

VEGETATION MANAGEMENT PLAN

VIRGIL PHILLIPS FARM COUNTY PARK

LATAH COUNTY, IDAHO

March 14, 2021



Authors and acknowledgements

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Contents

Overview	6
Location and general description.....	7
Visitor use	7
Climate, geography, pre-settlement vegetation, and history	8
Climate and geography	8
Pre-settlement vegetation	8
History	9
Vegetation management	9
Role of Friends of Phillips Farm and overarching plan objectives.....	9
Proposed vegetation management zones at Phillips Farm County Park.....	10
Prairie (29.3 acres)	10
Open forest/Savanna (96.4 acres).....	11
Forest (3.4 acres).....	11
Wetland/meadow (26.8 acres)	11
Primary vegetation management concerns and threats.....	11
Sweetbriar rose	11
Ventenata and other exotic winter annual grasses	12
Noxious weeds	12
Teasel	12
Reed canarygrass	12
Conifer regeneration and landscape resilience to wildfire	12
Phillips Farm County Park proposed management units	13
Unit 1.....	13
Unit 2.....	15
Unit 3.....	16
Unit 4.....	17
Unit 5.....	19
Unit 6.....	21
Unit 7.....	23
Unit 8.....	24
Unit 9.....	25

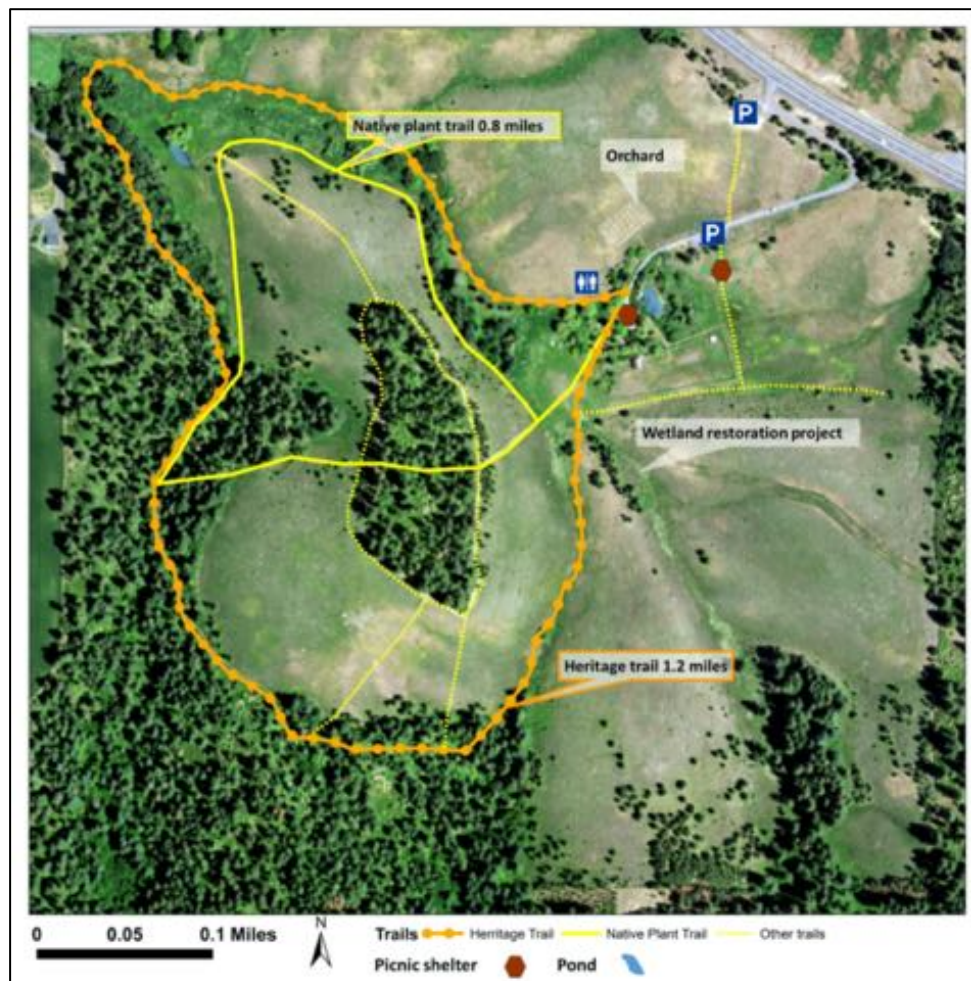
Unit 10.....	27
Unit 11.....	29
Unit 12.....	31
Unit 13.....	32
Unit 14.....	33
Unit 15.....	34
Unit 16.....	36
Unit 17.....	37
Unit 18.....	38
Unit 19.....	39
Unit treatment groups	40
Treatment group A. Widespread ventenata and noxious weeds.....	40
Treatment group B. Widespread ventenata and spotty noxious weeds.....	40
Treatment group C. Localized ventenata and spotty noxious weeds	41
Treatment group D. Spotty noxious weeds.....	41
Treatment group E. Driveway and trails	41
Treatment group F. Ponderosa pine and Douglas-fir regeneration	42
Treatment group G. Sweetbriar rose	42
Monitoring	42
Photo monitoring.....	42
Vegetation transects	43
References	44
Appendix A. Phillips Farm County Park trail map.....	45
Appendix B. Topography	46
Appendix C. Aspects in Phillips Farm County Park. Derived from 10 m digital elevation model.....	47
Appendix D. Slope (percent) in Phillips Farm County Park.	48
Appendix E. Proposed management zones at Phillips Farm County Park.....	49
Appendix F. Summary of the four main soil map zones.....	50
Prairie (Larkin Series: soil 24) 29.3 acres.....	50
Open Forest/Savanna (Taney Series: soil Ty9) 96.4 acres.....	50
Forest (Carrico and Micapeak series: soil Jp3) 3.4 acres.....	50
Wetland/Meadow (Latahco (55%), Thatuna (30%), Aquolls (5%) series: soil 28) 26.8 acres...	51
Potential grass, grass-like, and forb species along the wetness gradient.	52

Appendix G. Photos exemplifying restoration goals for Palouse Prairie and pine savanna.....	54
Appendix H. Relationships between tree canopy cover, density and spacing	57
Appendix I. Map of vegetation management zones and management units.	58
Appendix J. Plant species list (in progress, updated September 2020).....	59
Appendix K. Photos of management units, October 2020	61
Appendix L. Description of photo point locations.....	77
Appendix M. Instructions and field data sheet for vegetation monitoring transects	78
Appendix N. Monitoring locations for established plots.....	80
Appendix O. Transect photos.....	81

Overview

This document proposes a vegetation management plan for Virgil Phillips Farm County Park. Its primary focus is the 110 or so acres of the 160-acre park that were either farmed, in wetlands, or in lowland meadows, not the currently forested areas. Farming on the property probably began in the late 1800s and continued in various forms until 1991, when the farmlands were seeded to grasses and alfalfa (Camper et al. 1992). Smooth brome dominates in many of these areas today. The previously farmed areas and wetlands have also been invaded to greater or lesser extents by the following plants that interfere with recreation; diminish habitat for wildlife, including pollinators; require management by law; or increase fire risk now or in the future:

- Exotic winter annual grasses, especially ventenata
- Idaho noxious weeds
- Sweetbriar roses
- Teasel
- Reed canarygrass
- Ponderosa pine and Douglas-fir regeneration



The plan divides the park into four management zones based on soil type (prairie, open forest/savanna, meadow/wetland, and forest), then subdivides these zones into 19 management units based on current conditions and management goals. The plan describes the park in general terms, provides historical perspectives for management, states overarching objectives for management, describes current concerns and threats, gives detail on current conditions in each management unit, organizes units into treatment groups, and describes our vegetation monitoring efforts.

Although the plan discusses management of wetland and meadow vegetation, this aspect of the plan needs much more development, especially with respect to opportunities for reviving former wetlands. Management of the currently forested areas of the park is outside the scope of this plan. Also outside the scope of this plan is management of the isolated, 4-acre corner of the park on the east side of Highway 95.

Location and general description

Virgil Phillips Farm County Park is located 6 miles north of Moscow, Idaho, on the west side of Highway 95 at the very western edge of Moscow Mountain. Owned by the city of Moscow, the park is managed by the Latah County Parks and Recreation Department. The park consists of a 160-acre parcel of open fields, forested land, and wetlands. It includes several intermittent streams and two ponds. It is home to native Palouse species such as moose, elk, deer, black bear, coyotes, birds, amphibians, and reptiles. The Margaret Littlejohn memorial orchard, containing trees likely planted by Virgil Phillips, and a newer fenced orchard established by Friends of Phillips Farm are located in the park.

Visitor use

Phillips Farm County Park is open to the public daily from dawn to dusk year-round. Two open picnic shelters with charcoal grills are available for picnics and other outdoor activities. Running water from a well on the property is available seasonally. Trails of various lengths and difficulties, including an interpretive native plant trail, are available for hiking and dog walking during the snow-free months and for cross-country skiing in the winter. See appendix A for a trail map. Sledding on the open hillsides is another fun winter activity, and the park has been used for cross-country running races in the past. The park is also open to group gatherings such as weddings, birthday parties, and reunions. Friends of Phillips Farm organizes public events at the park throughout the year, such as a summer nature camp for youth, an annual fall festival, bird watching, and stargazing. See the Friends of Phillips Farm website for information:

<https://friendsofphillipsfarm.weebly.com/about-the-park.html>.

Climate, geography, pre-settlement vegetation, and history

Climate and geography

Phillips Farm County Park is located on the western edge of Moscow Mountain, on the ecotone where forest transitions into prairie. Precipitation ranges between 20 and 27 inches annually, mostly falling as rain or snow in the winter and spring months. The coldest month is January, with an average daily high temperature of 35°F and average daily low of 23°F. Summers are warm and dry. The warmest month is July, with an average daily high temperature of 84°F and average daily low of 49°F. The frost-free period is typically May through September (Barker 1981; to be updated).

Elevation varies from 3,040 feet in the southwest and northeast corners of the park to 2,720 feet in the northwestern corner (appendix B), where a fork of Upper Fourmile Creek leaves the park to empty eventually into the South Fork of the Palouse River farther west. The northeast part of the park is dominated by south- and southwest-facing aspects, while the southern part of the park mainly faces north, northeast or northwest (appendix C). The bottom lands are relatively flat (less than 10 percent slope), while the slopes both to the north and south are in the 10 to 30 percent range (appendix D); in a few areas, slopes are over 30 percent.

Pre-settlement vegetation

Palouse bunchgrass prairie has been described by Washington State University professor Daubenmire (1942, 1970) as the dominant vegetation type in the western part of Latah County prior to Euro-American settlement. Descriptions of the soil types in the park (NRCS 2020) suggest that 82 percent of the park, excluding the 26 acres of wetland/meadow soils and 3 acres of forest soils, consists of prairie soils (mollisols). The descriptions suggest that the pre-settlement prairie was dominated by grasses such as bluebunch wheatgrass and Idaho fescue and an assortment of forbs including lupine, sticky geranium, yarrow, penstemon, and arrowleaf balsamroot. The Latah County Soil Survey (NRCS 2020), and also descriptions of the land area from the early 1900s (Marcy 1991), indicate that some areas of the park also supported ponderosa pine and Douglas-fir. The survey also refers to shrubs such as ninebark, creamy oceanspray, common snowberry, and rose. Although trees and shrubs were present across the Phillips Farm County Park area, the understory vegetation of bunchgrasses and forbs must have dominated the soil formation processes to result in the mollisol soil.

Historically, the balance between a treeless bunchgrass prairie and an open forest of pine, fir, and shrubs with a grass-forb understory was likely maintained by frequent, low-severity wildfires. Recent research on the ecotone between historical Palouse Prairie and Moscow Mountain forest suggests that wildfires burned as often as every 5 to 8 years during the time period 1650–1900 (Morgan et al. 2020), maintaining the prairie vegetation and open pine savanna on the ecotone. Fires were lightning ignited or ignited by humans. Phillips Farm County Park is located on this ecotone, the transition between prairie and forest. While ecotones generally cover small areas, their sharp environmental gradients promote high biological

diversity and ecological interaction (Ladwig et al. 2018). Phillips Farm County Park supports a variety of mammals, birds, amphibians, and reptiles.

History

Permanent Euro-American settlement in the Moscow area and surroundings began in the 1870s (Black et al. 1998, Agee et al. 1917). Paul Marcy, who lived and farmed at Phillips Farm 1917–1923, said in a 1991 interview (Marcy 1991) that the land had been farmed for "many years" before his arrival in 1917. According to Marcy, the forested area within the park in 1991 was approximately the same as it had been in the 1920s and consisted of ponderosa pine and, to a lesser amount, Douglas-fir. He also described a 14- to 15-acre marsh in the northwestern end of the parcel. His farm animals included sheep, horses, and cows.

Virgil Edemoss Phillips, born in Moscow in 1912, lived at and farmed the property from 1944 to 1972. He bequeathed the parcel to the City of Moscow "for the benefit and use of the children of Moscow for recreation purposes" in 1972. Little evidence of the original farm buildings or those of Virgil Phillips remain on the property, although the older fruit trees in the park provide evidence of a homestead.

According to an undated, unauthored report from the city of Moscow, from 1973 to 1990 the city of Moscow leased the property to Rowland Hawley, who grew primarily wheat. According to the 1981 Latah County Soil Survey, by 1979 the farmed, north-facing slopes of the farm were severely eroded.

In spring 1991, the previously farmed areas were seeded with grasses and alfalfa (Camper et al. 1992) and the land was leased to Better Living, Inc., a nonprofit organization devoted to demonstrating examples of sustainable agricultural and forestry techniques. That lease lasted until 2000, when the county took over management (City of Moscow undated). The property is currently managed by the Latah County Department of Parks and Recreation.

Vegetation management

Role of Friends of Phillips Farm and overarching plan objectives

Friends of Phillips Farm Inc. (<https://friendsofphillipsfarm.weebly.com/>) is a nonprofit group formed in 2010 that encourages the use of Phillips Farm County Park. The mission of the Friends of Phillips Farm is

- To enhance opportunities for recreation and education at Virgil Phillips Farm County Park
- To educate children and adults about natural and managed ecosystems, with an emphasis on exploring and learning from nature
- To restore and enhance habitat that is characteristic of the Palouse Bioregion

As a response to the third goal of the mission, "*To restore and enhance habitat that is characteristic of the Palouse Bioregion,*" Friends of Phillips Farm is proposing this plan for

vegetation management in the park. Overarching objectives that underpin this vegetation management plan are to

- Promote continued recreational access to the park
- Provide a place for outdoor environmental and science education, to include K–12, university students, and Extension education
- Increase diversity within plant communities with a focus on native species
- Improve habitat for pollinators, including the Monarch butterfly
- Improve habitat for upland gamebirds, water birds, and songbirds, including central-place foragers such as the western bluebird
- Maintain a variety of habitats, including open fields or prairie, pine savanna, forest, and wetland.
- Control noxious weeds and invasive annual grasses
- Manage for plant communities resilient to the effects of potential wildfires and climate change

Proposed vegetation management zones at Phillips Farm County Park

The United States Department of Agriculture Natural Resources Conservation Service (NRCS 2020) soil survey for the Latah County area describes four different soil map zones within the park: (1) prairie on Larkin (24) soil, (2) open forest/savanna on Taney (Ty9) soil, (3) wetland/meadow on Latahco-Thatuna (28) soil complex, and (4) forest on Carrico-Micapeak (Jp3) soil complex. A map of the management zones is provided in appendix E and more-detailed soil descriptions in appendix F. Each soil zone contains one or more soil components with characteristics that make it more or less suitable for various uses and for supporting various kinds of vegetation. We use these soil map zones as the basis for our proposed vegetation management plan for the park.

Within each soil zone, we have defined management units for which we can recommend different treatments depending on the ecological site (soils, climate, and historical plant community), current condition of the vegetation, desired uses of the area, and other considerations. We propose the following overarching goals for each zone:

Prairie (29.3 acres)

Located in the northeastern part of the park, this zone consists mainly of open, grassy slopes that have a background population of smooth brome and high populations of weeds, especially *ventenata* and other exotic annual grasses, teasel, and noxious weeds. In the farming days, the land in this zone was probably dedicated to crops such as wheat, oats, alfalfa, or hay (Agee et al. 1917, Barker 1981).

Goal: Create a healthy, diverse plant community of grasses and forbs including, where feasible, a large component of native Palouse Prairie species. See appendix G for examples of native Palouse Prairie.

Open forest/Savanna (96.4 acres)

Located in the western and southeastern part of the park, the land in this zone consists in part of open, grassy slopes, some of them weed-infested, and in part of ponderosa pine and Douglas-fir forest. Invasive roses tend to be a problem in the open parts of this zone. Where open slopes adjoin the forest, conifer regeneration is moving into the open areas. The open areas of this zone were probably used to grow crops such as wheat, oats, alfalfa, or hay (Agee et al. 1917, Barker 1981). The forested areas appear to have been logged in the past.

Goals: (1) In the currently open areas, create or maintain a healthy savanna of scattered ponderosa pine with an understory of grasses, forbs, and shrubs, including, where feasible, a large component of native Palouse Prairie species. Pine savanna would have canopy cover in the range of 5 to 50 percent, 50 to 250 trees per acre, with trees in a clumpy pattern rather than evenly spaced. See appendix G for examples of open pine savanna with a bunchgrass understory.

(2) In the currently forested areas, manage for open forest according to forester recommendations. Appendix H provides graphs that can help guide management of tree density and spacing.

Forest (3.4 acres)

The forest zone is the only forested zone in the park with true forest soils. It is currently forested but has probably been logged.

Goal: Maintain a healthy forest that provides habitat for the wildlife in the park and is resilient to potential wildfire.

Wetland/meadow (26.8 acres)

Most of the historic farm buildings were located in this zone as is some of the current park development such as the lower gazebo, garden compound, well, and upper pond. Much of this zone consists of a reed canarygrass monoculture. In the farming days, parts of this zone may have been used for hay or pasture (Agee et al. 1917, Barker 1981, Marcy 1991). In the early 1900s, the zone is said to have encompassed a 14- or 15-acre marsh (Marcy 1991).

Goal: Maintain or enhance hydrologic function and create a diverse community of plant species associated with Palouse wetlands and meadows.

Primary vegetation management concerns and threats

In this section we outline current concerns and potential threats to vegetation management in the park.

Sweetbriar rose

Rose bushes have been encroaching on many open areas of the park, making them progressively unusable for recreation. The bushes outcompete other vegetation and can reach 22 feet in diameter and 12 feet tall. An eradication effort with herbicide in May 2019 and April 2020 killed almost all of the bushes in the park. However, roses continue to grow from seed and sprouts, so long-term vigilance and periodic treatment will be required.

Ventenata and other exotic winter annual grasses

Especially in the park's prairie zone, ventenata and other invasive annual grasses such as medusahead and cheatgrass are gaining ground or are already dominant, replacing longer-lived, deep-rooted perennials. Ventenata is considered to have no or little value for wildlife. It has very low forage value for mammals (ungulates may graze it early in the spring, before its silica content rises) and can decrease the nesting success of central-place foragers such as bluebirds by reducing insect numbers and insect species diversity. Its seeds, which drop in late spring or early summer, are easily transported from one place to the next on shoes and pets. A fine fuel when dry, it is flammable during the fire season.

Noxious weeds

A number of Idaho noxious weeds infest the park. Under Idaho state law, it is the landowner's "duty and responsibility" to control them. In rough order of occurrence, they are Canada thistle, rush skeletonweed, houndstongue, spotted knapweed, oxeye daisy, introduced hawkweed, and field bindweed. They tend to occur primarily along trails and in ventenata-infested areas. They have been managed over the years primarily by spot spraying along the driveway and trails. In 2019, Friends of Phillips Farm started mapping infestations throughout the park to provide the applicator with better information for targeting treatment. In addition, an area treated for ventenata in 2019 and 2020 was broadcast treated for noxious weeds in 2020 because of their abundance and wide distribution.

Teasel

Tall and spiny, with a spiny flower head sometimes used in flower arranging, this biennial is expanding its footprint in several parts of the park. Dense patches of teasel rosettes crowd out other plants. Spines on the tall, second-year plants scratch the skin and catch on fur and clothing. As a result, walking among them is unpleasant, and dense populations reduce recreational opportunities at the park. Teasel also interferes with herbicide application by catching spray nozzles.

Reed canarygrass

The open wetland areas of the park are choked with a monoculture of reed canarygrass. Tall and persistent, it shades out other plants. Extremely productive and easy to establish, it was used as a "breaking-in crop" in the early farming days in the Pacific Northwest and as livestock forage (Stannard and Crowder 2001). Today, it is often considered "the bane of wetland restorationists" (Stannard and Crowder 2001).

Conifer regeneration and landscape resilience to wildfire

Wildfire was a natural process in the pre-settlement Palouse, maintaining prairie and open pine savanna (Morgan et al. 2020). Local records have demonstrated that wildfire occurred every 5 to 8 years on the prairie–forest ecotone from 1650 to 1900 (Morgan et al. 2020), maintaining prairie vegetation and an open pine savanna as a transition between prairie and forest, a grassland–forest ecotone. Managing for grasslands that resemble historic native Palouse Prairie and for open pine woodlands typical of the historical Palouse landscape will mimic the historical plant communities. Currently, young ponderosa pine and Douglas-fir trees are spreading into the park from forested edges, often in high densities.

Phillips Farm County Park proposed management units

We divided each of the four management zones into management units based on their vegetation composition, goals for vegetation management, and treatment needs. In the fall of 2020, we surveyed the units with the goal of describing the most abundant plant species and presence of invasive species and noxious weeds in each one. The following unit descriptions list plants in rough order of abundance. Idaho noxious weeds are marked with an asterisk. A map of the proposed management zones and units can be found in appendix I. A list of plant species observed to date can be found in appendix J.

Unit 1

Zone: Prairie

Size: 9.2 acres

Aspect: South, southwest, west in northwest thumb

Description: Rather steep slopes of up to 30 percent occur within the unit, with the majority of the unit in the 10 to 20 percent range. This unit contained a heavy infestation of ventenata, noxious weeds (especially rush skeletonweed and Canada thistle), and teasel before treatment for ventenata in September 2019 and April 2020 and for noxious weeds in June and October of 2020. As of November 2020, the unit contained significant bare areas previously occupied by ventenata or noxious weeds, with the remainder dominated by smooth brome and some surviving noxious weeds.

A section in the northwest corner of this unit was treated for noxious weeds in October 2020 only. It contained large populations of rush skeletonweed, Canada thistle, houndstongue, and teasel of which we were unaware in the spring. This thumb also contains a hawthorn and apple thicket.

Uses: This unit borders the upper parking lot and contains the well-used trail that runs from the upper parking lot to the lower parking lot. One fenced section is set aside for the new orchard; some old orchard trees occur in the southwestern corner of the unit.

Plants (desirable or relatively benign)

Smooth brome

Intermediate wheatgrass (in patches)

Yellow salsify

Chicory

Weeds

Ventenata (along edges, especially at the edges of the driveway, upper parking area, fenced orchard, and trail at the bottom of the unit's south and west sides)

*Rush skeletonweed

*Spotted knapweed

*Canada thistle

*Field bindweed (lower priority for treatment)

*Houndstongue

Teasel

Goals

- (1) Control noxious weeds and exotic annual grasses.
- (2) Increase diversity of grasses and forbs with a focus on native plants.
- (3) Control teasel if it becomes more problematic.

Treatments to achieve goals

- (1) The unit was broadcast treated for ventenata in September 2019 (Esplanade herbicide) and April 2020 (Laramie herbicide).
- (2) The unit, except for the northwest thumb, was broadcast treated for noxious weeds in June 2020 (Opensight herbicide).
- (3) The entire unit was broadcast treated for noxious weeds in October 2020 (Milestone herbicide).
- (4) Treatment anticipated for spring or fall 2021: Drill seed throughout the unit, with an emphasis on large bare spots vacated by ventenata and noxious weeds.
- (5) Treat edges for ventenata.
- (6) Consider gravelling the rest of the upper parking area and rerouting trail from upper parking lot.

Unit 2

Zone: Prairie

Size: 3.1 acres

Aspect: West and northwest

Description: This unit runs from the top of unit 1 down to a draw. It was treated for ventenata in September 2019 and April 2020. As of November 2020, the area was predominantly smooth brome in a thick, healthy monoculture. Reed canarygrass predominates at the draw, with some ventenata at the edge of the draw, especially in the northwestern corner of the unit. Slopes are in the 10-20 percent range.

Uses: This unit receives very little use by park visitors. It has potential for skiing or sledding.

Plants (desirable or relatively benign)

Smooth brome

St Johnswort

Chicory

Yellow salsify

Juniper

Snowberry patch

Mullein

Timothy at northwest end

Goldenrod

Ponderosa pine clump near the draw

Weeds

*Canada thistle at draw

Ventenata at edges of the draw

Invasive roses (treated)

Goals

- (1) Control noxious weeds and ventenata.
- (2) Maintain healthy stand of smooth brome, while increasing diversity of grasses and forbs.
- (3) Control invasive rose regrowth.

Treatments to achieve goals

- (1) The unit was broadcast treated for ventenata in September 2019 (Esplanade herbicide) and April 2020 (Laramie herbicide).
- (2) Spot treat Canada thistle and ventenata near draw.
- (3) Drill seed over at least part of the unit at the same time unit 1 is seeded.
- (4) Monitor invasive rose regrowth and treat periodically.

Unit 3

Zone: Prairie

Size: 4.7 acres

Aspect: West and southwest

Description: Bordered on the southeast by a draw, this extremely weedy unit has a neighboring wheat field and homesite on its northern border. Slopes are below 20 percent in most of the unit but increase to 20 to 30 percent at the western portion. Near monocultures of ventenata mixed with low-density populations of smooth brome give way to thicker smooth brome patches toward the bottom of the unit, partway up the slope, and toward the eastern edge of the draw. Noxious weeds are particularly abundant along the unit's southern edge near the trail. There is a ponderosa pine patch at the western end.

Uses: Very little use by park visitors

Plants (desirable or relatively benign)

Smooth brome

Chicory

Intermediate wheatgrass

St. Johnswort

Weeds

Ventenata (about 50% of plant cover)

*Canada thistle

*Rush skeletonweed (some large patches)

Prickly lettuce

Teasel (thick in places)

*Field bindweed (lower priority for treatment)

Invasive roses (treated)

Goals

- (1) Control noxious weeds and exotic annual grasses.
- (2) Increase diversity of grasses and forbs with a focus on native plants.
- (3) Control invasive rose regrowth.

Treatments to achieve goals

- (1) Broadcast treat for ventenata.
- (2) Broadcast treat for noxious weeds and, incidentally, teasel.
- (3) Seed the entire unit.
- (4) Monitor invasive regrowth and treat periodically.

Unit 4

Zone: Prairie

Size: 6.5 acres

Aspect: Southwest

Description: This very weedy unit is bounded by the driveway to the northwest and a wetland/draw to the south, east, and southwest. Especially weedy is the area used for fall festival overflow parking, which contains ventenata, medusahead, cheatgrass, teasel, and a variety of noxious weeds. Slopes are in the 10 to 20 percent range in the unit.

Uses: Portions of this unit are being used for University of Idaho herbicide trials starting in fall 2020 and concluding summer 2022. A strip in the northeast has been used for fall festival overflow parking. A proposal by MAMBA would use some of the unit, including some ponderosa pine patches, for a multiuse trail geared at beginning mountain bikers. A couple of bluebird boxes are near the draw. Some visitors cross the northern and eastern edges of the unit to reach the bridge that crosses from unit 4 into unit 5, but otherwise it gets very little use by park visitors.

Plants (desirable or relatively benign)

Smooth brome, especially abundant in southeast portions

Intermediate wheatgrass

Chicory

Ponderosa pine (some along the drive and along draw; other patches)

Timothy

Meadow foxtail

Yellow salsify

Tall oatgrass (confirm identification)

Weeds

Ventenata

Teasel

Medusahead

Cheatgrass

*Rush skeletonweed

*Spotted knapweed (esp. a big patch along the draw)

*Canada thistle

Invasive roses (treated)

Goals

- (1) Control noxious weeds, exotic annual grasses, and teasel if it becomes problematic.
- (2) Increase diversity of grasses and forbs with a focus on native plants.
- (3) Control invasive rose regrowth.

Treatments to achieve goals

Treatments would begin after the UI herbicide trials conclude.

- (1) Broadcast treat for ventenata and other annual grasses.
- (2) Broadcast treat for noxious weeds and, incidentally, teasel.
- (3) Seed the unit.
- (4) Monitor invasive rose regrowth and treat periodically.
- (5) Plant the overflow parking area with hardy plants that can handle periodic mowing and keep it mowed.
- (6) Monitor any new trail for weed invasion and treat as needed.

Unit 5

Zone: Open forest/savanna

Size: 4.4 acres

Aspect: Northwest and north

Description: A large population of invasive roses in this unit was treated with Garlon 4 Ultra in May 2019 and April 2020. In January, February, and November of 2020, seed was scattered in the rose openings. In October 2020 some of the openings were planted with grass plugs. Ponderosa pine is expanding into the unit. Toward the top of the ridge, adjoining unit 6, ventenata mixes with smooth brome. At the eastern edge, aspen is moving into the unit. Slopes are below 20 percent in this unit.

Uses: This unit is adjacent to a bluebird trail.

Plants (desirable or relatively benign)

Smooth brome
Ponderosa pine (young)
Oceanspray
Goldenrod (near compound)
Snowberry
Serviceberry
Tall oatgrass (confirm identification)
Douglas-fir (young)
Pearly everlasting
Redstem ceanothus
Aster, esp. at eastern end
Meadow foxtail
Yellow salsify
Ninebark
Hawthorn at bottom

Weeds

Ventenata near top of ridge, adjoining unit 6
Invasive roses
Teasel
*Spotted knapweed at western end (may have been treated)
* Hawkweed at western end
*Oxeye daisy at western end

Goals

(1) Control ventenata and noxious weeds.

- (2) Develop and maintain pine savanna.
- (3) Control invasive rose regrowth.

Treatments to achieve goals

- (1) Treat ventenata adjoining unit 6.
- (2) Fill spaces left by rose eradication with native grasses and forbs.
- (3) Spot spray noxious weeds.
- (4) Thin pine seedlings and saplings.
- (5) Monitor the invasive roses and treat regrowth periodically.

Unit 6

Zone: Open forest/savanna

Size: 8.6 acres

Aspect: West and northwest

Description: This unit was treated for ventenata in fall 2019 and spring 2020. It is dominated by smooth brome. Some bare spots occur where ventenata was sprayed near the wetland. Slopes are generally below 20 percent, however a section in the south is in the 20 to 30 percent range.

Uses: The unit contains several bluebird boxes. People walk here and sometimes ski or sled.

Plants (desirable or relatively benign)

Smooth brome

Tall oatgrass (confirm identification)

Ponderosa pine

Yellow salsify

St Johnswort

Oak (one small tree)

Serviceberry

Weeds

Ventenata in very small patches near ponderosa pines and in scattered south-facing spots

Teasel

Invasive roses (treated)

Goals

- (1) Control ventenata.
- (2) Develop and maintain pine savanna.
- (3) Increase plant species diversity to benefit bluebirds.
- (4) Control invasive rose regrowth

Treatments to achieve goals

- (1) Broadcast treated for ventenata September 2019 (Esplanade herbicide) and April 2020 (Laramie herbicide).
- (2) Block spray remaining ventenata.
- (3) Spot spray noxious weeds as needed.
- (4) Vegetate bare spots.
 - Plant forb plugs raised by Tim Prather's UI class to add plant species diversity to attract insects fed upon by the bluebirds.
 - Broadcast seed into bare spots at a safe time post Esplanade. Cover seed with weed-free mulch.

- (5) Thin conifer seedlings if they expand into the area in the future.
- (6) Monitor invasive rose regrowth and treat periodically.

Unit 7

Zone: Open forest/savanna

Size: 1.4 acres

Aspect: West and southwest

Description: Adjacent to unit 6, this unit was not treated for ventenata in 2019 or 2020. It contains ventenata. Forest is filling in at the base. Slopes range from 10 to 30 percent.

Uses: Perhaps some skiing. Christmas tree cutting, mainly of Douglas-fir, by members of the public in December 2020.

Plants (desirable or relatively benign)

Smooth brome

Ponderosa pine

Douglas-fir

Yellow salsify

St. Johnswort

Timothy

Lupines close to the wetland restoration area

Weeds

Ventenata

Teasel

Goals

(1) Control ventenata.

(2) Develop and maintain pine savanna.

(3) Take advantage of excess Douglas-fir regeneration for Christmas tree cutting. (These are small trees that need to be removed anyway to develop or maintain pine savanna.)

Treatment to achieve goals

(1) Treat ventenata (unit-wide broadcast treatment).

(2) Thin ponderosa pine and Douglas-fir regeneration.

(3) Thin around selected young Douglas-fir trees to encourage their growth as Christmas trees.

Unit 8

Zone: Open forest/savanna

Size: 7.8 acres

Aspect: West

Description: Adjacent to unit 7 to the north and bordered by a draw to the west and some forest to the south, this unit has dense trees near the draw and open areas filling with ponderosa pine and Douglas-fir. Slopes are generally below 20 percent, however a section in the east is in the 20 to 30 percent range.

Uses: Wildlife

Plants (desirable or relatively benign)

Ponderosa pine
Douglas-fir
Oceanspray
Ninebark
Oregon grape
Maple
Pinegrass
Blue wildrye
Fern
Snowberry

Weeds

*Spotted knapweed
*Houndstongue
*Canada thistle

Goals

- (1) Manage along with the adjoining forested areas.
- (2) Control noxious weeds; check for ventenata.

Treatment to achieve goals

- (1) Spot spray noxious weeds and, if found, ventenata.

Unit 9

Zone: Open forest/savanna

Size: 12.0 acres

Aspect: Northeast and northwest

Description: Domelike and between two draws, this unit is filling with ponderosa pine and some Douglas-fir from the southern boundary, and from the southern ends of the draws. A homesite is at the southern edge, outside of the park boundary. It has some big ponderosa pine near the draws, especially on the southwest side. The dome is relatively flat on top (10 to 20 percent), while the slopes on both the east and west sides are 20 to 30 percent; the slope on the eastmost side is sometimes 30 to 40 percent. The Latah County 1981 soil survey (Barker 1981) indicated this unit contained severely eroded soils. The Heritage Trail runs along part of its northwestern side.

Uses: Bee boxes in adjacent wetland restoration area to the northeast. Wildlife use indicated by the presence of large-animal beds. People ski and sled here in winter. Christmas tree cutting, mainly of Douglas-fir, by members of the public in December 2020.

Plants (desirable or relatively benign)

Smooth brome

Ponderosa pine

Douglas-fir

Orchardgrass

Tall oatgrass (confirm identification)

Mullein

Maple

Snowberry

Native lupines at eastern draw

Aster

Goldenrod at eastern draw

St. Johnswort

Weeds

Ventenata (especially on top of ridge and on eastern side)

Reed canarygrass at draw

Teasel toward the top of the hill

*Hawkweed patch

*Canada thistle (some)

Goals

(1) Control ventenata and noxious weeds.

- (2) Develop and maintain pine savanna.
- (3) Take advantage of excess Douglas-fir regeneration for Christmas tree cutting. (These are small trees that need to be removed anyway to develop or maintain pine savanna.)

Treatment to achieve goals

- (1) Treat ventenata, probably in a unit-wide broadcast application.
- (2) Seed open areas with an emphasis on native species after ventenata treatment, if needed.
- (3) Spot spray noxious weeds.
- (4) Thin young ponderosa pine and Douglas-fir trees.
- (5) Thin around selected young Douglas-fir trees to encourage their growth as Christmas trees.

Unit 10

Zone: Open forest/savanna

Size: 1.6 acres

Aspect: North, northwest and northeast

Description: Wedged between two wetland/meadow areas, including the wetland restoration area to the east, this unit is thick with ventenata, especially at the ridge where it follows what appears to be a vehicle route. It has ponderosa pines mainly along its eastern edge, and young pine seedlings establishing within the unit. Slopes are less than 20 percent throughout the unit.

Uses: The Heritage trail hugs the western edge of the unit.

Plants (desirable or relatively benign)

Smooth brome
Ponderosa pine (large and young)
Douglas-fir (young)
Serviceberry
Oceanspray
Yarrow (eastern side)
Bulbous bluegrass
Tall oatgrass (confirm identification)
St. Johnswort
Juniper
Redstem ceanothus toward southern end
Snowberry

Weeds

Ventenata
*Spotted knapweed (occasional)
*Rush skeletonweed (in scattered pockets)
Teasel
Invasive roses (treated)

Goals

- (1) Control ventenata and noxious weeds.
- (2) Develop and maintain pine savanna
- (3) Consider part of the area for a demonstration prairie understory.
- (4) Control invasive rose regrowth.

Treatment to achieve goals

- (1) Treat ventenata, probably in a unit-wide broadcast application, assuming access is possible among the ponderosa pines.
- (2) Spot spray noxious weeds.
- (3) Plant bare areas after ventenata treatment.
- (4) Thin young ponderosa pine and Douglas-fir trees.
- (5) Monitor invasive roses and treat periodically.

Unit 11

Zone: Open forest/savanna

Size: 3.0 acres

Aspect: Northeast and east

Description: This is a strip of land between the eastern side of the forest island and the wetland/meadow below. It contains the segment of the Native Plant Trail that goes up the steep hill (20 to 30 percent slopes); this trail also runs below the unit's northeastern side. It is predominantly smooth brome, contains an area of young ponderosa pine and Douglas-fir, and is relatively free of weeds except for ventenata along the trail, especially the steep trail up the hill.

Uses: Hiking, sledding, skiing

Plants (desirable or relatively benign)

Ponderosa pine
Douglas-fir
Smooth brome
Lupine, especially a large patch near the forest island
Chicory
Serviceberry
St. Johnswort
Oceanspray
Vetch
Ninebark
Snowberry
Tall oatgrass (confirm identification)
Hawthorn
Redstem ceanothus
Mullein

Weeds

Ventenata along the trails and in one or two patches
Teasel (a bit)
*Canada thistle pockets, especially to the south of the steep trail
Bull thistle
Invasive roses (treated)
*Hawkweed (in vicinity of steep trail--mostly treated in spring 2020)

Goals

- (1) Control ventenata and noxious weeds.
- (2) Develop and maintain pine savanna.
- (3) Control invasive rose regrowth.

Treatment to achieve goals

- (1) Treat ventenata and noxious weeds along trails and in isolated, mapped spots.
- (2) Plant native shrubs, grasses, or forbs in bare spots from rose treatment.
- (3) Remove small ponderosa pine and Douglas-fir to maintain an open savanna.
- (4) Monitor invasive roses and treat periodically.

Unit 12

Zone: Open forest/savanna

Size: 3.6 acres

Aspect: East and northeast

Description: This unit contains the segment of the Native Plant Trail to the south of the forest island and another, unnamed, trail segment roughly parallel to it to the east. It is quite weedy, especially along the trails, with ventenata at the top and large patches of noxious weeds, especially rush skeletonweed, between the trails. Pockets of oxeye daisy, Canada thistle, and houndstongue were treated in June 2020. The western half has slopes of 10 to 20 percent, while in the eastern half the slope is 20 to 30 percent.

Uses: Hiking, skiing, sledding

Plants (desirable or relatively benign)

Smooth brome

St. Johnswort

Weeds

Ventenata

Cheatgrass

*Rush skeletonweed

*Oxeye daisy

*Canada thistle

*Houndstongue

Prickly lettuce

Goals

(1) Control ventenata and noxious weeds.

(1) Develop and maintain pine savanna.

Treatment to achieve goals

(1) Treat for ventenata, probably in a unit-wide broadcast application.

(2) Treat for noxious weeds, possibly spot spray but more probably a unit-wide broadcast application.

(2) Seed after the ventenata and noxious weed treatments if necessary. Otherwise, let smooth brome fill in.

Unit 13

Zone: Open forest/savanna

Size: 5.8 acres

Aspect: Northwest and north

Description: To the southwest of the forest island, this unit slopes down to the forest. Slopes are 10 to 20 percent on the southeast side and 20 to 30 percent on the northwest side. Smooth brome predominates, and it is relatively free of weeds.

Uses: Hiking along uphill edge around forest island, deer trail, gopher activity. Wildlife use as indicated by ungulate bed sites.

Plants (desirable or relatively benign)

Smooth brome

St. Johnswort

Ponderosa pine (young, scattered)

Bracken fern toward bottom

Meadow foxtail?

Snowberry

Penstemon (a patch)

Vetch understory

Mullein

Milkweed

Weeds

Bull thistle (scattered)

Prickly lettuce

*Oxeye daisy (mapped patch)

Teasel (occasional)

Goals

(1) Control noxious weeds.

(2) Develop and maintain pine savanna.

Treatments to achieve goals

(1) Spot spray noxious weeds.

(2) Thin young pine as needed.

Unit 14

Zone: Open forest/savanna

Size: 3.2 acres

Aspect: Northwest

Description: This relatively steep unit (up to 30 percent slope) is on the western side of the forest island. It dips down to a draw on its western side. It is crossed by an unnamed east-west trail and bordered on the east by a trail that circles the forest island. It is dominated by smooth brome and filling with ponderosa pine. It is relatively free of weeds except near the east-west trail, where you find Canada thistle and houndstongue, and the trail at the eastern edge, where you find ventenata. There is considerable teasel in the northwest section.

Uses: Hiking, wildlife (animal bed)

Plants (desirable or relatively benign)

Smooth brome
Ponderosa pine
Snowberry
St. Johnswort
Redstem ceanothus
Serviceberry
Goldenrod
Oceanspray
Ninebark

Weeds

Ventenata
*Canada thistle
*Houndstongue
Teasel

Goals

- (1) Control ventenata and noxious weeds.
- (2) Manage as open forest along with the forest island.

Treatments to achieve goals

- (1) Spot treat noxious weeds and ventenata along trails.
- (1) Thin young ponderosa pine as specified by forest managers.

Unit 15

Zone: Open forest/savanna

Size: 3.9 acres

Aspect: Northwest, west, north, northeast

Description: This unit at the northern tip of the forest island is bisected by an unnamed trail that leads from the northern tip of the Native Plant Trail to the northern tip of the forest island. Wetland/meadow borders the unit's downhill sides. Its western side contains a high density of ponderosa pine seedlings and saplings, smooth brome, and ventenata. The ventenata peters out near the draw. The northwestern end contains an especially thick stand of teasel. Noxious weeds occur in the vicinity of the trail the bisects the unit. Slopes are flat on the northern edge and increase gradually to 30 percent on the southern edge.

Uses: Hiking

Plants (desirable or relatively benign)

Smooth brome

Ponderosa pine

Yellow salsify

Vetch

Pearly everlasting

Mullein

Serviceberry

Bachelor's button

Flowering hawthorn

Milkweed patch (mapped?)

Chicory

Aster

Weeds

Ventenata

Teasel

*Rush skeletonweed patch (mapped?)

Prickly lettuce

*Houndstongue

Invasive roses (treated)

Goals

(1) Control ventenata and noxious weeds.

(2) Develop and maintain pine savanna.

(3) Control invasive rose regrowth

Treatments to achieve goals

- (1) Treat ventenata, probably in a unit-wide broadcast treatment.
- (2) Spot treat noxious weeds.
- (3) Seed after ventenata treatment if smooth brome does not fill in.
- (4) Remove small ponderosa pines and some bigger ones, too, to maintain a pine savanna.
- (5) Consider treating teasel if the area is slated for more human use.
- (6) Monitor invasive rose regrowth and treat periodically.

Unit 16

Zone: Various

Size: 3.0 miles along trails

Aspect: Various

Description: The driveway and trails unit runs throughout the park.

Use: Trails are used for hiking or jogging during the snow-free months and skiing in the winter. Motorized vehicles are not permitted on the park trails.

Weeds

Weeds of all kinds are common around trails.

Goals

(1) Control noxious weeds and exotic annual grasses to prevent spread to other units.

Treatment to achieve goals

(1) Spot spray on either side of driveway and trails, especially those in the open, as needed.

(2) Mow on either side of the trails in the open (5 to 15 feet)

(2) Seed treated areas if necessary, to fill in bare patches.

Unit 17

Zone: Open forest / Savanna

Size: 39 acres

Aspect: East, north, northwest

Description: The currently forested area was probably never farmed but likely logged entirely or partially. Tree canopy cover is generally high (70–90%). This unit consists of the western edge and the southwestern corner of the park parcel and also the forest island in the park center. The dominant tree species is ponderosa pine, but Douglas-fir is also common. The understory is composed of native shrubs, grasses, and forbs. Invasive species and noxious weeds are uncommon. Slopes are variable between 10 and 30 percent.

Use: Several stretches of park trails traverse the forested areas. The area is used by wildlife.

Plants (incomplete, needs further inventory)

Ponderosa pine
Douglas-fir
Ninebark
Oceanspray
Snowberry
Serviceberry
Redstem ceanothus
Pinegrass
Blue wildrye
Idaho fescue
Mountain brome

Weeds (incomplete, needs further inventory)

*Houndstongue

Goals

- (1) Control noxious weeds and exotic annual grasses to prevent spread to other units.
- (2) Maintain a healthy forest that provides habitat for wildlife, recreational opportunities, and is resilient to wildfire.

Treatment to achieve goals

- (1) Hand-pull or spot spray as needed to control noxious weeds with a focus around trails.
- (2) Maintain a forest structure that is resilient to wildfire by implementing periodic thinning and fuels management.

Unit 18

Zone: Forest

Size: 3 acres

Aspect: East, northeast, northwest

Description: This unit is composed of three small lobes of forest soil on the southern edge of the park. The area was never farmed but likely logged entirely or partially. Tree canopy cover is generally high (70–90%). The dominant tree species are ponderosa pine and Douglas-fir. The understory is composed of native shrubs, grasses, and forbs. Invasive species and noxious weeds are uncommon. Slopes are generally 20 to 30 percent, with some areas reaching 40 percent slopes.

Use: These small lobes of forest are rarely used by park visitors. The area is used by wildlife.

Plants (incomplete, needs further inventory)

Ponderosa pine

Douglas-fir

Grand fir

Ninebark

Oceanspray

Pinegrass

Blue wildrye

Weeds (incomplete, needs further inventory)

Weeds have not been inventoried in this unit

Goals

- (1) Control noxious weeds to prevent spread to other units.
- (2) Maintain a healthy forest that provides habitat for wildlife and is resilient to wildfire.

Treatment to achieve goals

- (1) Hand-pull or spot spray as needed to control noxious weeds.
- (2) Maintain a forest structure that is resilient to wildfire by implementing periodic thinning and fuels management.

Unit 19

Zone: Wetland/meadow

Size: 26.8 acres

Aspect: Various but mostly bottom lands on flat ground

Description: All of the wetland/meadow zone is currently included in this management unit. The wetland area is part of the Upper Fourmile Creek watershed, which drains into the South Fork of the Palouse River. Soils range from poorly drained aquolls in the bottom lands to deep, moderately well-drained soils higher upslope. Vegetation in the bottom lands is currently dominated by invasive reed canarygrass. The northwest section of the wetland area has a high percentage of tree and shrub cover of, for example, quaking aspen, ponderosa pine, hawthorn, and redosier dogwood, and it is mostly free of reed canarygrass. Most of the historic farm buildings were located in this unit. Slope is 0 to 10 percent, reaching 20 percent in some areas.

Use: Sections of the park trails traverse this unit. This unit includes the two ponds, the picnic shelters, and the garden area. The unit gets a lot of human use such as hiking, playing, picnicking, and dog walking.

Plants (incomplete, needs further inventory)

Smooth brome

Tall oatgrass (confirm identification)

Teasel

Weeds (incomplete, needs further inventory)

Reed canarygrass

*Canada thistle

*Houndstongue

*Hawkweed

Goals

- (1) Control noxious weeds and exotic annual grasses.
- (2) Reduce the invasive reed canarygrass and restore diverse wetland vegetation in areas dominated by reed canarygrass.
- (3) Maintain high tree and shrub canopy cover where it occurs. Promote quaking aspen and other native species.

Treatment to achieve goals

- (1) Hand-pull or spot spray as needed to control noxious weeds.
- (2) Mow reed canarygrass, apply eco-cloth or other temporary weed barriers, plant with native wetland species, mulch the plantings and protect vulnerable species from wildlife browsing and grazing until the wetland species have established. Select plant species from appendix F and in collaboration with the Latah Soil and Water Conservation District.

Unit treatment groups

We have placed units into treatment groups on the basis of their common vegetation management challenges, which will probably require the same treatments. Our thinking is that it may be more cost effective to treat all the units with a common problem together, rather than address problems in the park unit by unit.

No treatments have been specified for the meadow/wetland zone, the forest zone, or forested areas of the open forest/savanna zone. Wetland rehabilitation is already underway in one portion of the wetland zone (see map); a more comprehensive plan should be developed. Forested areas are addressed in the Latah County Parks and Recreation Five-Year Plan dated May 2016: "develop and implement a forestry management plan, to improve forest health and decrease fire danger."

Treatment group A. Widespread ventenata and noxious weeds

Units with widespread ventenata, wide distribution of noxious weeds, some large populations of teasel, and few to no native plants. These units, mostly in the prairie zone, tend to have decent populations of smooth brome. Suggested treatments include mowing to control exotic annual and noxious weeds, broadcast herbicide treatment of ventenata and of noxious weeds (with incidental treatment of teasel), and drill seeding (grass plus forbs) of the entire unit, with an emphasis on native plants.

Units 1 (9.2 acres), 3 (4.7 acres), 4 (6.5 acres), 12 (3.6 acres) Total acreage = 24.0

Dates of treatment and acreage. Unit 1 was broadcast treated for ventenata in September 2019 and April 2020 and for noxious weeds in June 2020 (except for northwest thumb) and October 2020. Because of large patches of bare ground, it is to be seeded in either spring or fall 2021.

Remaining acreage to treat is 14.8 acres as of 1/18/21.

Treatment group B. Widespread ventenata and spotty noxious weeds

Units with widespread ventenata and spotty distribution of noxious weeds or no noxious weeds, these units are in the open forest/savanna zone. These units tend to have low populations of native forbs and a background of smooth brome. Suggested treatments include mowing to control exotic annual and noxious weeds, broadcast herbicide treatment of ventenata, spot treatment of noxious weeds, and seeding of bare areas vacated by ventenata if smooth brome does not fill in, with an emphasis on native plants.

Units 6 (8.6 acres), 7 (1.4 acres), 9 (12 acres), 10 (1.6 acres), 15 (3.9 acres) Total acreage = 27.5

Dates of treatment and acreage. Unit 6 was broadcast treated for ventenata in September 2019 and April 2020, with plans for forb plug planting into bare spots in spring 2021. **Remaining acreage to treat is 18.9 acres** as of 1/18/21.

Treatment group C. Localized ventenata and spotty noxious weeds

Units with localized ventenata and spotty distribution of noxious weeds, units in this group contain some native forbs and/or shrubs and a background of smooth brome. Suggested treatments include localized treatment of ventenata, spot treatment of noxious weeds, and seeding of bare areas vacated by ventenata if smooth brome does not fill in.

Units 2 (3.1 acres), 5 (4.4 acres) Total acreage = 7.5

Dates of treatment and acreage. A portion of unit 2 was broadcast treated for ventenata in September 2019 and April 2020.

Treatment group D. Spotty noxious weeds

Units with no discernable ventenata except along trails but with spotty noxious weeds, these units contain native plants, especially native shrubs, and other desirable plants. Some have a background of smooth brome. Spot treatment of noxious weeds is suggested.

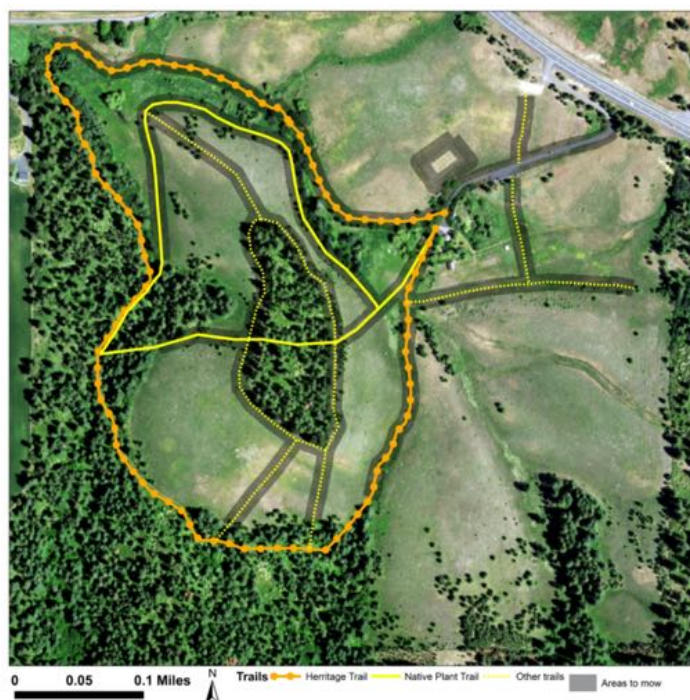
Units 8 (7.8 acres), 11 (3.0 acres), 13 (5.8 acres), 14 (3.2 acres) Total acreage = 19.8

Treatment group E. Driveway and trails

Roads and trails in the more open, sunny areas of all zones, except for the forest zone, this unit has widespread ventenata and noxious weeds. Suggested treatment is consistent annual mowing and spot or broadcast treatment for ventenata and noxious weeds where mapped. This is an ongoing effort to be reassessed annually.

Areas to mow includes the area around trails that are not in the forest (2.2 miles), the driveway (0.2 miles) and around the orchard (0.1 mile).

Unit 16 (2.5 miles)



Treatment group F. Ponderosa pine and Douglas-fir regeneration

Ponderosa pine and sometimes Douglas-fir regeneration is encroaching on previously open areas, often in high densities, in all units of the open forest/savanna zone. Suggested treatments include thinning of young trees to create a fire-resilient open savanna conducive to wildlife, dog walking, skiing, etc., except in units 14 and 8, which could be thinned then managed along with adjoining forest. Thinning now, with hand tools, will avoid a more-expensive thinning operation with mechanical equipment later on.

Units 5 (4.4 acres), 6 (8.6 acres), 7 (1.4 acres), 8 (7.8 acres), 9 (12 acres), 10 (1.6 acres), 11 (3.0 acres), 12 (3.6 acres), 13 (5.8 acres), 14 (3.2 acres), 15 (3.9 acres) Total acreage = 55.3 acres

Dates of treatment. Thinning of young trees started in fall 2020 in units 7, 9, 11, 14, and 15; this will be an ongoing effort reassessed annually.

Treatment group G. Sweetbriar rose

Basal-bark herbicide treatment during the dormant season is suggested, and would be followed by removal of dead roses by hand or brush mower in late spring or early summer, at least 1 or 2 months following treatment. The treatment is very effective, and since other plants are dormant, it has little environmental impact other than to the roses. For roses near the wetlands, spray in the winter and aim away from the water areas. Broadcast seeding with grass and/or forb seed and mulching with straw to follow in the autumn after herbicide treatment.

All units

Dates of treatment. Most park units treated in May 2019 and April 2020. Bare rose spots in units 5, 6, 10 and 11 partially seeded in 2020; this will be an ongoing effort reassessed annually.

Monitoring

Photo monitoring

Photo monitoring consists of repeat photography to document changes in a landscape over time. It is an easy and effective way to collect important information without collecting field data, which is more time consuming.

The objective of our photo monitoring in the Phillips Farm County Park is to document changes in vegetation over time, for example, changes resulting from

- Restoration or rehabilitation projects
- Weed management
- Successional development of trees or forestry treatments
- Development of trails or structures

Photo monitoring of each management unit was started in October 2020; photos can be found in appendix K. Descriptions of the locations from which the photos were taken are in appendix

L. For monitoring in future years, it will be important to take the photos from the same locations, at similar angles, and including the same fields of view. We therefore recommend that the previous years' photos be printed or brought to the park electronically on an iPad or other tablet and that the photographer use those photos to line up the shots. Photos will be stored in a shared Dropbox.

We suggest taking photographs of each unit at least every 5 years and more frequently in units that are undergoing rapid change.

Vegetation transects

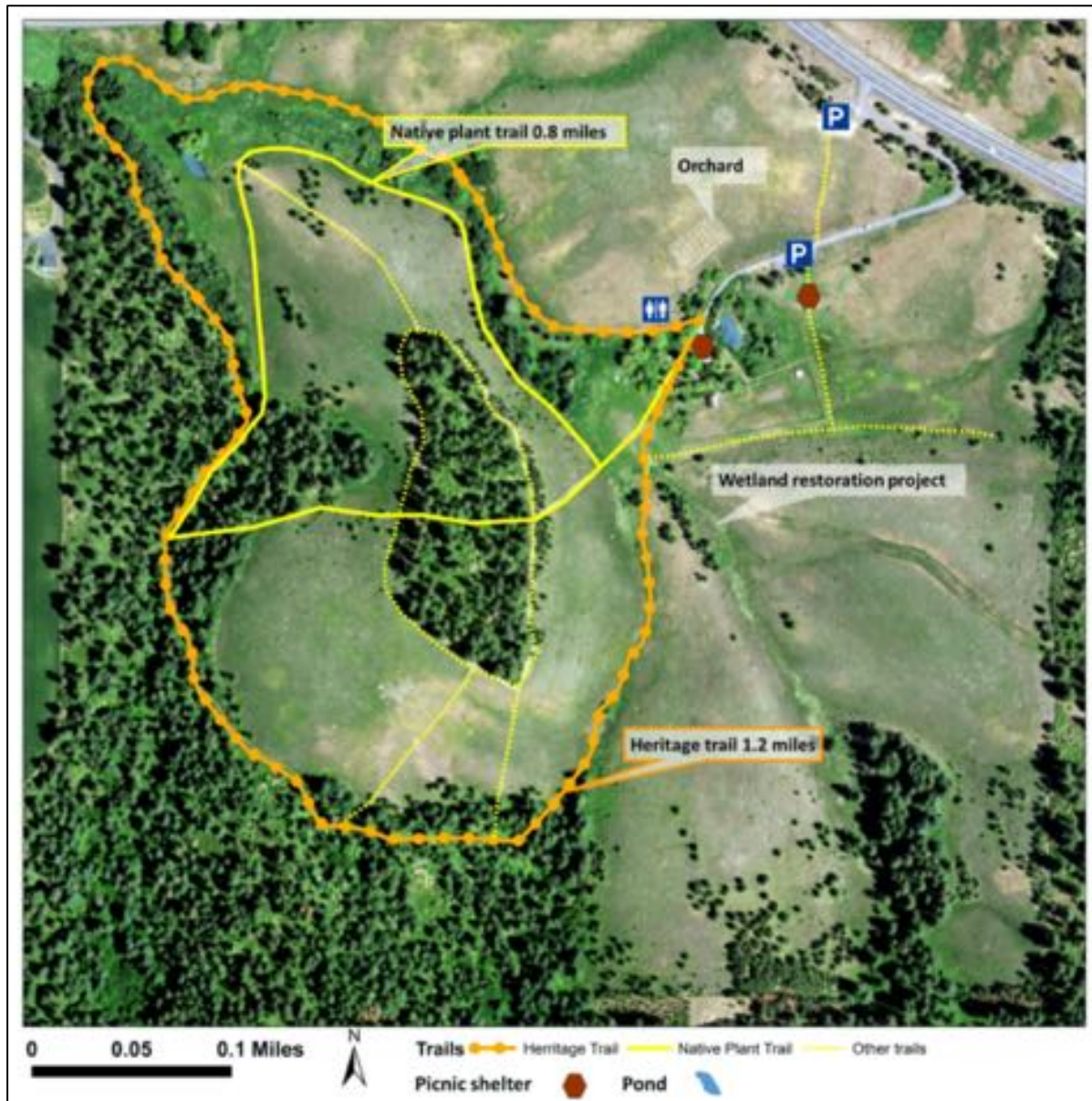
In management units undergoing treatments or rapid change, we recommend detailed monitoring of species composition and cover through time. We propose using 25-meter-long transects placed within the management units of interest. Canopy cover by species will be recorded within 20- by 50-centimeter Daubenmire quadrats placed at each meter mark along a 25-meter-long tape stretched between permanently marked start and end points. A photo will be taken at the start point of each transect, and the coordinates of the start and end locations will be documented with a GPS unit. The start and end points will be marked with wooden stakes for easy relocation and future monitoring. Instructions for how to establish new transects or resample already established transects, as well as a field data collection form, are detailed in appendix M.

Five transects were established in unit 1 in July 2020. The locations of the transects were selected to represent the vegetation in the unit, including areas dominated by smooth brome and areas where weed treatments resulted in largely bare patches. Transect locations are listed in appendix N and transect photos are in appendix O.

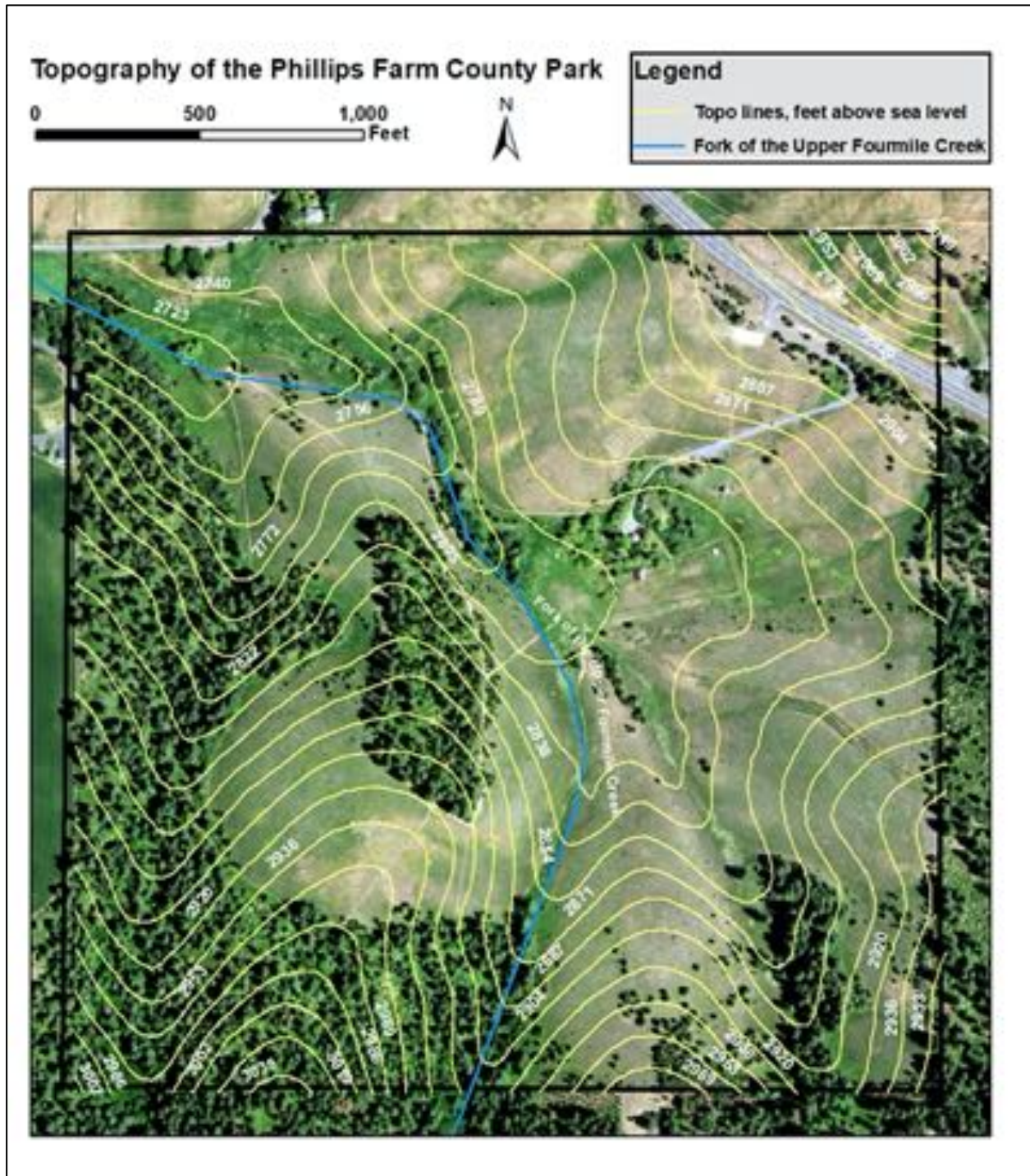
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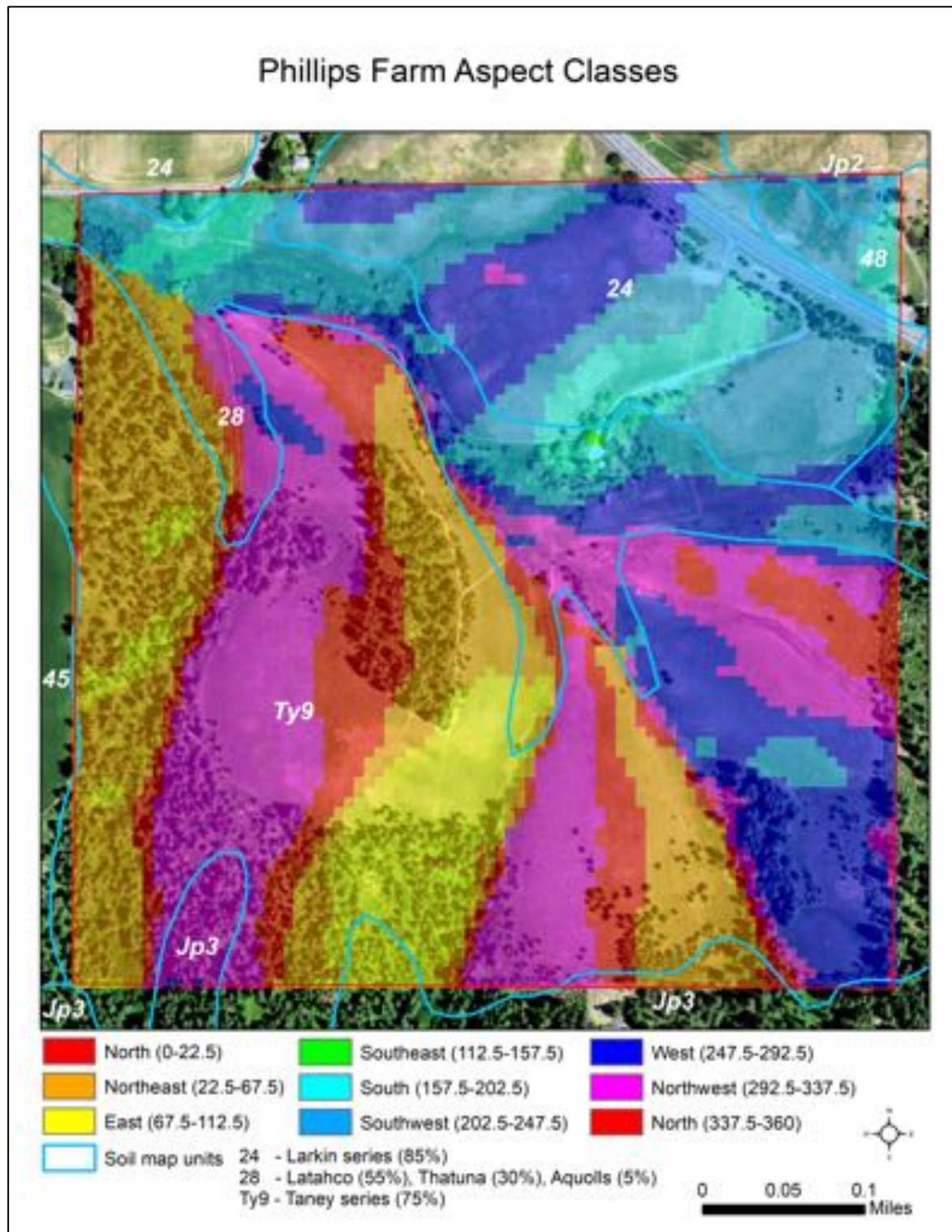
Appendix A. Phillips Farm County Park trail map.



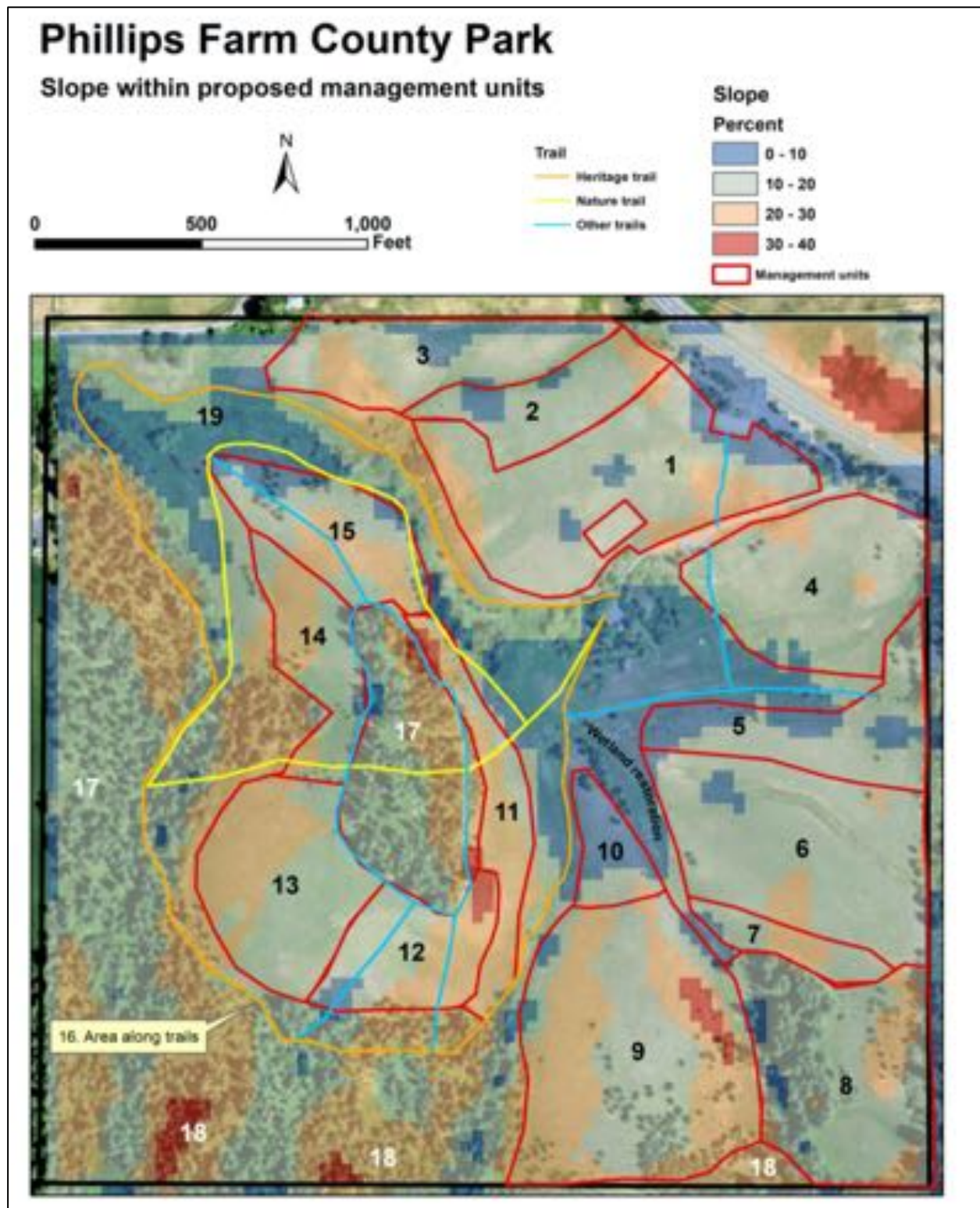
Appendix B. Topography. Topographic lines overlay a 2015 aerial photo of Phillips Farm County Park. The numbers on the topo lines are in feet above sea level. A fork of Upper Fourmile Creek flows from south to north through the park.



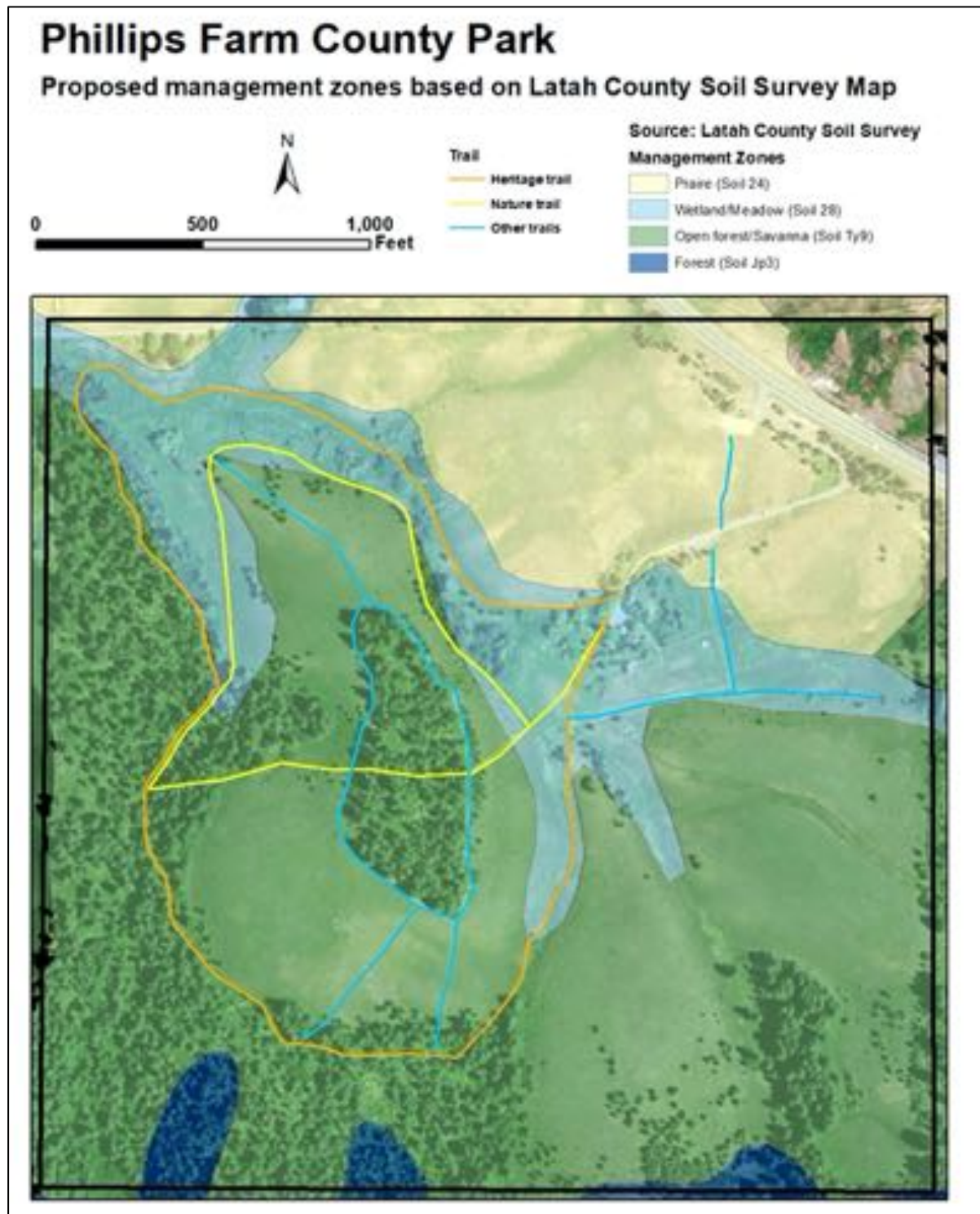
Appendix C. Aspects in Phillips Farm County Park.
Derived from 10 m digital elevation model.



Appendix D. Slope (percent) in Phillips Farm County Park.
Derived from 10 m digital elevation model.



Appendix E. Proposed management zones at Phillips Farm County Park. The source of the boundaries between proposed zones is the Latah County Soil Survey (NRCS 2020).



Appendix F. Summary of the four main soil map zones (Barker 1981, NRCS 2020) .

Prairie (Larkin Series: soil 24) 29.3 acres

Loess hill, structural bench or plateau with very deep, well-drained soil and a xeric (semi-arid) soil-moisture regime.

Parent material: Typically loess but sometimes loess over basalt residuum or loess mixed with a small amount of volcanic ash in the upper part.

Slope: 0–60%

Taxonomic class: Fine-silty, mixed, superactive, mesic Ultic Argixerolls

Typical pedon: Larkin silt loam, forested, on a 22%, convex, west-facing slope at an elevation of 925 meters

Potential natural vegetation: Ponderosa pine, bluebunch wheatgrass, mallow ninebark, Idaho fescue, lupine, sticky geranium, creamy oceanspray, rose, common snowberry, elk sedge

Open Forest/Savanna (Taney Series: soil Ty9) 96.4 acres

Dissected hills and hills on basalt plains, plateaus, and structural benches.

Soils are moderately deep to fragipan and moderately well-drained with a xeric (semi-arid) moisture regime.

Parent material: Soils formed mainly in loess or reworked loess with an influence of volcanic ash in the upper part.

Slope: 0–35%

Taxonomic class: Fine-silty, mixed, superactive, frigid Vitrandic Argixerolls

Typical pedon: Taney ashy silt loam, forested, on an 8% northwest-facing slope at 874 meters elevation.

Potential natural vegetation (NRCS 2020): Douglas-fir and ponderosa pine with an understory of common snowberry, white spirea, creambush oceanspray, mallow ninebark, Nootka rose, Woods rose, Columbia brome, sweetscented bedstraw, and pinegrass

Forest (Carrico and Micapeak series: soil Jp3) 3.4 acres

(Note: because our forest zone is north-facing, the following descriptors are for the Micapeak series only.)

Side slopes, ridges and structural benches of mountains at foothills at 600–1,280 meters

Soils are moderately deep and well drained.

Parent material: Colluvium and residuum weathered from granite, gneiss, and schist with minor amounts of loess and volcanic ash in the upper part.

Slope: 0–65%

Taxonomic class: Coarse-loamy, isotic, frigid Vitrandic Haploxerepts

Typical pedon: Micapeak gravelly ashy loam, timbered, on a north-west facing slope of 36% at 1,005 meters elevation

Potential natural vegetation (NRCS 2020): Douglas-fir, ponderosa pine, and lodgepole pine with an understory of mallow ninebark, creambush oceanspray, baldhip rose, pine grass, Saskatoon serviceberry, common snowberry, white spirea, and low Oregon grape

Wetland/Meadow (Latahco (55%), Thatuna (30%), and Aquolls (5%) series: soil 28) 26.8 acres

Narrow valley floors and toe slopes at about 2,600 feet

These three soils occur on a gradient, where the Thatuna is the driest of the three followed by Latahco (dry meadow soil) and Aquolls (wet meadow/wetland). A list of grass, grass-like, and forb species occurring along the wetness gradient are included in the table below.

Thatuna. Thatuna soil is very deep and moderately well drained; it formed in loess. Water is perched above the buried subsoil early in spring. Slope is 2–5%.

Vegetation: The Thatuna soil supports prairie grasses dominated by Idaho fescue and bluebunch wheatgrass; other grass species include Sandberg bluegrass, prairie junegrass, basin wildrye, and pinegrass. Forbs may include sticky geranium, groundsel, phlox, hawksbeard, arrowleaf balsamroot, lomatium, and lupine species.

Latahco. Latahco soil is very deep and somewhat poorly drained; it formed in alluvium derived predominantly from loess. Occasional, brief periods of flooding in spring. Water is perched above the subsoil early in spring. Slope is 0–3%.

Vegetation: See under Aquolls.

Aquolls. Aquolls soils occur at the valley floor around drainage ways or near seeps and springs.

Vegetation: Natural vegetation on the wetland/meadow soils (Latahco and Aquolls) varies depending on the water table level during the growing season. Dominant plant communities include *Carex* and *Juncus* species where the water table is at or near the soil surface the entire growing season. Drier areas where the water table is greater than 40 inches deep at the end of the growing season is dominated by grasses such as Nevada bluegrass, alpine timothy, and California oatgrass.

Potential grass, grass-like, and forb species along the wetness gradient.

Source: USDA-NRCS Latah County Soil Survey (2020)

Grass and grass-like species

Scientific name	Dry Meadow	Meadow	Wet Meadow	Marsh
<i>Leymus cinereus</i>	=====			
<i>Danthonia californica</i>	=====			
<i>Carex filifolia</i>	=====			
<i>Pascopyron smithii</i>	=====			
<i>Poa nevadensis</i>	=====			
<i>Juncus dudleyi</i>	=====			
<i>Muhlenbergia richardsonis</i>	=====			
<i>Hordeum brachyantherum</i>	=====			
<i>Phleum alpinum</i>	=====			
<i>Juncus balticus</i>		=====		
<i>Juncus torreyi</i>		=====		
<i>Alopecurus aequalis</i>		=====		
<i>Carex athrostachya</i>		=====		
<i>Calamagrostis canadensis</i>		=====		
<i>Deschampsia caespitosa</i>		=====		
<i>Carex nebrascensis</i>		=====		
<i>Glyceria striata</i>		=====		
<i>Carex lasiocarpa</i>			=====	
<i>Carex utriculata</i>			=====	
<i>Carex aquatilis</i>			=====	
<i>Eleocharis palustris</i>			=====	
<i>Carex rostrata</i>			=====	
<i>Carex hoodii</i>			=====	
<i>Carex exsiccata</i>			=====	
<i>Scirpus microcarpus</i>			=====	
<i>Juncus effusus</i>			=====	
<i>Beckmannia syzigachne</i>				=====
<i>Typha latifolia</i>				=====
<i>Schoenoplectus acutus</i>				=====
<i>Schoenoplectus pungens</i>				=====
<i>Sparganium erectum</i>				=====
<i>Schoenoplectus tabernaemontani</i>				=====

Forb species

Scientific name	Dry Meadow	Meadow	Wet Meadow	Marsh
<i>Arnica fulgens</i>	=====			
<i>Pyrrocoma lanceolata</i>	=====			
<i>Arenaria congesta</i>	=====			
<i>Artemisia ludoviciana</i>	=====			

<i>Achillea millefolium</i>	=====			
<i>Wyethia amplexicaulis</i>	=====			
<i>Pyrrocoma uniflora</i>	=====			
<i>Ranunculus</i> spp.	=====			
<i>Trifolium</i> spp.	=====			
<i>Potentilla gracilis</i>	=====			
<i>Senecio integerrimus</i>	=====			
<i>Aster</i> spp.	=====			
<i>Cirsium scariosum</i>	=====			
<i>Symphyotrichum ascendens</i>	=====			
<i>Iris missouriensis</i>	=====			
<i>Senecio serra</i>	=====			
<i>Helianthus nuttallii</i>	=====			
<i>Camassia quamash</i>	=====			
<i>Epilobium ciliatum</i>	=====			
<i>Montia chamissoi</i>	=====			
<i>Plantago major</i>	=====			
<i>Alisma triviale</i>	=====			
<i>Cicuta douglassii</i>	=====			
<i>Argentina anserina</i>	=====			
<i>Veronica anagallis-aquatica</i>	=====			
<i>Symphyotrichum frondosum</i>	=====			
<i>Polygonum bistortoides</i>	=====			
<i>Triglochin maritimum</i>	=====			
<i>Polygonum amphibium</i>	=====			
<i>Symphyotrichum foliaceum</i>	=====			
<i>Potamogeton natans</i>	=====			
<i>Lemna minor</i>	=====			

Appendix G. Photos exemplifying restoration goals for native Palouse Prairie and open pine savanna.



Palouse Prairie with mostly bluebunch wheatgrass



Palouse Prairie with Idaho fescue, bluebunch wheatgrass, and a variety of forbs



Palouse Prairie with Idaho fescue, bluebunch wheatgrass, and a variety of forbs in the foreground, transitioning to Palouse pine savanna in the background



Palouse Prairie with Idaho fescue, bluebunch wheatgrass and a variety of forbs in the foreground, transitioning to Palouse pine savanna in the background

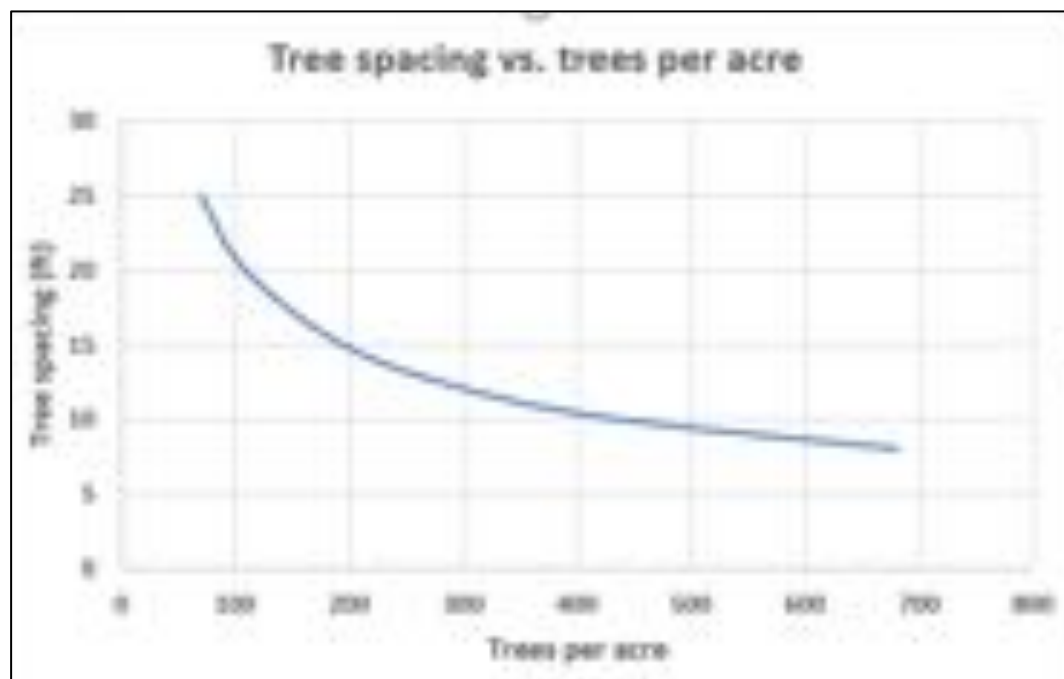
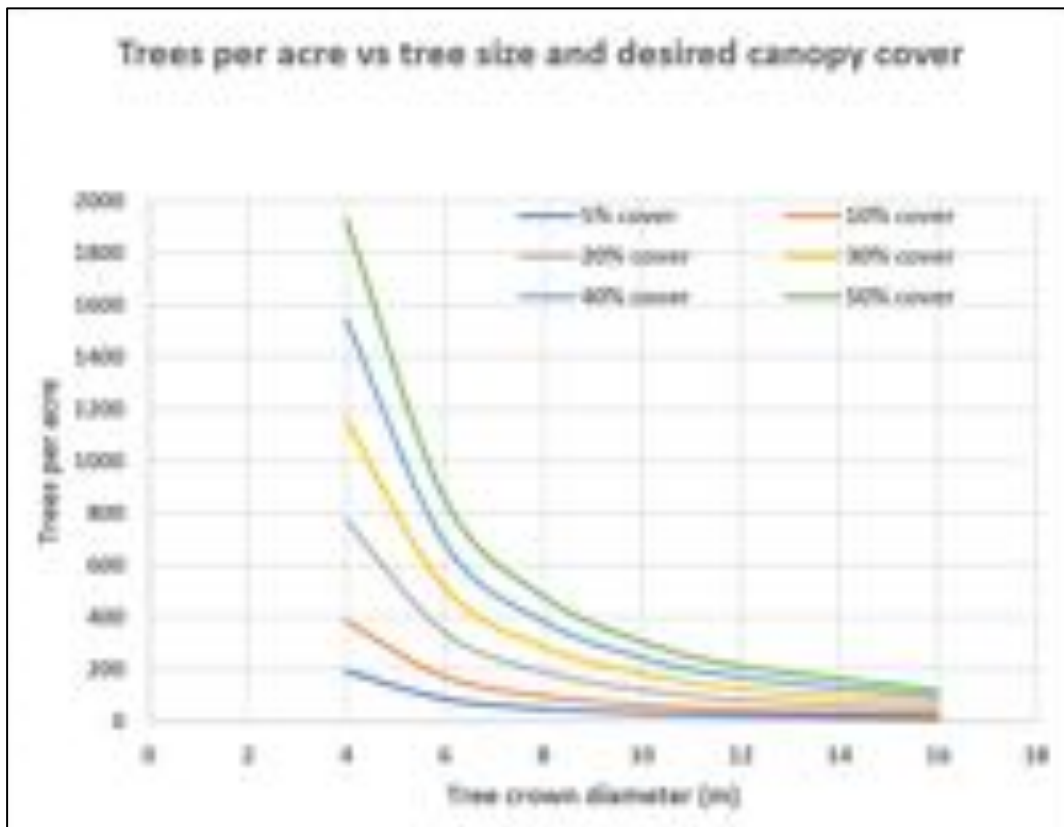


Palouse Prairie with bluebunch wheatgrass and a variety of forbs in the foreground, transitioning to pine savanna in the background.

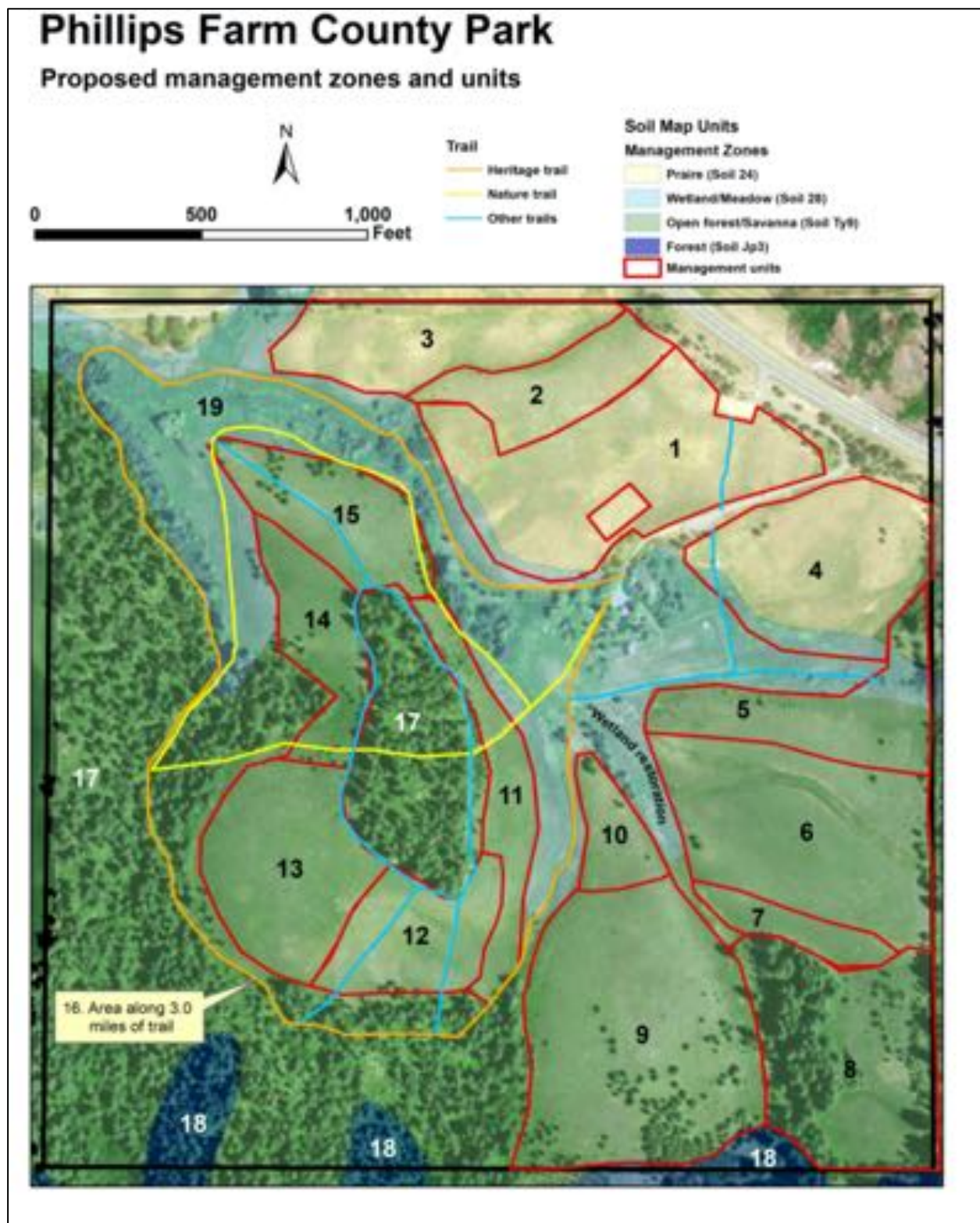


Ponderosa pine savanna in Montana. The understory is not typical for the Palouse, but the photo illustrates tree spacing typical of open forest or savanna.

Appendix H. Relationships between tree canopy cover, density and spacing



Appendix I. Map of vegetation management zones and management units.



Appendix J. Plant species list (in progress, updated September 2020).

Functional group	LifeCycle (P/A)	Origin (N/I/NOX)	Common name	Scientific name	USDA code
TREE	Perennial		cottonwood	<i>Populus</i> sp.	
TREE	Perennial	Native	Douglas-fir	<i>Pseudotsuga menziesii</i>	PSME
TREE	Perennial	Introduced	English oak	<i>Quercus robur</i>	QURO2
TREE	Perennial	Native	ponderosa pine	<i>Pinus ponderosa</i>	PIPO
TREE	Perennial	Native	quaking aspen	<i>Populus tremuloides</i>	POTR5
TREE	Perennial	Native	Rocky Mountain juniper	<i>Juniperus scopulorum</i>	JUSC2
SHRUB	Perennial	Native	black hawthorn	<i>Crataegus douglasii</i>	CRDO2
SHRUB	Perennial	Native	chokecherry	<i>Prunus virginiana</i>	PRVI
SHRUB	Perennial	Native	common snowberry	<i>Symphoricarpos albus</i>	SYAL
SHRUB	Perennial	Native	ninebark	<i>Physocarpus malvaceus</i>	PHMA5
SHRUB	Perennial	Native	oceanspray	<i>Holodiscus discolor</i>	HODI
SHRUB	Perennial	Native	Oregon grape	<i>Mahonia</i>	MAHON
SHRUB	Perennial	Native	redosier dogwood	<i>Cornus sericea</i>	COSE16
SHRUB	Perennial	Native	redstem ceanothus	<i>Ceanothus sanguineus</i>	CESA
SHRUB	Perennial	Native	Rocky Mountain maple	<i>Acer glabrum</i>	ACGL
SHRUB	Perennial	Native	Saskatoon serviceberry	<i>Amelanchier alnifolia</i>	AMAL2
SHRUB	Perennial	Introduced	sweetbriar rose	<i>Rosa rubiginosa</i>	RORU82
SHRUB	Perennial	Native	woods' rose	<i>Rosa woodsii</i>	ROWO
FORB	Annual/biennial	Introduced	prickly lettuce	<i>Lactuca serriola</i>	LASE
FORB	Annual/biennial	Introduced	redstem stork's bill	<i>Erodium cicutarium</i>	ERIC6
FORB	Annual/biennial	Introduced	yellow salsify	<i>Tragopogon dubius</i>	TRDU
FORB	Perennial	Native	aster	<i>Aster</i>	ASTER
FORB	Perennial	Introduced	bachelor's button	<i>Centaurea</i>	CENTA
FORB	Perennial	Introduced	bull thistle	<i>Cirsium vulgare</i>	CIVU
FORB	Perennial	Noxious	Canada thistle	<i>Cirsium arvense</i>	CIAR4
FORB	Perennial	Introduced	chicory	<i>Cichorium intybus</i>	CIIN
FORB	Perennial	Introduced	common mullein	<i>Verbascum Thapsus</i>	VETH
FORB	Perennial	Native	common yarrow	<i>Achillea millefolium</i>	ACMI2
FORB	Perennial	Noxious	field bindweed	<i>Convolvulus arvensis</i>	COAR4
FORB	Perennial	Native	goldenrod	<i>Solidago</i>	SOLID
FORB	Perennial	Introduced	hawkweed	<i>Hieracium</i>	HIERA
FORB	Perennial	Noxious	houndstongue	<i>Cynoglossum officinale</i>	CYOF
FORB	Perennial	Introduced	lupine	<i>lupinus</i>	LUPIN
FORB	Perennial	Introduced	oxeye daisy	<i>Leucanthemum vulgare</i>	LEVU
FORB	Perennial	Noxious	rush skeletonweed	<i>Chondrilla juncea</i>	CHJU
FORB	Perennial	Native	showy milkweed	<i>Asclepias speciosa</i>	ASSP
FORB	Perennial	Native	silky lupine	<i>Lupinus sericeus</i>	LUSE4
FORB	Perennial	Noxious	spotted knapweed	<i>Centaurea stoebe</i>	CEST8

FORB	Perennial	Native	spreading dogbane	<i>Apocynum androsaemifolium</i>	APAN2
FORB	Perennial	Introduced	St Johnswort	<i>Hypericum</i>	HYPER
FORB	Perennial	Introduced	teasel	<i>Dipsacus fullonum</i>	DIFU2
FORB	Perennial		vetch	<i>Vicia</i> sp.	
FORB	Perennial	Native	western pearly everlasting	<i>Anaphalis margaritacea</i>	ANMA
GRASS	Annual	Introduced	cheatgrass	<i>Bromus tectorum</i>	BRTE
GRASS	Annual	Introduced	field brome	<i>Bromus arvensis</i>	BRAR5
GRASS	Annual	Introduced	jointed goatgrass	<i>Aegilops cylindrica</i>	AECY
GRASS	Annual	Introduced	medusahead	<i>Taeniatherum caput-medusae</i>	TACA
GRASS	Annual	Introduced	rattail fescue	<i>Vulpia myuros</i>	VUMY
GRASS	Annual	Introduced	rattlesnake brome	<i>Bromus briziformis</i>	BRBR5
GRASS	Annual	Introduced	soft brome	<i>Bromus hordeaceus</i>	BRHO2
GRASS	Annual	Introduced	wiregrass	<i>Ventenata dubia</i>	VEDU
GRASS	Perennial	Native	blue wildrye	<i>Elymus glaucus</i>	ELGL
GRASS	Perennial	Native	bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	PSSP6
GRASS	Perennial	Introduced	bulbous bluegrass	<i>Poa bulbosa</i>	POBU
GRASS	Perennial	Native	California oatgrass	<i>Danthonia californica</i>	DACA3
GRASS	Perennial	Introduced	creeping bentgrass	<i>Agrostis stolonifera</i>	AGST2
GRASS	Perennial	Native	Idaho fescue	<i>Festuca idahoensis</i>	FEID
GRASS	Perennial	Introduced	intermediate wheatgrass	<i>Thinopyrum intermedium</i>	THIN6
GRASS	Perennial	Introduced	Kentucky bluegrass	<i>Poa pratensis</i>	POPR
GRASS	Perennial	Introduced	meadow foxtail	<i>Alopecurus pratensis</i>	ALAR
GRASS	Perennial	Native	mountain brome	<i>Bromus marginatus</i>	BRMA4
GRASS	Perennial	Introduced	orchardgrass	<i>Dactylis glomerata</i>	DAGL
GRASS	Perennial	Native	pinegrass	<i>Calamagrostis rubescens</i>	CARU
GRASS	Perennial	Native	reed canarygrass	<i>Phalaris arundinacea</i>	PHAR3
GRASS	Perennial	Introduced	smooth brome	<i>Bromus inermis</i>	BRIN2
GRASS	Perennial	Introduced	tall oatgrass	<i>Arrhenatherum elatius</i>	AREL3
GRASS	Perennial	Introduced	timothy	<i>Phleum pratense</i>	PHPR3
FERN	Perennial	Native	bracken fern	<i>Pteridium aquilinum</i>	PTAQ

Appendix K. Photos of management units, October 2020







unit 4 from pp3 E



unit 4 from pp4 E





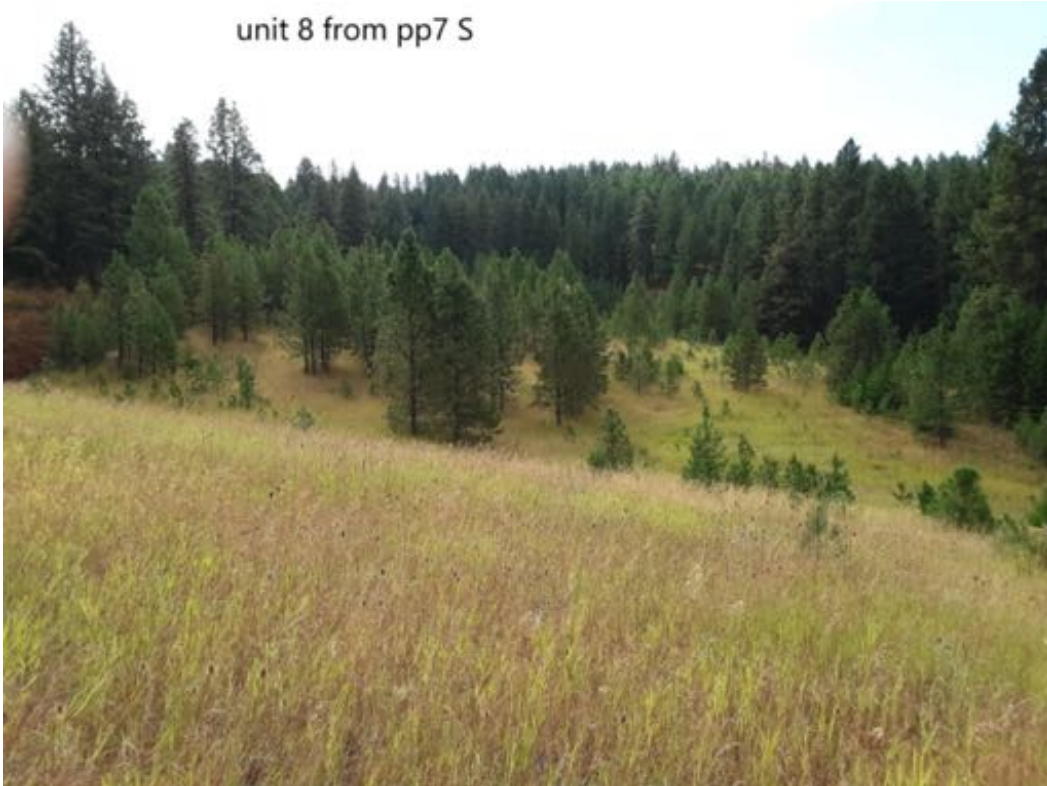
units 6, 9, 11 and 12 from pp6 W



unit 7 from pp7 W



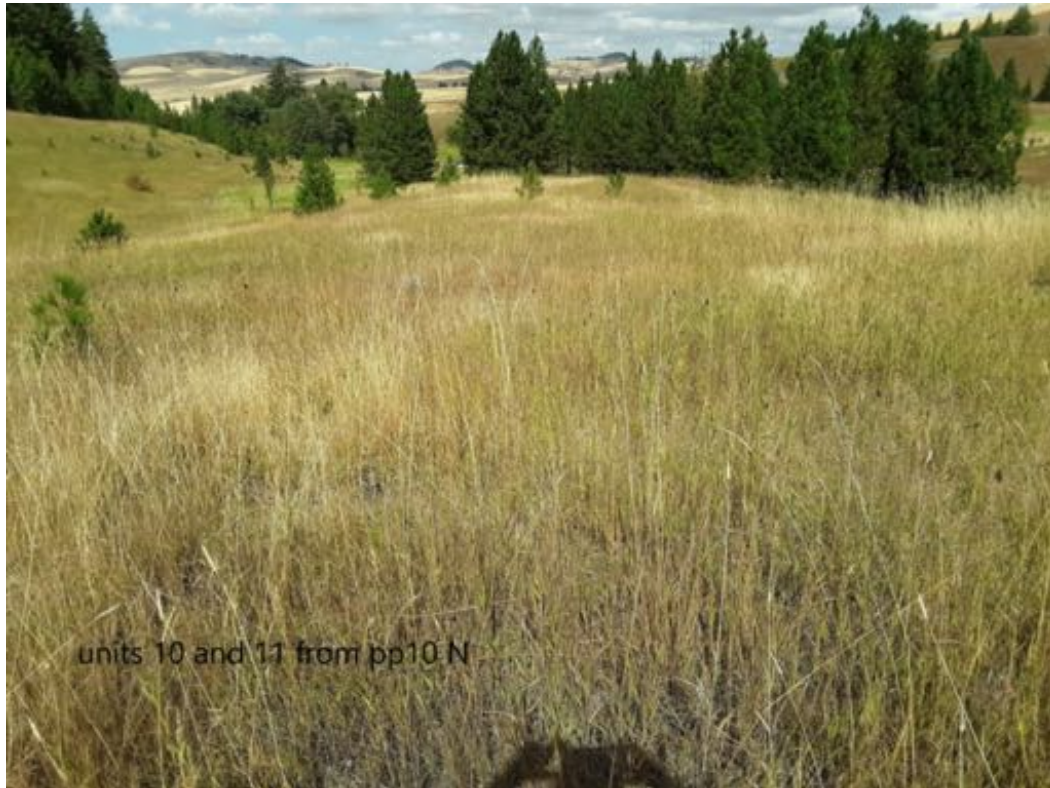
unit 8 from pp7 S

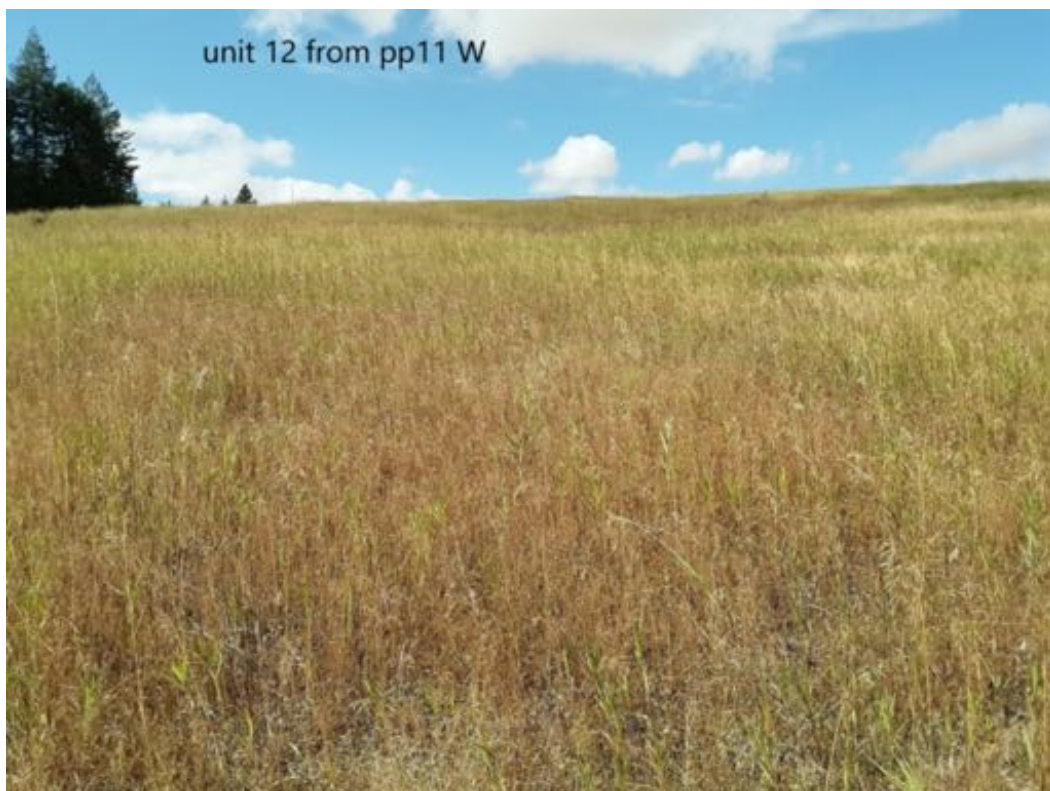


unit 8 from pp8 N















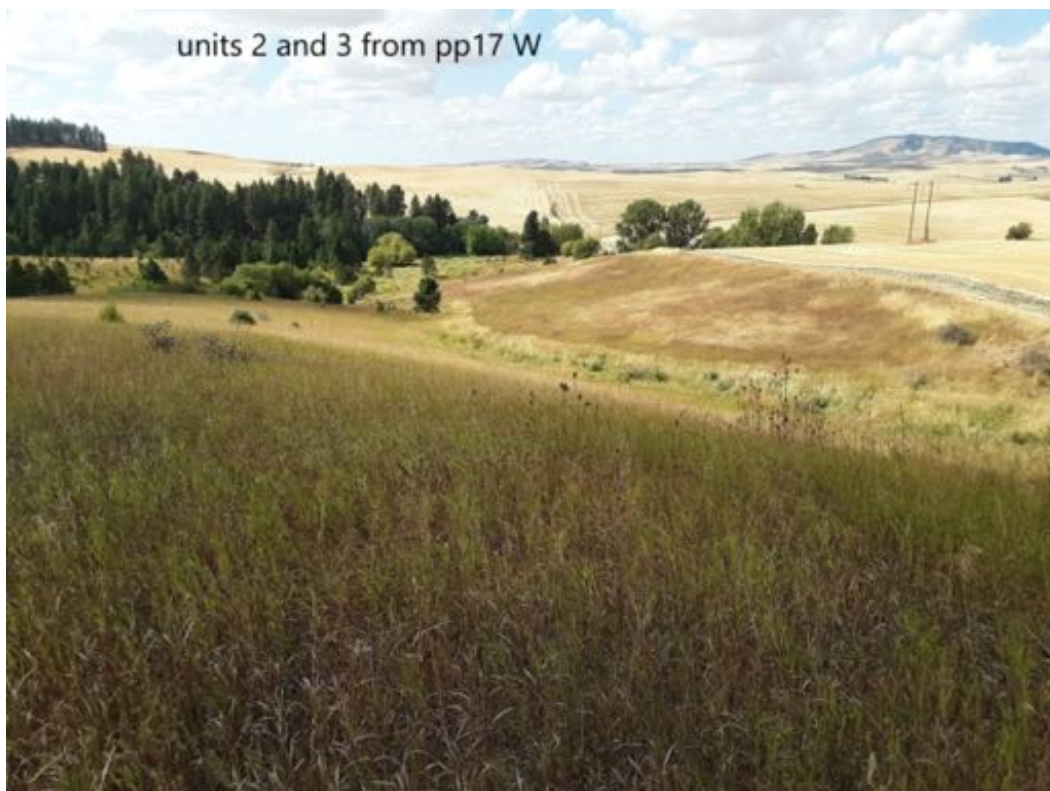


unit 14 from pp14 SSW



units 15 and 3 from pp15 N



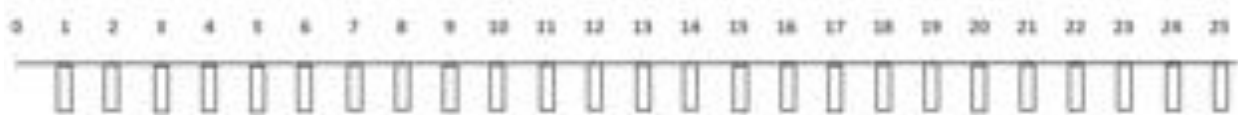


Appendix L. Description of photo point locations

- PP1: SE corner of upper parking lot
- PP2: Upper gazebo parking lot
- PP3: Between upper gazebo and corner of the fenced area on trail
- PP4: Further along trail at E boundary of fenced area
- PP5: Heading uphill toward unit 5 from small bridge, about $\frac{1}{4}$ of the way up the slope
- PP6: Directly under the 2 power poles at the top of unit 6, looking down the power line
- PP7: Top of the hill in unit 7
- PP8: At metal fence post with broken bird box, near top of hill in unit 8
- PP9: Near top of unit 9, around 100 ft below largest ponderosa pine trees
- PP10: Middle of the boundary between units 9 and 10
- PP11: Middle of the lower trail running N-S through unit 12
- PP12: S corner of unit 13, around 100 ft N of forest boundary and W of the top of the hill
- PP13: On trail below boundary of units 13 and 14
- PP14: Around 30 ft below top of trail running NW-SE in unit 15
- PP15: On trail in unit 15, about 30 ft below top
- PP16: Next to large apple tree at bottom of unit 2
- PP17: At edge of level top area along boundary of units 1 and 2, looking down into units 2 and 3

[illegible]

- 1) Choose the starting point for the transect or locate an already established start point. Avoid disturbing the plants in the area you plan to sample.
- 2) Install a permanent marker at the start point if you are establishing a new transect. Label the marker with the plot number if possible.
- 3) Secure a 30 meter measuring tape with a pin at the start point
- 4) Roll out the tape 25 meters perpendicular to the slope (not down or uphill), and secure it tightly with a pin at the end point
- 5) GPS the start point, and report easting and northing if this is a new transect
- 6) Take a photo at the start point, looking out over the transect tape. Make sure no people or equipment are in the photo
- 7) Enter plot number and date in the form.
- 8) Record elevation, slope, and aspect if it is a new transect.
- 9) Place a 20 x 50 cm quadrat on the downhill side of the tape at the 1 meter mark as shown in the figure below. The center of the short side should be at the 1 meter mark.
- 10) Record the percent canopy cover of each live plant species in the quadrat. Cover of overhanging plant parts should also be recorded if the plant is rooted in the soil. Dead plants from last year or plants not rooted in the soil should not be reported. If you are not able to confidently identify a species, collect a sample.
- 11) Record ground cover (bare ground, litter, moss, lichen). Ground cover usually adds up to 100% unless plant bases from bunchgrasses or similar plants cover the ground area.
- 12) Move to the 2 meter mark and repeat the procedure until the 25 quadrats are sampled.
- 13) GPS the end point and report easting and northing. Install a permanent marker if this is the first time for sampling.



- 14) If you see species along the transect tape that don't end up in a quadrat, record them under "Species not sampled but seen along the transect."
- 15) If the transect tape intersects shrubs, measure the length of shrub intercepted to the nearest centimeter and record under "Line intercept for shrub cover data."
- 16) Review the field sheet to make sure all data are entered.
- 17) Roll up the tape and collect the pins.

Appendix N. Monitoring locations for established plots.

Plots established in July 2020 in unit 1.

Unit	Plot	Latitude	Longitude	Y UTM NAD83	X UTM NAD83	date	altitude (m)
1	1A	46.81507	-117.01402	5184395.6	498930.9	25-JUL-20 3:01:13PM	874
1	1B	46.81515	-117.01433	5184404.9	498906.6	25-JUL-20 3:47:33PM	888
1	2A	46.81491	-117.01409	5184378.3	498925.0	25-JUL-20 3:58:16PM	873
1	2B	46.81503	-117.01438	5184391.6	498903.1	25-JUL-20 4:43:24PM	883
1	3A	46.8149	-117.01438	5184376.4	498902.9	25-JUL-20 5:01:50PM	877
1	3B	46.81499	-117.01471	5184386.6	498877.6	25-JUL-20 5:22:33PM	876
1	4A	46.81435	-117.0165	5184315.6	498741.1	27-JUL-20 8:35:05PM	859
1	4B	46.81421	-117.01676	5184299.6	498721.4	27-JUL-20 9:03:52PM	856
1	5A	46.81498	-117.01589	5184385.8	498787.8	27-JUL-20 9:15:46PM	866
1	5B	46.81484	-117.01615	5184370.7	498768.2	27-JUL-20 9:19:47PM	864
1	6A	46.81481	-117.01412	5184366.4	498923.0	27-JUL-20 9:30:39PM	872

Appendix O. Transect photos.

Plot 1, July 25, 2020



Plot 2, July 25, 2020



Plot 3, July 25, 2020



Plot 4, July 27, 2020



Plot 5, July 27, 2020



Plot 6, July 27, 2020

