Tualatin River
Dairy McKay Confluence site
Other Metro sites
Parks and/or Natural Areas
ugb
0
0.55
1.1 Miles
Dairy McKay Confluence Site Conservation Plan
map date: 10/4/2019

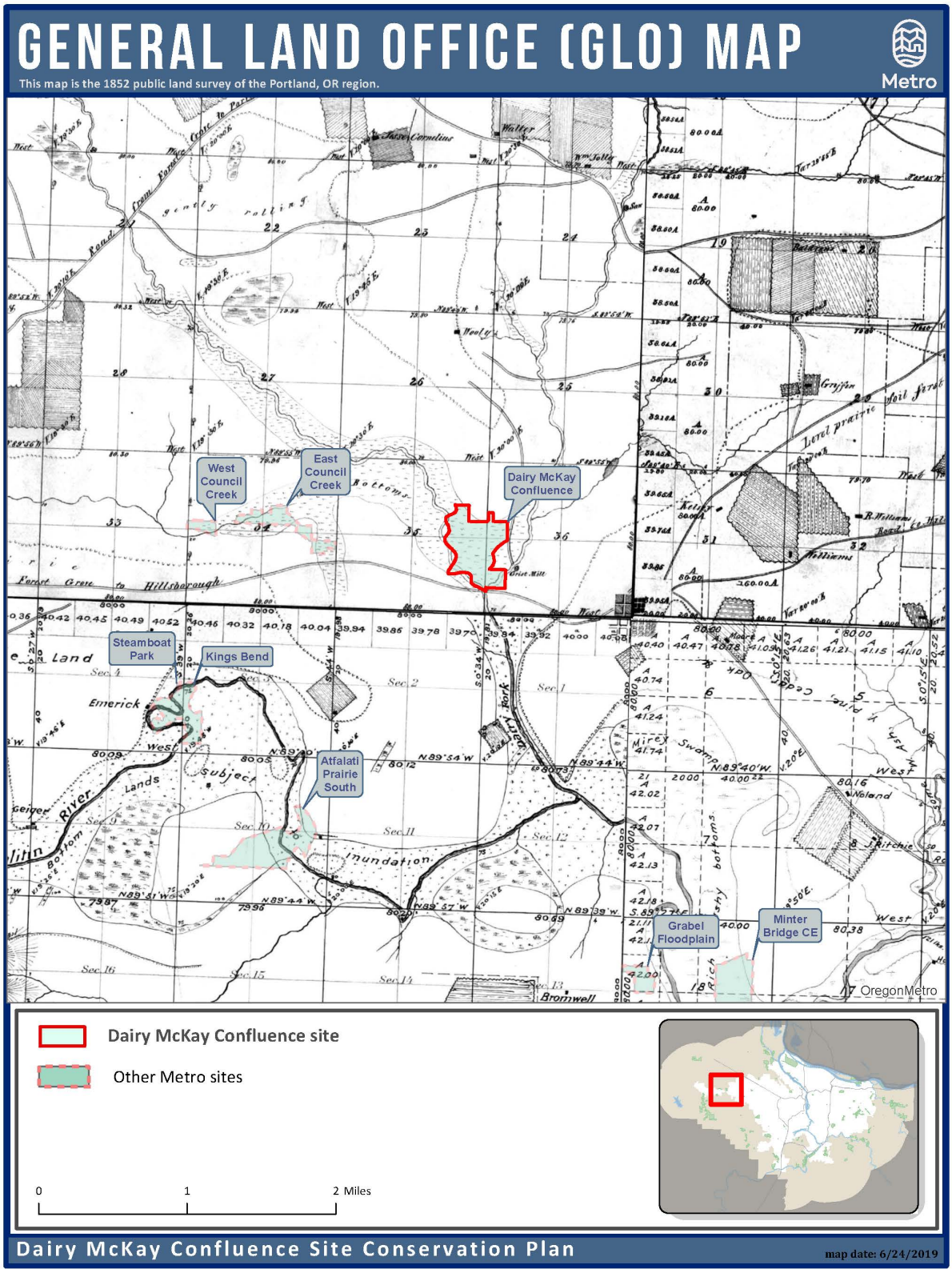
**MAP 2**


SITE MAP
Metro
NW Cavens Ln
McKay Creek
NW 334th Ave
Dairy Creek
McKay Creek
Dairy McKay Confluence site
Other Metro sites
NHDplusStrmFlowline
Intermittent stream
Perennial stream
0
700
1,400 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/24/2019

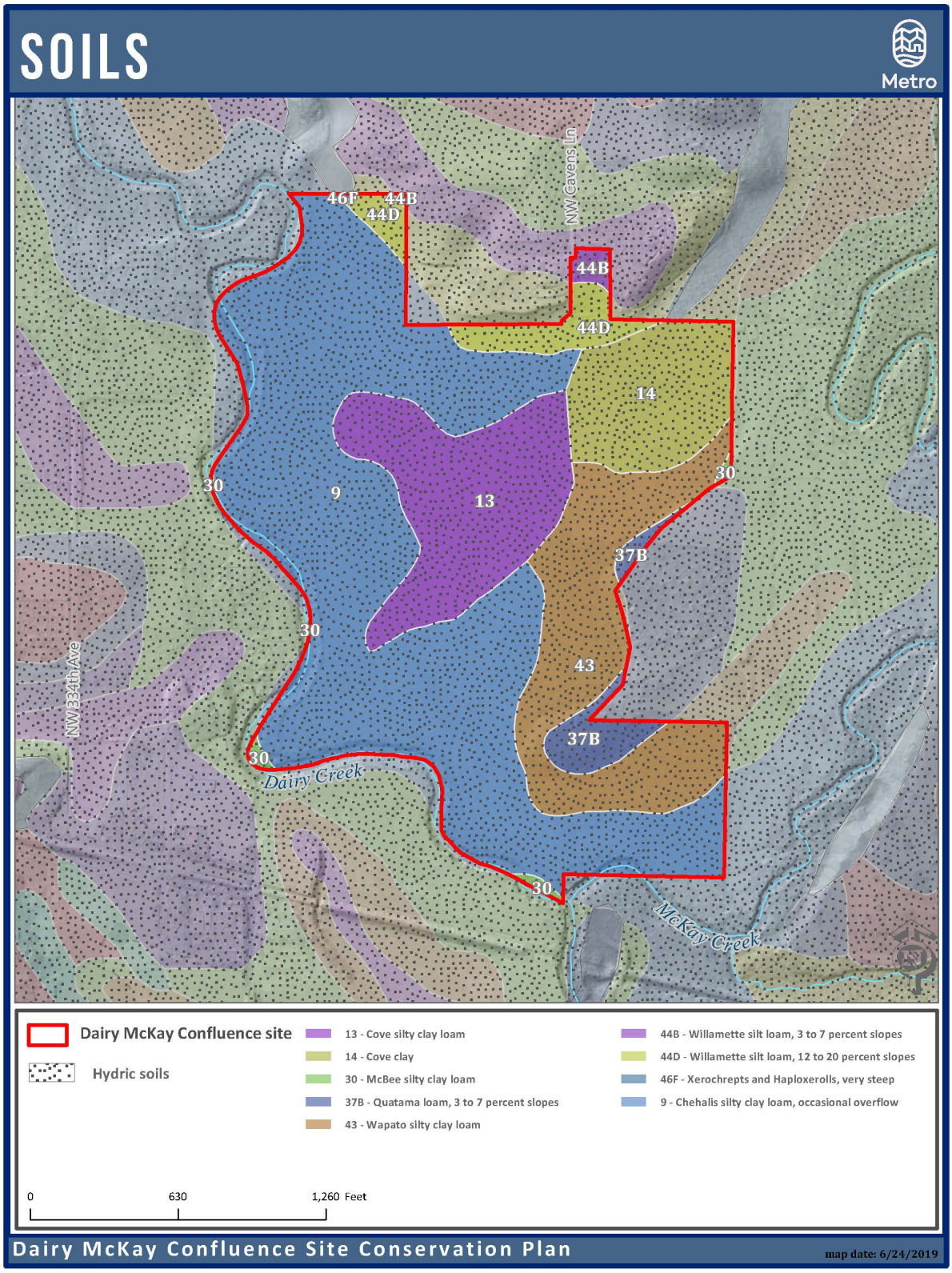
## MAP 3


HISTORICAL VEGETATION
Metro
* The historical vegetation map should be interpreted as a coarse resolution view into existing vegetation types in the late 1800s.
Dairy Creek
McKay Creek
Tualatin River
PW
PU
FFO
FFCL
W
WU
FFA
FA
HW
Dairy McKay Confluence site
Other Metro sites
FA - Closed forest; Riparian & Wetland
FFA - Closed forest; Riparian & Wetland
FFCL - Closed forest; Riparian & Wetland
FFO - Closed forest; Upland
HW - Shrubland
PU - Prairie
PW - Prairie
W - Water
WMU - Emergent wetlands
WU - Emergent wetlands
* Labels refer to vegetation subclasses.
Detailed descriptions can be found in
T:\OBMO\GIS\DATA_V\vegetation\Historical
0
2,000
4,000 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/24/2019

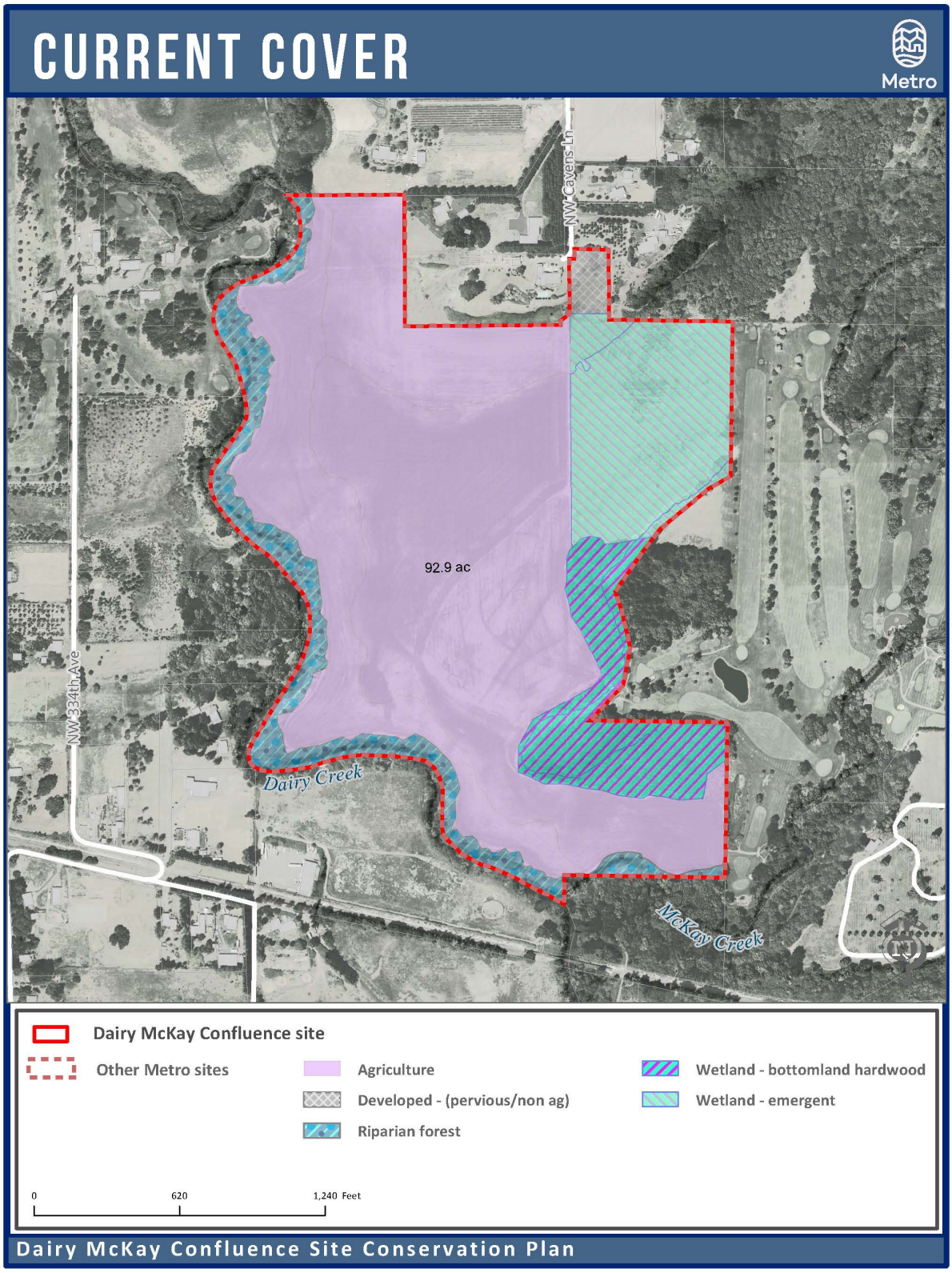
## MAP 4


GENERAL LAND OFFICE (GLO) MAP
This map is the 1852 public land survey of the Portland, OR region.
Metro
West Council Creek
East Council Creek
Dairy McKay Confluence
Steamboat Park
Kings Bend
Atfalati Prairie South
Grabel Floodplain
Minter Bridge CE
OregonMetro
Dairy McKay Confluence site
Other Metro sites
0
1
2 Miles
Dairy McKay Confluence Site Conservation Plan
map date: 6/24/2019

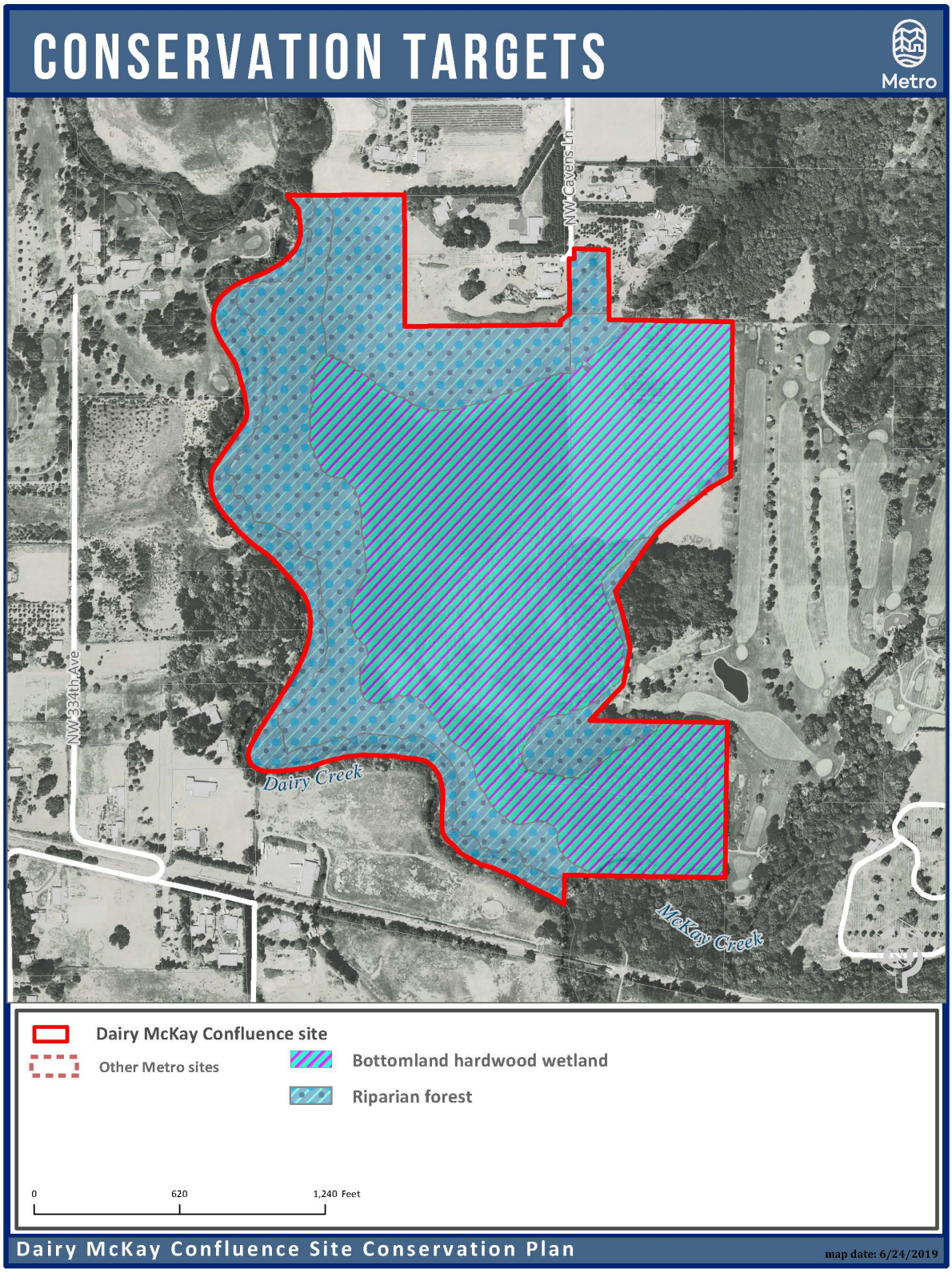
## MAP 5


SOILS
Metro
NW Cavens Ln
NW 334th Ave
Dairy Creek
McKay Creek
46F
44B
44D
14
30
9
13
37B
43
Dairy McKay Confluence site
Hydric soils
13 - Cove silty clay loam
14 - Cove clay
30 - McBee silty clay loam
37B - Quatama loam, 3 to 7 percent slopes
43 - Wapato silty clay loam
44B - Willamette silt loam, 3 to 7 percent slopes
44D - Willamette silt loam, 12 to 20 percent slopes
46F - Xerochrepts and Haploxerolls, very steep
9 - Chehalis silty clay loam, occasional overflow
0
630
1,260 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/24/2019

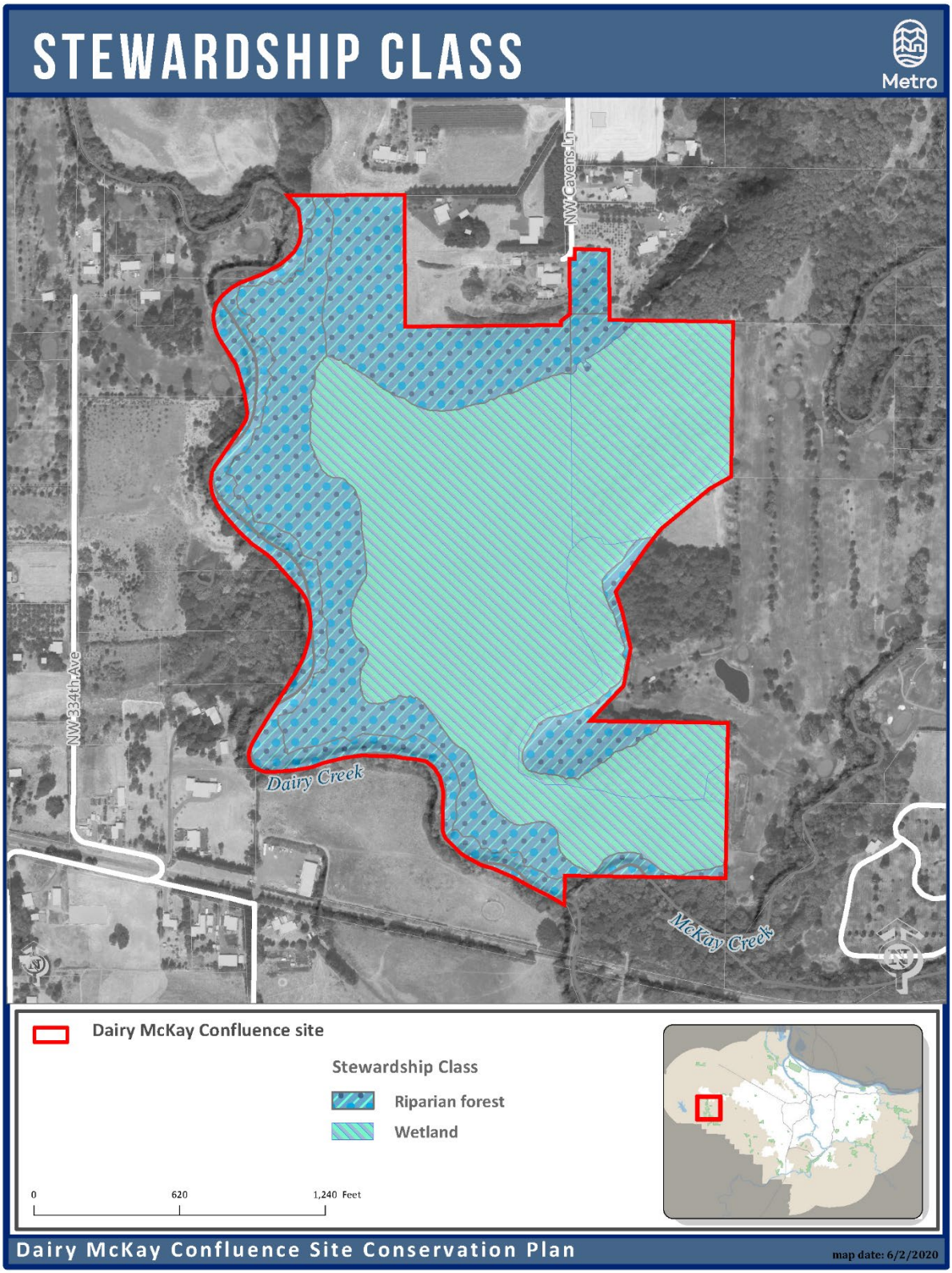
**MAP 6**


CURRENT COVER
Metro
NW Cayens Ln
92.9 ac
NW 334th Ave
Dairy Creek
McKay Creek
Dairy McKay Confluence site
Other Metro sites
Agriculture
Developed - (pervious/non ag)
Riparian forest
Wetland - bottomland hardwood
Wetland - emergent
0
620
1,240 Feet
Dairy McKay Confluence Site Conservation Plan

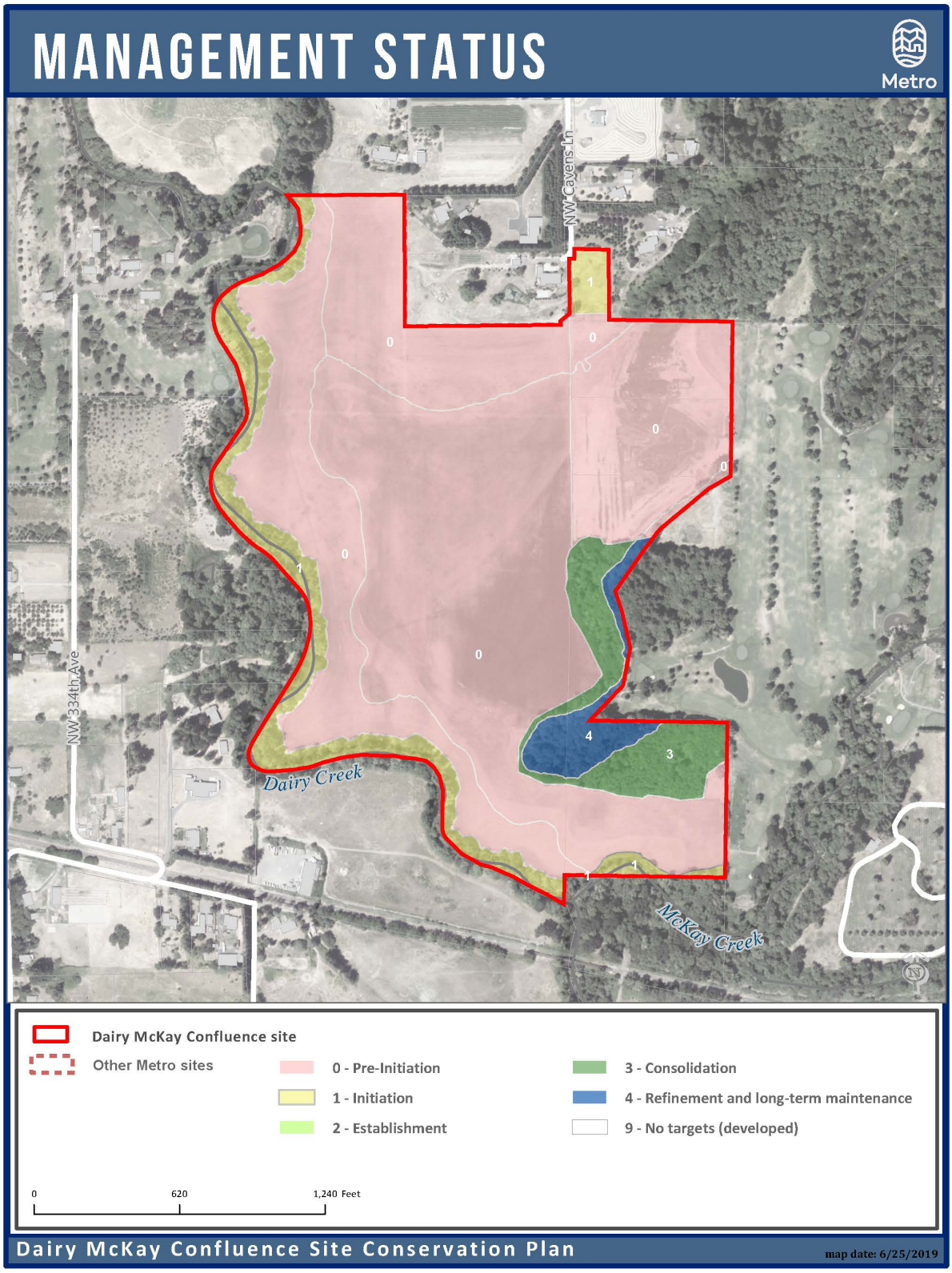
**MAP 7**


CONSERVATION TARGETS
Metro
NW Cayens Ln
NW 334th Ave
Dairy Creek
McKay Creek
Dairy McKay Confluence site
Other Metro sites
Bottomland hardwood wetland
Riparian forest
0
620
1,240 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/24/2019

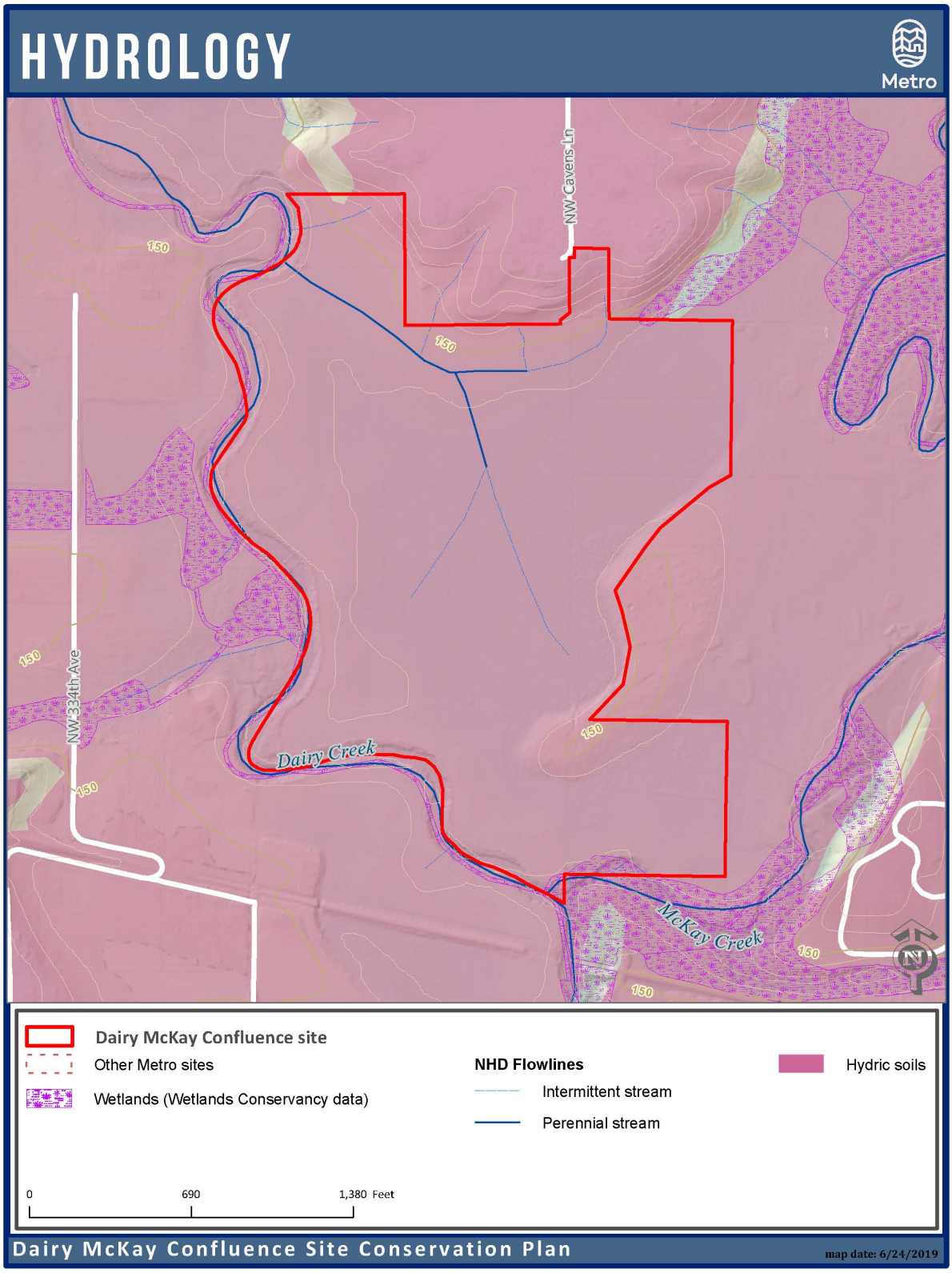
**MAP 8**


STEWARDSHIP CLASS
Metro
NW Cavens Ln
NW 334th Ave
Dairy Creek
McKay Creek
Dairy McKay Confluence site
Stewardship Class
Riparian forest
Wetland
0
620
1,240 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/2/2020

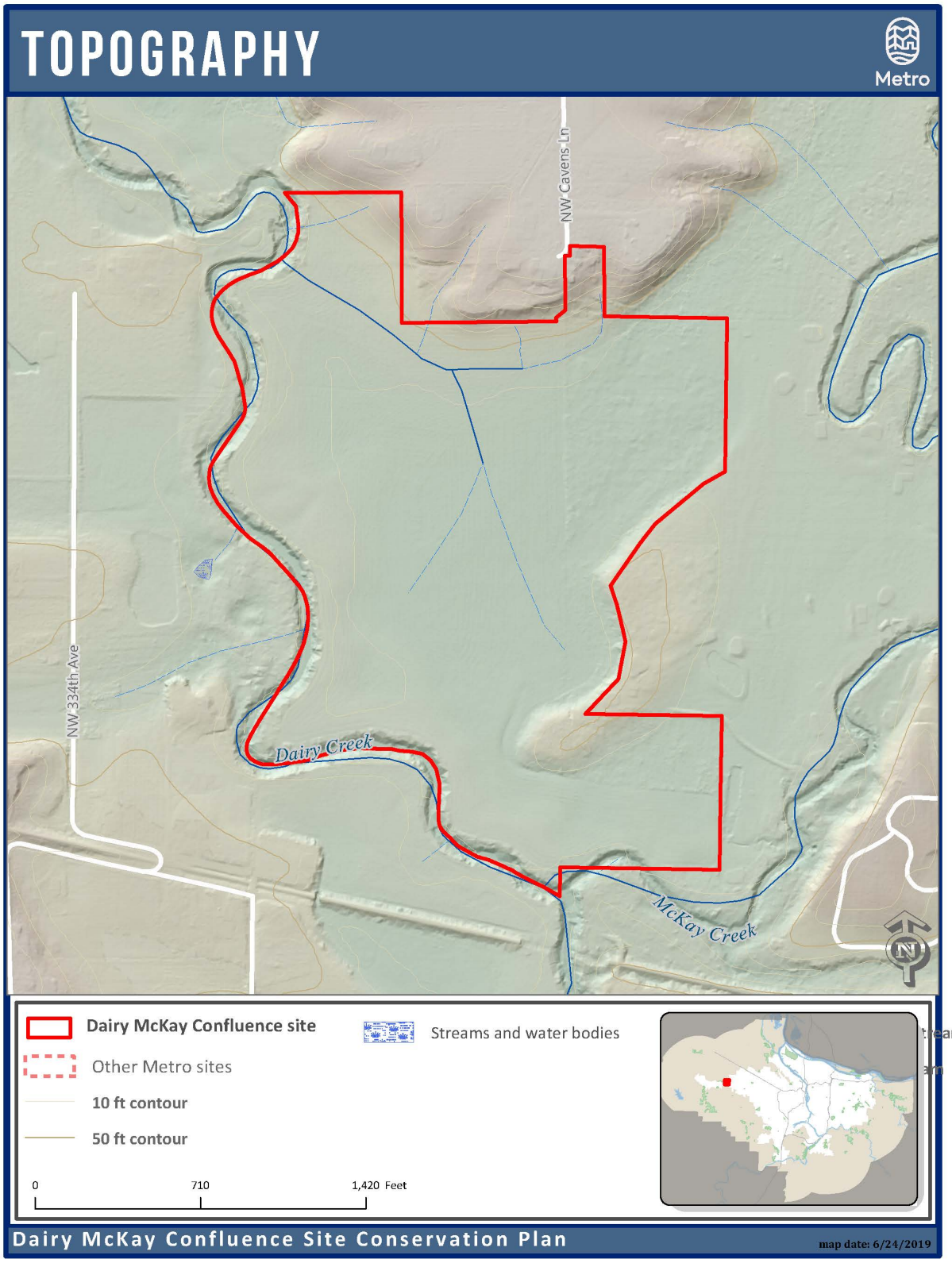
**MAP 9**


MANAGEMENT STATUS
Metro
NW Cayens Ln
NW 334th Ave
Dairy Creek
McKay Creek
0
1
2
3
4
Dairy McKay Confluence site
Other Metro sites
0 - Pre-Initiation
1 - Initiation
2 - Establishment
3 - Consolidation
4 - Refinement and long-term maintenance
9 - No targets (developed)
0
620
1,240 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/25/2019

## MAP 10


HYDROLOGY
Metro
NW Cavens Ln
NW 334th Ave
Dairy Creek
McKay Creek
150
Dairy McKay Confluence site
Other Metro sites
Wetlands (Wetlands Conservancy data)
NHD Flowlines
Intermittent stream
Perennial stream
Hydric soils
0
690
1,380 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/24/2019

**MAP 11**


TOPOGRAPHY
Metro
NW Cavens Ln
NW 334th Ave
Dairy Creek
McKay Creek
Dairy McKay Confluence site
Other Metro sites
10 ft contour
50 ft contour
Streams and water bodies
0
710
1,420 Feet
Dairy McKay Confluence Site Conservation Plan
map date: 6/24/2019