View of Mt Pisgah's western Slope, April 1972

Habitat Management Plan

Howard Buford Recreation Area

June 8, 2018

View of Mt Pisgah's western Slope, April 2017

Prepared by Lane County Parks Division, Public Works Department
In partnership with Friends of Buford Park & Mt. Pisgah and Mount Pisgah Arboretum

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Table of Contents

Figures

Appendices

Chapter 1: Executive Summary

The Habitat Management Plan for Lane County's Howard Buford Recreation Area (*Plan*) is designed to guide Lane County land managers, park stakeholders, agency partners, and interested park users in managing and sustaining the 2,214-acre Howard Buford Recreation Area's valuable aesthetic and natural resources and their enjoyment by the public.

This visionary document identifies high priority goals and strategies for application of available resources, and a focus for collaborative partnerships and future grant writing efforts. With this *Plan* in hand, park managers, partner agencies, and volunteer groups can work together more effectively to secure funding to sustain the park's diverse habitats, for the public to enjoy long into the future.

Howard Buford Recreation Area (HBRA) and the greater Middle Fork-Coast Fork Willamette confluence-area is recognized in the 2006 Oregon Conservation Strategy, as well as the 2016 revision, as a Conservation Opportunity Area—a location "that provide(s) good opportunities to address the conservation needs of high-priority habitats and species" (Oregon Department of Fish and Wildlife, 2006). More than 1,000 acres of prairie, savanna, and oak woodland are found within HBRA. With only about two percent of the Willamette Valley's original prairie and savanna and 10 percent of floodplain forest habitat remaining, HBRA is home to some of the largest remnants of these habitat types in public ownership. In 2010, The Nature Conservancy (TNC) purchased more than 1,200 acres of similar habitat immediately adjacent to HBRA, and the preserve was later expanded to 1305 acres. This presents extraordinary new opportunities for restoration and protection of significant contiguous acreage of these rare habitats. A fundamental challenge of park management in HBRA is to balance the recreational needs of park visitors with the conservation needs of plants and wildlife—some of which are listed as rare, threatened, or endangered.

Each year, an estimated 400,000 people visit HBRA to enjoy its diverse natural beauty.

1.1 Conservation Vision

The planning process and associated public input resulted in the creation of the following *Conservation Vision* for Howard Buford Recreation Area:

Conservation Vision for Howard Buford Recreation Area

The Howard Buford Recreation Area will be managed to conserve and restore prairie, savanna, woodland, forest, and river habitats in ways that enhance visitor experience, compatible recreation and educational uses described in the HBRA Master Plan (1994).

The uplands shall sustain increasingly rare Willamette Valley habitat types including a mosaic of open prairie, savanna, and oak woodland in portions of the park where these habitat types occurred historically. Conifer and mixed forest shall be retained and enhanced in upland portions of HBRA, particularly in portions of the park that historically supported forest conditions. The lowlands shall sustain healthy riparian (streamside) and aquatic habitats and processes. These native habitats shall conserve common and rare native plants and animals, including federally and state-listed threatened and endangered species.

Habitat restoration shall provide significant increases in quality and/or extent of priority habitat to support a diversity of wildlife species, particularly those that were historically more prevalent throughout the Willamette Valley. Restoration will also lessen the threat of severe wildfire through reduction of dense, brushy fuels in prairie, savanna, and oak woodland habitats.

1.2 Management Goals

Fifteen management goals and associated strategies were developed to provide measurable milestones on the road to achieving the Conservation Vision. Refer to Chapter 6 for a complete list of the strategies and projects associated with each goal, as well as a brief description of the conservation targets each goal is designed to address.

- **GOAL 1:** Provide a safe and positive visitor experience in Howard Buford Recreation Area.
- **GOAL 2:** Educate park users about the unique natural values that make the HBRA and the broader Mount Pisgah area a priority for conservation.
- **GOAL 3:** Maintain and improve the park's trail system to minimize ecological impacts while providing views of and access to HBRA's diverse habitats.
- **GOAL 4:** Minimize adverse impacts of park management on conservation targets.
- **GOAL 5:** Restore and enhance prairie, savanna and oak woodland habitats by reducing encroaching woody vegetation.

- **GOAL 6:** Achieve significant restoration of prairie and savanna, oak woodland, and wet prairie habitats in HBRA.
- **GOAL 7:** Achieve significant restoration of chaparral habitat in HBRA.
- **GOAL 8:** Manage for diverse native plant communities within each conservation target habitat.
- **GOAL 9:** Increase the size of wet prairie habitat patches.
- **GOAL 10:** Locate and, to the extent feasible, reduce populations of feral or harmful non-native animal species impacting each conservation target.
- **GOAL 11:** Locate and reduce the presence of habitat-modifying, non-native plant species within each conservation target habitat.
- **GOAL 12:** Remove fish passage barriers from the lower mile of creeks and streams in HBRA that flow into the Coast Fork and Middle Fork of the Willamette River.
- **GOAL 13:** Improve ecological health of creeks and streams.
- **GOAL 14:** Improve ecological health of riparian floodplain habitats.
- **GOAL 15:** Manage habitats in the North Bottomlands Stewardship Zone to be mutually compatible with recreational activities identified in the 1994 HBRA Master Plan and the recommendations of the Large Events Task Force (2015).

1.3 Moving Forward

Effective partnerships have been a key feature of the management of the Howard Buford Recreation Area since the park was established in 1972. Achieving the ambitious vision set forth in this *Plan* will require these partnerships to grow broader and deeper. The *Plan* provides the basis for that growth, and a solid framework for Lane County Parks and its partners to pursue the financial resources necessary for successful implementation.

1.4 Stakeholder Groups

At the outset of the planning process, HBRA stakeholders, including the Mount Pisgah Arboretum and the Lane County Sheriff's Mounted Posse, were invited to briefings on the project and to public input sessions. These groups are integral to the ongoing operation of HBRA.

Mount Pisgah Arboretum, a non-profit organization, is an approximately 203-acre, living tree museum on the west slope of Mount Pisgah within HBRA. The Arboretum operates through a 50-year lease with Lane County, which was initially established in 1973, and is responsible for habitat management within the Arboretum Stewardship Zone (see chapter 7). The primary purpose of Mount Pisgah Arboretum is nature education. Habitat management efforts are aimed at providing dynamic outdoor classrooms for teaching about local ecology. The Arboretum offers a wide range of both structured educational programs and informal learning opportunities for visitors of all ages, and is currently developing a series of interactive nature exhibits.

The **Lane County Sheriff's Mounted Posse**, established in 1941, was originally created to serve as both a community service group, and to assist the Sheriff, such as with search and rescue efforts. The posse operates the horse arena located in the North Bottomlands in HBRA as a training facility, hosts a series of regular events, and schedules regular trail rides to patrol park trails.

The mission of the **Friends of Buford Park and Mt. Pisgah** (the Friends), founded in 1989, is to protect and enhance native ecosystems and compatible recreation in the Mt. Pisgah area. The Friends is a 501(c)3 non-profit organization working to conserve the Mt. Pisgah area's incredible botanical, wildlife and recreational values. The Friends mobilizes funding, scientific expertise and volunteers to improve the botanical, fish, wildlife and recreational resources throughout the 4,700 acre greater Mt. Pisgah area.

The Friends is a separate organization distinct from the Mount Pisgah Arboretum, working to care for the 2,100 acres in Buford Park outside of the Arboretum Stewardship. Though separate organizations, together they help care for HBRA's natural and recreational values in partnership with Lane County, the landowner.

1.5 The Planning Process

The *Plan* was developed using the *Conservation Action Planning* process, or CAP (The Nature Conservancy, 2016). The CAP methodology is a science-based planning analysis developed by The Nature Conservancy and other land managers. The CAP process is an analytical methodology that allows a team of technical experts from diverse disciplines to work through a series of analytical steps that result in a set of priority strategies and actions to achieve conservation goals.

1.6 Methodology

Consistent with the CAP methodology, the Friends, with Lane County assistance, convened an inter-agency Technical Advisory Group (TAG) with diverse expertise to work through the planning process. The TAG held seven facilitated meetings to develop and review detailed conservation planning information. The TAG developed specific "conservation targets" for HBRA. Conservation targets are aspects of biodiversity or related habitat management focus. Conservation Targets in this plan include priority ecological communities or habitat types that are found within HBRA, as well as endangered, threatened, or at-risk native plant and animal species. Conservation targets are utilized in the planning process to guide development and analysis of conservation strategies in HBRA.

From the overall list of conservation targets identified for HBRA, the TAG selected nine targets as "focal conservation targets". These were chosen to represent the full array of biodiversity and habitat management priorities found in a project area. The focal conservation targets represent: 1) habitat types identified as important for conservation within the Oregon Conservation Strategy for the Willamette Valley Ecoregion; 2) habitats that provide important aquatic, wetland, and upland ecological functions; 3) federally listed species or species petitioned for listing; and 4) public uses that benefit from a landscape rich in native biodiversity. In the planning process, the focal targets are the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness.

The focal targets include six habitats, one federally endangered plant, one rare bird, and "visitor experience", to integrate and value compatible recreation. The specific focal conservation targets are:

- Upland prairie and savanna
- Oak woodland
- Wet prairie
- Bradshaw's lomatium (*Lomatium bradshawii)*
- Buckbrush chaparral
- Willamette riparian systems and associated floodplain
- Creeks and streams

- Oregon Vesper Sparrow (*Pooecetes gramineus affinis*)
- Visitor experience

Additional “nested targets” are identified in Chapter 4 of this document. Nested targets are rare or at-risk species or ecological communities whose conservation needs are similar to one or more focal conservation targets. It is expected that these species and communities of interest will benefit from strategies that address focal targets. Recognition of nested targets helps to ensure that strategies implemented to benefit focal targets also provide a wider range of benefits to HBRA’s natural features.

As part of the CAP methodology, the "viability" of and "threats" to the focal targets were assessed in order to establish clear goals and strategies (Chapter 6) for the desired future conditions for each target. Viability is defined as the status or health of a plant or animal species or habitat type. Viability is an indication of the ability of a conservation target to withstand or recover from disturbances or other alterations, and thus to persist into the long-term future. Threats are factors that directly or indirectly degrade or reduce the health of a conservation target. Identifying the important threats to conservation targets is a key step toward identifying effective conservation strategies.

Based on the viability and threats analysis for the focal conservation targets, 15 broad management goals were identified. Focusing on these 15 goals, strategies and stewardship projects were developed to address each goal, along with recommended best management practices and a “Stewardship Tool Box” (Chapters 10 and 11). The *Plan* calls for monitoring and adaptive management (Chapter 12) so that implementation actions may be adjusted to changing conditions and emerging information.

This plan has undergone extensive review and refinement. The Lane County Public Works Department performed a technical review of an early draft of the *Plan* in 2011. In 2012, habitat planning was postponed due to insufficient funding. In 2015, Lane County resumed the planning process, collaborating with Friends of Buford Park & Mt. Pisgah to complete the *Plan*. Version 2 of the *Plan* was released for public review and comment on May 6, 2016, and comments were received until July 31, 2016. The current version of the *Plan*, Version 3, reflects the input provided by the public and stakeholders during this public review process.

This *Plan* identifies strategies for habitat management to effectively guide the use of funding and labor on the part of Lane County and partners within HBRA. The work plan identified in Chapter 10 identifies a set of tasks to support the continued viability of the conservation targets present at HBRA. Maps showing desired future habitat conditions are intended to provide a template for achieving the conservation vision for HBRA. However, the maps do not constitute a financial commitment to implementing the necessary habitat improvements on a fixed timeline. Nor are the maps intended to describe future habitat conditions in any given portion of the park with certainty, given the financial and ecological variables that guide any course of habitat restoration. As such, this document is intended to be a technical document in support of administrative actions.

1.7 Public Input

During the planning process, Lane County, the TAG and Friends of Buford Park & Mt. Pisgah collaborated to:

- Host two public workshops: March 19, 2009 and June 2, 2009,
- Publish displays and informational materials on the internet,
- Obtain a major article in *The Register-Guard* (March 27, 2009),
- Host an informational booth at the Mount Pisgah Wildflower Festival in 2009, and

- Host two stakeholder meetings, Nov 12, 2008 and Sept 3, 2009.

During 2016 and 2017, Lane County solicited comments through:

- Stakeholder meetings,
- Outreach to the general public, park neighbors and other stakeholders through website postings; flyers at park kiosks; print, TV, and radio stories in May 2016,
- An informational booth at the May 19th 2016 Mount Pisgah Wildflower Festival,
- Three public park tours in June 2016, two public tours in 2017 (July and August respectively),
- An online survey to which there were 51 respondents,
- A public open house at Harris Hall on May 25th to provide information and solicit public feedback,
- Review by members of the inter-agency Technical Advisory Group, which met on May 5, 2016,
- Review by Parks Advisory Committee, including a public comment opportunity.

In 2018, Lane County conducted additional outreach on the revised "Proposed Plan":

- Outreach to the previous *Plan* commentators, general public, park neighbors, and other stakeholders through website postings, flyers at park kiosks, and print and radio stories in January and February 2018,
- A public open house at Harris Hall on February 15th to discuss the proposed *Plan*, and specifically identify has the *Plan* has been refined to reflect the public comment received, and
- Review by Parks Advisory Committee, including a public comment opportunity.
- Review and approval by Lane County Board of Commissioners, including additional opportunities for public comment.

1.8 Chapter 1 References

- Lane County Parks Division and Cameron & McCarthy Landscape Architects. 1994. Howard Buford Recreation Area Master Plan. Lane County Parks, Eugene, Oregon.
- Lane County Large Events Task Force. 2015. - Findings and Recommendations of the Lane County Large Events Task Force. Lane County Parks, Eugene, Oregon.
- Oregon Department of Fish and Wildlife. 2006 and 2016. Oregon Conservation Strategy. Pp. 9, 11, 234-245.
- The Nature Conservancy. 2016. Conservation by Design 2.0. Guidance Document. http://cmp-openstandards.org/wp-content/uploads/2016/04/CbD2.0_Guidance-Doc_Version-1.pdf

Chapter 2: Purpose & Need

2.1 Purpose

The purpose of this Plan is for Lane County and its partner agencies to identify goals, strategies and projects to effectively conserve a diversity of native habitats and species in the Howard Buford Recreation Area (HBRA or Buford Park) while effectively meeting demand for low intensity recreational use of the park, as provided for in the 1994 HBRA Master Plan. The *Plan* seeks to address identified threats to conservation targets, effectively manage habitat areas, reduce wildfire risk, and increase public safety within the park. The Plan will guide efforts by Lane County and its partners to secure sufficient resources for habitat conservation throughout Buford Park.

2.2 Regional Context: Mount Pisgah's Importance

The 2,214-acre HBRA, located primarily on the eastern, southern, and western slopes of Mount Pisgah, is a regionally significant natural area. The park encompasses a mosaic of increasingly rare habitats, including oak woodland, savanna, upland and wetland prairie, and riparian forest. HBRA is the second largest block of native prairie and oak habitats in the Willamette Valley under conservation management by a single owner; only the 5,706-acre Finley National Wildlife Refuge near Corvallis (managed by the U.S. Fish & Wildlife Service) is larger.

HBRA is the largest single public ownership in a 4,700-acre complex of conservation lands in the Mount Pisgah area owned by public and private agencies. Mount Pisgah is surrounded on three sides by two major rivers, the Middle and Coast Forks of the Willamette. At the confluence and across the river along the north bank of the Middle Fork of the Willamette, more than 1000 acres of additional public lands are managed by Willamalane Parks District, Springfield Utility Board, Oregon State Parks, and Friends of Buford Park & Mt. Pisgah. On HBRA's northern boundary is the 1305-acre Willamette Confluence Preserve, acquired in 2010 by The Nature Conservancy (TNC) with support from Lane County. This neighboring property includes conifer forest, oak woodland and savanna habitats on Mount Pisgah's northeast slope, as well as extensive floodplains, including large ponds from historic gravel mining and six miles of river frontage. TNC and partner agencies in the vicinity of the confluence of the Middle Fork and Coast Fork are collaborating to restore riparian and upland habitats on this property.

The resulting 4,700-acre block of contiguous open space not only offers primarily low-intensity recreation opportunities, but also serves as an important natural area for the conservation of declining fish, wildlife, and native flora, close to the cities of Eugene and Springfield, which combined are Oregon's second largest population center.

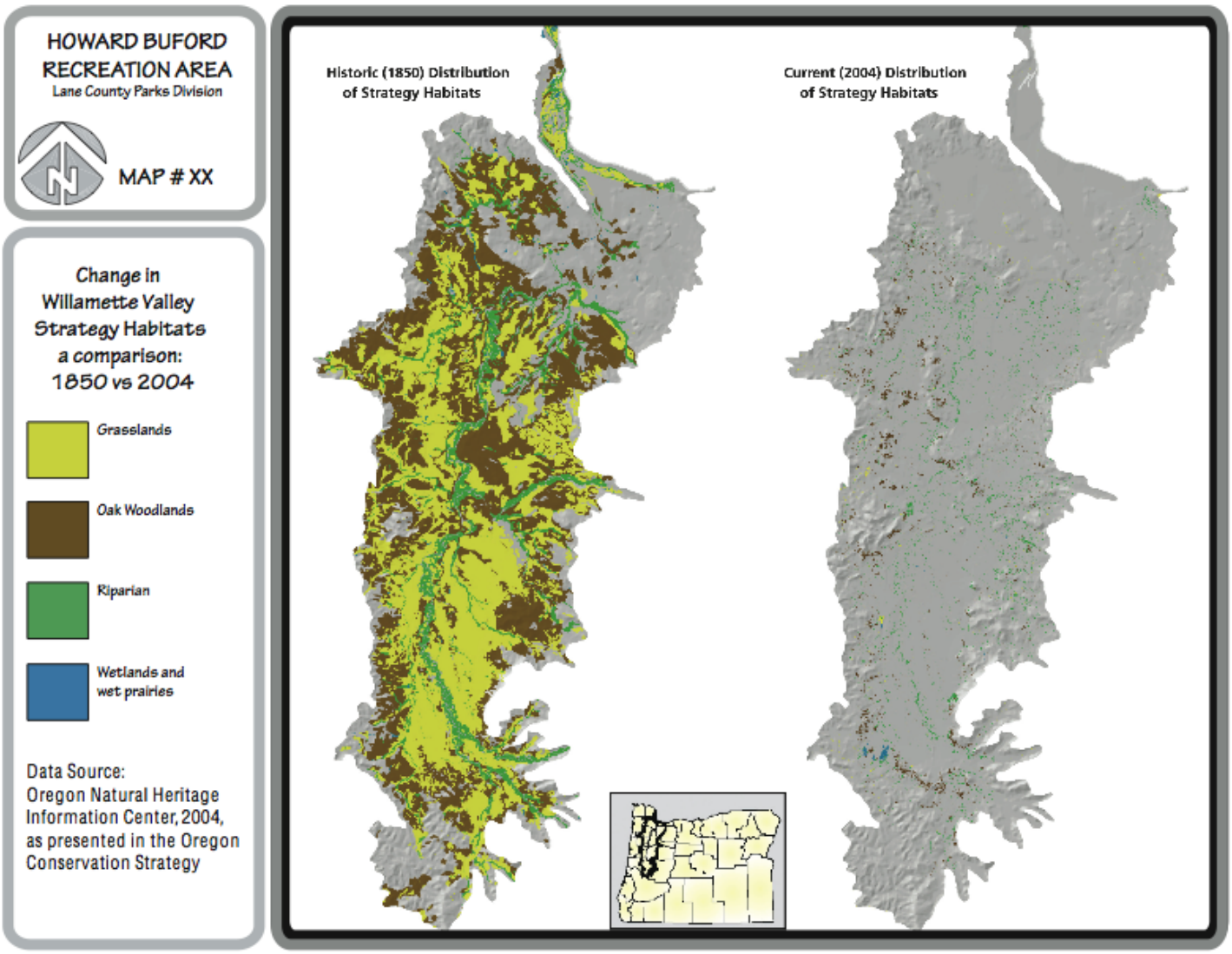
2.3 Rare Habitats at HBRA

Howard Buford Recreation Area is noted for its diversity of habitat types. A number of these Willamette Valley habitats have become increasingly rare as much of the Willamette Valley landscape continues to be converted to agricultural and urban uses. As a result, the loss of native grassland and oak woodland habitat types has been dramatic, making the preservation of these habitats at HBRA ecologically significant for the Willamette Valley. See maps entitled: *Change in Willamette Valley Strategy Habitats: 1850 vs. 2004* (Figure 2-1). Strategy habitats are those identified in the *Oregon Conservation Strategy* (ODFW, 2006). From lowland to upland, examples of rare habitat types within HBRA include:

- Willamette Valley riparian forest,
- Willamette Valley wetland prairie,
- Willamette Valley upland prairie,
- Willamette Valley savanna (scattered trees, often oaks, in native grassland)
- Willamette Valley chaparral (fire-adapted, drought-tolerant shrub land)

Some wonder if conifer forests are rare in the Willamette Valley. Since the 1850s, the acreage occupied by conifer forests has expanded into oak woodlands, savannas and prairies, in part because Euro-Americans settlers to Oregon introduced the practice of suppressing fires. As a result, acreage of closed canopy conifer forest in the Willamette Valley at the present time is similar to the acreage that existed in the 1850's (Hulse et al., 2002). Therefore, young and mature (less than 150-year old) conifer forests are a plentiful habitat type in the Willamette Valley, and not considered rare. Within HBRA, cooler, wetter north-facing slopes usually support Douglas-fir (*Pseudotsuga menziesii*) forests that contribute to the park's habitat diversity.

Figure 2-1: Change in Willamette Valley Strategy Habitats 1850 vs. 2004



Source: Oregon Conservation Strategy, 2006

2.4 Managing Conservation Targets & Fire Risk in a Changing Climate

Another need for the HBRA *Plan* is to anticipate and plan for how future changes in the region's climate could stress or change the park's habitats, wildlife and rare species in the coming century.

While some may debate whether human activity is a primary cause of the documented changes in air temperatures, precipitation patterns, and extreme weather occurrences, a broad consensus of current scientific research provides evidence of a changing climate regionally and worldwide. This evidence ranges from shrinking glaciers, decreased polar ice caps, decreased regional snow packs, rising sea levels, and record high temperatures. *Climate Change 2014: Synthesis Report* (United Nations Intergovernmental Panel, 2014) is a generally accepted compilation of the state of scientific research on the issue.

In the Willamette Valley, scientists project that climate change is expected to result in:

- warmer and drier spring weather,
- hotter and drier summers (with increased potential for wildfires), and
- warmer winters with more frequent severe storms causing increased flooding (from faster snow melt) and smaller snowpack.

Without planning and active management, longer, hotter, drier summers could increase the risk of catastrophic fires that could destroy both remnant oak woodlands and young conifer forests in HBRA, as well as threaten adjacent private property and increase risks to public safety. Because of the drought tolerance of native oaks, prairie grasses, and forbs, managing the park to sustain prairies and oak savanna can make the park's habitats more resilient, and reducing woody fuels can reduce the risk of stand-replacing or high intensity wildfires.

Restoring riparian floodplain habitats should increase their ability to detain and filter floodwaters, reducing impacts downstream during high flows. The South Meadow Floodplain project in HBRA offers an example of how this can be accomplished while also enhancing passive recreational amenities such as improved trails, backwater overlook, and a wildlife blind.

2.5 Relationship to Previous Plans

Local, state and federal efforts to conserve a large natural area at the confluence of the Coast and Middle Forks of the Willamette River date to the early 1970s, when the Oregon Legislature authorized state funds to match federal Land and Water Conservation funding to purchase the 2,200-acre Mount Pisgah State Park. In 1982, after the state transferred title to the park to Lane County, the Board of Commissioners renamed the park Howard Buford Recreation Area to honor Lane County planner Howard Buford.

2.5.1 HBRA Master Plan (1994)

In 1994, Lane County adopted the *HBRA Master Plan* as a refinement to the *Metro Plan*. The *HBRA Master Plan* provides a comprehensive site analysis, a set of nine park goals, and a facilities plan that addresses park goals, in addition to recommendations for further study, The *HBRA Master* Plan specifically directed Lane County to develop both a wildlife management plan and a separate vegetation management plan. In 2005, Lane County decided to combine both plans into a single Habitat Management Plan to address both wildlife and vegetation management. This practical and cost-saving approach allows for evaluation of HBRA's unique and thriving wildlife populations and their connections to diverse plant communities (habitats) when planning and implementing management activities. This

Plan is relevant to, and helps achieve, six of the nine broad goals listed on p. 3 of the HBRA Master Plan that are intended to guide managers:

1) Accommodate increased use while protecting the resource, minimizing development and preserving the natural and rural character of the HBRA.
2) Protect sensitive and significant natural resource areas and restore degraded habitat.
3) Minimize conflicts among Park users.
4) Maximize the value of the Park as an educational resource.
5) Help coordinate efforts and cooperate with groups whose goals are complementary to those of the HBRA.
6) Protect the park and its users from damage and injury and prepare for emergency needs.

This *Plan* seeks to advance these goals through a more specific planning process to manage the park's natural resources, minimize conflicts, coordinate efforts among park groups, increase public safety, and identify ways to increase the park's value as an educational resource.

The 1994 HBRA Master Plan also included recommendations for trail renovation and construction, and proposed an inventory and analysis of the HBRA trail system. This analysis was incorporated into the HBRA Trail Management Plan (Lane County Parks Division, 1995).

2.5.2 Confluence of Coast and Middle Forks Willamette River Project Area – Alternatives Team Recommendation (1997)

In response to the 1980 Northwest Power Planning and Conservation Act, which required the Bonneville Power Administration (BPA) to compensate for losses of fish and wildlife habitat caused by construction and operation of the region's hydroelectric system, an inter-agency "Alternatives Team" was formed to help generate a series of recommended habitat enhancements for the lower Coast Fork and Middle Fork Willamette River. Included in the report was a recommendation for the acquisition and restoration of a private agricultural parcel along the east bank of the Coast Fork, now the BPA-owned Sorenson site.

2.5.3 South Meadow Management Plan (2002)

The "South Meadow" (aka "South Pasture") is an approximately 200-acre floodplain site located within Lane County's Howard Buford Recreation Area (HBRA) along the Coast Fork of the Willamette River.

The 1994 HBRA Master Plan identified the South Meadow as an area of "diminished use" as compared to relatively greater use expected in the Arboretum and "North Bottomlands," both located north of the South Meadow. The Master Plan proposed new trails and wildlife observation blinds in the South Meadow, as well as an education exhibit along Quarry Rd Trail #5.

The South Meadow Management Plan, adopted January 9, 2002 by Lane County's Board of Commissioners, is consistent with the HBRA Master Plan goal 2:

To protect sensitive and significant natural resource areas and restore degraded habitat.

To advance this park-wide goal and to further refine the proposed actions in the 1994 Master Plan, the South Meadow Management Plan identifies three management goals:

Goal A: Restore the ecological integrity of the floodplain.

Goal B: Provide recreational opportunities compatible with ecological stewardship.

Goal C: Provide educational opportunities compatible with ecological stewardship.

2.5.4 Rivers to Ridges Open Space Study (2003)

Lane County, the Cities of Eugene and Springfield, and Willamalane Parks District endorsed the *Rivers to Ridges Metropolitan Regional Parks and Open Space Study: Vision and Strategies.* This document identified HBRA and the Willamette Confluence Preserve (acquired in 2010 by The Nature Conservancy) as open space anchors connected to parks in the metro area by "greenways" along ridgelines and "blueways" along streams and rivers. In general, the plan recognized the importance of the Willamette River for linking several of the region's most significant park and open space features such as Howard Buford Recreation Area, Island Park, Alton Baker Park, Skinner Butte Park, Delta Ponds, and Green Island.

This *Plan* specifies ways to conserve and balance habitat and recreational values on the largest public ownership in the Mount Pisgah area "open space anchor" as identified in the Rivers to Ridges Open Space study.

2.5.5 Oregon Conservation Strategy (2006, updated in 2016)

The *Oregon Conservation Strategy* (Oregon Dept. of Fish and Wildlife, 2006, pp. 244-5; the 2016 update is on the web at www.oregonconservationstrategy.org/ecoregion/willamette-valley/) specifically identifies the Mount Pisgah area in its ecosystem conservation opportunity profile. This document notes that:

- This area supports a number of at-risk species, including some of the largest Northwestern pond turtle (Actinemys marmorata) populations in the ecoregion,
- Lands in the Mount Pisgah area represent some of the area's largest tracts of native habitats,
- Mount Pisgah is a designated Oregon Important Bird Area, and
- The area contains a Great Blue Heron (*Ardea herodias*) rookery.

The *Oregon Conservation Strategy* explicity states the following actions should be taken:

- Actively manage uplands to promote and maintain oak savanna and prairie habitats,
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology,
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife, and
- Promote early detection and suppression of invasive weeds.

The *Oregon Conservation Strategy* identifies a number of priority habitats and species that are present on Buford Park, including:

- Oak woodlands:
    - Wayside aster (*Eucephalus vialis)*
    - Western gray squirrel (*Sciurus griseus*)
    - Songbird assemblage including Western Wood Pewee (*Contopus sordidulus*), Acorn Woodpecker (*Melanerpes formicivorus*), Western Bluebird (*Sialia mexicana),* White-breasted Nuthatch (*Sitta carolinensis aculeata*), Chipping Sparrow (*Spizella passerina*).
- Grasslands:
    - Grasshopper Sparrow (*Ammodramus savannarum perpallidus*)
    - Common Nighthawk (*Chordeiles minor*)
    - Western rattlesnake (*Crotalus oreganus)*
    - Monarch butterfly (*Danaus plexippus)*
    - Oregon Vesper Sparrow (*Pooecetes gramineus affinis)*
    - Western Meadowlark (*Sturnella neglecta*)

- Wetlands:
    - Bradshaw's lomatium (*Lomatium bradshawii)*
    - Willow Flycatcher (*Empidonax traillii)*
    - Yellow-breasted Chat (*Icterieria virens auricollis)*
    - Northern red-legged frog (*Rana aurora*)
- Riparian:
    - Olive-sided Flycatcher (*Contopus cooperi)*
    - Townsend's big-eared bat (*Corynorhinus townsendii)*
    - Western pond turtle (*Actinemys marmorata)*
    - Breeding riparian songbirds
    - Great Blue Heron
    - Bald Eagle (*Haliaeetus leucocephalus*)
- Columbia (Willamette as tributary) River:
    - Chinook salmon (*Oncorhynchus tshawytscha*)
    - Winter steelhead (*Oncorhynchus mykiss*)
    - Oregon chub (*Oregonichthys crameri*)
- Freshwater aquatic:
    - Western brook lamprey (*Lampetra richardsoni*)
    - Pacific lamprey (*Lampetra tridentata*)

Oregon Department of Fish and Wildlife provided partial funding for this *Plan* through its Oregon Conservation Strategy Implementation grant program, in recognition of the vital importance of habitats in HBRA and in the broader Mount Pisgah "conservation opportunity area."

2.5.6 Willamette River Open Space Vision (2010)

The Willamette River Open Space Vision is the first comprehensive open space vision or plan specifically for the Willamette River in the Eugene-Springfield region. It built on the 2003 *Rivers to Ridges Metropolitan Regional Parks and Open Space Vision* that identified the Willamette River as a key element of the region's open space network from a habitat, recreational, visual, and cultural perspective. Lane Council of Governments completed the *Willamette River Open Space Vision* in 2010. Below is the plan's vision statement:

> Our community has long treasured the Willamette River for the natural, recreational, and visual qualities it provides. The river gives us a sense of place and contributes greatly to the quality of life for all who call the Eugene-Springfield area home. The open space that lines the river provides a welcome break from the urban environment, accommodates recreational amenities of all types, and provides exceptional wildlife habitat. The river corridor also functions as a linear connector between many of our region's major parks and natural areas for wildlife and humans alike. The goal of this planning effort is to create an inspiring vision for the Willamette River corridor that will help lead the way for coordinated efforts to further improve this outstanding open space resource in the coming years and decades.

The document, maps and other information are available at: http://www.lcog.org/willamette/.

This *Plan* advances the *Willamette River Open Space Vision* by identifying priority habitat management actions to conserve native habitats and enhance recreational opportunities in an "open space anchor" located within the urban/rural interface of the Eugene-Springfield metropolitan area.

2.5.7 Lane County Parks and Open Space Master Plan (1981) and Lane County Parks Master Plan (revision in development)

Lane County Parks Division is updating its 1981 Parks and Open Space Master Plan. The updated document will be a long-term plan for the 70 recreation sites managed by the County, including HBRA. The Parks Master Plan update would become an amendment, or change, to the County's Comprehensive Plan. In order for the new system-wide park Master Plan to take effect, the Lane County Parks Advisory Committee will review and make recommendations to the Lane County Board of Commissioners, which must adopt it by ordinance.

The Lane County webpage with more information is:

http://www.lanecounty.org/Departments/PW/Parks/Pages/masterplan.aspx

2.5.8 Other Plans and Assessments

All of HBRA is located within the Willamette River Greenway, as designated under Oregon Statewide Planning Goal 15. The purpose of Goal 15 is to "protect, conserve, enhance and maintain the natural, scenic, historical, agricultural, economic and recreational qualities of lands along the Willamette River as the Willamette River Greenway".

To further aquatic and floodplain habitat improvements along the Willamette River, the Oregon Watershed Enhancement Board, Meyer Memorial Trust, and Bonneville Environmental Foundation created the "Willamette River Initiative", as a vehicle to support habitat restoration work. As part of this effort, priority areas have been identified as "Anchor Habitats", including both the Middle Fork and Coast Fork Willamette in the vicinity of Mount Pisgah (OWEB, 2016).

Management plans or assessments have been developed for several nearby conservation ownerships. These plans include:

1) Willamette Confluence Preserve Management Plan (TNC, 2012).
2) Sorenson Parcel Management Plan (Friends, 2015).
3) Turtle Flats Baseline Assessment (Friends, 2015).
4) Thurston Hills Management Plan (Willamalane, 2016).
5) Turtle Flats Management Plan (Friends, 2017).

2.6 Chapter 2 References

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- Oregon Watershed Enhancement Board (2016). Willamette Special Investment Partnership, Accomplishments Summary Report. http://www.oregon.gov/OWEB/docs/pubs/2016_Willamette_SIP_Report.pdf

Chapter 3: Methodology

3.1 The Conservation Action Planning Process

The "Conservation Action Planning" (CAP) methodology is a science-planning process used by governments and land trusts around the world to develop management plans for large natural areas. The Nature Conservancy initially developed the methodology in the 1990's, in consultation with other land management agencies and conservation organizations. The CAP process draws upon the best professional judgment of a team of technical experts with knowledge in diverse disciplines and about the planning area. The planning process has the following steps:

1) Identify conservation targets,
2) Evaluate viability and critical threats to conservation targets,
3) Incorporate public input,
4) Develop conservation strategies,
5) Establish conservation measures, and
6) Develop a supporting stewardship work plan.

More information about conservation action planning can be found in the "Conservation by Design 2.0. Guidance Document" (The Nature Conservancy, 2016). The planning terms used in this chapter are defined in the Glossary (Appendix A.)

3.1.1 Why This Tool Was Selected

Conservation Action Planning (CAP) is a straightforward and proven approach for planning, implementing and measuring success for conservation projects. The analytical rigor of the CAP process provides a level of confidence in the management strategies that are developed from it. CAP requires analysis of the threats that impact the selected conservation targets, and identifies management strategies to address the significant threats or improve viability of conservation targets. It then establishes management actions and benchmarks for success to provide a quantifiable basis for evaluating progress toward goals.

3.1.2 Other Conservation Action Plans developed in Western Oregon

Public agencies have used the Conservation Action Planning methodology to develop habitat management plans for natural areas elsewhere in western Oregon. Below are four examples:

- *The West Eugene Wetlands Conservation Action Plan* included the City of Eugene, Bureau of Land Management, and The Nature Conservancy.
- *The Spencer Creek (south of Eugene, Oregon) Conservation Action Plan* (U.S. Forest Service, City of Eugene and The Nature Conservancy)
- *The Table Rocks (in Medford, Oregon) Conservation Action Plan* was developed by Bureau of Land Management in partnership with The Nature Conservancy. BLM is using the results of the Table Rocks CAP to inform their internal planning process.
- *Nehalem River Watershed (north Oregon Coast) Conservation Action Plan* was developed with representation from two Soil and Water Conservation Districts.

3.2 Planning Process Overview

3.2.1 Technical Advisory Group

Consistent with the CAP process, Lane County convened an inter-agency Technical Advisory Group with diverse expertise to work through the Conservation Action Planning protocol. Participants serving on the TAG included representatives from the following agencies listed in the table below:

Figure 3-1: HBRA Habitat Management Plan Technical Advisory Group

AGENCY	MEMBER	ROLE / EXPERTISE
Lane County Parks Division	Todd Winter	Former Parks Manager and TAG chair
Oregon Dept. of Forestry	Greg Wagenblast	Fire management and suppression
Oregon Dept. of Fish and Wildlife	Jeff Ziller, Kelly Reis, Erik Moberly, Brian Wolfer, and Chris Yee	Aquatic and terrestrial biologists
Oregon Department of Agriculture	Glenn Miller	Invasive species management
Bonneville Power Administration	Ben Tilley	Vegetation management specialist
US Army Corps of Engineers	Roberta Swift Garrett Dorsey (2016)	Wildlife (western pond turtle) biologist Wildlife Biologist
The Nature Conservancy	Ed Alverson Jason Nuckols (2016)	Botanist and ecologist Willamette and Restoration Program Manager
Mount Pisgah Arboretum	Tom LoCascio	Arboretum Site Manager and HBRA Caretaker with historic knowledge of the planning area
Watersheds Inc.	Paul Hoobyar	TAG facilitator specializing in natural resource issues
Friends of Buford Park & Mt Pisgah	Jason Blazar	Designer, landscape ecologist, steward Friends Stewardship Coordinator and Support staff to TAG
Friends of Buford Park & Mt. Pisgah	Bruce Newhouse	Botanist and ecologist Board member and chair of the Friends Stewardship Technical Advisory Committee
Project intern University of Oregon	Sandra Koike	TAG note taker Candidate for Masters in Landscape Architecture

Lane County thanks the many agencies and their staff that contributed in-kind time to help develop this habitat management plan.

3.2.2 The Role of Friends of Buford Park & Mt. Pisgah

Friends of Buford Park & Mt Pisgah, a non-profit 501c3 organization, was a primary contributor to the development of the habitat management planning process. Friends supported Lane County by:

- collaborating with Lane County to scope the *Habitat Management Plan* process,
- securing and administering a $40,000 “Oregon Conservation Strategy” grant from Oregon Dept. of Fish and Wildlife to support plan development,
- providing funds for support staff, meeting facilitators, public outreach materials, public tours, and

- developing a Geographic Information System (GIS) project, which includes historic and current vegetation maps and pertinent base layers to support development of the desired future condition map, and to generate acreage figures for various habitat types, and
- developing the draft plan in collaboration with county staff.
- In addition, Friends of Buford Park's Stewardship Technical Advisory Committee (STAC), which is comprised of volunteer scientists, biologists, botanists, ecologists and related professions, served as a research and support resource to the TAG. The TAG sometimes would refer a question or issue to the STAC for additional research. Members of the STAC during development of this plan are listed in Figure 3-2.

Figure 3-2: Friends of Buford Park & Mt. Pisgah Stewardship Technical Advisory Committee

MEMBER	AFFILIATION / EXPERTISE
Bruce Newhouse	Chair, field ecologist and naturalist, Salix Associates, and Friends' representative on Technical Advisory Group.
Gail Baker	Botanist and educator (retired) – joined STAC in 2014
Kat Beal	Wildlife biologist (retired) – served on STAC 2013 - 2016
Bill Castillo	Wildlife Biologist, Oregon Dept. of Fish and Wildlife (retired) – resigned from STAC in 2009
Greg Hyde	Parks planner (retired) – joined STAC in 2015
Aryana Ferguson	Restoration Specialist, Madrona Consulting
Dr. Bart Johnson, Ph.D.	Associate Professor, Dept. of Landscape Architecture, University of Oregon
John Koenig	Botanist and hydrologist (retired)
Tom LoCascio	Site Manager, Mount Pisgah Arboretum
David Predeek	Botanist, U.S. Forest Service (retired)
Dr. Jim Reed, Ph.D.	GIS specialist, The Hydrologic Group – STAC ex officio member
Dr. Bitty A Roy, Ph.D.	Plant ecologist specializing in invasion biology and plant-fungus ecology, University of Oregon – STAC sub-committee member
Kevin Shanley	Landscape architect (retired) - joined STAC in 2015

Lane County thanks the technical experts on the Stewardship Technical Advisory Committee for their contributed services to help develop this HBRA habitat management plan.

3.3 Public Involvement

Lane County, in collaboration with Friends, sought public input during the development of this *Habitat Management Plan* through multiple outreach methods. Input from the public was essential to ensure that the resulting plan addresses the needs and perspectives of park visitors and stakeholders.

In the spring and fall of 2008, prior to initiation of habitat planning, Friends implemented a related, highly visible demonstration project along the Summit Trail (Trail 1) to educate the public about the need to enhance prairie, savanna and oak woodland habitat. This project included weed removal and savanna restoration through the removal of Douglas-fir and thinning of oaks and maples. Before, during and after implementation, the project engaged park visitors and the public through trailside information tables, temporary signage, and brochures. In addition, multiple pre- and post-project tours described the project goals and methods and the upcoming habitat management planning process. During implementation, extensive media coverage included numerous television, radio and print media, including a front-page article in *The Register-Guard.*

When habitat management planning began with the formation of the Technical Advisory Group (TAG), park stakeholders, including the Mount Pisgah Arboretum and Sheriff's Posse were invited to briefings on the project and upcoming public input opportunities. During the planning process, Lane County, the TAG and Friends collaborated to:

- host two public workshops: March 19, 2009 and June 2, 2009,
- publish displays and informational materials on the internet,
- obtain major article in *The Register-Guard* (March 27, 2009),
- host an informational booth at the Mount Pisgah Wildflower Festival in 2009,
- host two stakeholder meetings, Nov 12, 2008 and Sept 3, 2009, and
- post information about the planning process on the internet.

3.3.1 Lane County Technical Review

Lane County's Public Works Department completed a technical review of the draft *Habitat Management Plan* in 2012. An environmental engineer, natural resource analyst and environmental engineering specialist were primary County contacts that reviewed and commented on the goals and objectives developed during the planning process, and provided comments and suggestions on the final draft plan. Lane County's Parks Manager and Natural Areas Coordinator reviewed and contributed to the final draft of this plan. This technical review augments the public meetings and other public input opportunities.

3.3.2 Habitat Management Plan, Version 2

Version 2 of the *Habitat Management Plan* was presented to the PAC and released for public review via the Lane County Parks web site on May 9, 2016. A public comment period was open until July 31, 2016. A news release was distributed to local media outlets on May 18, 2016, and an extensive public outreach effort was implemented. Outreach events and opportunities included:

- Stakeholder meetings,
- Outreach to the general public, park neighbors and other stakeholders through website postings; flyers at park kiosks; print, TV, and radio stories in May 2016,
- An informational booth at the May 19th 2016 Mount Pisgah Wildflower Festival,
- Three public park tours in June 2016, two public tours in 2017 (July and August respectively),
- An online survey to which there were 51 respondents,
- A public open house at Harris Hall on May 25th to provide information and solicit public feedback,
- Review by members of the inter-agency Technical Advisory Group, which met on May 5, 2016,
- Review by Parks Advisory Committee, including a public comment opportunity,

After the close of the public comment period, the comments were compiled and presented, along with a summary memo, to the PAC on September 12th, 2016.

3.3.3 Habitat Management Plan, Version 3

The current version of the *Plan*, Version 3, reflects the input provided by the public and stakeholders during this public review process. Outreach in early 2018 associated with presentation of Version 3 included:

- Outreach to the previous *Plan* commentators, general public, park neighbors, and other stakeholders through website postings, flyers at park kiosks, and print and radio stories in January and February 2018,
- A public open house at Harris Hall on February 15th to discuss version 3 of the *Plan*, and specifically identify has the *Plan* has been refined to reflect the public comment received, and
- Review by Parks Advisory Committee, including a public comment opportunity.

As part of this process, the Lane County Parks Advisory Committee (PAC) reviewed the *Plan* and recommended approval by the Lane County Board of Commissioners. The Board approved the final document, and subsequently adopted the *HBRA Habitat Management Plan* as a refinement to the Lane County Rural Comprehensive Plan.

This *Plan* identifies strategies for habitat management to effectively guide the use of funding and labor on the part of Lane County and partners within HBRA. The work plan identified in Chapter 10 constitutes a set of tasks, which if implemented, will support the continued viability of the conservation targets present at HBRA. Maps showing desired future habitat conditions are intended to provide a template for achieving the conservation vision for HBRA. However, the maps do not constitute a financial commitment to implementing the necessary habitat improvements on a fixed timeline. Nor are the maps intended to describe future habitat conditions in any given portion of the park with certainty, given the financial and ecological variables that guide any course of habitat restoration.

While the *Plan* will be an adopted refinement plan, it is also intended to support an adaptive management process. The *Plan* provides a conservation vision, nine focal conservation targets, and 15 management goals, to guide habitat management at HBRA over the next 15 years. The strategies (Ch. 6) and projects (Ch. 10) listed in this document reflect our current understanding of the best means to achieve the conservation vision and goals. As Lane County Parks and partners implement the strategies and projects, Parks staff and partners will evaluate the results and, if appropriate, consider alternative strategies or projects that may provide better results or be less costly to implement. The Habitat Advisory Team (HAT), described in Section 11.3, will participate in the adaptive management process through its annual meetings. In these meetings, the HAT will assess project outcomes, and recommend changes for plan improvement. Following each of the five year implementation phases, the HAT will assist Lane County Parks and stakeholders in updating the work plan for the coming five years, to incorporate previous experience and current knowledge.

3.4 Chapter 3 References

- The Nature Conservancy. 2016. Conservation by Design 2.0. Guidance Document. http://cmp-openstandards.org/wp-content/uploads/2016/04/CbD2.0_Guidance-Doc_Version-1.pdf

Chapter 4: Conservation Vision, Conservation Targets, and Other Habitats

4.1 Conservation Vision Statement

This Conservation Vision Statement expresses the positive future outcome of managing habitats at the Howard Buford Recreation Area.

Conservation Vision Statement for HBRA
The Howard Buford Recreation Area will be managed to conserve and restore prairie, savanna, woodland, forest, and river habitats in ways that support compatible recreational and educational uses described in the HBRA Master Plan (1994).

The uplands shall sustain increasingly rare Willamette Valley habitat types including a mosaic of open prairie, savanna, and oak woodland on sites where these habitats occurred historically. Conifer and mixed forest shall be retained and enhanced in upland portions of HBRA that historically supported forests. The lowlands shall sustain healthy riparian (streamside) and aquatic habitats and processes. These native habitats shall conserve common and rare native plants and animals, including federally and state-listed threatened and endangered species

Habitat restoration shall provide significant increases in quality and/or extent of priority habitat to support a high diversity of wildlife species which were historically much more prevalent throughout the entire Willamette Valley. Restoration will also lessen the threat of severe wildfire through reduction of dense, brushy fuels in prairie, savanna, and oak woodland habitats.

4.2 Conservation Targets

This plan identifies nine **focal conservation targets.** (See glossary for definitions of planning terms). Six are habitats, one is a federally endangered plant, one is a rare bird, and one is "visitor experience." The focal conservation targets represent: 1) habitat types identified as important for conservation within the Oregon Conservation Strategy for the Willamette Valley Ecoregion; 2) habitats that provide important aquatic, wetland, and upland ecological functions; 3) federally listed species or species petitioned for listing; and 4) public uses that benefit from a landscape rich in native biodiversity. Together, the focal conservation targets are intended to represent and encompass the full array of priority conservation values (habitats, species, and related beneficial public uses) of HBRA.

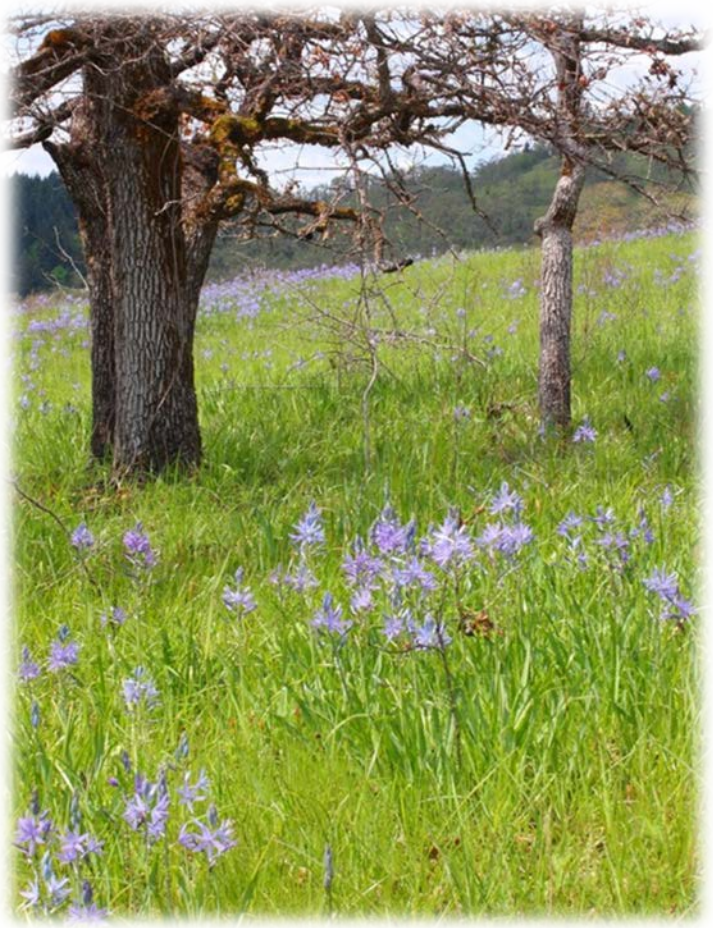
The TAG determined that this set of focal conservation targets was sufficient to represent the full range of ecological communities and native plant and animal species within the park, without being such a large list as to make the analysis unwieldy. The focal conservation targets are:

- Upland prairie and savanna
- Oak woodland
- Wetland prairie
- Bradshaw's lomatium (*Lomatium bradshawii)*
- Buckbrush chaparral
- Willamette riparian systems and associated floodplain
- Creeks and streams
- Oregon Vesper Sparrow (*Pooecetes gramineus affinis*)
- Visitor experience

Nested conservation targets are more specific natural features or species associated with each of the six habitats selected as focal targets. These are rare species, habitat types, or ecological communities whose conservation needs are subsumed by one or more focal conservation targets. Examples of nested targets include rare species, like the Western Meadowlark (Oregon's state bird that nests in prairies) and rare features, such as a seep within an upland prairie. Management actions that benefit the focal targets will also benefit the associated nested targets. Rare species that are included as nested targets are based on their status as determined by the Oregon Biodiversity Information Center (2016).

The nine focal conservation targets are described below. Nested targets are listed under the habitat they are most commonly associated with. Chapter 6 defines goals and strategies to conserve the conservation targets. Rare plant communities or habitat types are from the *Oregon Conservation Strategy* (ODFW, 2006).

4.2.1 Upland prairie and savanna



Description: These are grass and forb-dominated plant communities on non-hydric soils with few to no trees or shrubs (prairie), or with scattered open-grown trees that are not so dense as to break up the continuous grassland ground layer (savanna). The primary savanna tree species is Oregon white oak (*Quercus garryana*), but scattered conifers such as ponderosa pine (*Pinus ponderosa*), incense cedar (*Calocedrus decurrens*), and Douglas-fir may also be present. California black oak (*Quercus kelloggii*) grows naturally within about 1.5 miles to the west of HBRA, and one tree is located within HBRA in the Mount Pisgah Arboretum, but the origin of this tree is uncertain. Locations vary from productive soils on the valley floor to shallow soils on hot, dry exposures in the valley foothills. These grass and forb-dominated habitats were historically maintained by fire, which prevented succession to woodland and forest. Upland prairie often grades continuously into savanna, which in turn may grade into oak woodland. Upland prairie, savanna, and oak woodland provides important habitat for snakes and lizards, particularly where rocky.

Nested targets include:

- Western Meadowlark (*Sturnella neglecta*)
- Upland yellow violet (*Viola praemorsa* ssp. *praemorsa*)
- Camas pocket gopher (*Thomomys bulbivorus*)
- Western pond turtle (*Actinemys marmorata*, for nest sites)
- Monarch butterfly (*Danaus plexippus*)

- Western rattlesnake (*Crotalus oreganus*)
- Seasonal seeps and swales
- Herbaceous balds and rock outcrops

Several other globally-rare plant species documented from upland prairie and savanna habitats in the southern Willamette Valley could potentially be found occurring naturally within HBRA. These species, which are rare throughout their entire geographic range, include Willamette daisy (*Erigeron decumbens*), shaggy horkelia (*Horkelia congesta* ssp. *congesta*), Kincaid's lupine (*Lupinus oreganus*), and white-topped aster (*Sericocarpus rigidus*).

4.2.2 Oregon Vesper Sparrow

Description: Oregon Vesper Sparrow (*Pooecetes gramineus affinis*) is a subspecies of Vesper Sparrow that breeds only in the region west of the Cascades from northern California to western Oregon, western Washington, and (historically) southwestern British Columbia. Recent range-wide surveys estimate that only about 5,000 birds remain, with fewer than 500 birds in the Willamette Valley ecoregion. Very few of the remaining breeding populations are on public lands. More information on the bird's status can be found at *New Study Heightens Concern for Oregon Vesper Sparrow* (American Bird Conservancy, 2016).

Birders have long documented this resident during the breeding season in prairie and savanna habitats in HBRA, but sightings have declined in recent years. This grayish, brown bird has a streaked chest and back with white outer tail feathers. Oregon Vesper Sparrow is a ground-nesting bird, and is a species of upland prairie and savanna, with fairly specific habitat requirements in terms of tree density, short vegetation, plant species composition, and bare ground. Managing prairie habitats in HBRA can help sustain the presence of vesper sparrow in the park. It generally does not nest in otherwise suitable habitat located within about 25 meters of dense forest.

4.2.3 Oak Woodland

Description: Oak woodland is a sparsely treed community dominated by oaks with tree density intermediate between the scattered trees of an oak savanna and the interlocking crowns of a closed canopy forest. Tree crowns usually do not touch, allowing sunlight to penetrate to the ground. Tree architecture is a mixture of open-grown oaks and more vase-shaped oaks whose canopies are constrained by nearby trees. Conifers, including Douglas-fir, Ponderosa Pine, and Incense Cedar, may be associated with oaks. The ground layer of grasses and forbs is broken up by tree shade and/or by the presence of dispersed or dense shrubs. Oak woodland is located on non-hydric soils with varied topography, frequently on hill slopes of small buttes and valley foothills. It grades into savanna at the lower end of tree density and into closed canopy forest on the upper end.

Ponderosa pine is an important component of an oak-pine woodland community that is found in several parts of HBRA, particularly on the south and east slopes of Mount Pisgah. Ponderosa pine, which is at the edge of its geographic distribution in the Willamette Valley, grows with, and has a similar ecological profile to, Oregon white oak. It is commonly associated with dry or rocky soils that historically were fire-influenced. While Ponderosa pine occurs naturally in scattered pockets throughout much of the Willamette Valley, very few conservation sites or preserves happen to support examples of Ponderosa pine communities. In the absence of management, Ponderosa pine is similarly vulnerable to suppression by faster growing conifers such as Douglas-fir.

Typical oak woodland habitat along West Summit Trail #1. A 2008 restoration project removed invasive plants, woody vegetation and encroaching conifers in this area to enhance oak woodland.

Nested targets include:

- Western gray squirrel (*Sciurus griseus*)
- White-breasted Nuthatch (*Sitta carolinensis*)
- Acorn Woodpecker (*Melanerpes formicivorus*)
- Wayside aster (*Eucephalus vialis*)
- Thin-leaved peavine (*Lathyrus holochlorus*)
- Ponderosa pine-Oregon white oak woodland

4.2.4 Wetland Prairie

Description This is a grass and forb dominated community with few to no trees or shrubs, located on hydric soils that are saturated to the surface during the rainy season and dry during the summer. Perched water tables associated with relatively impermeable clay soils are characteristic of this wetland type, but it also is found on lower slopes in areas of seasonal groundwater discharge. Surface topography includes pedestals and hummocks emerging above water level as well as vernal pools. Wetland prairie may be associated with shrub-scrub and forested wetlands where woody plants have established due to fire suppression.

Nested targets include:

- Western Meadowlark (*Sternella neglecta*)
- Yellow- Breasted Chat (*Icteria virens*)
- Willow Flycatcher (*Empidonax traillii*)
- Timwort (*Cicendia quadrangularis*)
- Meadow checkermallow (*Sidalcea campestris*)
- Cusick's checkermallow (*Sidalcea cusickii)*
- Hitchcock's blue-eyed grass (*Sisyrinchium hitchcockii*)
- Seeps and swales

Cusick's checkermallow

4.2.5 Bradshaw's lomatium

Description: Bradshaw's lomatium (*Lomatium bradshawii*) is a conservation target species at the HBRA because it is federally and state listed as an "endangered" species. It grows in wet prairie habitat in the southeast portion of the HBRA. It is an important population for the recovery of the species, because it is the largest population within the Eugene East recovery zone.

Bradshaw's Lomatium is endemic to the Willamette Valley and occurs only in wet prairie habitat. Wet prairies that comprise suitable habitat have heavy clay soil and a seasonally high water table (water perched usually at or just above the surface) through the early part of the growing season, and often are dominated by tufted hairgrass (*Deschampsia cespitosa*). Historically, vegetation of these sites were maintained by fire (from either indigenous peoples' cultural practice of burning prairies or from ignition by lightning strike), or by flooding from rivers, or high water tables. Sustaining the population of Bradshaw's lomatium in HBRA is an important action identified in the US Fish and Wildlife Service's 2010 "Recovery Plan for the Prairie Species of Western Oregon and Southwestern Oregon".

4.2.6 Buckbrush chaparral

Description: This is a shrub-dominated community with few to no trees located on excessively drained to shallow soils on hot, dry hillside exposures and upon gravel bars within the floodplain. The principal shrub species is buckbrush (*Ceanothus cuneatus)*, with associations of snowberry (*Symphoricarpos albus*), tall Oregon grape (*Berberis aquifolium*), poison oak (*Toxicodendron diversilobum*), and the occasional Oregon white oak tree. Lane County is the northern limit in the range of buckbrush chaparral and Mount Pisgah is the largest remaining patch of this habitat in the area. A population of Hedgerow hairstreak (*Satyrium saepium*) butterflies, uncommon at low elevations (below 1000'), utilize the buckbrush as its sole larval host plant at Mount Pisgah.

Nested targets include:

- Hedgerow hairstreak (*Satyrium saepium*)
- Blue-gray Gnatcatcher (*Polioptila caerulea*)

4.2.7 Willamette riparian systems and associated floodplain

Description: Riparian areas are dynamic biological and physical systems that act as the interface between terrestrial and aquatic ecosystems. Riparian areas encompass the land and vegetation adjacent to Willamette River channels, oxbow lakes, alcoves, backwater areas, and sloughs that are influenced by perennial or intermittent water and the influence of hydric and fluvent soils. The frequency and physical extent of periodic flooding, an important disturbance regime, shapes the form and ecosystem function of the floodplain. Plant communities common within this system include Oregon ash (*Fraxinus latifolia*) - big leaf maple (*Acer macrophyllum*) floodplain forest, black cottonwood (*Populus trichocarpa*) bottomland forest, and willow (*Salix sp.*) shrub thickets.

Nested targets include:

- Upper Willamette spring chinook (*Oncorhynchus tshawytscha*)
- Cutthroat trout (*Oncorhynchus clarkii*)
- Rainbow trout, (*Oncorhynchus mykiss*), including the anadromous variant Winter Steelhead
- Oregon chub (*Oregonichthys crameri*)
- Northwestern pond turtle (*Actinemys marmorata*)
- Northern red-legged frog (*Rana aurora*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- Dwarf false rue-anemone *(Enemion stipitatum)*

4.2.8 Creeks and Streams

Description: These are riparian areas with intermittent flows, typically running from October through early June, originating from the slopes of Mount Pisgah. These areas are characterized as first and second order streams. Those that are first order headwater streams are closely associated with seeps fed by ground water discharge. Plant communities common within this system include oak woodland, wet prairie and mixed forest.

Nested targets include:

- Cutthroat trout (*Oncorhynchus clarkii*)
- Rainbow trout, (*Oncorhynchus mykiss*), including the anadromous variant Winter Steelhead

Winter Steelhead at HBRA (photo: Jim Reed)

4.2.9 Visitor Experience

Description: Compatible public use in the Howard Buford Recreation Area (HBRA) includes recreational and educational uses and activities identified in the 1994 *HBRA Master Plan*. This plan recognizes that a primary reason people visit HBRA is to recreate in the diverse natural beauty provided by diverse, healthy habitats. This *Habitat Management Plan* provides guidance to land managers to help ensure that recreation and visitor experience are enhanced and compatible with the management of the significant natural values and conservation targets recognized in the *HBRA Master Plan.*

4.2.10 Other Habitats

HBRA contains hundreds of acres of other habitats that visitors enjoy, such as conifer forests on Mount Pisgah's north facing slopes. Unlike the habitats selected as conservation targets, conifer forests have not declined from historic abundance in the Willamette Valley ecoregion, although their structure has been altered, and the acreage of conifer forest currently managed primarily for conservation values is limited. However, these forests still contribute to the diversity of habitats for plants and wildlife in HBRA. While habitat management at HBRA will prioritize projects to sustain the conservation targets, regionally common habitat types will also be managed and conserved. These habitat types are described below:

Conifer forest:

Description: In general, a forest is considered as a stand of trees at a density of 100 to 200 trees per acre (or greater). The canopy cover from trees occupying the overstory is greater than 75 percent. Within the HBRA, Douglas-fir (*Pseudotsuga menziesii*) is the most common tree associated with conifer forest and is most often the dominant tree in the overstory. This habitat type includes several sub-types as listed below. In addition, there are small stands of Pacific yew (*Taxus brevifolia*), a fire-sensitive conifer, on Mount Pisgah's north slope. Most conifer forest within HBRA is 50-75 year-old second growth from logging in areas of historic mature forests, as well as conifer encroachment into former oak savanna and oak woodland over the last 5-7 decades.

However, there are scattered older conifers, often "wolf trees" that were not removed during previous logging.

Nested community types and rare species include:

- Douglas-fir – Bigleaf maple (Acer macrophyllum) forest
- Douglas-fir – Grand fir *(Abies grandis)* forest
- Douglas-fir – Incense cedar (*Calocedrus decurrens*) forest
- Douglas-fir – Western hemlock *(Tsuga heterophylla)* forest
- Douglas-fir – Pacific madrone (*Arbutus menziesii)* forest
- Tall bugbane (*Cimicfuga elata*)

4.3 Projected Increase in Extent of Focal Conservation Target Habitats and Resources

Implementation of the HBRA Habitat Management plan and its supporting work plan (as presented in Chapter 10 and Appendix E) will result in a direct increase in the total area occupied by each Focal Conservation Target Habitat, resources that directly support Focal Conservation Targets, as well as Other Habitats. Figure 4-1 presents an accounting of the projected change. Acreage of all map units within the HBRA boundary for both 2008 and 2035 are presented in Figure 4-2.

Figure 4-1 Focal Conservation Target or Other Habitat Percent Change 2008-2035

Target	Extent in 2008 (ACRES)	Projected Extent in 2035 (ACRES)	NET CHANGE (ACRES)	PERCENT CHANGE
Visitor Experience - parking areas and roads	16	18	2	13%
Visitor Experience – historic facilities	2	2	0	0%
Visitor Experience - event facilities	3	6	3	100%
Savanna	338	693	355	105%
Upland Prairie	178	246	80	38%
Wet Prairie	35	66	31	89%
Oak Woodland	225	491	266	118%
Buckbrush Chaparral	14	40	26	186%
Forested Wetland (incl. Alder forest)	42	30	-12	-29%
Riparian Bottomland Forest	125	173	48	38%
Upland Conifer forest	275	377	102	37%
Upland Hardwood Forest	27	35	8	30%
Other non-target cover types	910	23	-887	-97%

NOTE - This table does not account for changes associated with Creeks and Streams, Bradshaw's lomatium, Oregon Vesper Sparrow, or the trail system inventory.

4.4 Chapter 4 References

- American Bird Conservancy. 2016. New Study Heightens Concern for Oregon Vesper Sparrow. https://abcbirds.org/new-study-heightens-concern-oregon-vesper-sparrow/
- Christy, J.A. and D. Vander Schaaf. Oregon Natural Heritage Program, natural (Pre-settlement) vegetation classification. 1996.
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- Rare, Threatened, and Endangered Species of Oregon, Oregon Biodiversity Information Center (2016). http://inr.oregonstate.edu/sites/inr.oregonstate.edu/files/2016-rte-book.pdf
- Titus, Jonathan. Native Wetland, Riparian, and Upland Ecotypes and their Biota – Willamette Valley, Oregon. 1996.
- US Department of Agriculture, US Forest Service Pacific Northwest Region. Field Guide to Riparian Plant Communities in Northwestern Oregon. 2005.
- US Fish and Wildlife Service. Recovery Plan for the Prairie Species of Western Oregon and Southwestern Oregon. 2010

Figure 4-2: Acreages of all Habitat or Land Cover Types for HBRA circa 2008 and 2035

Habitat or Land Cover	Extent in 2008 (ACRES)	Projected Extent in 2035 (ACRES)	Conservation Target?
Upland Prairie	**178**	**246**	**Yes**
Oak Woodland	**225**	**491**	**Yes**
Oak-Conifer Woodland	310		
Savanna - Good Condition	**46**	**693**	**Yes**
Savanna - Fair Condition	**188**		**Yes**
Savanna - Poor Condition	**104**		**Yes**
Upland Conifer Forest	275	377	
Emergent Wetland	0.1		
Powerline Scrub	28	11	
Riparian Bottomland Forest	**125**	**173**	**Yes**
Forested Wetland	**42**	**26**	**Yes**
Buckbrush Chaparral	**14**	**40**	**Yes**
Conifer - Oak Woodland	393		
Upland Hardwood Forest	27	35	
Alder Forest		**4**	**Yes**
Pasture	172		
Riparian Mixed Upland Forest	**16**	**5**	**Yes**
Quarry	1	1	
Gravel Bar	2	2	
Wet Prairie	**35**	**66**	**Yes**
Scrub Wetland	4	9	
Historic Facilities	2	2	
Stewardship Facilities	8	9	
Parking & Roads	16	18	
Event Facilities	3	6	
Total Acres	2214	2214	

Figure 4-3: HBRA Existing Condition circa 2008 Map

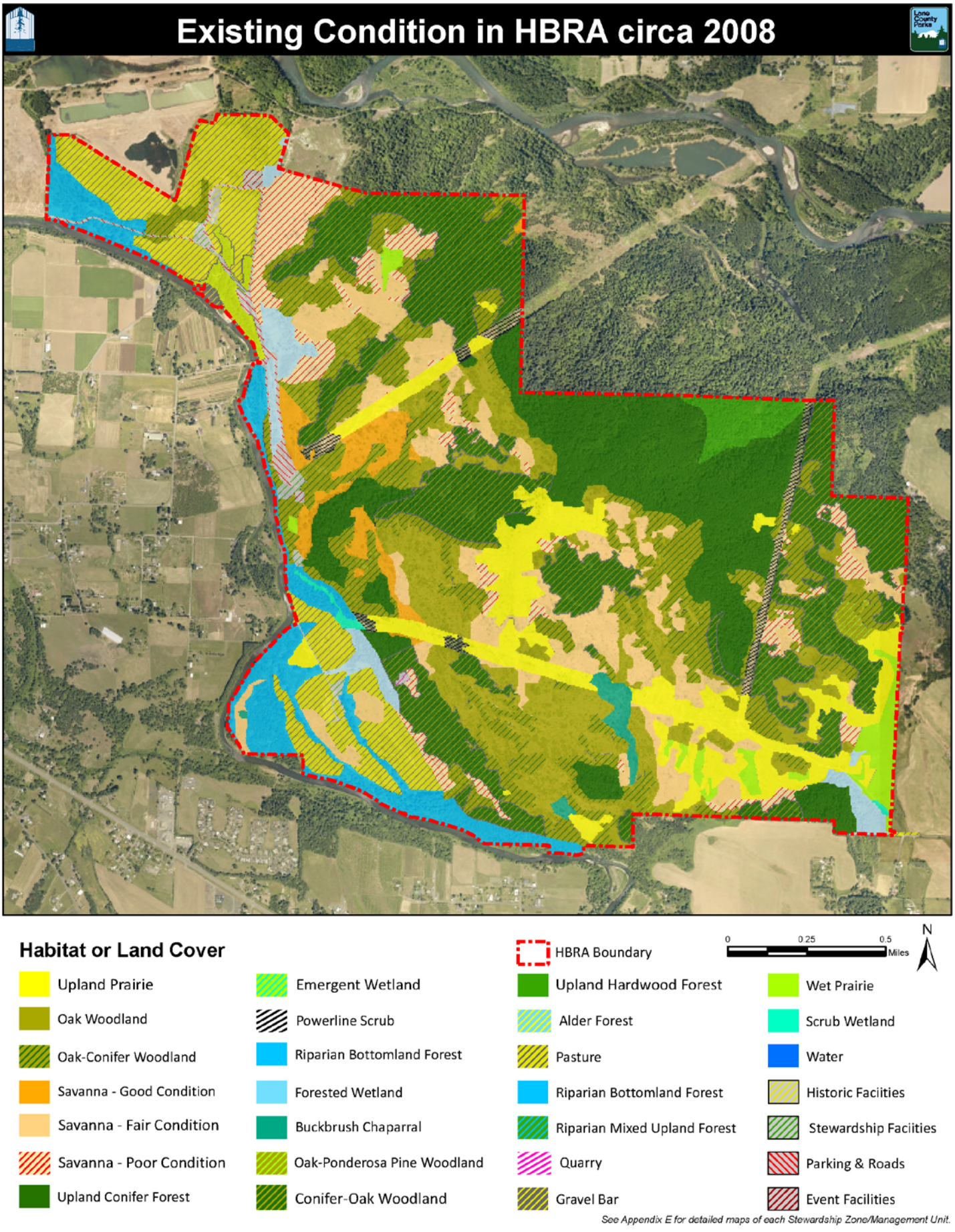
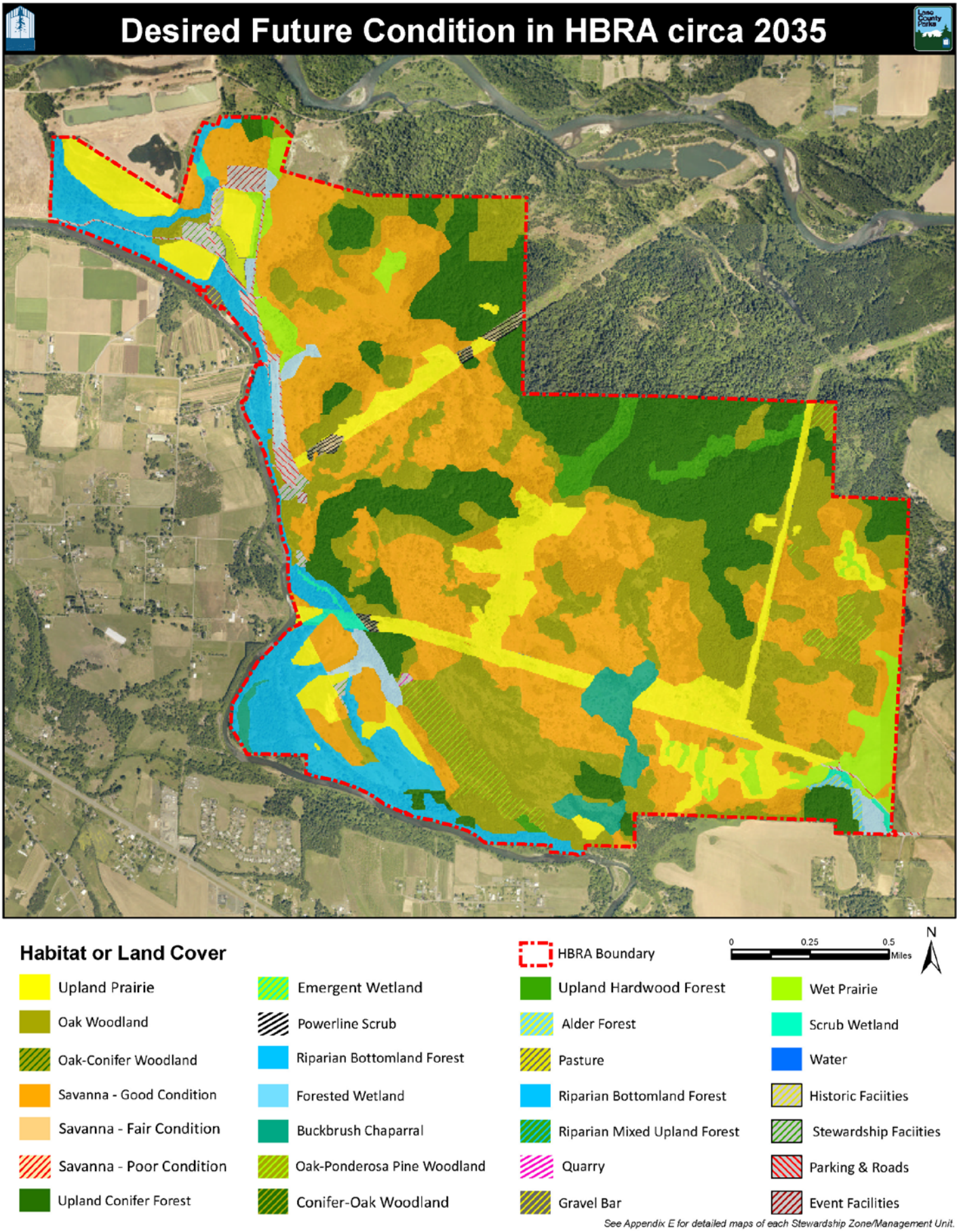


Figure 4-4: Desired Future Condition in the HBRA circa 2035



Chapter 5: Viability and Threats to the Conservation Targets

5.1 Assessing the Viability of Each Conservation Target

The Technical Advisory Group (TAG) evaluated the current "viability" of each focal conservation target. This provides a measure of the "health" of the target, and leads to the development of strategies to maintain or enhance the target's health. The Conservation Action Planning process does this by having the team of experts first identify several "key ecological attributes" that are necessary to the long-term health of each conservation target.

For example, a healthy, viable prairie may have a "key ecological attribute" of an abundance of native grasses and forbs ("wildflowers"). Another example of a key ecological attribute of a healthy prairie is low cover of woody vegetation. After identifying a number of "key attributes" for each focal conservation target, the experts assigned one of four viability rankings for each attribute: "poor," "fair," "good," or "very good." For example, a prairie whose key attribute of less than five percent woody cover (trees and shrubs) was ranked as "very good." Figure 5.1 identifies key ecological attributes and the TAG's viability rankings for each conservation target.

5.2 Assessing Threats to Each Conservation Target

The next step in the CAP process is to analyze the threats to the long-term viability of each conservation target. Building on the understanding of each target's "key attributes," the TAG examined what ecological processes or external threats (such as invasive weeds) would undermine or threaten those key attributes.

For example, invasive exotic shrubs, like Scotch broom and blackberry, can convert a prairie's structure to a shrub land. Western Meadowlarks or western pond turtles can no longer nest in the former prairie. Therefore, the threat of invasive non-native woody plants may be a greater threat than an invasive grass. Where possible, the TAG also attempted to identify and analyze the root causes of the threats.

Figure 5-2 is a summary of the TAG's analysis of the most significant threats by conservation target. This is an attempt to synthesize many hours of analysis and discussion. After the most significant threats have been identified, the CAP planning process seeks to identify high priority stewardship goals, objectives and projects to reduce the threats.

5.3 Chapter 5 References

- The Nature Conservancy. 2016. Conservation by Design 2.0. Guidance Document. http://cmp-openstandards.org/wp-content/uploads/2016/04/CbD2.0_Guidance-Doc_Version-1.pdf

Figure 5-1: Viability of Conservation Targets Table

Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	2008 Indicator Status	Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Bradshaw's lomatium (*Lomatium bradshawii*)	Size	Population size relative to recovery plan goals for Eugene East recovery zone, maintained over 10 years	Number of plants	10 year average of <5000 plants	10 year average of 5000 to 10,000 plants	10 year average of 10,000 to 20,000 plants	10 year average of > 20,000 plants	Fair - monitoring data 1998-2008 suggests total population is about 7500 plants and increasing.	Fair	Very Good	2008	2033
Bradshaw's lomatium (*Lomatium bradshawii*)	Condition	Population growth rate (recruitment)	Number of plants in several age classes	Declining	Stable	Increasing		Appears to be fluctuation around a longer term average.	Fair	Very Good	2008	2022
Buckbrush Chaparral	Size	Acres of habitat	Number of potential male blue gray gnatcatcher territories (4.5 acres)	Insufficient prairie/ savanna habitat within or adjacent to chaparral for one male blue gray gnatcatcher i.e. less than 4 acres of chaparral	Enough suitable habitat for 1-2 male blue gray gnatcatcher territories, i.e. at least 5 acres of chaparral with 10+ acres of adjacent grassland	Enough suitable habitat for 3-5 male blue gray gnatcatcher territories, i.e. at least 13.5 acres of suitable contiguous or connected habitat. Alternatively 3 patches of closely associated suitable habitat, each > 4 acres in size	Enough suitable habitat for > 10 male blue gray gnatcatcher territories, i.e. > 40.5 acres of contiguous habitat.	1 successful pair (with chick) observed within 1 of 2 existing patches along Buckbrush Creek	Fair	Very Good	2008	2033
Buckbrush Chaparral	Condition	Native grass and forb abundance	Native species frequency	< 3 native high and moderate fidelity herbaceous prairie species occurring with >50% frequency and < 9 additional species occurring with at least 10% frequency in 1 meter sq. quadrats (i.e. does not meet fair criteria)	At least 3 native high and moderate fidelity herbaceous prairie species occurring with >50% frequency and at least 9 additional species occurring with at least 10% frequency in 1 meter sq. quadrats	At least 3 native high and moderate fidelity herbaceous prairie species occurring with >75% frequency and at least 9 additional species occurring with at least 25% frequency in 1 meter sq. quadrats	At least 7 native high and moderate fidelity herbaceous prairie species occurring with >75% frequency and at least 15 additional species occurring with at least 25% frequency in 1 meter sq. quadrats	Estimate: status uncertain, more data needed	Fair (estimate / need to review data further)	Very Good	2008	2033
Buckbrush Chaparral	Condition	Host plant for uncommon butterfly	Presence of hedgerow hairstreak butterfly population	None present	One small subpopulation present	Two small or one large sub-population present	One small and one large sub-population present or at least three subpopulations present	One small subpopulation	Fair	Very Good	2008	2033

Figure 5-1: Viability of Conservation Targets Table

Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	2008 Indicator Status	Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Buckbrush Chaparral	Condition (process)	Fire regime	Notes: FEIS 30-100 year fire return interval (attached)	Fire return interval of <10 years	Fire return interval of 10-20 or >150 years	Fire return interval of 20-30 or >100 years	80% of the total population area has experienced one fire event over the last 50 years as a result of up to 3-5 spatially discrete low to moderate severity fires	There is no knowledge of fire having occurred within buckbrush habitats at HBRA	not able to rate at this time	Very Good	2008	2033
Buckbrush Chaparral	Landscape Context	Number and extent of patches	Number of patches at least 4 acres in size	0	1	2	3+	2 patches >4 acres occur along Buckbrush Creek	Good	Very Good	2008	2033
Creeks & Streams	Condition	Native riparian composition of first order creeks	% of riparian corridor with predominantly native shrub/herbaceous vegetation along both banks	<30% of potential vegetation	> 30% of potential vegetation	> 60% of potential vegetation	> 80% of potential vegetation	Estimate: status uncertain, more data needed	Fair	Good	2008	2033
Creeks & Streams	Landscape Context	Connectivity to floodplains in Buckbrush, Canyon, and Pudding Creek	Relative bed stability			Baseline	Above baseline	Baseline is existing condition	Good	Very Good	2008	2033
Creeks & Streams	Landscape Context	Connectivity of stream segments to Willamette River	# of .25-mile stream segments (measured from confluence upstream) that are free from fish passage barriers	<50% of the .25-mile segments are free of barriers	50-75% of 0.25-mile segments are free of barriers	76-90% of 0.25 mile segments are free from barriers	>90% of 0.25 mile segments are free from barriers	Partial barriers exist on lower reaches of Canyon and Buckbrush Creeks	Poor	Very Good	2008	2033
Oak Woodland	Condition	Native grass and forb presence	Native species richness (alpha diversity). # of species/unit - need to identify size of sample area	<20 native species with high and moderate fidelity to oak woodland occur within the patch.	20 -39 native species with high and moderate fidelity to oak woodland occur within the patch.	40 -59 native species with high and moderate fidelity to oak woodland occur within the patch.	>60 native species with high and moderate fidelity to the system types present within the patch.	90 species	Very Good	Very Good	2008	2033
Oak Woodland	Size	Acres of habitat	Number of 20 acre units with mature oaks exhibiting sufficient habitat structure: based on a combination of white-breasted nuthatch, acorn woodpecker and gray squirrel home range size	Insufficient oak woodland/forest for home range of two nuthatch pairs or acorn woodpecker colonies, i.e. less than 40 acres of oak woodland or oak forest in a contiguous patch.	Enough suitable habitat for 2 to 5 nuthatch pairs or acorn woodpecker colonies, i.e. at least 40 acres of oak woodland or oak forest in a contiguous patch.	Enough suitable habitat for 6 to 20 nuthatch pairs or acorn woodpecker colonies, i.e. at least 120 acres of oak woodland or oak forest in a contiguous patch. Alternatively, 3 patches of closely associated suitable habitat, each >40 acres in size.	Enough suitable habitat for >20 nuthatch pairs or acorn woodpecker colonies, i.e. at least 400 acres of oak woodland or oak forest in a contiguous patch. Alternatively, 3 patches of suitable contiguous or connected habitat, each >140 acres in size.	At least 5-20 ac patches of open oak woodland At least 3-20ac patches of closed oak woodland	Good	Very Good	2008	2028

Figure 5-1: Viability of Conservation Targets Table

Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	2008 Indicator Status	Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Oak Woodland	Condition	Native grass and forb abundance	Native species frequency	< 3 native high and moderate fidelity herbaceous prairie species occurring with >50% frequency and < 9 additional species occurring with at least 10% frequency in 1 meter sq. quadrats (i.e. does not meet fair criteria)	At least 3 native high and moderate fidelity herbaceous prairie species occurring with >50% frequency and at least 9 additional species occurring with at least 10% frequency in 1 meter sq. quadrats	At least 3 native high and moderate fidelity herbaceous prairie species occurring with >75% frequency and at least 9 additional species occurring with at least 25% frequency in 1 meter sq. quadrats	At least 7 native high and moderate fidelity herbaceous prairie species occurring with >75% frequency and at least 15 additional species occurring with at least 25% frequency in 1 meter sq. quadrats	California Oatgrass, Oregon Sunshine, and Western Buttercup occur with at least 50% frequency in open oak woodland with at least 9 additional native species meeting frequency standard (10%)	Fair	Very Good	2008	2028
Oak Woodland	Condition	Vegetation Structure	Cover (25-60%) and architecture of woody vegetation (trees)	Woody vegetation is invading woodland and forest and total woody cover is acceptable (25-60%) over less than 50% of the area being managed for oak woodland.	Woody vegetation is invading woodland and forest habitat but total woody cover is acceptable (25%-60%) over at least 50% of the area being managed for oak woodland.	Woody vegetation is invading woodland and forest habitat but total woody cover is acceptable (25%-60%) over at least 90% of the area being managed for oak woodland.	Woody vegetation is invading woodland and forest habitat but total woody cover is acceptable (25%-60%) over at least 90% of the area being managed for oak woodland, and canopy architecture represents an appropriate mix of large open grown trees and younger tree recruitment that will replace older trees when they die.	-43% (230 or 544ac) of existing oak woodland meets desired condition. -57% of existing oak woodland exceeds desired condition. -Douglas fir cover is greater than 50% where Oregon white oak persists in the understory on 385acres. -Visual assessment of recent leaf-off aerials show extensive presence of conifers in oak woodlands.	Poor	Very Good	2008	2028
Oak Woodland	Condition	Vegetation Structure	Relative dominance of oak vs other woody vegetation in the canopy	Relative cover of oak approximates historic condition (i.e. is within 10% of the condition that existed ca. 1950) over < 50% of the site occupied by oak woodland and forest	Relative cover of oak approximates historic condition (i.e. is within 10% of the condition that existed ca. 1950) over >50% but < 90% of the site occupied by oak woodland and forest	Relative cover of oak approximates historic condition (i.e. is within 10% of the condition that existed ca. 1950) over >90% of the site occupied by oak woodland and forest	Relative cover of oak approximates historic condition (i.e. is within 10% of the condition that existed ca. 1950) over >90% of the site occupied by oak woodland and forest, and non-oak individuals in the subcanopy do not represent a substantial risk to appropriate oak canopy cover.	Approximately 300 of 550 acres of areas mapped as oak woodland in 1950 remain oak woodland in 2008.	Fair	Good	2008	2028

Figure 5-1: Viability of Conservation Targets Table

Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	2008 Indicator Status	Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Oregon Vesper Sparrow	Size	Acres of habitat away from forest edge	Acres of prairie and savanna in patches of 20 acres or more that are >75 m from forest edge	<40 acres (insufficient habitat for 2 Oregon Vesper Sparrow territories)	40-100 acres (sufficient habitat for 2 - 5 Oregon Vesper Sparrow territories)	100 - 400 acres (sufficient habitat for 6 - 20 Oregon Vesper Sparrow territories)	>400 acres (sufficient habitat for >20 Oregon Vesper Sparrow territories)	-60ac total comprised of 3 patches of pasture, prairie, & savanna (grade b) -1-20 acre patches of grade b savanna, -1-20 ac patch of grade b savanna & prairie, -1-20ac patch of pasture. -100ac total comprised of 5 patches of prairie, savanna (grade c) & wet prairie in varying condition -1-20 ac patches of grade c savanna, -1-20ac patch of mixed prairie & grade c savanna, -1-20ac patch of mixed wet prairie & grade c savanna, -2-20ac patch of mixed wet prairie, prairie, & grade c savanna	Fair although there is sufficient acreage for a good rating, the number of acres of grade c savanna warrants a lower rating.	Very Good	Jul 2008	Dec 2027
Oregon Vesper Sparrow	Condition	Acres of habitat with suitable vegetative structure	Acres of prairie and savanna in patches of 20 acres or more that are >75 m from forest edge, with short grass (mostly < 2 ft. tall), and <15% shrub cover	<40 acres (insufficient suitable habitat for 2 Oregon Vesper Sparrow territories)	40-100 acres (sufficient suitable habitat for 2 - 5 Oregon Vesper Sparrow territories)	100 - 400 acres (sufficient suitable habitat for 6 - 20 Oregon Vesper Sparrow territories)	>400 acres (sufficient suitable habitat for >20 Oregon Vesper Sparrow territories)	1-20 ac patch of pasture	Poor	Very Good	Jul 2008	Dec 2027
Savanna Portion of Upland Prairie and Savanna Target	Condition	Vegetation structure	Cover (5-25%) and architecture of woody vegetation	Woody vegetation is invading savanna habitat and total woody cover is acceptable (5-25%) over less than 50% of the area being managed for savanna.	Woody vegetation is invading savanna habitat but total woody cover is acceptable (5%-25%) over 50% to 90% of the area being managed for savanna.	Woody vegetation is invading savanna habitat but total woody cover is acceptable (5%-25%) over at least 90% of the area being managed for savanna.	Woody vegetation is invading savanna habitat, but total woody cover is acceptable (5%-25%) over at least 90% of the area being managed for savanna, and canopy architecture represents an appropriate mix of large open grown trees and younger tree recruitment that will replace older trees when they die.	47ac - very good 208ac - fair-good (grade B) 109ac - poor (grade C)	Fair	Very Good	2008	2028

Figure 5-1: Viability of Conservation Targets Table

Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	2008 Indicator Status	Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Upland Prairie and Savanna	Condition	Native grass and forb presence/ absence	Native species richness (alpha diversity)	<20 native species with high fidelity to the system types present within the patch.	20-39 native species with high fidelity to the system types present at the patch.	40-59 native species with high fidelity to the system types present at the patch.	> 60 native species with high fidelity to the system types present at the patch.	Approximately 80 of 143ac of prairie is dominated by either tall oatgrass or tall fescue and has fewer than 20 native species present within effected areas. There are small patches (less than .25ac inclusion) where native species diversity meets the good condition.	Fair	Very Good	2008	2023
Upland Prairie Portion of Prairie and Savanna Target; Wetland Prairie	Condition	Vegetation structure	Woody vegetation cover less than 5%	Total woody cover is acceptable (i.e. <5%) over less than 50% of the area being managed for prairie.	Total woody cover is acceptable (i.e. <5%) over 50% to 90% of the area being managed for prairie.	Total woody cover is acceptable (i.e. <5%) over at least 90% of the area being managed for prairie, though trees saplings and/or shrub sprouts may be present within these areas.	Total woody cover is acceptable (i.e. <5%) over at least 90% of the area being managed for prairie, and trees saplings and/or shrub sprouts are absent.	Woody cover occupies 25-50% of the 143 ac of upland prairie	Fair	Very Good	2008	2023
Visitor Experience	Size	Scope of interpretive opportunities	Acres of high quality habitat types available for education and interpretive use	<50% of HBRA acres support high quality habitats for educational and interpretive use	Between 50% and 80% of HBRA acres support high quality habitats for educational and interpretive use	Between 80% and 95% of HBRA acres support high quality habitats for educational and interpretive use	>95% of HBRA acres support high quality habitats for educational and interpretive use	Percentage of high quality habitat differs from different habitat types; generally high quality wetlands and forest habitats are better represented than prairie, savanna, and oak woodland. Given that 190 acres or 28 percent of prairie and savanna is currently mapped as grade A, it is plausible to estimate that the current condition is less than 80%, and thus is either Poor or Fair.	Poor or Fair (estimate)	Good	April 2016	2033
Visitor Experience	Condition	Dispersal of park users	Likelihood of users of trails other than 1, 2, and arboretum trails to encounter hikers moving in opposite direction	High likelihood (>90% of time) of encountering >2 hikers moving in opposite direction	Moderate likelihood (50 to 90% of time) of encountering >2 hikers moving in opposite direction	Occasional likelihood (10 to 50% of time) of encountering >2 hikers moving in opposite direction	Low likelihood (<10% of time) of encountering >2 hikers moving in opposite direction	While we lack data on numbers and dispersal of trail users, it appears that the majority of hikers use the Arboretum or Trail 1 or 2 to hike to the summit. The trail system is sufficiently extensive that hikers can usually find solitude on weekdays, when weather is not ideal, or at certain times of the day.	Fair (estimate)	Good	Apr 2016	2033
Visitor Experience	Size	Number of interpretive opportunities	# of participants in guided tours and other educational events and activities lead by Arboretum, Friends, or other groups	< 10K participants in educational events and activities per year	10K to 15K participants in educational events and activities per year	15K to 20K participants in educational events and activities per year	> 20K participants in educational events and activities per year	12K participants in educational events and activities per year	Fair	Very Good	Jul 2008	2033

Figure 5-1: Viability of Conservation Targets Table

Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	2008 Indicator Status	Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Visitor Experience	Size	Number of park visits	Vehicle Count	< 100K, or > 400K vehicle entries per year	100K to 200K vehicle entries per year	200K to 300K vehicle entries per year	300K to 400K vehicle entries per year	250K vehicle entries per year	Good	Very Good	2008	2022
Visitor Experience	Size	Number of interpretive opportunities	# of visits to educational webpages per year, including visits via links at interpretive exhibits	< 5K visits to educational webpages per year	5K to 10K visits to educational webpages per year	10K to 15K visits to educational webpages per year	> 15K visits to educational webpages per year	6K visits to educational webpages per year	Fair	Very Good	2008	2033
Visitor Experience	Size	Amenities	Number of toilets and drinking water sources relative to total visitors	<1 toilet and 1 drinking water source for each 100K annual vehicle entries at each trailhead	1 toilet and at least 1 drinking water source for each 100K annual vehicle entries at each trailhead	2 toilets and at least 1 drinking water source for each 100K annual vehicle entries at each trailhead	At least 3 toilets and 1 drinking water sources for each 100K annual vehicle entries at each trailhead	At least 1 restroom (including porta potties) per 100K vehicle entries, but drinking water only available at 1 of 3 trailheads	Poor	Good	2008	2023
Visitor Experience	Size	Public safety	Number of reported crimes and vandalism incidents in the park each year	> 50 crimes reported in the Park annually	Between 30 and 50 crimes reported in the Park annually	Between 10 and 30 crimes reported in the Park annually	< 10 crimes reported in the Park annually	Status unknown	Poor	Very Good	2008	2023
Visitor Experience	Condition	Trail condition	Percentage of trail segments meeting standards for width, grade, poison oak control, hazard removal, and surface condition	< 50% of trail segments meet standards for width, grade, poison oak control, hazard removal, and surface condition	Between 50% and 80% of trail segments meet standards for width, grade, poison oak control, hazard removal, and surface condition	Between 80% and 95% of trail segments meet standards for width, grade, poison oak control, hazard removal, and surface condition	> 95% of trail segments meet standards for width, grade, poison oak control, hazard removal, and surface condition	Approximately 12 of 25miles of trail meet the standard	Poor	Very Good	2008	Dec 2022
Wet Prairie	Condition	Native grass and forb presence/ absence	Native species richness (alpha diversity)	<20 native species with high fidelity to the system types present within the patch.	20-39 native species with high fidelity to the system types present at the patch.	40-59 native species with high fidelity to the system types present at the patch.	> 60 native species with high fidelity to the system types present at the patch.	At least 50 native species with high fidelity are found on approximately 30 or 35 acres of wet prairie	Good	Very Good	2008	2023
Wet Prairie	Condition	Native grass and forb abundance	Native species frequency	< 2 native high fidelity herbaceous prairie species occurring with >50% frequency and < 9 additional species occurring with at least 10% frequency in 1 meter sq. quadrats (i.e. does not meet fair criteria)	At least 2 native high fidelity herbaceous prairie species occurring with >50% frequency and at least 9 additional species occurring with at least 10% frequency in 1 meter sq. quadrats	At least 3 native high fidelity herbaceous prairie species occurring with >75% frequency and at least 9 additional species occurring with at least 25% frequency in 1 meter sq. quadrats	At least 7 native high fidelity herbaceous prairie species occurring with >75% frequency and at least 15 additional species occurring with at least 25% frequency in 1 meter sq. quadrats	Straight beaked buttercup and Western rush occur with at least 50% frequency with at least 9 additional native species meeting frequency standard (10%)	Fair	Very Good	2008	2023

Figure 5-1: Viability of Conservation Targets Table

Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	2008 Indicator Status	Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Wet Prairie	Condition	Surface hydrology	Seasonal high water table	Wet prairie soils are either never saturated to the surface during the rainy season, or are completely inundated for more than 120 continuous hours (5 days) at least once in a five year period.			Wet prairie soils are generally saturated to the surface during the rainy season, with pedestals/hummocks emerging above water level except for short duration flood events, and low spots between pedestals generally covered with shallow water < 2" deep.	Much of wet prairie has altered hydrology resulting from trailside ditching or historic attempts to drain the area by ditching however soils remain super saturated or flooded during the rainy season.	Fair - Good	Very Good	2008	2023
Willamette Riparian System & Floodplain	Size	Size/extent of characteristic communities/ ecosystems	% of floodplain gallery forest potential unconverted, by branch	<30% of potential vegetation	> 30% of potential vegetation	> 60% of potential vegetation	> 80% of potential vegetation	Mapped bottomland forest is 66% of historic acreage	Good	Good (DFC is 73% of historic acreage)	2008	2023
Willamette Riparian System & Floodplain	Condition	Presence/ abundance of keystone species	Beaver abundance	Beaver absent as permanent residents	Less than acceptable range of variation (ARV)	acceptable ARV	NRV of beaver numbers	1-2 beavers occur per linear mile of river frontage	Fair	Good	2008	2023
Willamette Riparian System & Floodplain	Condition	Understory native vascular plant composition and cover	Presence/ absence of mono-culture non-natives	>10% of 10 ha grids in bottomland habitats occupied by non-native plant monocultures	<10%-5% of 10 ha grids in bottomland habitats occupied by non-native plant monocultures	<5% of 10 ha grids in bottomland habitats occupied by non-native plant monocultures	<1% of 10 ha grids in bottomland habitats occupied by non-native plant monocultures	Need more data but non-native monocultures are currently fairly limited	Fair	Good	2008	2023
Willamette Riparian System & Floodplain	Landscape Context	Dynamic fluvial system	Percent of channel with artificial impediments to in-channel and overbank flow.	>35 percent and few or more instream structures that have severe impact	21-35 percent and few instream structures that have moderate impact	10-20 percent and few instream structures that have minimal impact	<10 percent of total stream length accounting for both sides of stream and no instream structures	Extensive reaches of the bank of the Coast Fork are armored with rip-rap	Poor	Good	2008	2023
Willamette Riparian System & Floodplain	Landscape Context	Dynamic fluvial system	Percentage of historic floodplain that is part of current floodplain	<10% of the bottomland portions of HBRA are within the 20 year floodplain	>10% and <50% of the bottomland portions of HBRA are within the 20 year floodplain	>50% and <90% of the bottomland portions of HBRA are within the 20 year floodplain	<90% of the bottomland portions of HBRA are within the 20 year floodplain	Some but not all of the South Bottomlands floodplain has been reconnected	Fair	Good	2008	2023

Figure 5-2: Summary of Threats Table

Summary of Threats, HRBA - Mt. Pisgah												
Threats Across Systems		Wet Prairie	Upland prairie	Savanna	Oak Woodland	Creeks and Streams	Willamette Riparian System and Floodplain	Buckbrush Chaparral	Bradshaw's lomatium (*Lomatium bradshawii*)	Oregon Vesper Sparrow	Visitor Experience	Overall Threat Rank
		1	2	3	4	5	6	7	8	9	10	
1	Loss of ability to interact with floodplain - channelization	low	NA	NA	NA	high	high	low	low	NA	low	medium
2	Loss of ability to interact with floodplain - altered flow regime	low	NA	NA	NA	high	high	low	low	NA	low	medium
3	Lack of riparian vegetation for shade, wood recruitment, bank stabilization, habitat for insects (fish food supply)	low	NA	NA	NA	low	medium	low	NA	NA	medium	medium
4	Artificial blockages to fish passage (culverts)	medium	NA	NA	NA	high	high	NA	NA	NA	low	high
5	Upstream nonpoint source - chemical pollution	low	NA	NA	NA	low	high	low	low	NA	NA	high
6	Upstream nonpoint source - temperature pollution	low	NA	NA	NA	low	high	low	low	NA	NA	high
7	Changing water flow patterns from natural range of variation - upstream	low	NA	NA	NA	low	very high	NA	low	NA	NA	very high
8	Changing water flow patterns from natural range of variation - within the HBRA	very high	medium	low	low	very high	high	low	very high	NA	NA	very high
9	Encroachment of native trees	high-very high	high-very high	high-very high	high	low	low	high	high-very high	very high	high	high-very high
10	Expansion of native shrubs	high	high	medium	medium	low	low	low	very high	high	high	high
11	Expansion of non-native shrubs and small trees	high-very high	high-very high	high-very high	high-very high	high-very high	high-very high	high-very high	very high	very high	high	high-very high
12	Livestock farming and ranching	very high	very high	very high	very high	very high	very high	very high	very high	medium	High	very high
13	Altered ecological fire regime	very high	very high	very high	very high	high	low	high	very high	very high	low	very high

Figure 5-2: Summary of Threats Table

Summary of Threats, HRBA - Mt. Pisgah												
Threats Across Systems		Wet Prairie	Upland prairie	Savanna	Oak Woodland	Creeks and Streams	Willamette Riparian System and Floodplain	Buckbrush Chaparral	Bradshaw's lomatium (*Lomatium bradshawii*)	Oregon Vesper Sparrow	Visitor Experience	Overall Threat Rank
		1	2	3	4	5	6	7	8	9	10	
14	Invasive non-native terrestrial animals (feral pigs, turkeys, E fox squirrel, opossum)	high	high	high	high	high	high	high	high	high	low	high
15	Invasive non-native aquatic animals	medium	low	low	low	high	very high	low	high	NA	low	medium-high
16	Invasive non-native herbaceous plants	very high	very high	very high	very high	very high	very high	very high	very high	very high	medium	very high
17	Invasive fungal or microbial species	low	low	high	high	medium	medium	high	high	low	NA	medium-high
18	Problematic native animal species (elk)	medium	medium	medium	medium	medium	medium	medium	very high	medium	low	medium
19	Trampling from recreation	high	high	high	high	high	high	high	high	high	high	high
20	Trampling from management	high	high	high	high	high	high	high	high	medium	high	high
21	Roads and trails	medium	low	low	low	medium	high	low	high	medium	low	medium
22	Utility and service lines	medium	medium	medium	medium	low	medium	low	medium	medium	high	medium
23	Trail closures to conduct habitat and facility improvements	NA	NA	NA	NA	NA	NA	NA	NA	NA	low	low
24	Park closure due to high fire danger	NA	NA	NA	NA	NA	NA	NA	NA	NA	high	high
25	Poison oak height and density along designated trails	NA	NA	NA	NA	NA	NA	NA	NA	NA	medium	medium
26	Rogue trails	medium	medium	medium	medium	NA	NA	medium	medium	medium	high	medium-high
27	Unauthorized park use	medium	medium	medium	medium	medium	medium	medium	medium	medium	medium	medium
Threat Status for Targets and Site		very high	very high	very high	high	high	high	high	very high	very high	high	high

Chapter 6: Goals and Strategies

The goals and strategies listed below were carefully developed to address park management issues in a way that maintains or improves the condition of (Figure 5-1) and/or addresses the most significant threats (Figure 5-2) to the nine focal conservation targets and their associated nested targets. However, despite the importance of these activities, funding and other resources available for implementation are currently limited.

Fortunately, wide recognition of the conservation value of Howard Buford Recreation Area has generated significant support for habitat improvement in the park in the past. This support has come from a variety of sources, including private donors and grants secured by Friends of Buford Park & Mt. Pisgah and, separately, by the Mount Pisgah Arboretum; participation in projects by Lane County's operations team; in-kind contributions of technical expertise and services from partner agencies; scientific research by University professors and their graduate students; and tens of thousands of hours of labor contributed by volunteers to care for the park.

This visionary plan identifies the highest priorities for available resources, and a focus for collaborative partnerships and future grant writing efforts. With this management plan in hand, park managers, partner agencies and volunteer groups can collaborate more effectively to conserve the park's diverse habitats for the public to enjoy for many years to come. Note that there is no priority implied by the order in which the goals and strategies are listed.

Projects that are consistent with these goals and strategies are described in Chapter 10, both by conservation target and geographically by stewardship zone.

6.1 Overview of Goals and Strategies

GOAL 1: Provide a safe and positive visitor experience in Howard Buford Recreation Area (HBRA)

Conservation Target: Visitor Experience

Issues Addressed: Goal 1 seeks to enhance the visitor experience and alleviate impediments to a quality experience.

- Strategy 1.1: Minimize adverse impacts of management activities upon visitor experience.
- Strategy 1.2: Manage vegetation within designated parking areas to enhance visibility and deter crime.
- Strategy 1.3: Collaborate with Oregon Department of Forestry to incorporate fire evacuation information (in case of wildfire) within signage posted at the trailhead.
- Strategy 1.4: Monitor trail usage and collect census information to quantify park usage, inform seasonal management decisions, and guide long term planning considerations.
- Strategy 1.5: Identify and address hazard trees within 30' of the edge of designated trail corridors.
- Strategy 1.6: Manage populations of poison oak and non-native blackberry to prevent encroachment along all designated recreational trail corridors.
- Strategy 1.7: Locate viewpoints and benches in a manner that nurtures a sense of place while minimizing impacts to other users and habitat.

- Strategy 1.8: Manage dog use in HBRA to reduce impacts to other visitors by requiring that dogs be on leash throughout the park except in specific designated off-leash areas or trails.

GOAL 2: Educate park users about the unique natural values that make the HBRA and the broader Mount Pisgah area a priority for conservation.

Conservation Target: All conservation targets.

Issues Addressed: Goal 2 seeks to foster visitors' appreciation of Mount Pisgah's importance and uniqueness as a regionally significant habitat area, to encourage visitors to enjoy the park with care, minimize their impacts to other conservation targets, and become engaged in and supportive of habitat management and conservation activities.

- Strategy 2.1: Collaborate with Friends of Buford Park & Mt. Pisgah, Mount Pisgah Arboretum, the Sheriff's Mounted Posse, and other stakeholders to survey and educate park patrons about impacts of off-trail activity and cultivate a "stay-on-the-trail" ethic.
- Strategy 2.2: Partner with organizations such as Friends of Buford Park & Mount Pisgah, Travel Lane County, Mount Pisgah Arboretum, equestrian groups, the University of Oregon, and watershed councils, to develop an interpretation program including media outreach, guided tours, self-guided tours (possibly using digital media), and informational displays. The program should enhance appreciation for Mount Pisgah's natural capital, elevate understanding of and support for native habitat management and conservation on local and ecoregional scales, and cultivate a "leave no trace" ethic.
- Strategy 2.3: Educate visitors to help them understand the seasonal sensitivities of wildlife to visitor activities.

GOAL 3: Maintain and improve the park's trail system to minimize ecological impacts while providing views of and access to HBRA's diverse habitats.

Conservation Target: All conservation targets.

Issues Addressed: Goal 3 seeks to enhance visitor experience by improving trail conditions and reducing impacts of recreation upon other conservation targets.

- Strategy 3.1: Encourage park visitors to remain on designated trails.
- Strategy 3.2: Manage dog use in HBRA to reduce impacts to wildlife by requiring that dogs be on leash throughout the park except in specific designated off-leash areas or during specified seasons.
- Strategy 3.3: Manage vegetation to preserve and enhance trailside viewpoints, as well as provide shade in appropriate locations.
- Strategy 3.4: Update 1995 HBRA Trail Management Plan to ensure that the trail system addresses the visitor experience and habitat needs/goals of the Habitat Management Plan.
- Strategy 3.5: Apply best management practices and trail standards (see Chapter 11) when implementing trail construction and maintenance projects.
- Strategy 3.6: Research feasibility of a forage production program to produce "Pisgah" native hay (consisting of native grasses and forbs harvested from designated areas in bottomland portions of HBRA) with consultation from area ranchers and equestrian groups.
- Strategy 3.7: Use best available science about wildlife and habitat impacts of different visitor uses and facilities to guide decisions about improving or constructing trails and facilities for park visitors.

GOAL 4: Minimize impacts of park management on conservation targets.

Conservation Target: All conservation targets.

Issues Addressed: Goal 4 seeks to reduce impacts from park management upon conservation targets.

- Strategy 4.1: Manage natural areas, recreational facilities (including but not limited to trails and parking areas), and utility corridors consistent with best management practices in the Oregon Department of Transportation BMPs (adopted by Lane County) and the "Stewardship Tool Box" in Chapter XI of this *Habitat Management Plan.*
- Strategy 4.2: Managers will reference the *Habitat Management Plan* to guide habitat management practices.
- Strategy 4.3: Partner with confluence area land management agencies to design and develop an equipment cleaning facility.
- Strategy 4.4: Collaborate with agency partners to secure designated equipment for use specifically within natural areas in the Mount Pisgah area.

GOAL 5: Restore and enhance prairie, savanna and oak woodland habitats by reducing encroaching woody vegetation.

Conservation Targets: Prairie and savanna, oak woodland, wet prairie, Oregon Vesper Sparrow.

Issues Addressed: Goal 5 seeks to enhance viability of wet prairie, upland prairie, savanna and oak woodland habitats by reducing the threat of encroachment from woody vegetation.

- Strategy 5.1: Treat 1,000+ acres to reduce woody cover in oak woodland, savanna and prairie and wet prairie habitats so these habitats are under the appropriate thresholds for woody cover, using methods that minimize soil disturbance and impacts to remnant native herbaceous vegetation.
- Strategy 5.2: Collaborate with Bonneville Power Administration, Friends of Buford Park & Mt Pisgah, Oregon Department of Forestry, U.S. Fish & Wildlife Service and other partners to reduce density of woody vegetation within prairie, savanna, and oak woodland habitats.
- Strategy 5.3: Retain appropriate amounts of large down wood and dead trees, or create snags, for habitat value when reducing tree density as part of savanna and oak woodland restoration.

GOAL 6: Achieve significant restoration of prairie and savanna, oak woodland, and wet prairie habitats in HBRA.

Conservation Targets: Upland prairie and savanna, oak woodland, wet prairie, Oregon Vesper Sparrow

Issues Addressed: Goal 6 seeks to enhance viability of upland and wet prairie, savanna and oak woodlands by introducing periodic ecological burns.

- Strategy 6.1: Continue ongoing collaboration with Oregon Department of Forestry East Lane District, Rivers to Ridges Partnership, and other qualified fire management entities to design and implement ecological burns on an average of 50-250 acres annually.
- Strategy 6.2: By 2020 collaborate with Oregon Department of Forestry East Lane District to revise fire management plan to update suppression objectives within HBRA to minimize negative habitat impacts from wildfire suppression efforts.
- Strategy 6.3: By 2022, use an integrated pest management strategy to manage fuels along the edge of forests, prairies and savannas to reduce potential for fire escape and catastrophic fire behavior.

- Strategy 6.4: By 2032, achieve a fire-return interval of three to 13 years on at least 1,500 acres spanning prairie and savanna, oak woodland, and wet prairie.

GOAL 7: Achieve significant restoration of chaparral habitat in HBRA.

Conservation Targets: Buckbrush chaparral.

Issues Addressed: Goal 7 seeks to enhance viability of this habitat by using ecological burns.

- Strategy 7.1: Burn 25 percent of the buckbrush chaparral habitat periodically to achieve a fire return interval of 50 years.
- Strategy 7.2: By 2032, triple the acreage where buckbrush (*Ceanothus cuneatus)* affords at least 25 percent cover in habitat blocks of at least five acres.

GOAL 8: Manage for diverse native plant communities within each conservation target habitat.

Conservation Targets: Prairie and savanna, oak woodland, wet prairie, Oregon Vesper Sparrow.

Issues Addressed: Goal 8 seeks to enhance viability of prairie and savanna, oak woodland, and wet prairie by reducing the threat of invasive, non-native vegetation.

- Strategy 8.1: By 2020, 10 or more patches greater than 10 acres of prairie, savanna, oak woodland, and wet prairie have five or more "high-fidelity" (defined in Appendix A: Glossary) native herbaceous species with 75 percent frequency in one meter square plots, and 10 or more additional native herbaceous species occurring with at least 25 percent frequency in one meter square plots.
- Strategy 8.2: Maintain existing high quality habitat patches using ecological burning, mowing, and other treatments to control species of invasive plants.
- Strategy 8.3: Enhance low quality patches of existing habitat.

GOAL 9: Increase the extent of wet prairie habitat.

Conservation Targets: Wet prairie, Bradshaw's lomatium.

Issues Addressed: Goal 9 seeks to enhance viability of federally endangered Bradshaw's lomatium and its wet prairie habitat by increasing the extent of wet prairie habitat on HBRA. Threats include impacts from management of roads and trails, encroachments of native woody vegetation, invasion of non-native vegetation, and altered ecological fire regime.

- Strategy 9.1: Where feasible, restore areas of wet prairie on HBRA that have been filled, drained, modified or adversely affected by adjacent land management (such as modification of upslope/upstream hydrology in conjunction with trail infrastructure).
- Strategy 9.2: Identify intact wet prairie on adjacent properties and explore potential to cooperate on habitat enhancements, restoration funding, or conservation easements.
- Strategy 9.3: Establish new and expand existing populations of Bradshaw's lomatium within wet prairies.

GOAL 10: Locate and, to the extent feasible, reduce populations of feral or harmful non-native animal species impacting each conservation target.

Conservation Targets: All conservation targets.

Issues Addressed: Goal 10 seeks to reduce the threat of impacts by non-native animals.

- Strategy 10.1: Document observations of non-native animal species present or potentially present within HBRA and evaluate to identify species that represent threats or potential threats to conservation targets ("problem species").
- Strategy 10.2: Initiate an Early Detection Rapid Response program in partnership with Lane County Animal Services (for feral domestic animals), Oregon Dept. of Agriculture (ODA), and Oregon Dept. of Fish and Wildlife (ODFW) to report observations of problem species within the greater Mount Pisgah area.
- Strategy 10.3: Collaborate with Lane County Animal Services, Feral Cat Coalition, Oregon Humane Society, and related groups to initiate an educational campaign to discourage people from releasing domestic animals into natural areas.
- Strategy 10.4: Working under the direction of ODFW and other partners, monitor abundance (particularly for game species) and reduce or eliminate threats to conservation targets from non-native animal species that are creating significant impacts to conservation targets. Implement strategies to the extent practicable.
- Strategy 10.5: Collaborate with neighboring landowners (public and private), stakeholders, and watershed councils to control problem species on adjoining lands and in the greater Mount Pisgah area.

GOAL 11: Locate and reduce the presence of habitat-modifying, non-native plant species within each conservation target habitat.

Conservation Targets: All conservation targets.

Issues Addressed: Goal 11 seeks to address the threat from invasion of non-native plant species (herbaceous and woody plants). A preliminary list and profile of "habitat modifying" non-native plant species is located in Chapter 9 (developed by the Friends of Buford Park Stewardship Technical Advisory Committee).

- Strategy 11.1: Screen and prioritize for management all non-native species known to occur within the HBRA using the standardized assessment tool, "Handbook for Ranking Exotic Plants for Management and Control", created by U.S. National Park Service (Hiebert and Stubbendieck, 1993).
- Strategy 11.2: Operate an "Early Detection - Rapid Response" program. Train volunteers to identify and report invasive plant populations.
- Strategy 11.3: Effectively manage all target "invasive" plants along their vectors of distribution; treat all "outlier" populations and effectively contain the "main" populations.
- Strategy 11.4: Manage "secondary invaders" (e.g. nipplewort (*Lapsana communis*) along edges of roads, recreational trails, and wildlife trails.
- Strategy 11.5: Reduce populations of false brome (*Brachypodium sylvaticum*), Maltese star thistle (*Centaurea melitensis*), spotted knapweed (*Centaurea stoebe*), meadow knapweed (*Centaurea × moncktonii*), cotoneaster (*Cotoneaster sp.*), English ivy (*Hedera hibernica*), and giant knotweeds (*Polygonum cuspidatum, P. x bohemicum*), to less than five percent of the 2008 area of occupation.

- Strategy 11.6: Effectively treat populations of shining geranium (*Geranium lucidum*), reed canary grass (*Phalaris arundinacea*), and tansy ragwort (*Senecio jacobaea*) among other species growing within vicinity of rare, sensitive, and listed plants and animals.
- Strategy 11.7: Remove individual trees and patches of non-native fruit and nut trees, including English hawthorn (*Crataegus monogyna*), apple (*Malus domestica*), common pear (*Pyrus communis*), Myrobalan plum (*Prunus cerasifera*), sweet cherry (*Prunus avium*), hazelnut (*Corylus avellana*), and walnuts (*Juglans nigra* and *J. regia*) impacting conservation target species and habitats.
- Strategy 11.8: Remove patches of non-native blackberry species (*Rubus armeniacus, R. anglocandicans, R. laciniatus, R. vestitus*) and Scotch broom (*Cytisus scoparius*) impacting conservation target species and habitats.
- Strategy 11.9: Collaborate with neighboring landowners (public and private), stakeholders, and watershed councils to proactively reduce the threat of invasive non-native species on adjoining lands and in the broader confluence/Mount Pisgah area, with a particular focus on early invaders.
- Strategy 11.10: Partner with Friends of Buford Park, Mount Pisgah Arboretum and other partners to fund a stewardship endowment to support ongoing management of invasive species.
- Strategy 11.11: Partner with Friends of Buford Park & Mt. Pisgah, Mount Pisgah Arboretum and Bonneville Power Administration to remove priority invasive non-native plant species from power line rights-of-way, and prevent the establishment of new invaders.

GOAL 12: Remove fish passage barriers from the lower mile of creeks and streams on HBRA that flow into the Coast Fork and Middle Fork of the Willamette River.

Conservation Targets: Creeks and streams

Issues Addressed: Goal 12 seeks to enhance viability of creeks and streams by improving fish passage, a key ecological attribute. Threats to this conservation target include obstructions to fish passage, such as poorly designed culverts.

- Strategy 12.1: Inventory each creek or stream in HBRA to identify barriers obstructing aquatic connectivity/passage (and their impacts).
- Strategy 12.2: Where appropriate, remove human-created barriers to aquatic passage identified in the inventory.

GOAL 13: Improve ecological health of creeks and streams.

Conservation Target: Creeks and streams

Issues Addressed: Loss of creek or stream's ability to interact with its floodplain due to channelization, lack of riparian vegetation, and impacts from management. Goal 13 considers the form and function of streams in HBRA and seeks to enhance viability for creeks and streams for this "key ecological attribute."

- Strategy 13.1: Improve 50 percent of stream miles rated "poor" to "good" condition for macro-invertebrates.
- Strategy 13.2: Research, prioritize and begin restoration of stream reaches that have been straightened, channelized, or dewatered. Start implementation on downstream ends where feasible, aiming to restore functionality of entire high priority stream basins before moving to lower priority basins.
- Strategy 13.3: Manage grazing practices near streams and wetlands to limit damage.

GOAL 14: Improve ecological health of riparian floodplain habitats.

Conservation Target: Willamette River riparian system and associated floodplains

Issues Addressed: Goal 14 seeks to enhance the viability of Willamette River riparian and floodplain habitat by addressing the threat of loss of the river's ability to interact with its floodplain due to channelization. Goal 14 will also benefit nested targets and other native plants and animals that rely on floodplains for some or all of their habitat and life history requirements.

- Strategy 14.1: Reconnect and improve function of the sloughs, oxbows and historic channels within the contemporary floodplain.
- Strategy 14.2: Remove plugs and constructed barriers that obstruct connectivity with the river for flows equal to or greater than bank full events.
- Strategy 14.3: Restore and connect historic alcoves, side channels, and back water sloughs to the river.
- Strategy 14.4: Explore opportunities to collaborate with neighboring landowners (public and private), stakeholders, and watershed councils to restore historic alcoves, side channels, and back water sloughs that connect to the river on adjoining lands and in the greater Mount Pisgah area.

Goal 15: Manage habitats in the North Bottomlands Stewardship Zone to be mutually compatible with recreational activities identified in the 1994 HBRA Master Plan and the recommendations of the Large Events Task Force.

Conservation Targets: Goal 15 seeks to enhance visitor experience (specific to the North Bottomlands) while also enhancing oak woodland, Willamette River riparian systems and associated floodplains, upland and wet prairie.

Issues Addressed: Impacts to visitor experience, impacts from management (such as infrastructure improvements); invasion of non-native vegetation. Goal 15 seeks to enhance visitor experience in the North Bottomlands by enhancing habitats in a manner that accommodates more active recreational uses (such as small events and use of the outdoor equestrian arena) through compatible conservation actions for oak woodland, upland and wet prairie, and for Willamette River riparian systems and associated floodplains.

- Strategy 15.1: When issuing special use permits for events, consider protocols and conditions that minimize potential impacts to conservation targets to the maximum extent practicable.
- Strategy 15.2: Reduce the potential for the colonization of invasive plant species within the North Bottomlands and their spread to other areas of the park.
- Strategy 15.3: Develop and appropriately site infrastructure improvements to minimize impacts to adjacent habitats.
- Strategy 15.4: Develop projects within the North Bottomlands Stewardship Zone to highlight HBRA conservation vision and education opportunities in a manner that is accessible to all park visitors.
- Strategy 15.5: Sustain and, if warranted, expand operation of the native plant nursery managed by Friends of Buford Park & Mt. Pisgah to provide native plant materials (seeds and plants) for restoration projects in HBRA.
- Strategy 15.6: Manage agricultural activities so they are compatible with recreation and conservation goals.

- Strategy 15.7: Restore a configuration of habitats in the North Bottomlands that is compatible with and complementary to the planned Desired Future Conditions for habitat restoration in adjacent portions of The Nature Conservancy's Willamette Confluence Preserve.
- Strategy 15.8: Work with partners to identify ecologically appropriate corridors to extend the trail system to afford access along the northwest boundaries of the park and to the Willamette Confluence Preserve if (and when) it becomes open to the public.

6.2 Chapter 6 References

- Hiebert, R.D. and J. Stubbendieck, 1993. Handbook for Ranking Exotic Plants for Management and Control. U.S. National Park Service, Natural Resources Report NPS/NRMWRO/NRR-93/08.

Chapter 7: Enhancing Visitor Experience While Managing Habitats

7.1 Recreational and Educational Values of Healthy Native Habitats

Howard Buford Recreation Area is the most visited park in the Lane County park system. The park annually receives an estimated 400,000 visits by people who enjoy its diverse natural beauty. There is also diversity in how these hundreds of thousands of visitors use the park. Every time a visitor enters HBRA, he or she has an opportunity to enjoy and learn about these diverse and valuable native habitats.

- Many park users hike or ride horses to the summit, enjoying vistas of the Willamette Valley to the west and the snow-capped Cascades to the east. The open character of prairie and savanna habitat makes these views possible.
- Others enjoy a leisurely walk on the level trails along the Coast Fork Willamette River in the Mount Pisgah Arboretum or along the South Bottomlands trails.
- Some people seek vigorous exercise, training daily with hikes or runs on the park's 27-mile trail network, winding through forest, savanna, and prairie habitats.
- Other visitors come to enjoy the remarkable birds and other wildlife that inhabit HBRA. The park's habitat diversity supports 30 butterfly species and more than 120 bird species, and Mount Pisgah is recognized by the Audubon Society as an official Important Bird Area.

- Spring wildflower displays are spectacular. Artists, photographers, botanists, and naturalists find inspiration in the myriad wildlife and botanical species and varied landscapes present in the park.

Each year, thousands of visitors attend Mount Pisgah Arboretum's Spring Wildflower and Fall Mushroom Festivals.

- Mount Pisgah Arboretum has developed and is implementing a comprehensive interpretive plan for its approximately 203-acre lease area. The Friends and Lane County Parks Division support that effort and have collaborated with the Arboretum to develop interpretive sign standards for all of HBRA. The goal is to enable park visitors to more easily learn about native habitats throughout the park, no matter what their primary reason for visiting.
- HBRA also serves as an educational resource for children and adults from pre-school through graduate school and beyond. Whether enrolled in formal classes or out of personal interest, many visitors study the diverse plants, animals, and habitats in the park. By participating in projects led by the Arboretum or the Friends, school groups and university classes regularly visit the park to learn about botany, wildlife, natural history, and natural resource management. Mount Pisgah Arboretum provides environmental education programs that teach thousands of school children and hundreds of adults each year about the park's native fauna and flora. The restoration activities and ongoing ecosystem management envisioned in this plan will complement these environmental education curricula by providing additional important natural resource learning opportunities.
- Volunteers form the common thread that creates and connects so much of the recreation, education, and community value that HBRA provides. They are key to Mount Pisgah Arboretum's environmental education program, and also help care for the Arboretum's trails and natural habitats. Volunteers are the backbone of the Friends native plant nursery. Friends volunteer Trails Committee is crucial to trail planning, design, and maintenance on several of the park's most popular hiking routes. Friends and Arboretum volunteers are an essential complement to County and both non-profits' staffs, who together maintain and restore natural habitats throughout the park.

7.2 Balancing Visitor experience with Habitat Management

A key purpose of this *Habitat Management Plan* is to enhance visitor experience while protecting and improving habitat for plants, fish and wildlife. This plan's Goals 1, 2, and 15 (see Chapter 6) seek to sustain and improve recreation by:

- Improving visitor experience at HBRA,
- Increasing public understanding and appreciation for "the unique qualities that make HBRA and the broader Mount Pisgah area a priority for conservation" and,
- Expanding habitat management activities in the North Bottomlands Stewardship Zone that are compatible with existing recreational activities as identified within the HBRA Master Plan and other applicable documents such as the Large Event Task Force recommendations.

By raising awareness of the regional importance of habitats within HBRA, we expect visitors will increasingly choose to tread thoughtfully and lightly on the park. In addition, carefully designed park infrastructure, such as trails that are properly located and constructed, will help minimize the impacts to habitats from park visitors.

7.2.1 Suitable locations for interpretive signage

Interpretive signage can help increase public understanding and appreciation for the park's "unique qualities," but too many signs far from the trailheads would degrade the "wild backcountry" feel of the park's trails that visitors value. This plan calls for additional interpretation at each of the three main trailheads. Existing kiosks may be used or new signage installed.

Signage to interpret habitat restoration is valuable to help the public understand habitat management. Outside of the Arboretum, this plan calls for temporary signage (posted for up to 3 years) along trails to

explain the purpose and benefits of habitat management actions, such as ecological burns, vegetation management, or wetland restoration.

Mount Pisgah Arboretum, in its role as an educational hub for the Mount Pisgah area, has initiated implementation of its own comprehensive interpretive program. The Arboretum interpretive plan envisions permanent interactive interpretive exhibits at each of eight designated habitat "eco-nodes" within its lease area that exemplify the park's varied native ecosystems.

7.2.2 Suitable locations for benches and view points

The summit of Mt. Pisgah is the most common destination to take in sweeping views of the Southern Willamette Valley. Visitors to the summit, as well as other areas of the park, perch upon rock outcrops, low hanging branches, or on the ground to take in the view or simply stop and rest as there are few benches within the park outside of the Arboretum. The sheer number of people who visit the park warrants installation of additional benches in carefully selected sites as a means to reduce the impacts of trampling habitat as well as disturbance to wildlife and other users.

Carefully located benches and viewpoints can foster a sense of place in HBRA. For some visitors, to spend time in the outdoors represents an opportunity to get away from the hustle and bustle of one's daily routine. It is important that the location of benches and viewpoints do not dominate the adjacent landscape. The view, which may frame points of interest near and far away, should be structured in a manner that screens the viewer from other points on the trail as well as to the area beyond the trail.

As with interpretive signage, benches located far from trailheads and the most popular trails will degrade the "wild backcountry" feel of the park's trails. Benches are most appropriate on the western side of Mt. Pisgah. Along trails on the eastern and southern slopes, selected viewpoints can be identified where natural objects, such as boulders or fallen logs, can provide sitting places. But otherwise viewpoint development on the east and south side of the park will be limited to unobtrusive pruning or clearing of vegetation to frame viewing opportunities.

In particular it should be noted that the view from the summit westward is being increasingly obscured by Douglas-fir trees that have established on the upper summit ridge in the past 25 years. Removal of these trees will be necessary to preserve existing views, and will also benefit the existing prairie vegetation.

7.2.3 Dogs On Leash

Many park visitors enjoy bringing their dogs to the HBRA, whether they hike to the summit, stroll through the old fields and prairie in the bottomlands, or swim in the Willamette River on a hot summer day.

No matter the destination, it's important that dog owners manage their dogs responsibly so that everyone can enjoy the park and its trails. Current policy requires all dogs within the park to be under voice control by their owners, and within the Arboretum and on Trails 1 and 2 dogs are required to be on a leash not more than 6 feet in length.

Unfortunately, with these park rules in place, off-leash dogs have been a frequent source of conflict for park users for many decades. This plan calls for developing a new policy for dog use in HBRA, possibly in conjunction with a future update to the 1994 HBRA Master Plan, which would require dogs to be kept on leash in all parts of the park except for designated places and trails where they may be off leash. The reasons for developing a new policy are many, including:

1) Off-leash dogs can impact visitor experience, jump on other visitors, including children, and can cause accidents or injuries.
2) Off-leash dogs scare and/or chase or otherwise harass wildlife.
3) For people who are afraid of or uncomfortable around dogs, an encounter with an off-leash dog can be unpleasant or downright terrifying.
4) Off-leash dogs can instigate aggression or fights with leashed dogs.
5) If an off-leash dog causes a serious issue, the dog owner could be held liable in a lawsuit or face criminal charges, or even loss of the pet.
6) When off-leash, dogs can encounter or ingest harmful substances.
7) Dogs may transfer irritating poison oak oils to owners or others park users.

Lane County Parks and planning partners will engage in a public involvement process to obtain feedback from the entire spectrum of park users, including dog owners and non-dog owners, to identify appropriate areas of the park to allow off-leash dog use, without significantly impacting habitat values or the visitor experience for non-dog owners.

7.3 Habitat Stewardship Zones

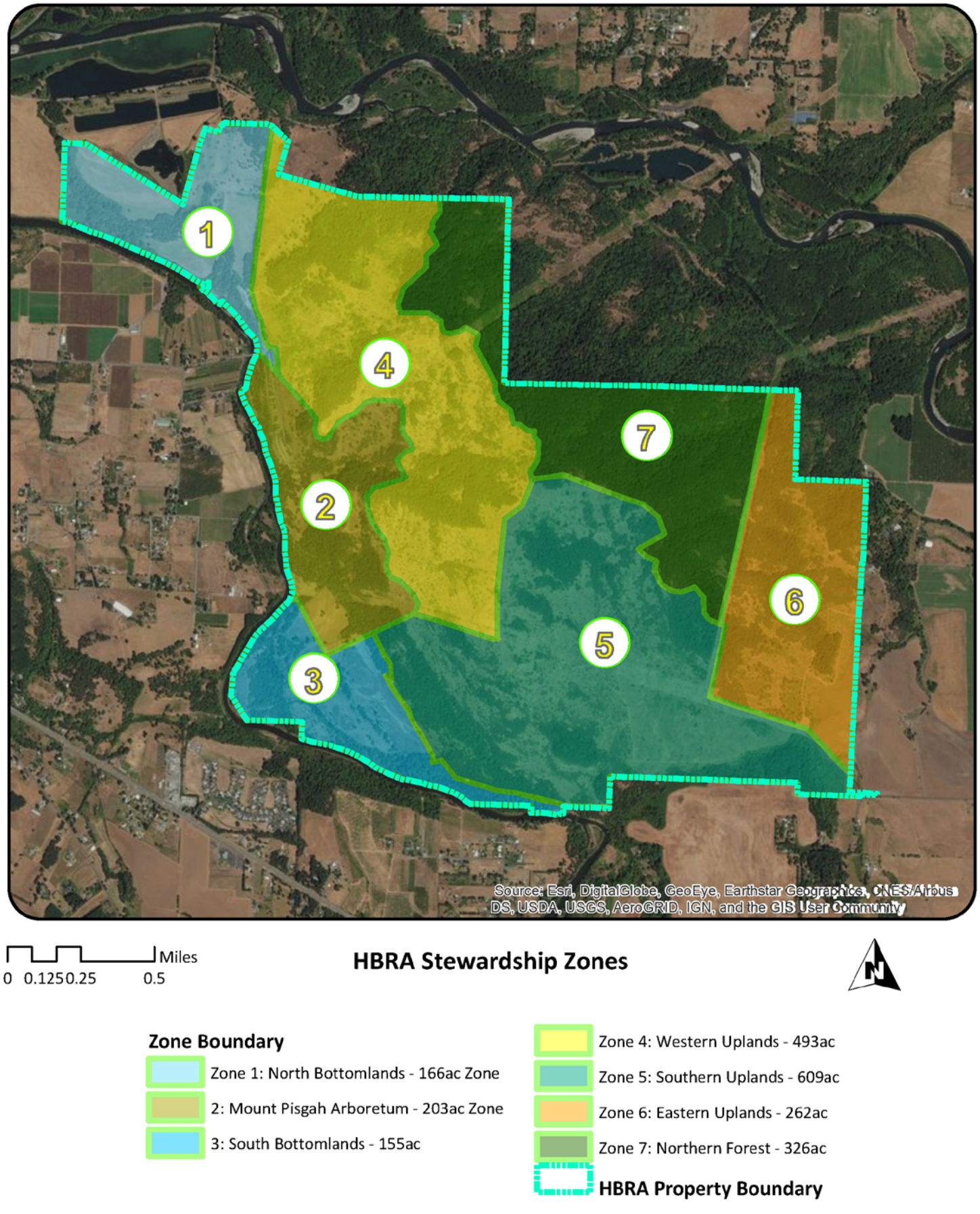
The 1994 HBRA Master Plan (p. 33) designated six management "Zones and Elements", including:

- North Bottomlands
- Main Entrance
- Main Parking Area
- Mount Pisgah Arboretum
- South Meadow, and
- Mount Pisgah Trail System (the entire hillside except for an upland portion of the Arboretum).

The South Meadow Zone has been re-named here as the "South Bottomlands", since this zone contains a variety of habitat types. In addition, the "Main Entrance" is consolidated here into the North Bottomlands Zone, and the "Main Parking Area" is consolidated into the Mount Pisgah Arboretum.

To facilitate habitat stewardship, as shown in Figure 7.1, this management plan further divides the largest zone, the "Mount Pisgah Trail System," into four smaller stewardship zones: Western Uplands, Southern Uplands, Eastern Uplands, and Northern Forest. Each of the four new stewardship zones are further subdivided into a set a subordinate management units.

Figure 7-1: HBRA Stewardship Zones Map



7.4 Brief Descriptions of Stewardship Zones

North Bottomlands Stewardship Zone (166 acres)

This zone encompasses the floodplain of the Coast Fork of the Willamette River at the far northwest corner of the park. The zone's habitat includes various wetland and riparian woodlands and prairies. Part of Thompson Slough, a forested old river meander/seasonal wetland, flows into the Willamette Confluence Preserve. Park facilities located within this stewardship zone include the horse arena, the Native Plant Nursery, the Kienzle house and barn, and the North Trailhead/Parking Lot. These facilities support a variety of recreational uses, consistent with direction provided in the 1994 *HBRA Master Plan*. This zone provides opportunities for enhancing and restoring a diversity of riparian and floodplain plant communities. Here, habitat management will be compatible with and enhance recreational uses. For example, removal of blackberry in riparian forests will make the areas more accessible and scenic if additional trails are developed in the future.

Mount Pisgah Arboretum (203 acres)

Lane County leases approximately 203 acres within HBRA to Mount Pisgah Arboretum, an independent non-profit 501c3 organization founded in 1973. The Arboretum was involved in the original justifications and development of the Park, and has been an active partner with Lane County since HBRA was established. The Arboretum's stewardship zone lies immediately adjacent to the Coast Fork of the Willamette River and encompasses portions of the west slope of Mount Pisgah. This area contains many diverse Willamette Valley plant communities, including oak savanna, oak woodland, Douglas-fir forest, incense cedar forests, mixed forests, riparian forests, riverine wetlands, and grassy meadows. The Arboretum boundary has never been formally surveyed, and the 203 acre figure is based on the original paper maps, which lack precision. Once the lease boundary is surveyed, the actual number of acres may differ slightly from this number.

Mount Pisgah Arboretum is responsible for habitat management in this stewardship zone. Over more than four decades, the Arboretum has worked to enhance its native ecosystems by controlling invasive plant species and restoring native habitats. In doing so, the Arboretum seeks to actively engage the public in hands-on stewardship, and to minimize the use of herbicides.

The primary purpose of Mount Pisgah Arboretum is nature education, and habitat management efforts are aimed at providing dynamic outdoor classrooms for teaching about local ecology. The Arboretum offers a wide range of both structured educational programs and informal learning opportunities for visitors of all ages, and is currently developing a series of interactive nature exhibits.

As one of the Park's busier access points, the Arboretum maintains more than seven miles of all-season trails as well as public restrooms and drinking water, parking areas, a picnic area, a covered pavilion, a small visitor center, and on-site offices. The Arboretum's Site Manager lives on-site and serves as HBRA caretaker for Lane County Parks.

South Bottomlands Stewardship Zone (155 acres)

This zone encompasses the floodplain of the Coast Fork of the Willamette River upstream and south of the Mount Pisgah Arboretum Lease Area. The zone includes a mosaic of restored prairie and savanna, oak woodlands, riparian forest, and shrub thickets. It features enhanced connections between the river and the floodplain along a restored side channel and associated backwater. Miles of fencing were removed and replaced with a network of mowed and graveled trails. Wildlife observation is encouraged at two developed viewing points, including a 'wildlife viewing blind' that provides opportunities to observe beavers, birds, deer, turtles and other species of interest.

Western Uplands Stewardship Zone (493 acres)

This zone encompasses much of the west-facing slope of Mount Pisgah, from the Arboretum boundary uphill to the main summit ridgeline. This is the most visible side of the mountain to approaching visitors, and its condition impacts the experience of park visitors as they first enter the park.

Western Uplands Stewardship Zone Management Units	Period of Intensive Restoration	Acreage
BPA North: Santiam-Alvey	2023 - 2027	17
BPA South: Marion-Alvey + Lookout Point-Alvey	2018 - 2022	9
Bridge Bowl	2019 - 2022	63
Fir Ridge	2023 - 2024	46
Lazuli	2024	41
Spring Box	2018	43
Swing Hill	2019 - 2022	121
Upper Canyon Creek	2023 - 2024	108
Vesper	2021 - 2022	45

Southern Uplands Stewardship Zone (609 acres)

This zone is dominated by oak savanna, oak woodland and upland prairie. Much of the park's buckbrush chaparral is found within this zone as well as some of the most intact prairie and savanna habitats in the park.

Southern Uplands Stewardship Zone Management Units	Period of Intensive Restoration	Acreage
BPA: Marion-Alvey + Lookout Point-Alvey	2018 - 2022	34
Buckbrush	2025 - 2027	254
Fawn Lily	2025 - 2027	139
Meadowlark South	2019	182

Eastern Uplands Stewardship Zone (262 acres)

This zone extends from wetland prairie and wetland shrub habitats located at the foot of Mount Pisgah, uphill to include both upland savanna and woodland habitats. This zone supports most of the wet prairie within the park as well as extensive ponderosa pine stands.

Eastern Uplands Stewardship Zone Management Units	Period of Intensive Restoration	Acreage
BPA: Marion-Alvey	2018 - 2019	10
Meadowlark East	2018 - 2019	143
Ponderosa	2018 - 2020	109

Northern Forest Stewardship Zone (326 acres)

This zone includes a large, mostly forested area on the northeast slope of Mount Pisgah that will largely be managed as conifer woodland or forest. This zone has a mix of Douglas-fir, bigleaf maple and grand fir overstory, with lesser amounts of and other tree species. Pockets of Oregon white oak communities are also found within this zone in areas of shallow soils. Although not a focal conservation target in this plan, conifer forest, which has not declined in acreage in the Willamette Valley, provides habitat for a variety of native plant and wildlife species, some of which are not found in other habitat types.

Northern Forest Stewardship Zone Management Units	Period of Intensive Restoration	Acreage
BPA: Santiam-Alvey	2023 - 2027	5
Bugbane	2023 - 2024	75
Eagle's Lair	2028 - 2029	50
Headwaters	2029 - 2030	196

Park Facilities (Main Entrance, Roads, Parking Lots, Trails, Utility Corridors)

Some of these infrastructure elements are present in each of the stewardship zones. In general, this plan's best management practices provide guidance for how to manage these infrastructure elements to protect the conservation targets, including visitor experience.

7.5 Chapter 7 References

- Lane County Parks Division and Cameron & McCarthy Landscape Architects. 1994. Howard Buford Recreation Area Master Plan.
- Bend Park & Recreation District. Dogs in Parks (web site reference). www.bendparksandrec.org/parks__trails/dogs_in_parks/

Chapter 8: Fire as a Management Tool

8.1 The Historic Role of Fire in Chaparral, Prairie, Savanna, & Woodland Habitats

8.1.1 Historic Climate Variations

Significant portions of Oregon's ecoregions support habitats that are dependent on fire for their continued health and survival. Climate conditions approximately 5,000 to 8,000 years ago that were warmer and drier than today likely influenced the establishment of prairie and savanna habitats in the Willamette Valley ecoregion. As the climate subsequently cooled, frequent low intensity wildland fires maintained extensive prairies and savannas, which would otherwise have declined in the absence of fire. While some fires may have been the result of lightning strikes, deliberate ignition by the indigenous peoples of the area as a land management practice is likely to have been an important ecological influence (Walsh et al. 2010; Walsh et al. 2015).

8.1.2 Observations of Early Explorers

The first Euro-American explorers and settlers who arrived in the Willamette Valley in the early 1800's described the Willamette Valley as having extensive areas of prairie and oak savanna. Land surveys conducted by the General Land Office of the US Government in the 1850's documented that about one million acres of the Willamette Valley was prairie, and 500,000 acres were savanna (Christy and Alverson, 2011; Appendix B). These native prairie and savanna habitats have been greatly reduced in extent due to agriculture, grazing of domestic livestock, residential and urban development, and expansion of forest vegetation into former prairies. Only a few thousand acres of high quality native prairie and savanna are currently known to survive in the Willamette Valley, a reduction of 98 percent or more from the original extent of prairie and savanna.

Thus, it was a "natural" landscape shaped (largely) by human-set fires that the first Euro-American explorers and settlers encountered in the early 1800's (Habeck 1961, Johannessen et al 1970, Towle 1974). Morris (1934), Johannessen (1971) and Boyd (1986) document this practice through reviews of the early Euro-American explorers' and missionaries' journals (David Douglas-1826, John Work-1834, C. Wilkes-1845, B. Hines-1881, etc.). These records report that fires were set annually in late summer and early fall, and covered extensive portions of the Willamette Valley. The main difficulty with historic observations and descriptions is that they do not clearly describe how often fires returned to any specific location, and that is a pertinent question that remains to be answered.

Drastic population declines resulting from introduced diseases, and ultimately, the removal of the Kalapuya Indians to the Grand Ronde Reservation halted wide scale burning in the Willamette Valley in the 1830s and 1840s. Without fire, wet prairies that have been left undisturbed have in many cases gradually changed into willow and ash forests, while the drier prairies have converted to oak woodlands and maple and Douglas-fir forests.

8.1.3 Cultural Use of Fire as a Management Tool

The Winefelly group of the Kalapuya people (a primary tribe in the Willamette Valley), who spoke the Central Kalapuya dialect, were the primary native inhabitants of the Mount Pisgah/Confluence area. The Mount Pisgah area was likely used for seasonal hunting and food plant gathering activities.

Because of the Willamette Falls at Oregon City, the Willamette was not historically a major salmon stream, and the Kalapuya did not utilize salmon as a food source to the extent that tribes along the Columbia River did. Instead, the Kalapuya, hunted game such as deer and elk, and gathered food plants from the native flora. The prairies provided the majority of their food plants, including camas (*Camassia* spp.) bulbs, yampah (*Perideridia* spp.) roots, and tarweed (*Madia* spp.) seeds.

Though they were not farmers in the conventional sense, the Kalapuya used fire to maintain prairie habitats for valued food plants, increase production of native nut and fruit trees, and facilitate harvest of food plants such as tarweed. In addition, they may have found fire useful in hunting game, by attracting animals to browse on the fresh green growth that emerges soon after a fire (Boyd 1986). During the many millennia that the Kalapuya subjected the Willamette Valley to frequent low intensity fires, a diverse flora and fauna evolved that had appropriate adaptations to avoid, withstand, or even depend upon fire. In some cases, these were species occurring nowhere else in the world except the Willamette Valley.

From the mid-1800s, settlers stopped the periodic wild land fires that jeopardized homes and towns and generally discontinued the practice of prescribed burning. Cessation of frequent fires has resulted in significant alteration of habitats and landscapes even if they have not been converted to economic uses such as agriculture and urbanization.

For instance, fire suppression resulted in the development of “closed form” oak forests, and consequently closed form oak habitat (where the tree canopy is continuous) is now relatively more abundant than the open grown trees that were once common within the Willamette Valley’s savannas (Towle 1982). The increased density and extent of conifers such as Douglas-fir, which expands in the absence of periodic fire, has also resulted in loss of prairie and oak savanna habitat. The fast growing conifers overtop, shade out and eventually kill the oak trees in a decades-long process of ecological succession. Evidence for this process can be seen in historical aerial photographs of HBRA that go back to 1936 (see Appendix C); even since the park was first established in 1972, significant ecological changes in habitat types have occurred (see photo comparison on the cover).

8.1.4 Ecological Fire as a Habitat Management Tool

Since 1999, ecological burning has been used as a management tool in HBRA. Based on careful planning and preparation, prescribed ecological burns are implemented in specific areas of the park to help create and maintain prairie, savanna, and woodland habitat. These burns are conducted in collaboration with the Oregon Department of Forestry (ODF), U.S. Fish & Wildlife Service, Bureau of Land Management, U.S. Forest Service, and The Nature Conservancy. All burns are implemented in compliance with Lane Regional Air Pollution Authority (LRAPA) permit regulations.

8.1.5 Ecological benefits of frequent low intensity fire

Having established that fires likely were a significant feature of the landscape prior to Euro-American settlement, scientists began developing hypotheses regarding the specific roles that fire plays in maintaining prairie and savanna habitats. Historical analyses of vegetation change at individual sites led to the development of a number of hypotheses, including:

A 1999 wildfire (pictured above) closed HBRA. Fires in prairies and savannas usually burn with low intensity and cause little damage to native forbs or oak trees.

- Fires occurring at frequent intervals maintained open prairie habitats and prevented colonization of trees and shrubs on sites where they would be able to occur if fire was excluded;
- Many native herbaceous prairie species may possess tolerance or even adaptation to fire as a frequent influence; and
- Some non-native plant species, particularly those coming from regions where fires do not occur, may be negatively affected by fire.

Thus, ecological burning can reduce cover of encroaching woody plants, enhance the populations of native plant species, and help reduce the abundance of some undesirable non-native plants.

Experience with prescribed burning in Willamette Valley prairie and oak habitats began in the 1970s at Finley National Wildlife Refuge, and continued in the 1980's on Corps of Engineers prairies at Fern Ridge reservoir and BLM and Nature Conservancy land in West Eugene. Prescribed burning began in HBRA in 1999. In general, the results of the burns have supported the hypotheses listed above. Typically, new green growth begins to sprout within two weeks after the burn; species such as tufted hairgrass (*Deschampsia cespitosa*), the dominant native grass in wet prairies, grow more vigorously through the fall and winter than in unburned areas. The following year, and often the following two years, see increases in the flowering and seed production of many native prairie plants such as camas.

With increased flowering and seed production, the fire adapted species may gradually increase in population size. For example, a study of the federally listed endangered Bradshaw's lomatium (*Lomatium bradshawii*) found that within two years of a fire the populations showed an increase in density of vegetative and reproductive plants, and demographic analyses suggest that without fire, Bradshaw's lomatium will not persist (Pendergrass et al., 1999, Kaye et al., 2001). In addition, researchers have observed that some invasive plant species, such as the ox-eye daisy (*Leucanthemum vulgare*), decrease in abundance in the year immediately following a fire (Nuckols et al. 2011).

Woody plants, which have encroached into these native prairie remnants, have also been negatively affected by prescribed burns. Observations suggest that the burns are successful in killing smaller conifers as well as seedlings of deciduous trees and shrubs. Fires also kill the above ground portions of the majority of deciduous woody plants, which are subject to subsequent resprouting from the stump. However, the large oaks that were historically present at low density in savannas, have thick bark and are resistant to damage from fire (Niemiec et al., 1995). Manual or mechanical removal of woody plants may also be needed in conjunction with prescribed burns, to help speed progress toward achieving site management goals.

8.1.6 Potential drawbacks to ecological burning

The main drawback of prescribed burns from the point of the general public is that smoke that is generated. While a prescribed burn may resemble a grass field burn, the amount of smoke produced by a prescribed burn in a native prairie is much less than a burn of an equal area of grass seed field. This is because the amount of fuel present in a grass seed field is typically two to four times greater per unit area than in a native prairie. Prescribed burns are only conducted under atmospheric conditions that provide for the most efficient upward dispersal of smoke. Generally small burn units also mean that the actual length of time during which the burns occur is quite short. Risk of escape of prescribed burns is minimized by ensuring that conditions the day of the burn are within the designed prescription, and the personnel and equipment used to conduct the burn are sufficient and appropriately trained.

8.1.7 Wildfire versus ecological burning:

Public safety is the number one goal of wildfire management at HBRA. Unlike controlled fire used as a management tool (ecological burns), wildfire is a significant safety threat for park patrons and neighbors. It also has the potential for devastating impacts on important natural habitats throughout HBRA. The most recent large wildfire in HBRA occurred in September 1999. The fire started in the Mount Pisgah Arboretum and moved upslope toward the summit. The fire was suppressed along the summit ridge in the Southern Uplands Stewardship Zone. 119 acres burned in total through prairie, savanna, and woodland. Several Douglas-fir trees were killed by the fire or by subsequent fire suppression actions. Lane County contracts with the Oregon Department of Forestry (ODF) for development of wildfire plans

Decades of fire suppression has resulted in larger "fuel loads" in the park's forest and woodlands. The dense woody vegetation increases the risk of a catastrophic "crown fire" that will damage or destroy mature oak trees and large conifers.

and wildfire control services at HBRA. Because of the threat fire poses to park visitors, as well as the park's location in the midst of rural residential properties, the primary objective of wildfire control is suppression. It is important to note that much of the prairie and oak savanna restoration work identified in this *Habitat Management Plan* will also serve to reduce wildfire risks in HBRA by reducing potential

fuels and reducing the likelihood of high severity wildfire. Implementation of the *Habitat Management Plan* will help reduce the risk of wildfire in the years ahead. In addition, Lane County Parks and park partners will continue to work with ODF to reduce, as much as possible, negative impacts on native habitat caused by fire suppression activities.

8.2 Ecological Burn Strategy

Utilize ecological burning (prescribed fire) to maintain chaparral, upland and wetland prairie, savanna, and oak woodlands following recommended fire return intervals identified for each conservation target within Chapter VI (Goals and Objectives).

8.2.1 Implement ecological burns annually in accord with habitat management plan

- Burn 50 to 250 acres/year. (See Figure 8-1: Ecological Burn Units Map)
    - Where feasible keep vehicles and equipment on designated trails and access corridors.
    - Secure annual permit from Lane Regional Air Pollution Authority
        - Collaborate with Rivers to Ridges partnership to prepare and secure annual multi-agency permit.
        - Comply with permit to minimize impact of smoke drifting into the Eugene-Springfield metropolitan area, the City of Pleasant Hill, and the City of Oakridge.
- Coordinate all ecological burn activities with the Oregon Department of Forestry (ODF).
    - Utilize ecological burns to train fire suppression personnel and improve the capacity of local forestry districts, fire protection personnel, and other natural resource agency staff.
    - Collaborate with and utilize non-ODF fire teams and other resources when available.
    - Consider using contract fire crews to implement ecological burns if ODF crews are not available and the burn's timing is important to achieve the desired habitat outcomes.
- Provide public notice of the upcoming ecological burns.
    - Post notice at trailheads and in proximity to the burn unit.
    - Notify adjacent landowners of the upcoming annual ecological burn activities.
    - Release Public Service Announcements in advance of implementation.
- Prepare ecological burn sites.
    - Implement site preparation prescriptions in late June or early July to minimize adverse effects to wildlife, botanical resources, and public safety (resulting from a wild land fire).
    - Follow specified Best Management Practices as described in Chapter XII.
- Implement ecological burn(s)
    - Lane County Parks Manager or his/her designee reviews and approves the burn plan and coordinates with designated "burn boss" to approve ignition of the burn in HBRA.

8.2.2 Factors to consider when planning ecological burns:

- First, apply research on the effects of prescribed fire and alternate management methods on the vegetation associated with each of the conservation targets identified for ecological burning.
    - The timing of burns may affect the response of vegetation.
    - When feasible, participate in and support studies to evaluate the responses of species to fire and to evaluate the efficacy of alternative management manipulations in stewardship efforts. These alternatives may include but are not limited to mowing with removal of cut material, "flash grazing," hand-removal of woody species, and no manipulation.
- Second, evaluate populations of nonnative plants occurring within each management unit where ecological burns will occur.

    - Implement site preparation strategies to neutralize the threat posed by those species that have the capability to change the species composition and structure of the conservation target if left untreated.
        - Site preparation and associated stewardship tasks may occur for several years preceding implementation of the ecological burn to provide adequate control.
- Third, consider smoke-management rules and variable weather conditions when planning and implementing ecological burns.
    - Give preference to scheduling burns during the season when fires most commonly occurred within the given conservation target.
    - If appropriate, implement burns during a non-traditional season to minimize adverse impacts to air quality, such as during a cold, dry period in winter.

8.3 Chapter 8 References

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Chapter 9: Management of Non-Native Invasive Species

9.1 What is a Non-Native Invasive Species?

The U.S. Department of Agriculture defines "invasive species" as:

- non-native (or alien) species to the ecosystem under consideration, and
- if established, causes or is likely to cause economic or environmental harm or harm to human health.

Invasive species can be plants, animals, insects and other organisms (e.g., microbes). Only a subset of documented non-native species are considered invasive, due to their negative impacts to native species and ecosystems. Human actions are the primary means of invasive species introductions.

9.2 Non-Native Species at HBRA

Over 200 species of wild plants that have been documented at HBRA are considered to be non-native species and did not occur in Oregon prior to the arrival of Euro-American settlers. These species were either intentionally or accidentally introduced to the area after the mid-1800's.

Some non-native plant species provide resources to native wildlife, including shelter and food. However, the invasive non-native plant species that are prioritized for management in this plan substantially alter habitat structure or displace native species that in many cases provide greater habitat function for wildlife. When certain non-native plants are generally acknowledged as not belonging in the parks' landscape, it can be detrimental to the visitor experience if the plants are highly visible, creating an overall impression of a lack of stewardship of the park. A particularly visible example are large patches of non-native blackberries seen covering the open slopes of the mountain and infesting the floodplain woodlands.

Fewer than 25 percent of the 200+ non-native plant species in HBRA are identified here as priorities for management because they can significantly degrade habitat functions and values. Strategy 11.1 references a methodology that can identify the invasive plant species that are priorities for management (Hiebert and Stubbendieck, 1993).

The goal of invasive plant management is not just to eliminate problematic non-native plants, but to also to promote and maintain high quality native plant communities. Managing invasive non-native plant species at HBRA provides opportunities, on a park-wide scale, to gradually replace any ecological functions or resources provided by non-native species with the increased abundance and function of native species.

In most cases, complete eradication of a particular non-native species is not feasible. Rather, the objective is to substantially reduce their ecological influence. Complete eradication of particular invasive non-native plant species will be sought only in a select few cases where the species has established only recently, or is present only in small numbers. As such, early detection and treatment of new invaders is perhaps the most important step in the management of invasive non-native plants.

Non-native animals can also have negative impacts on native species and habitats, through predation, competition, or direct habitat disturbance. For example, feral cats may hunt native birds in a natural area, which is particularly problematic for ground nesting grassland birds. Non-native bullfrogs can swallow a rare native western pond turtle hatchling. Managing non-native animals can be challenging

due to the simple fact that animals are mobile compared to a plant, which once located can be treated by manual removal, mowing to interrupt seed maturation, etc.

9.3 Problematic Native Species

Native species can also cause economic or environmental harm or harm to human health. For example, poison oak, a native plant, is a common associate of the plant communities that compose each of the Conservation Targets. However, poison oak may cause mild to significant harm to human health. For that reason, this *Habitat Management Plan* recommends the Best Management Practice of clearing poison oak along trails.

Over time, native woody species such as Douglas-fir trees can overtop, shade out and kill oak trees in rare oak woodlands and savannas. For the purpose of this plan, native species that expand into conservation target habitats are referred to as "encroaching" species to distinguish them from exotic "invasive" species.

9.4 Management of Invasive Non-Native Species in the HBRA

Efforts to manage exotic invasive species in the HBRA will follow the principles of Integrated Pest Management, which utilizes a variety of methods (manual, mechanical, chemical) to achieve the best result and minimize environmental impact.

Invasive species are considered in two categories:

- species known to occur within the HBRA, and
- species that do not occur in the HBRA but are known to occur in other areas of Lane County, in the State of Oregon, or in the Pacific Northwest.

9.5 Integrated Pest Management

Integrated Pest Management (IPM) is an approach to reduce or eliminate a wide spectrum of noxious flora and fauna utilizing a combination of common-sense practices. IPM fuses a diversity of pest management methods and strategies (identified in the Stewardship Tool Box, Chapter XI), describes an organism's life history and ecological context, and takes into account the most recent scientific research to manage populations of targeted pests in a cost-effective and environmentally sensitive manner. As outlined by the US Environmental Protection Agency, IPM practitioners follow a four-tiered approach to management of noxious organisms.

1) **Set Action Thresholds:** Identify the parameters for which a population of introduced organisms occurring within the ecoregion or ecosystem under management will be tolerated. If the size of the population exceeds this outside limit, treatment actions are initiated. The threshold at which pests become an economic threat is critical to guide future pest treatment decisions.
2) **Monitor and Identify Pests:** IPM programs work to monitor for pests and identify them accurately, so that appropriate treatment decisions can be made in conjunction with action thresholds.
3) **Prevention:** IPM programs seek to prevent pests from becoming a threat while minimizing risk to people or the environment.
4) **Treatment:** Once monitoring, identification, and action thresholds indicate that pest treatment is required and preventive methods are no longer effective or available, IPM programs then evaluate the proper method(s) both for effectiveness and risk. Effective, less *risky* treatment methods are

chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical methods, such as mowing, trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky methods are not working or are not feasible, then additional methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

For invasive non-native species such as non-native blackberries, which have been well established in the park for many years, reducing their abundance to acceptable levels is a major endeavor that will require substantial funding and concerted effort. For cases such as these, treatment is often best conducted (and funded) in conjunction with other habitat restoration efforts. Treatment should also prioritize important visitor use areas (such as trail corridors and viewpoints), outlier patches, and areas of high quality habitat that currently have minimal levels of infestation.

9.6 Early Detection and Rapid Response: Prevention and Suppression of "New" Invasive Species

Early Detection and Rapid Response (EDRR) seeks to prevent establishment and spread of new noxious species introductions before they become widespread. EDRR is the most cost effective and environmentally benign program to successfully manage threats to the viability of the conservation targets from invasive species within HBRA. If new invasive noxious species are left unmanaged, economic losses will exponentially exceed the present costs of eradication or containment. The EDRR strategy seeks to:

- Identify new invaders prior to widespread establishment or introduction.
- Eradicate or contain new invading animals and weeds.
- Increase awareness of new invaders with partners and public.

Early Detection and Rapid Response (EDRR) is a primary strategy of the Oregon Department of Agriculture's Noxious Weed Program. Weeds are listed and targeted for early detection and rapid response activities. The goal is to prevent their introduction or eradicate them before they become widespread, or to contain limited populations to prevent their widespread occurrence in Oregon.

9.7 Invasive Species Lists

The following lists were formulated with consideration of Oregon Department of Agriculture (State Weed Board) lists of noxious invasive weeds and animals as well as information from the Oregon Department of Fish & Wildlife. The lists below should be reviewed and updated at least every three years in response to monitoring for new invasive plants that may appear in the park.

Figure 9-1: Invasive Plants Known to Occur in the HBRA

Herbaceous Plants:	
Carduus pycnocephalus	Italian thistle
Carduus tenuiflorus	slender thistle
Centaurea × moncktonii	meadow knapweed
Centaurea melitensis	Maltese star thistle
Cirsium arvense	Canada thistle
Cirsium vulgare	bull thistle
Conium maculatum	poison hemlock
Convolvulus arvensis	bindweed
Datura stramonium	Jimson weed
Daucus carota	Queen Anne's lace
Digitalis purpurea	foxglove
Dipsacus fullonum	teasel
Geranium lucidum	shining geranium
Geranium robertianum	Herb Robert
Geranium spp.(several other non-native species occur within HBRA)	crane's bill geranium
Heracleum mantegazzianum	giant hogweed
Hypericum perforatum	St. John's wort
Lactuca serriola	prickly thistle
Lapsana communis	nipplewort
Leucanthemum vulgare	ox-eye daisy
Melissa officinalis	lemon balm
Mentha pulegium	pennyroyal
Parentucellia viscosa	yellow glandweed
Phytolacca americana	pokeweed
Polygonum x bohemicum, P. japonicum, P. sachalinense	giant knotweeds
Ranunculus ficaria	lesser celandine
Ranunculus repens	creeping buttercup
Rumex crispus	curly dock
Senecio jacobaea	tansy ragwort
Silybum marianum	blessed milk thistle
Sonchus spp. (several species occur within HBRA)	sow thistle
Trifolium spp.(several non-native species occur within HBRA)	clover
Verbascum blattaria	moth mullein
Verbascum thapsus	common mullein

Grasses:

Agrostis capillaris	bentgrass
Aegilops cylindrica	jointed goatgrass
Agropyron repens	quackgrass
Arrhenatuerum elatius	tall oatgrass
Avena fatua	wild oat
Brachypodium sylvaticum	false brome
Cynosurus echinatus	hedgehog dogtail grass
Phalaris arundinacea	reed canarygrass
Taeniatherum caput-medusae	medusahead rye

Shrubs, Trees, and Vines:

Corylus avellana	common hazel
Cotoneaster spp.	cotoneaster
Crataegus monogyna	English hawthorn
Cytisus scoparius	Scotch broom
Hedera helix	English ivy
Hedera hibernica	Atlantic Ivy
Ilex aquifolium	English holly
Juglans nigra	black walnut
Juglans regia	English walnut
Malus domestica	domestic apple
Photinia serratifolia	Chinese photinia
Prunus avium	cherry (domestic)
Prunus cerasifera	cherry plum
Prunus domestica	plum (domestic)
Pyrus communis	pear (domestic)
Rosa rubiginosa (R. eglanteria)	sweetbriar rose
Rosa multiflora	multi-flowered rose
Rubus anglocandicans	English blackberry
Rubus armeniacus	Armenian blackberry
Rubus laciniatus	evergreen blackberry
Rubus vestitus	velvet blackberry
Ulmus procera	English elm
Vinca major	greater periwinkle
Vinca minor	lesser periwinkle

Figure 9-2: Non-Native Invasive Plants Not Currently Known to Occur in the HBRA (Watch List)
Early detection and monitoring efforts should be alert to these potential "new arrivals" at HBRA.

Herbaceous Plants:	
Aegopodium podagraria	goutweed
Alliaria petiolata	garlic mustard
Anchusa officinalis	common bugloss
Arum italicum	Italian lords and ladies
Centaurea diffusa	diffuse knapweed
Centaurea solstitialis	yellow starthistle
Centaurea stoebe	spotted knapweed
Chaerophyllum temulum	rough chervil
Cyperus esculentus	yellow nutsedge
Echium plantagineum	Paterson's curse
Foeniculum vulgare	fennel
Geum urbanum	Herb Bennett
Hieracium aurantiacum	orange hawkweed
Hieracium floribundum	yellow hawkweed
Hieracium pilosella	mouse-ear hawkweed
Hydrilla verticillata	waterthyme
Impatiens capensis	orange jewelweed
Impatiens glandulifera	policeman's helmet
Iris pseudacorus	yellow flag iris
Lamiastrum galeobdolon	yellow archangel
Lathyrus latifolius	everlasting pea
Lathyrus sylvestris	flat peavine
Linaria vulgaris	yellow toadflax
Lotus corniculatus	birdsfoot trefoil
Lotus uliginosus	greater birdsfoot trefoil
Ludwigia hexapetala.	willow primrose
Lythrum salicaria	purple loosestrife
Myriophyllum aquatica	parrot's feather
Nymphoides peltata	yellow floating heart
Pentaglottis sempervirens	evening bugloss
Picris echioides	bristly oxtongue
Polygonum polystachyum (*Persicaria wallachii*)	Himalayan knotweed
Potentilla recta	sulfur cinquefoil
Soliva sessilis	lawn burrweed
Tribulus terrestris	puncturevine
Valerianella eriocarpa	Italian Cornsalad
Grasses:	
Eragrostis curvula	weeping lovegrass
Glyceria declinata	waxy mannagrass
Holcus mollis	creeping velvetgrass
Phalaris aquatica	Harding grass
Stipa tenuissima	Mexican feather grass

Shrubs and Trees:

Acer platanoides	Norway maple
Aesculus hippocastanum	horse chestnut
Ailanthus altissima	tree of heaven
Buddleja davidii (B.variabilis)	butterfly bush
Clematis vitalba	old man's beard
Cytisus striatus	Portugese broom
Daphne laureola	spurge laurel
Elaeagnus umbellata	autumn olive
Genista monspessulana	French broom
Juniperus virginiana	eastern Juniper
Lonicera maackii	Amur honeysuckle
Prunus laurocerasus	English laurel
Pueraria lobata	kudzu
Robinia pseudoacacia	black locust
Ulex europaeus	gorse
Viburnum opulus var. *opulus*	snowball bush

Figure 9-3: Documented or Potential Harmful Non-Native Animals of Howard Buford Recreation Area
Actions to reduce the presence of animal species that impact native wildlife should be explored.

Non-Native Animals documented within HBRA:

Chelydra serpentina	Common snapping turtle
Didelphis virginiana	Opossum
Felis catus	Feral cat
Meleagris gallopavo intermedia	(Rio Grande) Turkey
Myocastor coypus	Nutria
Rana catesbeiana	Bullfrog
Sciurus niger	Fox squirrel
Sturnus vulgaris	Common starling
Trachemys scripta elegans	Red-eared slider

Non-Native Animals Known in Willamette Valley but not documented within HBRA

Cipangopaludina chinensis	Chinese mystery snail
Cipangopaludina japonica	Japanese mystery snail
Orconectes neglectus	Ringed crayfish
Procambarus clarkia	Red swamp crayfish
Sus scrofa	Feral swine
Sylvilagus floridanus	Eastern cottontail rabbit

9.8 Chapter 9 References

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- Oregon Department of Agriculture. Oregon Noxious Weed Profiles (web site reference). www.oregon.gov/oda/programs/weeds/oregonnoxiousweeds/pages/aboutoregonweeds.aspx
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- US Department of Agriculture. Introduced, Invasive, and Noxious Plants (web site reference). www.plants.usda.gov/java/noxiousDriver
- US Environmental Protection Agency. Introduction to Integrated Pest Management (web site reference). www.epa.gov/managing-pests-schools/introduction-integrated-pest-management

Chapter 10: Stewardship Projects to Protect and Enhance Conservation Targets

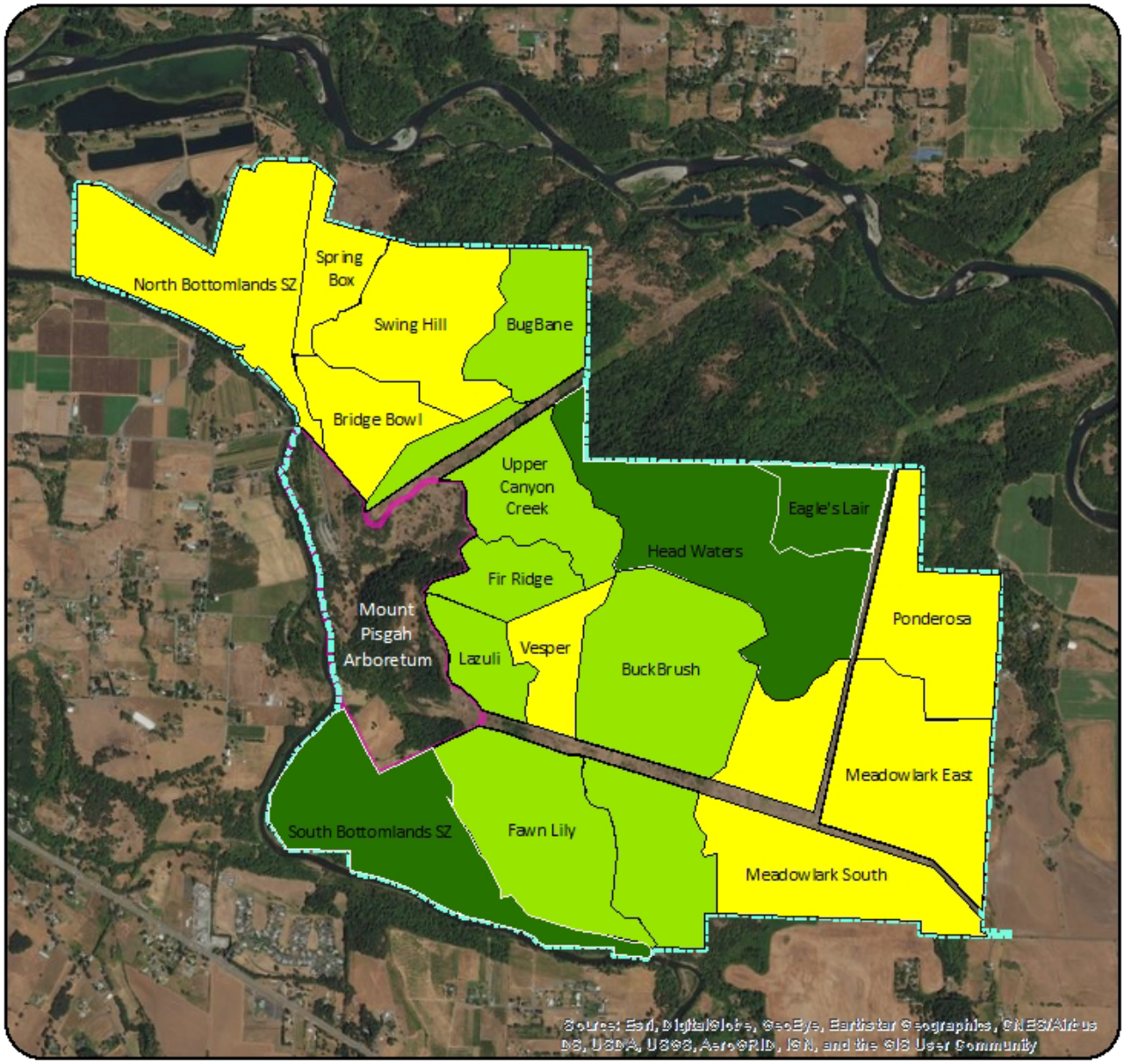
This chapter presents recommendations for habitat projects to improve the viability of the conservation targets and to enhance visitor experience at HBRA. These projects are presented in a table organized by *Habitat Management Plan* Goals.

The table presents the period of project implementation by assigning it one of three five-year periods in the next fifteen years (i.e., 0-5 years, 5 to 10 years, or 10 to 15 years). In some cases, projects span multiple periods or the entire fifteen-year arc of plan implementation. The Habitat Advisory Team will meet periodically to meet review and evaluate progress and will make recommendations to adjust the timeline accordingly.

Land management is normally site specific, for that reason the implementation schedule for intensive investments to advance restoration of Focal Conservation Target Habitats as well as other Significant Habitats corresponds with Management Units within Each Stewardship Zone with exception to those Stewardship Zones which are not subdivided into Management Units. Management Unit specific projections of Historic Vegetation, the Existing Condition Circa 2008, and the Desired Future Condition Circa 2035 are presented in Appendix E. In addition, Appendix E includes a summary of stewardship activities completed 1998 – 2018 within each Management Unit as well as a set of prescriptions forecast for implementation within the Management Unit.

As noted in Chapter 6, funding for project implementation may not be in hand for the fifteen-year horizon of this plan. However, this park-wide *Habitat Management Plan* will help Lane County or its partners secure grants and other funding, since the plan provides a clear "road map," which is key to marshaling the resources and partnerships necessary to accomplish this collective vision.

Figure 10-1: Implementation Schedule



Implementation Schedule for Habitat Management within the HBRA

0 0.125 0.25 0.5 Miles

HBRA Property Boundary

Mount Pisgah Arboretum Boundary

Schedule

- 2018 - 2022 Bridge Bowl Management Unit
- 2018 - 2022 Meadowlark East Management Unit
- 2018 - 2022 Meadowlark South Management Unit
- 2018 - 2022 North Bottomlands Stewardship Zone
- 2018 - 2022 Ponderosa Management Unit
- 2018 - 2022 Spring Box Management Unit
- 2018 - 2022 Swing Hill Management Unit
- 2018 - 2022 Vesper Management Unit
- 2023 - 2027 BuckBrush Management Unit
- 2023 - 2027 BugBane Management Unit
- 2023 - 2027 Fawn Lily Management Unit
- 2023 - 2027 Fir Ridge Management Unit
- 2023 - 2027 Lazuli Management Unit
- 2023 - 2027 Upper Canyon Creek Management Unit
- 2028 - 2032 Eagle's Lair Management Unit
- 2028 - 2032 Head Waters Management Unit
- 2028 - 2032 South Bottomlands Stewardship Zone

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
Goal 1: Provide a safe and positive visitor experience in HBRA			
1.1	Visitor Experience	0-15yrs	o Project 1.1.1: Maintain a permanent 'notice' board at the three trailheads and within the Arboretum to inform park users of areas of project activity or closures. Parking Areas: includes West (Main/MPA) lot, North Lot, and East lot.
1.1	Visitor Experience	0-15yrs	o Project 1.1.2: Maintain and update the HBRA trail map to clearly indicate segments of closed trail.
1.1	Visitor Experience	0-15yrs	o Project 1.1.3: Post Stewardship Program Project or Activity updates at Trail Head Kiosks to inform park visitors about area closures or habitat and vegetation management activity in progress in proximity to the trail.
1.1	Visitor Experience	0-5yrs	o Project 1.1.4: Establish criteria for trailside temporary signage ("sandwich board" or equivalent) to inform trail users of habitat or vegetation management activity in progress adjacent to the trail.
1.1	Visitor Experience	0-5yrs	o Project 1.1.5: Establish criteria to limit the installation of permanent signage along trails away from trailheads.
1.1	Visitor Experience	0-5yrs	o Project 1.1.6: Establish criteria to limit the use of flagging tape and the period it is posted in the field.
1.1	Visitor Experience	0-5yrs	o Project 1.1.7: Develop a riverfront trail plan to establish preferred routes to access the river for the public and for first responders (in the case of emergencies) while protecting sensitive habitats. Consider closing certain access points to the river during nesting season and other times when disturbance to wildlife will result in an adverse impact.
1.1	Visitor Experience	0-5yrs	o Project 1.1.8: Survey the riverfront and delineate sensitive habitat features.
1.1	Visitor Experience	0-5yrs	o Project 1.1.9: Improve parking areas, construct trails, and develop supporting infrastructure to improve access to the river
1.2	Visitor Experience	0-15yrs	o Project 1.2.1: Develop vegetation management protocols for all parking areas within the HBRA.
1.2	Visitor Experience	0-15yrs	o Project 1.2.2: Remove vegetation to maintain sightlines to enhance public safety and deter property crime.
1.3	Visitor Experience	0-5yrs	o Project 1.3.1: Post fire evacuation information at trailhead kiosks during the fire season (June-October).
1.4	Visitor Experience	0-5yrs	o Project 1.4.1: Gather data and interview trail users.
1.5	Visitor Experience	0-5yrs	o Project 1.5.1: Survey trail segments for nearby hazards and clearly delineate areas of caution.
1.6	Visitor Experience	0-5yrs	o Project 1.6.1: Inventory patches of poison oak growing within 5' of the edge of all recreational trails.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
1.6	Visitor Experience	0-5yrs	o Project 1.6.2: Remove poison oak growing within 5' of recreational trail edge.
1.6	Visitor Experience	0-5yrs	o Project 1.6.3: Maintain trail edges with annual mowing.
1.7	Visitor Experience	0-5yrs	o Project 1.7.1: Develop a bench location plan that identifies appropriate locations to provide at least one bench or viewpoint per mile of trail along major trail corridors (trails 1, 2, 3, 5, and 6).
1.7	Visitor Experience	0-5yrs	o Project 1.7.2: Install benches at designated locations.
1.7	Visitor Experience	0-15yrs	o Project 1.7.3: Maintain viewpoints and benches.
1.8	Visitor Experience	0-5yrs	o Project 1.8.1: Prepare an "on leash policy".
1.8	Visitor Experience	0-5yrs	o Project 1.8.2: Collaborate with stakeholders and interested members of the public to identify areas within the park where dogs will be allowed to be off leash.
1.8	Visitor Experience	0-5yrs	o Project 1.8.3: Solicit input from park users through trailhead tabling and public open houses.
1.8	Visitor Experience	0-5yrs	o Project 1.8.4: Conduct a pilot implementation project to evaluate compliance and community support
1.8	Visitor Experience	0-5yrs	o Project 1.8.5: Implement the approved policy
Goal 2: Educate park users about the unique natural values that make the HBRA and the broader Mount Pisgah area a priority for conservation			
2.1	All Conservation Targets	0-5yrs	o Project 2.1.1: Develop signage and associated educational materials interpreting the park's natural values, and post at trailheads.
2.1	All Conservation Targets	0-5yrs	o Project 2.1.2: Maintain and update trail map to clearly indicate segments of closed trail.
2.2	All Conservation Targets	0-5yrs	o Project 2.2.1: Maintain a permanent 'notice' board at trail head kiosks to inform park users of temporary area closures in the park.
2.2	All Conservation Targets	0-5yrs	o Project 2.2.2: Implement interpretive plan for 203-acre Arboretum lease area.
2.3	All Conservation Targets	0-5yrs	o Project 2.3.1: Lead a series of tours that showcase the natural history of wildlife that reside within or pass through the HBRA.
2.3	All Conservation Targets	0-5yrs	o Project 2.3.2: Host a series of natural history talks that showcase species of wildlife that reside within or pass through the HBRA.
2.3	All Conservation Targets	0-5yrs	o Project 2.3.3: Post informational displays at trail head kiosks that encourage park visitors to be respectful of wildlife.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
Goal 3: Maintain and improve the park's trail system to minimize ecological impacts while providing views of and access to HBRA's diverse habitats.			
3.1	Visitor Experience	0-5yrs	o Project 3.1.1: Construct and maintain seed removal stations at each trailhead including capacity to accommodate hikers, equestrians (horse trailers, horses, etc. at the east and north parking areas) and their dogs.
3.2	All Conservation Targets	0-5yrs	o Project 3.2.1: Conduct a pilot project to evaluate the effects of dogs upon the success of nesting species during the breeding season.
3.2	All Conservation Targets	0-5yrs	o Project 3.2.2: Conduct a pilot project to evaluate the impact of dogs upon habitat quality during structured periods of "off leash" activity.
3.2	All Conservation Targets	0-5yrs	o Project 3.2.3: Monitor wildlife species richness before and after implementation of the "on leash" policy.
3.3	All Conservation Targets	0-5yrs	o Project 3.3.1: Collaborate with Friends of Buford Park and Mount Pisgah Arboretum and other partners to utilize volunteers to preserve and enhance viewpoints.
3.4	All Conservation Targets	0-5yrs	o Project 3.4.1: Collaborate with groups such as the Friends of Buford Park, Mount Pisgah Arboretum, Northwest Youth Corps, equestrian groups, and other trail partners to develop an updated trail management plan with input from diverse group of stakeholders. Trail standards should seek to minimize impacts of trail infrastructure upon adjacent conservation targets. Plan should identify actions to address management of high use areas (such as the Summit and Swing Hill), to improve viewpoints or focal areas. The plan should evaluate the benefits and drawbacks of seasonal closure of trail segments that traverse sensitive regions of the park (with regards to habitat usage, e.g., nesting seasons, hydrology, soils, slope, etc.)
3.4	All Conservation Targets	0-5yrs	o Project 3.4.3: Inventory the condition of all trails.
3.4	All Conservation Targets	0-5yrs	o Project 3.4.4: Inventory "rogue trails", analyze trail function, and identify management actions to reduce the impact to conservation targets from rogue trails while addressing the needs of park users that such trails support.
3.4	All Conservation Targets	0-5yrs	o Project 3.4.5: Identify trail segments that bisect conservation target habitats and measure the area of the habitat patch size to identify and evaluate areas where trails are undermining viability of conservation targets.
3.5	All Conservation Targets	0-5yrs	o Project 3.5.1: Measure the effectiveness of recommended BMP's and adjust the standards with consideration of monitoring results and data analysis.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
3.5	All Conservation Targets	0-5yrs	o Project 3.6.1: Develop and implement a pilot project to explore the feasibility of producing native hay within HBRA.
3.5	All Conservation Targets	0-5yrs	o Project 3.7.1: Conduct a pilot project to evaluate measures to mitigate visitor impacts on wildlife habitat.
Goal 4: Minimize impacts of park management on conservation targets.			
4.1	All Conservation Targets	0-5yrs	o Project 4.1.1: provide a copy of the ODOT BMP handbook & 'Stewardship Toolbox' to stakeholders, volunteer groups, and staff who assist with management of habitat within the park.
4.2	All Conservation Targets	0-5yrs	o Project 4.2.1: designate a location to develop an equipment cleaning facility.
4.2	All Conservation Targets	0-5yrs	o Project 4.2.2: construct a facility to clean and remove foreign material from equipment.
4.3	All Conservation Targets	0-5yrs	o Project 4.3.1: identify needed equipment.
4.3	All Conservation Targets	0-5yrs	o Project 4.3.2: acquire equipment.
Goal 5: Restore and enhance prairie, savanna and oak woodland habitats by reducing encroaching woody vegetation.			
5.1	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-15yrs	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions within each management unit.
5.1	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
5.2	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-15yrs	o Project 5.2.1: Collaborate with partners to develop and conduct projects in accordance with the 2018-2032 Implementation Schedule as outlined in Appendix E.
5.3	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 5.3.1: Collaborate with research scientists at the UO or OSU to determine the appropriate amount of coarse woody debris to retain within restoration project areas of different habitat types.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
Goal 6: Achieve significant restoration of prairie and savanna, oak woodland, and wet prairie habitats in HBRA.			
6.1	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 6.1.1: prepare prescribed burn plans for the Meadowlark South MU (2018), Meadowlark East MU & Ponderosa MU (2020), Bridge Bowl MU & Swing Hill MU (2021), and North Bottomlands SZ & Vesper MU (2022)
6.1	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	5-10yrs	o Project 6.1.2: prepare prescribed burn plans for the Bugbane MU (2023), Lazuli MU, & Upper Canyon Creek MU (2024), Buckbrush MU (2025), and Fawn Lily MU (2026)
6.1	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	10-15yrs	o Project 6.1.3: prepare prescribed burn plans for the Eagle's Lair MU & Head Waters MU (2029)
6.2	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 6.2.1: Collaborate with Oregon Department of Forestry to prepare a revised fire management strategy for the HBRA. (2019-20)
6.3	Oak Woodland, Oregon Vesper Sparrow, Other Significant Habitats, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
6.3	Oak Woodland, Oregon Vesper Sparrow, Other Significant Habitats, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 6.3.2: once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
6.3	Oak Woodland, Oregon Vesper Sparrow, Other Significant Habitats, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 6.3.3: flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
6.4	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-15yrs	o Project 6.4.1: implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.
Goal 7: Achieve significant restoration of chaparral habitat in HBRA.			
7.1	Buckbrush Chaparral	5-10yrs	o Project 7.1.1: Prepare burn plan for buckbrush patches within the Buckbrush MU.
7.1	Buckbrush Chaparral	5-10yrs	o Project 7.1.2: Collaborate with Oregon Department of Forestry East Lane District, Rivers to Ridges partners, and other fire management organizations to implement prescribed burns within at least 4 distinct units within the buckbrush chaparral habitat type. Units should be at least 5 acres and no larger than 13 acres in size. The size and form of unit will be determined with consideration of slope, aspect, and proximity to established control features such as Buckbrush Creek, Trail 3, Trail 5, & Trail 6.
7.2	Buckbrush Chaparral	5-10yrs	o Project 7.2.1: manage invasive vegetation and broadcast seed or plant Buckbrush in designated areas of the Buckbrush MU
7.1	Buckbrush Chaparral	10-15yrs	o Project 7.2.2: manage invasive vegetation and broadcast seed or plant Buckbrush in designated areas of the South Bottomlands Stewardship Zone
Goal 8: Manage for diverse native plant communities within each conservation target habitat.			
8.1	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 8.1.1: remove and manage invasive species where cover is greater than 25% within ten 10acre patches of oak woodland, prairie, savanna, and wet prairie within the Bridge Bowl MU, Meadowlark East MU, Ponderosa MU, Spring Box MU, Swing Hill MU, and Vesper MU.
8.1	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-5yrs	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within ten 10acre patches of oak woodland, prairie, savanna, and wet prairie within the Bridge Bowl MU, Meadowlark East MU, Ponderosa MU, Spring Box Mu, Swing Hill MU, and Vesper MU.
8.2	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-15yrs	o Project 8.2.1: annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
8.3	Oak Woodland, Oregon Vesper Sparrow, Prairie & Savanna, and Wet Prairie	0-15yrs	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 9: Increase the extent of wet prairie habitat.			
9.1	Bradshaw's Lomatium & Wet Prairie	0-5yrs	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
9.1	Bradshaw's Lomatium & Wet Prairie	0-5yrs	o Project 9.1.2: Secure resources to advance and support restoration of wet prairies
9.1	Bradshaw's Lomatium & Wet Prairie	0-5yrs	o Project 9.1.3: Restore wet prairie(s) in identified project areas within the Bridge Bowl MU, Meadowlark South MU, North Bottomlands SZ, Ponderosa MU, Spring Box MU, and Swing Hill MU.
9.1	Bradshaw's Lomatium & Wet Prairie	5-10yrs	o Project 9.1.4: Restore wet prairie within the balance of areas identified under the scope of project 9.1.1
9.2	Bradshaw's Lomatium & Wet Prairie	0-5yrs	o Project 9.2.1: Identify, assess, and inventory wet prairie within the greater Mt. Pisgah area
9.2	Bradshaw's Lomatium & Wet Prairie	0-5yrs	o Project 9.2.2: Convene property owners and stakeholders to discuss conservation easements, fee title acquisition, and property donation options.
9.2	Bradshaw's Lomatium & Wet Prairie	0-10yrs	o Project 9.2.3: Collaborate with partners to use conservation easements to protect wet prairie on nearby private properties.
9.3	Bradshaw's Lomatium & Wet Prairie	0-5yrs	o Project 9.3.1: propagate seed and plugs of Bradshaw's lomatium at the Friends Native Plant nursery
9.3	Bradshaw's Lomatium & Wet Prairie	0-5yrs	o Project 9.3.2: plant plugs and broadcast seed of Bradshaw's lomatium in 5x100 sq. ft. plots within wet prairie restoration sites.
9.3	Bradshaw's Lomatium & Wet Prairie	5-10yrs	o Project 9.3.3: Plant plugs and broadcast seed of Bradshaw's lomatium within 1x100 sq. ft. plot within the balance of areas identified under the scope of project 9.1.1

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
Goal 10: Locate and, to the extent feasible, reduce populations of feral or harmful non-native animal species impacting each conservation target.			
10.1	All Conservation Targets	0-5yrs	o Project 10.1.1: develop reporting system for park users to document sightings of non-native animals within the HBRA.
10.1	All Conservation Targets	0-5yrs	o Project 10.1.2: Acquire and deploy "trail cameras" located away from trails to discreetly monitor the HBRA for non-native animal species.
10.1	All Conservation Targets	5-10yrs	o Project 10.1.3: Process data and identify the types of non-native animal species observed in and around HBRA.
10.2	All Conservation Targets	0-5yrs	o Project 10.2.1: Collaborate with ODFW, neighbors, and partner agencies to monitor for the presence of non-native animals previously undocumented within the Greater Mount Pisgah Area.
10.2	All Conservation Targets	0-5yrs	o Project 10.2.2: develop an 'EDRR most wanted poster' to communicate the species of interest to park users.
10.3	All Conservation Targets	0-5yrs	o Project 10.3.1: Create presentation and outreach materials.
10.3	All Conservation Targets	0-5yrs	o Project 10.3.2: Host educational presentations & distribute outreach materials that explain the issue.
10.4	All Conservation Targets	5-10yrs	o Project 10.4.1: Collaborate with ODFW to survey and monitor native and non-native wildlife game species within the HBRA.
10.4	All Conservation Targets	0-5yrs	o Project 10.4.2: Collaborate with ODFW to evaluate monitoring data to set tolerance thresholds to govern actions to manage non-native species within the HBRA.
10.5	All Conservation Targets	0-5yrs	o Project 10.4.3: Where feasible, collaborate with ODFW, Oregon State Police, Lane County Animal Services to employ prescriptions to eliminate the threat of increased populations of non-native species listed on the 'EDRR most wanted poster' to HBRA conservation targets. When appropriate, collaborate with Lane County Animal Services to facilitate adoption of captured domestic animals such as cats.
10.5	All Conservation Targets	5-10yrs	o Project 10.5.1.: Collaborate with ODFW to trap and remove non-native animal species, such as Wild Turkeys, that pose the greatest threat to conservation targets and native animals that are known to occur within the greater Mount Pisgah area.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
Goal 11: Locate and reduce the presence of habitat-modifying, non-native plant species within each conservation target habitat.			
11.1	All Conservation Targets	0-5yrs	o Project 11.1.1: Update Invasive Species management and watch lists
11.2	All Conservation Targets	0-15yrs	o Project 11.2.1: Monitor all Stewardship Zones for all invasive species noted on the EDRR watch list.
11.2	All Conservation Targets	0-15yrs	o Project 11.2.2: Collaborate with partners to recruit and train volunteers to assist with monitoring activities.
11.3	All Conservation Targets	0-15yrs	o Project 11.3.1: Manage patches of invasive species adjacent to roads and trails and within parking areas and power line easements.
11.3	All Conservation Targets	0-10yrs	o Project 11.3.2: Manage small patches of invasive species to suppress their spread within a Management Unit or through the HBRA.
11.3	All Conservation Targets	0-15yrs	o Project 11.3.3: Manage large areas occupied by invasive species as part of Management Unit specific restoration investments.
11.4	All Conservation Targets	0-15yrs	o Project 11.4.1: Manage or suppress species classified as "secondary invaders" along roads, trail corridors and within parking areas or powerline easements.
11.5	All Conservation Targets	0-15yrs	o Project 11.5.1: Intensively manage false brome as part of Management Unit specific restoration investments.
11.5	All Conservation Targets	5-10yrs	o Project 11.5.2: Intensively manage Maltese star thistle as part of Management Unit specific restoration investments.
11.6	All Conservation Targets	0-5yrs	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
11.7	All Conservation Targets	0-10yrs	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry, as part of Management Unit specific restoration investments.
11.8	All Conservation Targets	0-15yrs	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom as part of Management Unit specific restoration investments.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
11.9	All Conservation Targets	0-5yrs	o Project 11.9.1: Convene partners, stakeholders, and neighbors to identify invasive species management priorities for the Greater Mount Pisgah Area.
11.9	All Conservation Targets	5-15yrs	o Project 11.9.2: Collaborate with partners to host an invasive species management workshop
11.9	All Conservation Targets	5-15yrs	o Project 11.9.3: Collaborate with partners to secure funding to manage invasive species on adjacent lands.
11.10	All Conservation Targets	10-15yrs	o Project 11.10.1: Collaborate with partners to assess mechanisms to fund an endowment.
11.10	All Conservation Targets	10-15yrs	o Project 11.10.1: Collaborate with partners to establish and fund an endowment.
11.11	All Conservation Targets	0-15yrs	o Project 11.11.1: Collaborate with BPA to manage large areas within the powerline easement occupied by invasive species in conjunction with their three year system wide vegetation management cycle.
Goal 12: Remove fish passage barriers from the lower mile of creeks and streams on HBRA that flow into the Coast Fork and Middle Fork of the Willamette River.			
12.1	Creeks & Streams	0-5yrs	o Project 12.1.1: identify, assess, and inventory barriers to fish passage
12.2	Creeks & Streams	0-5yrs	o Project 12.2.1: replace culvert and improve stream crossing at the intersection of Buckbrush Creek and Trail 56.
12.2	Creeks & Streams	5-10yrs	o Project 12.2.2: secure resources to replace culverts or implement other retrofits to improve fish passage in the balance of sites identified during the inventory.
Goal 13: Improve ecological health of creeks and streams.			
13.1	Creeks & Streams	0-5yrs	o Project 13.1.1: assess macroinvertebrate populations within streams.
13.2	Creeks & Streams	0-5yrs	o Project 13.2.1: Identify impacted stream corridors
13.2	Creeks & Streams	0-10yrs	o Project 13.2.2: secure resources to advance stream restoration
13.2	Creeks & Streams	0-10yrs	o Project 13.2.3: implement stream restoration projects.
13.3	Creeks & Streams	5-10yrs	o Project 13.3.1: Coordinate with livestock producers to identify and evaluate opportunities to utilize grazing as a means to manage vegetation in a manner that enhances conservation target habitats.
13.3	Creeks & Streams	5-10yrs	o Project 13.3.2: Collaborate with a livestock producer(s) to implement a pilot project to assess the benefits of grazing in conservation target habitats including oak woodland, prairie, savanna, and wet prairie while minimizing adverse effects to creeks and streams.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
Goal 14: Improve ecological health of riparian floodplain habitats.			
14.1	Willamette Floodplain	0-5yrs	o Project 14.1.1: Survey the Thompson Slough channel corridor and adjacent floodplain and install dataloggers and staff gages within the lowest reaches of the floodplain.
14.1	Willamette Floodplain	0-5yrs	o Project 14.1.2: Monitor hydrology within the Thompson Slough channel corridor and adjacent floodplain.
14.1	Willamette Floodplain	0-5yrs	o Project 14.1.3: Monitor and document wildlife along Thompson Slough and in the adjacent floodplain.
14.1	Willamette Floodplain	0-5yrs	o Project 14.1.4 Collaborate with partners to design & permit prescriptions and develop site engineering plans to restore Thompson Slough channel corridor and adjacent floodplain.
14.1	Willamette Floodplain	0-5yrs	o Project 14.1.5: Manage invasive species within the Thompson Slough channel corridor and adjacent floodplain in preparation for site construction.
14.1	Willamette Floodplain	0-5yrs	o Project 14.1.6: Implement restoration plans including site construction along the Thompson Slough channel corridor and within the adjacent floodplain.
14.2	Willamette Floodplain	0-5yrs	o Project 14.2.1: Survey the sloughs and adjacent floodplain in proximity to the North Parking lot in the North Bottomlands and install dataloggers and staff gages within the lowest reaches of the floodplain.
14.2	Willamette Floodplain	0-5yrs	o Project 14.2.2: Monitor hydrology within the proximity to the North Parking lot in the North Bottomlands.
14.2	Willamette Floodplain	0-5yrs	o Project 14.2.3 Collaborate with partners to design & permit prescriptions and develop site engineering plans to remove plugs and restore sloughs in proximity to the North Parking lot in the North Bottomlands.
14.2	Willamette Floodplain	0-5yrs	o Project 14.2.4: Manage invasive species within proximity to the North Parking lot in the North Bottomlands in preparation for site construction and grading associated with floodplain restoration.
14.2	Willamette Floodplain	0-5yrs	o Project 14.2.5: Implement restoration plans including site construction in proximity to the North Parking lot in the North Bottomlands.
14.3	Willamette Floodplain	10-15yrs	o Project 14.3.1: Survey the South Bottomlands sloughs and adjacent floodplain and install dataloggers and staff gages within the lowest reaches of the floodplain.
14.3	Willamette Floodplain	10-15yrs	o Project 14.3.2: Monitor hydrology within the South Bottomlands sloughs and adjacent floodplain.
14.3	Willamette Floodplain	10-15yrs	o Project 14.3.3: Monitor and document wildlife along South Bottomlands sloughs and in the adjacent floodplain.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
14.3	Willamette Floodplain	10-15yrs	o Project 14.3.4 Collaborate with partners to design & permit prescriptions and develop site engineering plans to restore Thompson Slough channel corridor and adjacent floodplain.
14.3	Willamette Floodplain	10-15yrs	o Project 14.3.5: Manage invasive species within the South Bottomlands sloughs and adjacent floodplain in preparation for site construction.
14.3	Willamette Floodplain	10-15yrs	o Project 14.3.6: Implement restoration plans including site construction along the South Bottomlands sloughs and within the adjacent floodplain.
14.4	Willamette Floodplain	0-5yrs	o Project 14.4.1: Collaborate with partners to convene a round table of stakeholders and neighbors to discuss and identify floodplain enhancement and restoration opportunities within the Seavey Floodplain along the lower Coast Fork of the Willamette.
14.4	Willamette Floodplain	0-5yrs	o Project 14.4.2: Collaborate with partners to convene a round table of stakeholders and neighbors to discuss and identify floodplain enhancement and restoration opportunities along the lower Middle Fork of the Willamette.
Goal 15: Manage habitats in the N. Bottomlands Stewardship Zone to be compatible with the HBRA Master Plan and Large Event Task Force recommendations.			
15.1	Visitor Experience	0-5yrs	o Project 15.1.1: Develop event protocols and conditions of use that can be incorporated into special use permits for North Bottomlands events.
15.1	Visitor Experience	0-5yrs	o Project 15.1.2: Define and include best management practices for invasive plant treatments as a condition of use for event organizers.
15.2	Oak Woodland, Oregon Vesper Sparrow, Other Significant Habitats, Prairie & Savanna, Wet Prairie, & Willamette Floodplain	0-5yrs	o Project 15.2.1: Continue to treat non-native blackberry and other invasive plant species within the North Bottomlands.
15.2	Visitor Experience	0-5yrs	o Project 15.2.2: Construct seed removal stations at each trailhead that accommodate hikers, equestrians and dog walkers.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
15.2	Visitor Experience	0-5yrs	o Project 15.2.3: Define and implement vegetation management objectives to facilitate recreation and enhance habitat in the North Bottomlands. (Examples may include controlling poison oak, deadly nightshade, and poison hemlock, or using vegetative barriers to impede entry into sensitive habitats.).
15.2	Visitor Experience	0-5yrs	o Project 15.2.4: Utilize trailhead temporary signage during North Bottomlands events ("sandwich board" or equivalent) to inform trail users of the importance of using seed removal stations to prevent movement of invasive weeds from event area into the natural areas of the park.
15.3	Visitor Experience	0-5yrs	o Project 15.3.1: Lane County park managers and partners reference the *Habitat Management Plan* and consider 'context sensitive' design alternatives when reviewing, approving and implementing infrastructure improvements in the North Bottomlands. (Examples may include renovation of Kienzle house and barn, trail and equestrian developments, etc.)
15.3	Visitor Experience	0-5yrs	o Project 15.3.2: Identify potential negative conservation impacts of each priority improvement. Considering financial, logistical and technical feasibility and constraints, and design improvements to minimize negative impacts to park safety as well as adjacent habitats.
15.4	Visitor Experience	0-5yrs	o Project 15.4.1: Install temporary signage near future conservation project areas in the North Bottomlands that educate park users about the parallel goals to enhance conservation targets and continue recreation uses in the North Bottomlands.
15.4	Visitor Experience	0-5yrs	o Project 15.4.2: Staff booths at special events that educate the public on future conservation actions and ongoing recreation uses in the North Bottomlands.
15.4	Visitor Experience	0-5yrs	o Project 15.4.3: Install signage in appropriate locations that educate the public about County conservation goals in higher use recreation areas.

Figure 10-2: Stewardship Projects Table Figure 10-2: Stewardship Projects Table

Supporting Strategy	Benefitting Conservation Target	Schedule	Project
15.4	Oak Woodland, Oregon Vesper Sparrow, Other Significant Habitats, Prairie & Savanna, Wet Prairie, & Willamette Floodplain	0-5yrs	o Project 15.4.4: Implement demonstration conservation projects in higher use recreation areas.
15.5	All Conservation Targets	0-15yrs	o Project 15.5.1: Collaborate with Friends of Buford Park & Mt. Pisgah to develop a lease agreement for the Native Plant Nursery facility. Consider expanding the footprint of the production area to afford ample acreage to support plant material production to advance implementation of the Habitat Management Plan as well as conservation actions by Rivers to Ridges partners or other partners working in the Willamette Valley.
15.6	All Conservation Targets	0-5yrs	o Project 15.6.1: Coordinate with partners and area farmers to manage old pastures for hay production.
15.7	Oak Woodland, Oregon Vesper Sparrow, Other Significant Habitats, Prairie & Savanna, Wet Prairie, & Willamette Floodplain	0-5yrs	o Project 15.7.1: Develop conservation actions and best management practices (BMPs) for the North Bottomlands for a 100-foot riparian revegetation area adjacent to the Coast Fork Willamette River, in conjunction with planning for the Thompson Slough restoration project.
15.8	Visitor Experience	0-5yrs	o Project 15.8.1: Collaborate with partners to design a trail through the North Bottomlands that addresses both ecological and visitor access goals.
15.8	Visitor Experience	0-5yrs	o Project 15.8.2: Collaborate with partners to maintain a temporary mowed trail to evaluate and adjust the alignment.
15.8	Visitor Experience	0-5yrs	o Project 15.8.3: Collaborate with partners to construct a permanent trail

Chapter 11: Best Management Practices and Stewardship Tool Box

11.1 Use of the Best Management Practices

The intent of this chapter is to document and describe the protocols and procedures that will be incorporated into implementation of ongoing stewardship projects, to ensure that stewardship actions are conducted in a safe and effective manner, and do not create unacceptable harm to other conservation targets. To a considerable extent the Best Management Practices ("BMPs") listed below capture the expertise and practices that have been developed as a part of ongoing stewardship actions since the park was established.

Lane County managers and operational staff, as well as staff from partner agencies, such as Friends of Buford Park & Mt. Pisgah, Mount Pisgah Arboretum, and Lane County Sheriff's Posse ("Staff") are expected to become familiar with this section of the HBRA Habitat Management Plan. Staff will review this section when planning and implementing projects so that actions are consistent with the avoidance and minimization measures, as well as the BMPs. Whenever an organization that is approved to work within HBRA initiates a project, it is the responsibility of that organization to ensure that it complies with any and all local, state, and federal regulatory and permitting requirements associated with the project.

The purpose of this Habitat Management Plan is for Lane County Parks and its partners to identify goals, strategies, and projects to effectively conserve a diversity of native habitats and species throughout HBRA, while effectively meeting demand for recreational use of the park. It should be noted that Mount Pisgah Arboretum holds a long-term lease on approximately 203 acres within HBRA, and has developed its own policies and practices. There is no intention on the part of Lane County or its partners to reduce the Arboretum's current level of autonomy in the management of its leased area. The Arboretum policies and practices are generally compatible with those described in this chapter, but may vary in some cases to meet the specific needs of its mission and programs.

11.2 Professional Judgment

Within this section, words and phrases such as "where feasible", "where appropriate", and "where practicable" are used in conjunction with some minimization and avoidance measures, BMPs, and techniques. These phrases, which allow some exercise of professional judgment by Staff, are not to be used for convenience or ease of operation. Rather, these words are included to depict the unique nature of habitat management at the HBRA, which may be either scheduled, dependent on site conditions, or responsive to unexpected events (such as wildfire, windstorm, flood, etc.).

Projects or other treatments will be planned and implemented in selected locations based on an analysis of conditions and needs. Funds are limited, and the intention is to treat areas where the benefits are greatest, or the risk of negative impacts is greatest if action is not taken.

11.3 Habitat Advisory Team (HAT)

Lane County Parks Manager shall create and seek advice from a Habitat Advisory Team (HAT). The HAT will be composed of representatives from Lane County Parks (Parks Manager, Parks Supervisor, Natural Areas Coordinator), Friends of Buford Park & Mt. Pisgah, Mount Pisgah Arboretum, Sheriff's Posse, and

The Nature Conservancy. The HAT may also include other stakeholders, such as Oregon Dept. of Forestry, Oregon Dept. of Fish and Wildlife, Bonneville Power Administration, as appropriate. The HAT will meet at least annually to review implementation of the *Habitat Management Plan* and recommend changes for plan improvement. The HAT will annually assess previous project outcomes, report on projects planned for the upcoming year, and discuss future project priorities.

11.4 Training

Understanding and correctly implementing BMPs for maintenance and stewardship activities is the responsibility of every employee and anyone who supervises volunteers from each organization approved and authorized to work within the HBRA. Stakeholders may collaborate on trainings where appropriate, or when more appropriate, implement training opportunities individually.
Examples of training opportunities include:

- Stewardship Academy: For new employees and volunteers, includes presentation of the Habitat Management plan, associated environmental issues, and the HBRA Master Plan
- Herbicide applicator trainings
- Wildland fire suppression and management training
- Participation in professional symposiums and conferences
- Continuing education classes
- New product trials and equipment demonstrations
- Rivers to Ridges Field Operations Group project tours and site visits
- HBRA quarterly meetings with special interest groups
- Team meetings

11.5 Documentation and Reporting

Stewardship staff involved with plan implementation will brief the Habitat Advisory Team (HAT) about plan-related activities that occurred during the year prior to each annual meeting. HAT members will review and discuss this information as the basis for developing any possible recommendations for changes to the plan. Elements that may be addressed during this review include:

- Summary of routine work accomplished throughout the year.
- Challenges, controversies, and successes affecting implementation of the BMPs.
- Results of research and any recommendations for modifications to BMPs.
- Summary of Stewardship Project accomplishments.
- Summary of storm damage or accidental incidents such as fire, including unanticipated ecological damage and associated outcomes.
- A summary of projects that could not use the BMPs and actions taken to inform future revisions of this section of the Habitat Management Plan.

11.6 Best Management Practices by Category

11.6.1 Trails (TR)

In General

TR-1. When maintaining trails, if feasible, prioritize activities during the weekday (M-Th: 9-3pm and Friday 10-2pm) when tasks have the potential for causing adverse impacts to park patrons during periods of peak use.

TR-2. Post temporary precautionary signage to advise park patrons as they are approaching hazard(s).

When managing vegetation adjacent to trails:

TR-3. Remove vegetation encumbering trail corridors.

- Prune and remove limbs from shrubs, small trees, and trees in ways that minimize visible evidence, such as flush cuts.

TR-4. Manage and remove invasive vegetation.

- Incorporate recent EDRR reports for each trail segment when implementing vegetation management actions.

TR-5. Remove undesirable woody vegetation (such as blackberry and poison oak) growing adjacent to the trail edge.

- Mechanically or chemically manage vegetation growing adjacent to (typically within 3') the trail edge.
  - Schedule treatments for a time of year that will minimize impacts to native herbaceous species, such as during the late summer – fall.
  - Identify and treat any invasive herbaceous species that occur under cover of the targeted vegetation.
  - Post signage and pertinent information to inform trail users about the application.
  - When practical, close the trail segment concurrent with the application and for a period following the completion of the application consistent with guidelines defined on the product label.

TR-6. If planning (non-routine) maintenance or trail improvements that will alter vegetation growing adjacent to the trail (new switch backs, trail alignment, overlooks, etc.) coordinate with appropriate experts to conduct surveys for sensitive species in selecting alignments, salvage and/or transplant native plant materials, and take other precautionary actions to minimize impacts.

Maintain trail bed

TR-7. When removing branches and/or organic debris (leaf litter, twigs and branches, etc.) from trail segments,

- Cut and scatter branches in forest understory at least 3' from trail, if quantity of material is small, or
- Place branches in small piles at least 15' from the edge of the trail, or
- Scatter debris across a larger area, if quantity of material is large.
- Avoid placing debris and branches within prairie, savanna, and oak woodland habitats if at all possible. Such debris should be hauled off site, or can be placed in nearby conifer forest habitat instead.

TR-8. When preventing vegetation from establishing or growing up within the trail bed.

- Apply wood chips where feasible to create a vegetation-free trail surface
- Mow trails occasionally during the mowing season where appropriate.
- Utilize thermal treatments in the winter, spring, and fall to eliminate vegetation, particularly annual seedlings.
- If necessary and appropriate, utilize chemical treatments to eliminate persistent perennial vegetation attempting to colonize the trail bed.

TR-9. When agitating and re-compacting trail surfaces to maintain an even trail surface.

- Source gravel products from trustworthy vendors who can guarantee that the gravel is "weed free."

Management of hazard trees or fallen trees

TR-10. Contact Lane County Parks Division to report trees that may pose a potential threat to public safety. Contact Number: (541) 682-2000. Following a storm event causing tree damage, Lane County Parks Division will determine whether to implement a temporary park closure, and will coordinate with stakeholders to identify roles and responsibilities for cleanup implementation within the park. Providing safe access to the public will be the first priority in storm response efforts.

TR-11. When County operations employees, park partners, and/or contractors remove hazard trees:

- Prior to project work, photo-document and describe any potential tree hazard risks. This will aid in minimizing safety risks and provide for hazard abatement prior to the start of any project. Photo documentation is also desirable to accompany Federal Emergency Management Agency (FEMA) reimbursement requests for clean-up costs after federally declared disaster storm events.
- Consult with appropriate experts to determine if sensitive animal or plant species are known to occur in proximity to the hazard tree, and if so, take action to minimize collateral impacts to these natural resources.
- Priority should be given to reducing the potential hazard by means of hazard mitigation and assessment. Not all tree hazards require removal and can be eliminated or reduced through pruning, crown cleaning and other approved arboricultural practices. These methods should be evaluated prior to the removal of an assessed hazard tree.
- For those trees warranted for removal because of hazard risk, if feasible leave as much "standing snag habitat" while insuring no further hazard remains at the site. This can be done by designing snags so that if they were to fall, they would not hit a trail, road, or other public gathering place.
- When practicable, manage (using manual, mechanical or chemical treatments) patches of blackberry or other invasive woody species prior to placement of removed hazard tree logs or debris.
- When feasible, place large woody debris and/or logs adjacent to trails, or other areas that would provide for suitable habitat or benefit to the natural area. Consult with appropriate staff to insure the best use of the downed wood prior to completion.
- When feasible, utilize removed portions of the hazard tree to obstruct unauthorized trails from within a reasonable proximity of the removal. Outside the Arboretum, this should require the authorization of appropriate County staff prior to implementation.

TR-12. Following significant storm events (including high winds, excessive rain, lightning strikes) patrol high use trail corridors to identify and remove trees or branches that obstruct the trail corridor.

11.6.2 Stormwater Management

In General

TR-13. Promote trail design that maintains storm water sheet flow across the trail bed and/or minimizes hydrologic changes to adjacent wetland habitats when and where appropriate. Example methods for maintaining sheet flow include grading and/or utilization of a French drain structure to re-establish sheet flow in areas where storm water is being concentrated.

TR-14. If necessary to allow a desired trail alignment, incorporate boardwalks or similar infrastructure in trail design in areas where site hydrology may otherwise be affected by trail construction.

TR-15. If planning (non-routine) maintenance or trail improvements that will alter the trail bed (new switch backs, trail alignment, overlooks, etc.) or change the existing drainage (new rolling dip, rolling grade, culvert) coordinate with appropriate experts to determine if formal design, permits, etc. are required to modify existing storm water management facilities.

TR-16. Implement seasonal closure of trail segments where trails traverse areas of sensitive habitat, hydrology, or other biological, ecological, or geological features of concern.

TR-17. Upon discovery of trail corridor damage caused by erosion or storm events, contact the Lane County Parks Division (or Mount Pisgah Arboretum staff for trails located inside the Arboretum lease area) to report the problem and to coordinate trail abatement measures.

11.6.3 Parking Areas and Access Roads (PR)

When County operations employees, park partners, volunteers, and/or contractors carry out management of parking areas and access roads:

In General

PR-1. Utilize Lane County's Routine Road Maintenance Best Management Practices (RRM BMP) Guide.

PR-2. Manage vegetation within parking areas (and within 100 yards along roadsides on the approach to parking areas) to enhance and maintain visibility, to deter theft, and protect the safety of park patrons.

PR-3. Manage refuse to minimize impact on wildlife where refuse facilities are provided.

- Collect and remove refuse at a regular frequency.
- Use refuse containers that are sealed and designed in a manner to prevent access to wildlife.

PR-4. Manage herbaceous vegetation by mowing annually (ideally in late June or early July) near parking areas and along roadsides to reduce fuels that could carry and spread wildfire.

PR-5. Manage problematic vegetation, such as poison oak, near parking areas to protect park patrons.

PR-6. When re-vegetating disturbed soils, utilize native seed from the Mount Pisgah provenance (such as that produced through Friends' nursery program) and/or other native seed that has an identified collection source located within 20 miles of the park.

11.6.4 Utility Corridors (BPA powerlines, natural gas lines, EPUD powerlines) (UC)

For BPA right of way, please refer to "Transmission System Vegetation Management Program Final Environmental Impact Statement (FEIS), May 2000" and the Memorandum of Understanding between BPA and 'Pisgah Partners'.

When utility company employees and/or contractors, County operations employees, park partners, and/or contractors carry out management within utility corridors:

In General

UC-1. Prioritize maintenance activities during the weekday (M-F: 9-3pm) to minimize adverse impacts to park patrons during periods of peak (weekly) use.

UC-2. Post temporary precautionary signage to advise park patrons as they are approaching hazard(s).

Season

UC-3. Prioritize timing of vegetation management activities for seasons that minimize collateral impacts or risks. To the extent possible, mowing should be timed to avoid impacts to nesting songbirds, reptiles, and reproduction of native herbaceous plants. Chemical treatments should be timed to avoid impacts to pollinators, minimize impacts to actively growing native herbaceous species, and minimize seed set of invasive plants. Thermal treatments should be timed to avoid wildfire risk.

Access

UC-4. Utilize the existing trail system to access easements. Minimize off-trail travel including pedestrian and vehicle traffic.

Vegetation Management

UC-5. Coordinate with utilities to seek advance notice of planned work.

UC-6. Minimize and abate disturbance to soil or vegetation**.**

UC-7. When re-vegetating disturbed soils, utilize native seed from the Mount Pisgah provenance (such as produced through Friends nursery program) and/or other native seed that has an identified collection source located within 20 miles of the park.

11.6.5 Ecological Tree Removal (for habitat restoration purposes) (ER)

Recommended guidelines and BMPs for ecological tree removal activities are presented for reference only. All potential tree removal activities within HBRA are evaluated on a project-by-project basis by Lane County, and the recommendations identified below are not intended to limit the discretion of Lane County Park Manager, County Administrator, or Board of County Commissioners when making policy decisions. Tree removal and related actions within the Mount Pisgah Arboretum's lease area will be governed by the lease and associated agreements based on the lease intent. The recommendations under Item 3 are presented in a prioritized sequence. If the first recommendation is not available, or is fully met with additional material remaining, then the next recommendation in the list is to be considered.

ER-1. All trees proposed for removal as part of a County-approved project (outside the Arboretum) will be appropriately marked to assist Lane County staff field inspections prior to any work activities.

ER-2. Utilize appropriate erosion control BMPs that prohibit the movement of disturbed soils from the identified work area

ER-3. Recommendations for the disposition of trees determined to have commercial value.

1) Utilize logs for restoration and habitat conservation purposes or park facility improvements:
   - Within the boundaries of the restoration project from which they are cut, or
   - On another restoration project within HBRA.
   - Mill logs on site with a portable mill to produce materials for fences, benches, siding, and other park facilities.
2) Use proceeds from the sale of the merchantable material to offset costs directly related to the tree-removal activities on the restoration project from which the trees are cut.
3) If funds remain after direct tree removal costs are paid, use proceeds to support habitat and visitor infrastructure improvement projects within HBRA.

11.7 HBRA Stewardship Zones

S-1 Protect the Best Habitats.

1) In prairie and oak habitats, identify areas with a
   - High richness of high fidelity native herbaceous prairie plant species.
   - Abundance of features associated with native reptiles such as nesting areas, basking areas, or hibernacula
   - Sites with unique or diverse examples of the native invertebrate fauna

2) In riparian and conifer forest habitats, identify areas with
   - A high richness or cover of spring wildflowers, or
   - A high density of nesting neotropical migrant songbirds.
3) Minimize adverse impacts to populations of plant and animal species in high quality habitats.
   - Follow appropriate BMPs for restoration and/or maintenance activities in these areas.
   - Utilize appropriate site preparation activities at the onset of large scale enhancement and restoration projects.
   - When performing ecological burns, treat no more than half of the target areas in a single year to allow invertebrates and other inhabitants in the untreated portion to complete their life cycles.

S-2 Minimize soil disturbance and compaction.

1) When feasible, implement soil-disturbing restoration, construction or maintenance activities when soils are dry.
2) Minimize the creation of new maintenance corridors (subject to repetitive use) into or through a management unit.

S-3 Minimize hydrological disturbance.

1) When feasible, implement soil-disturbing restoration, construction or maintenance activities when soils are dry.
2) Minimize the creation of new maintenance corridors into or through a management unit, particularly corridors that follow the fall line.

S-4 Minimize disturbance of native vegetation.

1) When feasible, implement vegetation disturbing activities between July 15 (after seed set and bird nesting) and November 15.
2) Minimize the creation of new maintenance corridors into or through a management unit.
3) Where necessary, locate maintenance corridors utilized by mechanized equipment in areas already invaded by non-native species such as blackberry and Scotch broom, so as to avoid impacting prairie habitats.

S-5 Minimize adverse impacts on native animal species, including nesting birds.

1) When feasible, avoid noise and vegetation disturbance from March 15 – July 15, except where it can be demonstrated that adverse impacts will be minimal.
2) When feasible, plan significant activities according to seasonal sensitivity of species of interest.
3) Protect and enhance invertebrate species.
   - When feasible, time use of herbicides to minimize adverse impacts on pollinators and other invertebrates.
   - When reintroducing native plants, provide many individuals of each species.
   - Provide native plants that flower throughout the growing season and provide pollen or nectar for all types of pollinators.
   - During maintenance of restored habitats, use management techniques that do not affect an entire habitat patch in the same year.
   - Provide different sizes of standing and down wood (snags and logs).
   - Provide small areas of bare soil for ground nesting bees.

S-6 Minimize transport of invasive plant species.

1) Identify how invasive species are being introduced to the Park.
2) Identify actions to reduce introduction, including both on-site and off-site movement.
3) Wash soil, seeds, and vegetative debris from all classes of equipment, as well as from individual operators or technicians when entering or leaving any portion of the site where invasive species are present.

S-7 Minimize adverse impacts of stewardship activities on park patrons.

1) Prioritize stewardship activities in high use areas to non-peak times, such as M-F, 7 am – 5 pm.
2) Post temporary precautionary signs to advise park patrons of potential hazards associated with stewardship activities.
3) Remove temporary signage as promptly as safety considerations will permit.

S-8 Avoid impacts to cultural resources.

1) Plan projects so as to avoid impacting cultural resources documented in the 1994 HBRA Master Plan or subsequent surveys.
2) Incorporate an appropriate level of cultural resource monitoring to any stewardship project that has potential to impact cultural resources through soil disturbance (excavation, tilling/disking, etc.).

11.8 Stewardship Toolbox

11.8.1 Stewardship, Site Preparation and Invasive Management Methods

The following section details stewardship methods that can be implemented to maintain conservation targets, to manage invasive vegetation and prepare project areas for enhancement or restoration actions, such as floodplain channel excavation, ecological burns, etc.

When feasible, assign a botanist or lead steward to track progress and effectiveness of site preparation activities and evaluate methods of the Stewardship Tool Box to manage populations of invasive plants occurring on a micro-site scale. Working at this scale, being flexible, and employing a combination of site preparation and methods can help ensure project success.

11.8.2 Equipment Cleaning Guidelines

All equipment utilized (by staff, contractors, or volunteers) during implementation of site stewardship must be thoroughly cleaned (preferably with compressed air and/or a pressure washer) prior to site entry to remove all dirt and debris to reduce the possibility of introduction of invasive plants not currently existing within the project area. If cleaning occurs within the HBRA, the area in which the cleaning takes place should be noted or mapped so it can be monitored and checked for any future weed growth.

11.8.3 Invasive Plant Management Methods

1) **Bradley Method.** In areas of high quality habitat (where native species cover is relatively high with respect to total cover), small patches of invasive species are removed manually. The area relieved of invasive vegetation is not replanted; rather the area is left for natural colonization by adjacent native plants. The treated area is periodically re-visited by work groups who remove any and all seedlings and/or root sprouts of undesirable species. In time the area is colonized by native species. In some circumstances plants (either salvaged from the project area or grown by

local native plant nurseries) may be planted in these areas when a particular habit, character, or presence not currently represented within the area is desired. This method may also be applied in habitats adjacent to a project site to support the larger project area and prevent further spread.

2) **Repetitive mowing.** In areas where noxious woody perennial species cover is both dominant and high (relative cover greater than 80 percent, the area is mowed periodically with a tractor mounted mower or with a walk-behind rotary mower (depending on the size of the area to be treated). Treatments may be applied at any time in the year but it is recommended that treatments occur between May-November to avoid the potential for soil disturbance and compaction that may result during the rainy season. In some sites with well drained soils, it may be possible to implement mowing in early spring before native plants emerge. In those areas where relative cover by native species is at least 10-20 percent with respect to total cover (depending upon native species composition), the first treatment should not be applied until the native plants have set seed. It is expected that an area may be treated 2-7 times before the prescription may be considered successful. Following several cycles of mowing, a brush rake may be used to dislodge root crowns and root masses from the treatment area. If it is determined that the treatment will adversely affect roots of desirable vegetation, root crowns of invasive woody plants (primarily Armenian blackberry) should be removed manually. If a brush rake is used, the ground is then dressed/rolled following disturbance. The area should be seeded with a mix of herbaceous native annual pioneer species intrinsic to the particular ecotype that will develop as the noxious species are managed. Native hay may be broadcast over the disturbed soil as well to minimize soil erosion. Following the final treatment, desirable native perennial shrubs and trees will be planted in accordance with the Future Conditions Plan for the specific area.

3) **Removal of seed heads**. In some cases, manual or mechanical removal of seed heads may be an important interim measure, if more permanent treatments methods are not feasibly given available resources. This will at least prevent an increase in the quantity of non-native seed being added to the seed bank.

4) **Repetitive shallow disking, tilling and irrigation.** Within areas of non-native pasture grasses and forbs, where native species are absent, a field is mowed through the growing season. In early summer the field may be chemically treated with either a gator-mounted boom sprayer or brush monitor. A few weeks later the field is shallowly disked and tilled several times. The field may be irrigated following tillage. Tillage is repeated after a week or ten days following germination from the seed bank. The treatment is repeated until germination is sparse across the field. After tilling is complete, the restoration area should be seeded heavily with an aggressive native seed mix. Spot herbicide treatment (ideally using selective herbicides), followed by broadcast seeding, may be needed within some parts of the restoration area.

5) **Solarization.** In areas where invasive herbaceous species cover is both dominant and high, and high-fidelity native prairie species are absent, Solarization may be appropriate. The area is first mowed short and then tilled with either a tractor-mounted roterra device or with a rototiller. The soil should be well-churned when tilling is complete. Larger areas may be graded for desirable micro-topography following tilling. The area of treatment is then covered with a 4-year/6 mil clear plastic. The plastic edge should be sealed to retain heat, and anchored to ensure that it is not adversely affected by wind. The plastic is left in place for 8-12 weeks. It is critical that ambient air temperatures are at least 90°F for a period of not less than three days during the time of treatment. This prescription is applied in the summer months. It is recommended that plastic be laid no later than the third week of June. Plastic should be removed prior to the return of regular fall precipitation. Following treatment, a native seed mix is broadcast within the footprint. Herbaceous plugs and woody plants may be planted as well.

6) **Smothering.** Summer-Fall application: In small areas (less than 100 sq. ft.) within a prairie/meadow or forested ecotype where invasive species cover is both dominant and high (greater than 60 percent) with respect to total cover, the area is mowed very short and then covered with heavy black nursery fabric or non-woven road fabric. The fabric should be secured in place with landscape staples. The fabric is then removed in the fall of the following year (fabric may be left in place for multiple years). The area is then planted with plugs, salvaged plant materials and/or broadcast with a mix of native seed.

7) **Herbicide Application.** Those areas dominated by habitat-altering, invasive vegetation for which other means of control have not been successful may be treated with chemical herbicides. Herbicide will be applied by licensed applicators. Applicators will strictly follow the rules and regulations as directed on the label. Furthermore, selection of herbicide will closely follow those products approved under the biological opinion developed for Bonneville Power Administration by the federal National Marine Fisheries Service. Herbicide may be applied by wiper applicator, brush, backpack spray, motorized hand gun, and motorized boom spray applicator.

8) **Infrared (propane) burner.** In areas where annual or perennial herbaceous species cover is both dominant and high (greater than 60 percent) with respect to total cover, the area is flamed with an infrared (propane) burner. The treatment is applied to wilt the invasive vegetation, not consume it. Treatments are applied when fire danger is low and when plant growth or seed production will be impacted. Subsequently, the area should be seeded with a mix of herbaceous native pioneer species associated with the particular habitat that will develop as the invasive species are reduced. In addition, desirable native perennial shrubs and trees will be planted in accordance with planting plan for the specific area.

9) **Biological Control.** Biocontrol agents destroy plant tissues and cause stress to the weeds, making them less competitive against desirable flora. It may take 10-20 years for a biocontrol project to successfully manage a weed at the regional scale. Managers should work with the Oregon Department of Agriculture to collect and redistribute biocontrol agents to other infested areas throughout the park. Treatment areas are to be monitored to ensure populations of biological control agents remain at optimal levels to control select species of invasive vegetation within the HBRA and the greater Mount Pisgah Area. Biological control agents are not to be used if they have been determined to create adverse effects to native (and endemic) species related to the target of control.

10) **Bio Char.** Where practical instead of burning piles of brush, convert woody debris generated through vegetation management prescriptions to reverse encroachment by native plants or invasion by non-native plants into bio char. Bio char is charcoal produced from plant matter and stored in the soil as a means of removing carbon dioxide from the atmosphere.

11.9 Chapter 11 References

- Bonneville Power Administration. 2000. Transmission System Vegetation Management Program Final Environmental Impact Statement. Chapter II: The Methods.
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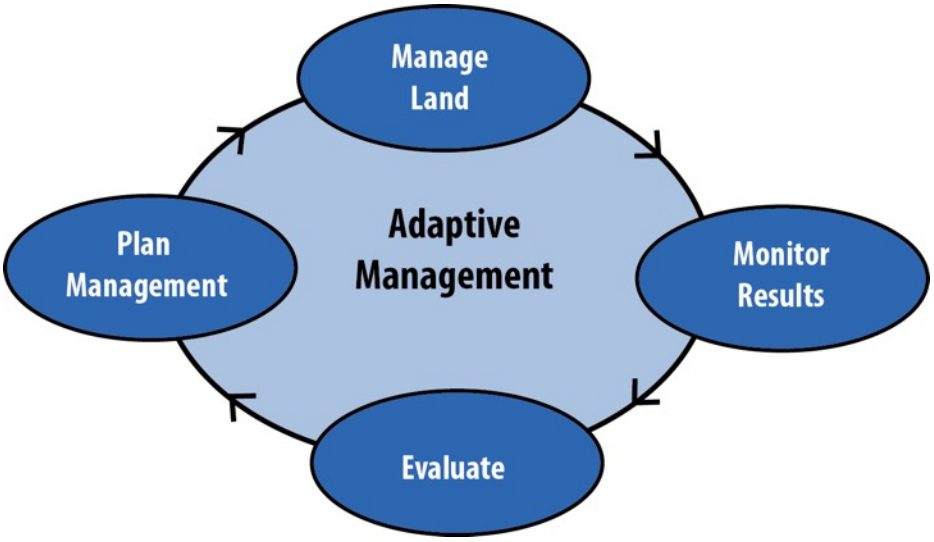
Chapter 12: Monitoring and Adaptive Management

12.1 What is Adaptive Management?

Adaptive management is an approach that incorporates monitoring of past management into the planning of subsequent management actions, and systematically tests assumptions in order to learn and adapt. First, a management objective is identified. Next, a best management option is selected and stewardship actions are implemented. Stewardship results are monitored and compared with expectations so that subsequent management actions can be adjusted after considering insights gained and lessons learned from previous management actions. The following flow chart image suggests the cycle of adaptive management.

Figure 12-1: Adaptive Management Diagram



Monitoring within HBRA should focus on two basic questions:

1. Strategy effectiveness - Are the conservation actions being taken within HBRA achieving their desired results?
2. Status assessments - What is the status and what are the trends of conservation targets within HBRA?

More specifically, monitoring tasks should be linked to the plan objectives, conservation targets, key ecological attributes, and threats outlined in this plan. Implementation of the HBRA *Habitat Management Plan* will incorporate the practice of adaptive management to ensure that lessons learned improve the results of future management.

Following approval of the HBRA *Habitat Management Plan*, a comprehensive monitoring plan will be developed by Lane County Parks Division and partners, which will identify a realistic set of monitoring tasks and time frames, based on the monitoring categories described below, to provide information to guide adaptive management. At five year intervals, a review of habitat management accomplishments and conservation target status will be completed, to provide direction for planning of subsequent management actions.

In addition, each project proposal approved by Lane County Parks for implementation of stewardship activities will include both a monitoring component and a maintenance component, to describe the process for identifying and implementing follow-up stewardship tasks as identified through monitoring and adaptive management.

12.2 Funding for Monitoring

Funds for the monitoring activities specified in this chapter are not secured. However, monitoring of habitat conditions has been ongoing since at least the 1980s by volunteers. For example, botanists mobilized by Friends have developed a database of over 500 plant species identified and located in the park, and have conducted annual monitoring of the Bradshaw's lomatium population nearly every year since 1993. Amateur ornithologists have documented over 100 bird species using the park. In more recent years, as grants have been secured for habitat improvement, modest funding for monitoring, combined with volunteer labor has enabled monitoring of fish, herptiles, birds and hydrology along the Coast Fork Willamette, as well as invasive removal in the park. With clear priorities and more effective partnerships, limited funding for monitoring can be focused to better inform future management.

12.3 Monitoring Conservation Targets

Documenting the status and trends of individual focal conservation targets is an important benchmark for determining whether the goals of the plan are being met. Status of habitat types can be quantified over time by mapping their extent from aerial photographs and other historic data. Condition of habitat types can be most efficiently documented in a qualitative way by use of permanent photo points; supplemented, where appropriate, by data from vegetation plots. Status and trend of species targets requires some documentation of distribution and population size (preferably but not necessarily annually), with a monitoring intensity sufficient to document change over time. For monitoring nested targets, documenting presence/absence (ideally on a Management Unit basis) will be valuable documentation. This need not be done annually, but if done by volunteers at three to five year intervals, this would be sufficient.

12.4 Monitoring Key Ecological Attributes

The "Key Ecological Attributes" identified in Chapter 5, Figure 5.1, represent important factors for the viability of the habitat types and species listed in this plan as focal and nested conservation targets. Figure 5.1 lists specific indicators for each KEA, and monitoring should provide information, where appropriate, sufficient to update indicator ratings (poor, fair, good, or very good) over time. The necessary intensity of data collection varies for different indicators. For particular indicators that require intensive data collection, it may only be appropriate to invest resources in collecting such data where the level of treatments or management effort is correspondingly high. Visitor experience KEA's will guide monitoring for this target, but in addition, occasional visitor surveys could supplement other monitoring and, if implemented consistently over time, may provide data on trends.

12.5 Monitoring Threats

Threats to conservation targets are identified in Chapter 5, Figure 5.2. The status of threats with an overall threat rank of "High" or "Very High" should be done in a qualitative way on an annual basis. If there is uncertainty as to whether threat abatement practices in place are adequate, a more intensive assessment of the threat's impacts may be warranted.

12.6 HBRA Species Inventory/Monitoring

Baseline species inventory provides important data related to viability and threats of conservation targets within HBRA. Documenting the species of plants and animals present within HBRA, as well as change over time, informs ongoing management planning and implementation. For some types of organisms, species lists developed over the years are fairly complete, but for others only partial species lists exist. Compiling existing species presence data and improving completeness, where feasible, should be an ongoing endeavor. For nested species conservation targets, documenting locations of populations with GIS should be a priority. For other species, documenting presence/absence by Stewardship Zone or other appropriate sub-unit of the park will be beneficial. Introduced non-native species are a particular category for which strategic tracking of distribution and abundance will benefit conservation management.

12.7 Project Effectiveness Monitoring

Project effectiveness monitoring is likely to be a requirement of grant funding to support habitat restoration work at HBRA. In a general sense, project effectiveness monitoring should help us determine whether the conservation actions being taken within HBRA are achieving their desired results. More specifically, project effectiveness monitoring tasks can be selected to provide useful information to feed the adaptive management cycle described above, by improving the effectiveness, efficiency, quality, or cost of restoration and management activities.

12.8 Chapter 12 References

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Appendix A:
Glossary
HBRA Habitat Management Plan

Stewardship and Conservation Planning Terms used within the Habitat Management Plan

ADAPTIVE MANAGEMENT – A process originally developed to manage natural resources in large scale ecosystems by formal or observational experimentation and systematic monitoring of the results. More broadly, it is the incorporation of a formal learning process into conservation action. Specifically, it is the integration of design, management, and monitoring to systematically test assumptions in order to learn and adapt.

BEST MANAGEMENT PRACTICES – In the context of ecological stewardship, a standard set of activities that can be implemented in appropriate situations or locations, that provide desired habitat benefits and at the same time minimize possible negative impacts to habitats.

BRADLEY METHOD – A habitat restoration technique that involves focused, small scale manual removal of invasive plant species in a way that allows regeneration by native species to naturally fill the bare gaps left after invasives are removed. This method is particularly applicable to higher quality habitats where invasive plant species are still a minor component of the vegetation, or at the boundaries between high quality habitats and denser patches of invasives.

CONSERVATION TARGET – An element of biodiversity or related habitat management focus. Conservation Targets typically include plant and animal species, ecological communities, and ecological systems. For the purposes of this plan, "Visitor Experience" as it relates to habitat management has also been identified as a conservation target.

ECOLOGICAL BURNING – Prescribed burning to achieve one or more ecological goals – such as reducing woody plant invasion of prairies, enhancing flowering and reproduction of native prairie plants, or reducing the abundance of non-native herbaceous plant species.

FIRST ORDER STREAM – A seasonal or perennial stream that has no flowing tributaries. First, second, and third order streams are considered to be headwater streams.

FIDELITY – Refers to an estimate of the proportion of a native plant species' occurrences in prairie or oak habitats at the time of Euroamerican settlement in the mid-1800's. High fidelity species would have been largely restricted to prairie and oak habitats at the time of settlement. Moderate fidelity species may have occurred with equal frequency in prairie/oak and non-prairie/oak habitats. Low fidelity species would have also been widely distributed in a range of conifer forest, wetland, riparian forest, or other non-prairie/oak habitats.

FIRE RETURN INTERVAL – For prescribed burning and other fire management strategies, Fire Return Interval is a measure of fire frequency based on a number of fires per unit of time. Median fire return interval provides information on the average number of years between fires. However, this is just an average, and time spans between burns may be more or less than the average.

FLASH GRAZING – A livestock grazing practice that involves short term use of a high concentration of livestock, often applied in a stewardship setting to manage non-native plant species or other undesirable vegetation.

FOCAL CONSERVATION TARGET – A limited subset of species, communities, and ecological systems that are chosen to represent the full array of biodiversity and habitat management priorities found in a project area. They are the basis for setting goals, carrying out conservation actions, and measuring

conservation effectiveness. Conservation of the focal targets is intended to ensure the conservation of all native biodiversity within functional landscapes.

FORB – An annual or perennial herbaceous plant (lacking woody stems) that is not a member of the grass, rush, or sedge plant families; these are typically recognized as wildflowers.

GRAMINOID – An annual or perennial herbaceous plant (lacking woody stems) that is a member of the grass, rush, or sedge plant families.

HABITAT ENHANCEMENT – Refers to actions taken to increase the ecological function of an area of habitat; typically used in cases where the habitat type is not converted, or fundamental ecological processes are not altered, but other actions are taken to improve habitat quality.

HABITAT MANAGEMENT PLAN – A document that identifies habitat conservation goals and objectives, providing a context for prioritizing on-the-ground restoration and enhancement projects over a defined period of time. A Habitat Management Plan should also identify ways to measure success through monitoring, and adapt and learn over time through analysis of monitoring results.

HABITAT RESTORATION – Refers to management actions taken to return an area of habitat to a condition that existed previously. The term may be applied to conversion of a habitat type to one that existed previously, or the return of a fundamental ecological process. Our best assessment of the condition or processes that were in place at the time of Euroamerican settlement (roughly 1850) is commonly used as the benchmark. However, the term can also be used to refer to a less specific time frame, and/or a more general (such as ecoregional) spatial scale. This term is often used somewhat interchangeably with “Habitat Enhancement” under a broader category of “Habitat Management”.

HABITAT TYPE – Generally synonymous with “cover type”. Habitat types are general classifications of vegetation structure (tree density and height) and functional category (e.g., conifer vs. hardwood) within relatively homogeneous stands.

HYDRIC SOIL – A soil that forms under conditions of water saturation, ponding, or flooding for a sufficient length of the growing season to expose the root systems of plants to anaerobic conditions (lacking oxygen).

INDICATOR – Measurable entities related to a specific information need (for example, the status of a key ecological attribute, change in a threat, or progress towards an objective). A good indicator meets the criteria of being: measurable, precise, consistent, and sensitive.

INVASIVE – In the context of this plan, invasive species are a subset of non-native species which colonize and spread relatively rapidly, and/or significantly to greatly impact a native habitat or native species.

KEY ATTRIBUTE – Aspects of a conservation target's biology or ecology that, if missing or altered, would lead to the loss of that target over time. They are aspects that sustain a target's viability or ecological integrity.

LEGACY TREE – In the context of this plan, refers to an older tree, typically Oregon white oak, which was originally open grown, but has become surrounded by a denser stand of younger trees. Savanna restoration often involves identifying and protecting legacy trees as a key feature of the restored habitat.

MAIN POPULATION – In the context of invasive species management, this term refers to a larger, long-established patch of an invasive species that is in the process of expanding its occurrence within a site or geographic area.

NON-NATIVE – Synonyms of non-native are exotic, introduced and alien. For the purposes of this plan, a non-native species is defined as one that was not present at the HBRA ca. 1850, and does not have a recent, local, shared evolutionary history with plant, animal, fungi or other species present. Non-native species have arrived either incidentally with human activities (such as ballast or as "hitchhikers" with other plant materials) or were introduced deliberately (such as escaped ornamentals). See "Native" and "Invasive".

NATIVE – "Indigenous" is a synonym. For the purposes of this plan, a native species is defined as one that was present at the HBRA ca. 1850, and has a recent, local, shared evolutionary history with plant, animal, fungi or other species present. This definition recognizes local ecological relationships that have evolved over time as a basis for the definition, rather than recognizing a randomly chosen geographic area as a basis as is typically done (e.g., "native to Oregon").

NESTED CONSERVATION TARGET – Species, ecological communities, or ecological system targets whose conservation needs are subsumed by one or more focal conservation targets. An example is a rare species that is associated with a particular habitat type that has been selected as a focal target.

OUTLIER POPULATION – In the context of invasive species management, this term refers to a smaller, more recently established satellite patch of an invasive species that is in the process of expanding its occurrence within a site or geographic area.

PATCH – Distinct areas of a habitat type. Patches of similar habitats dominating the landscape form a matrix, within which individual, smaller patches of other habitats exist. For example, a large area of forest habitat may contain small patches of prairie intermixed. Size of habitat patches can be an important factor in maintaining the viability of some conservation targets.

PUBLIC SAFETY – As a general term, "public safety" refers to the safety, security, and protection of members of the public. For Parks, specifically, the term addresses providing a safe place for citizens and visitors to enjoy outdoor recreation activities.

SECOND ORDER STREAM – A seasonal or perennial stream that is the product of two first order streams joining together. First, second, and third order streams are considered to be headwater streams.

SECONDARY INVADER – Refers to particular non-native plants that often proliferate in newly opened space soon after primary invasive plants (such as non-native blackberries) are removed.

SPOT SPRAY – A method of selectively applying herbicides directly to individual target plants without impacting adjacent non-target species; contrast with broadcast spray methods where all vegetation within a treatment area receives the spray.

STAKEHOLDER – An individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

STEWARDSHIP – This term refers to an ethic of responsible habitat management. The term is a metaphor that originates from the concept of a domestic steward, a household servant responsible for

managing the needs of a large household. Ecological Stewardship is a practice that was championed by Aldo Leopold, as part of a "Land Ethic" that addressed modern humans' relationship to the natural world.

THREAT – An agent or factor that directly or indirectly degrades or reduces the health of a conservation target. Threats can be divided into two types. These are direct threats, which are the agents that directly degrade targets (for example, "woody plant invasion in prairie habitats"), and indirect threats, which are the factors that are drivers of direct threats (for example, "lack of fire"). Indirect threats are often the most effective entry point for conservation actions.

VIABILITY – The status or "health" of a population of a specific plant or animal species. More generally, viability indicates the ability of a conservation target to withstand or recover from most natural or anthropogenic disturbances and thus to persist for many generations or over long time periods.

VISION – A general summary of the desired state or ultimate condition of the project area or scope that a project is working to achieve. A good vision statement meets the criteria of being visionary, relatively general, brief, and measurable.

WILDLAND – A mosaic of habitats which are unmanaged, or managed for the integrity of native habitat types, and are dominated by (or at least have a significant component of) native species.

WILDLIFE BLIND – A shelter that is used to camouflage or hide park visitors so they can observe wildlife at close quarters.

WOLF TREE – A *wolf tree* is an unusually large coniferous tree (at least in the Pacific Northwest) which was originally growing in an open environment. Wolf Trees tend to have an irregular crown, often with the top broken off due to storm or lightning damage, and have large lower branches or branch stubs Their large size and irregular form provide valuable habitat for wildlife. Typically wolf trees are 150 years old or older. At HBRA wolf trees can be seen along Trial 1 just north of the summit of Mt. Pisgah.

Definitions of Focal Targets and Other Habitat Types

BALD – A plant community with little or no woody vegetation, where bedrock is at or close to the surface, which consists of plant species adapted to very dry conditions during the summer.

FOREST – In general, a forest is considered as a dense stand of trees where the canopies of adjacent trees generally touch, forming a more or less continuous canopy. However, older stands in particular may support canopy gaps, so overall canopy cover ranges from 75% to 100%. General Land Office survey notes from the 1850's indicate that Willamette Valley forests generally supported at least 40, and up to 100, trees per acre at the time of Euroamerican settlement (tree density was partially a function of tree size and age). Forest Types in HBRA include conifer or mixed conifer-hardwood forest, riparian and floodplain forest, and forested wetland.

PRAIRIE – Grass and forb-dominated communities on non-hydric soils with few or no trees and few shrubs. Trees (particularly Oregon white oak), if present, are very widely scattered; 5% canopy cover is generally consider the upper limit of tree cover in prairie. General Land Office survey notes from the 1850's indicate that Willamette Valley prairies supported fewer than 1 tree per acre at the time of Euroamerican settlement. Upland prairies occur on well drained soils and seasonal wet prairies occur on hydric soils. Upland prairie often occurs in a mosaic with savanna, and for the purposes of this plan the two habitat types are combined as a single conservation target.

SAVANNA – Savanna has scattered open-grown trees (5% to 25% canopy cover) that are not so dense as to break up the continuous layer of grasses and forbs. General Land Office survey notes from the 1850's indicate that Willamette Valley savannas supported 1 to 7 trees per acre at the time of Euroamerican settlement . Oregon white is the dominant tree species of savanna but scattered conifers such as ponderosa pine, Douglas-fir, and incense cedar may also be present.

SHRUBLAND – Naturally occurring shrublands are found where native shrub species such as buckbrush (*Ceanothus cuneatus*) form dense stands, along with grasses, forbs, and scattered Oregon white oak trees.

WATERWAY – Waterways within HBRA range from narrow riparian areas with seasonal flows (typically running from late fall through late spring) that originate from the slopes of Mount Pisgah, to the channel and banks of the Coast Fork of the Willamette River.

WOODLAND – In general, a woodland is considered to be a more or less continuous stand of trees where the canopies do not touch, but rather provide continuous gaps. Overall canopy cover may range from 25% to 75%. General Land Office survey notes from the 1850's suggest that Willamette Valley woodlands supported 7 to 40 (100) trees per acre at the time of Euroamerican settlement. Some researchers separate two woodland types, an open woodland (25% to 50% canopy cover), and a closed woodland type (50% canopy cover to 75% canopy cover). Data from the General Land Office surveys suggest that historic woodlands in the Willamette Valley were generally of the open woodland type. In HBRA, oak woodland and associated community types (such as Oregon white oak-ponderosa pine woodland) are a focal target for habitat management.

Appendix B:
Bibliography
HBRA Habitat Management Plan

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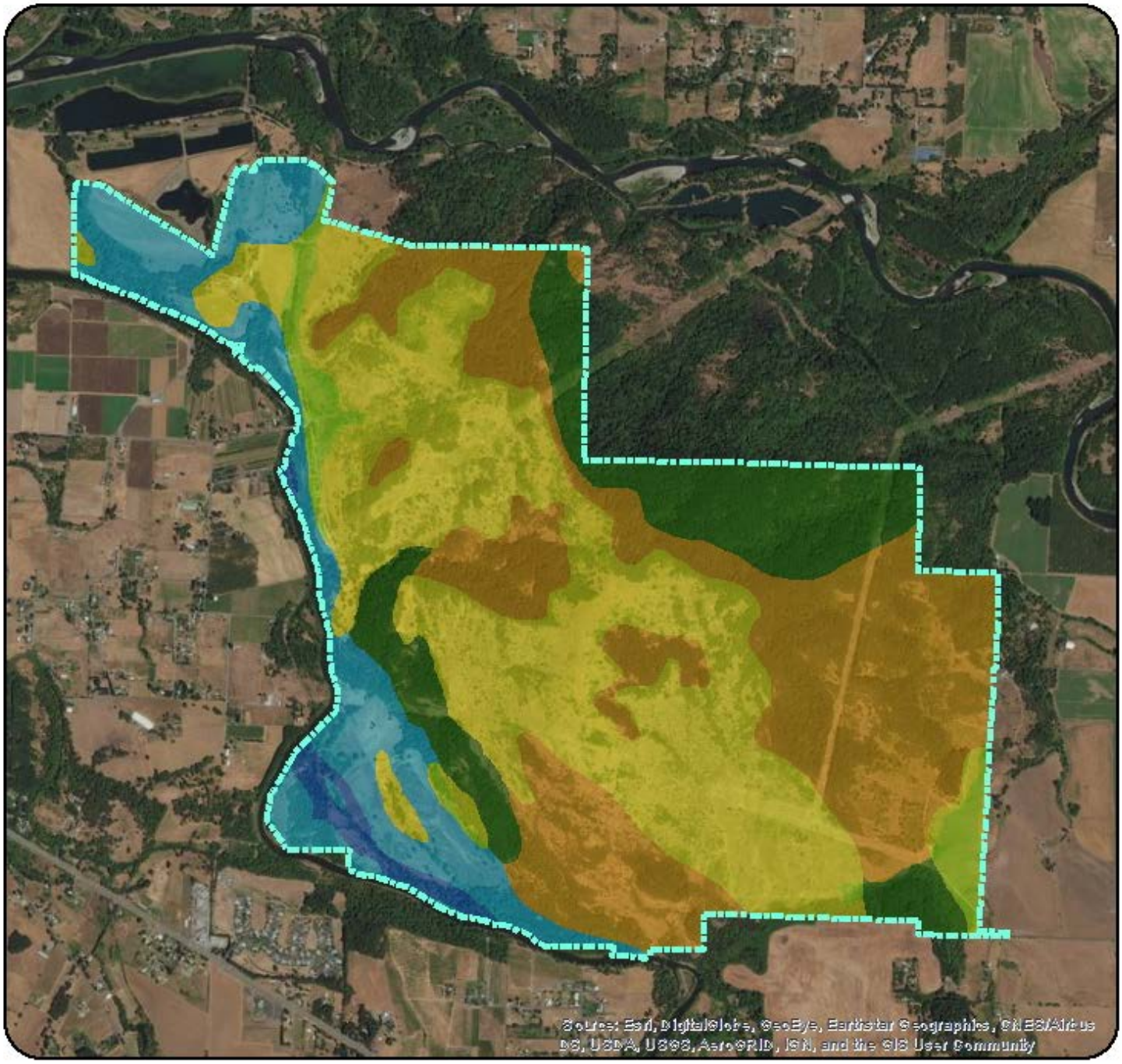
Appendix C:
Historic Vegetation and Land Use
HBRA Habitat Management Plan



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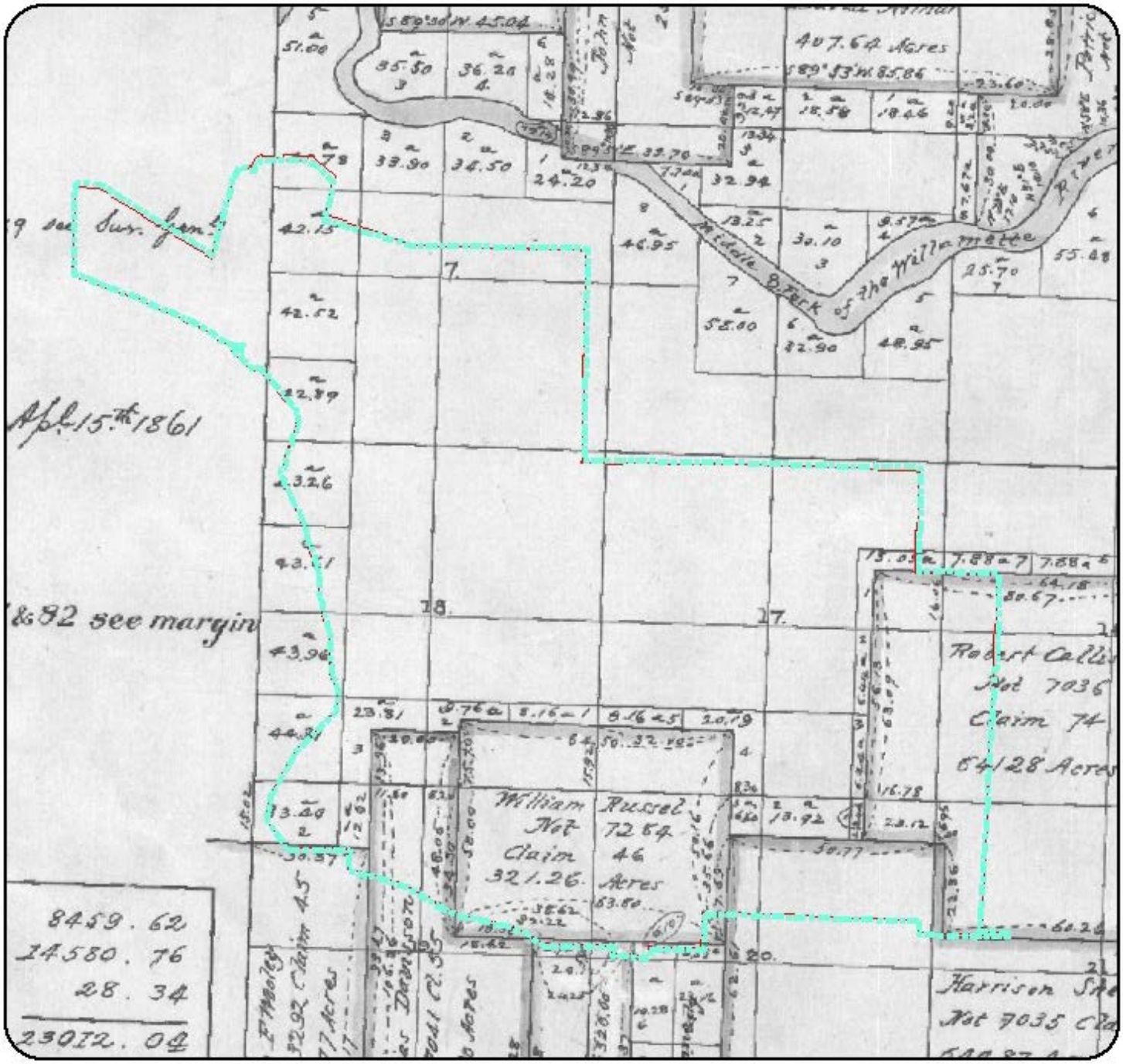
Historic Condition in HBRA circa 1855.

source: (Federal) Government Land Office survey records

Habitat

- Prairie
- Savanna
- Riparian Forest or Forested Wetland
- Upland (conifer and/or hardwood) Forest
- Open Water
- Wet prairie
- HBRA Property Boundary



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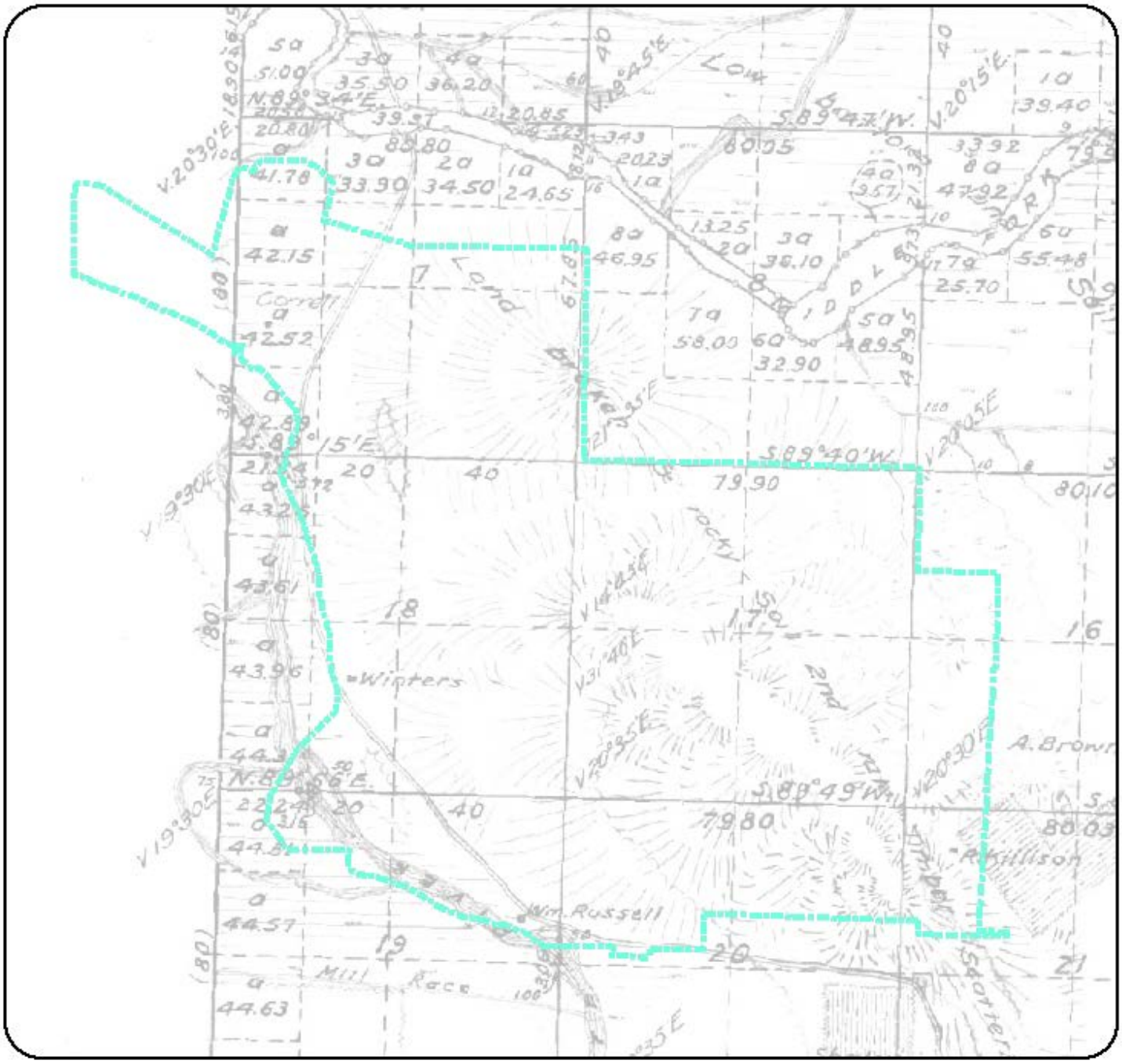
Historic Land Claims within (and in proximity) to the HBRA circa 1855.

source:

HBRA Property Boundary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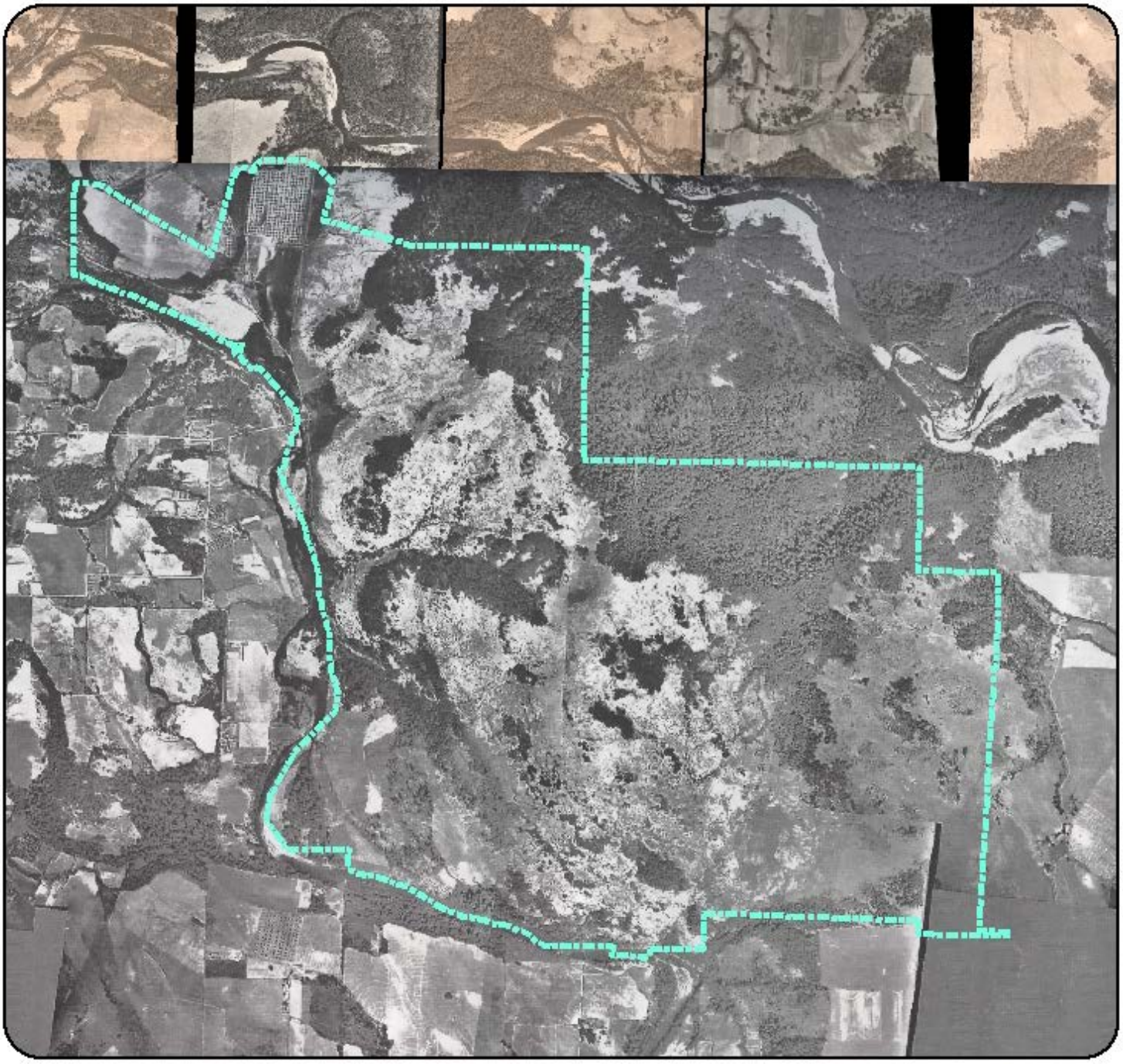
Township, Range, Section map
within (and in proximity to) the HBRA circa 1855
source:
HBRA Property Boundary

Appendix D:
Aerial Imagery Archive
HBRA Habitat Management Plan



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1936 Aerial Imagery

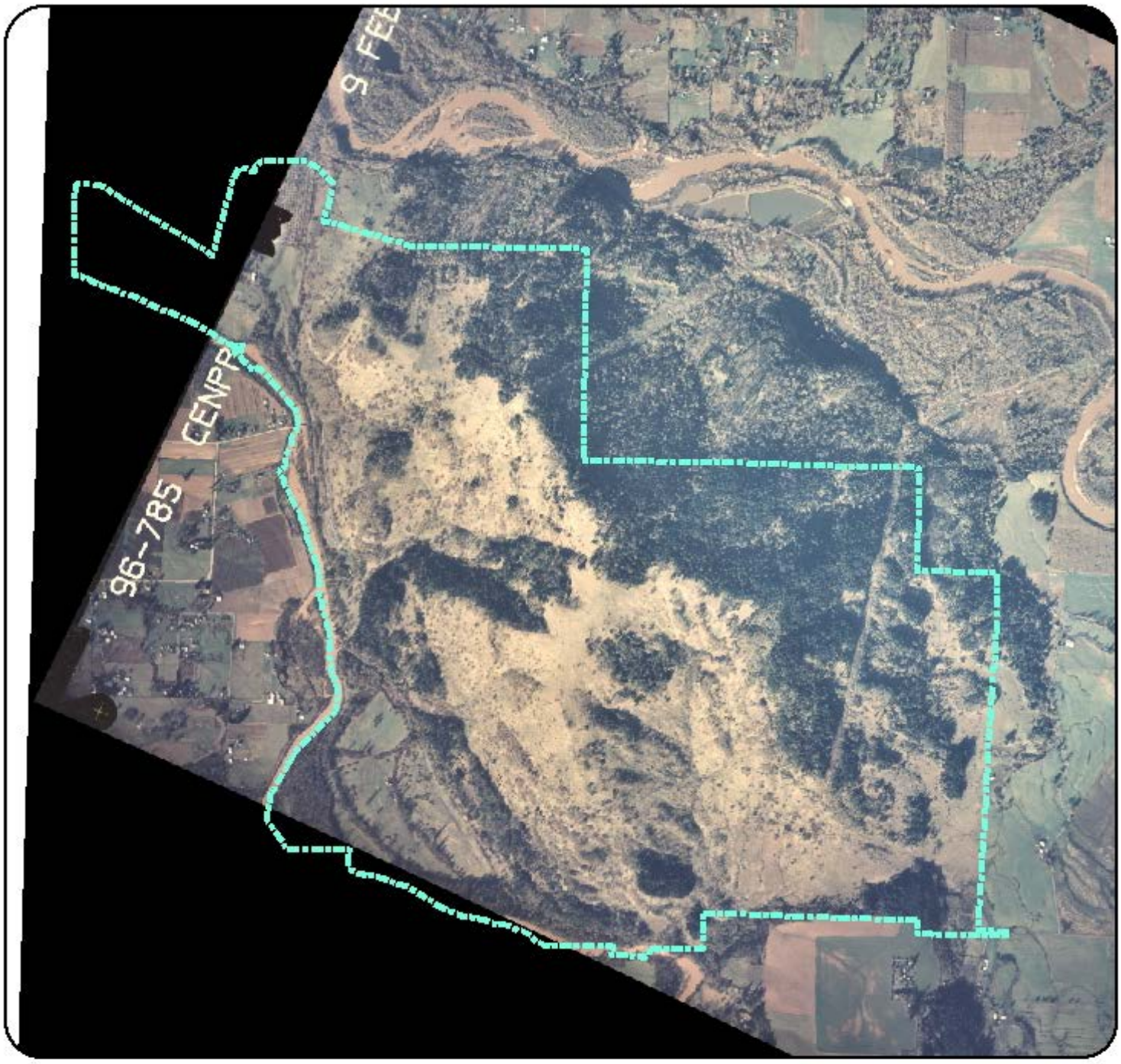
source: US Army Corps of Engineers

HBRA Property Boundary

1975 Aerial Imagery

source: USGS Earth Explorer

HBRA Property Boundary



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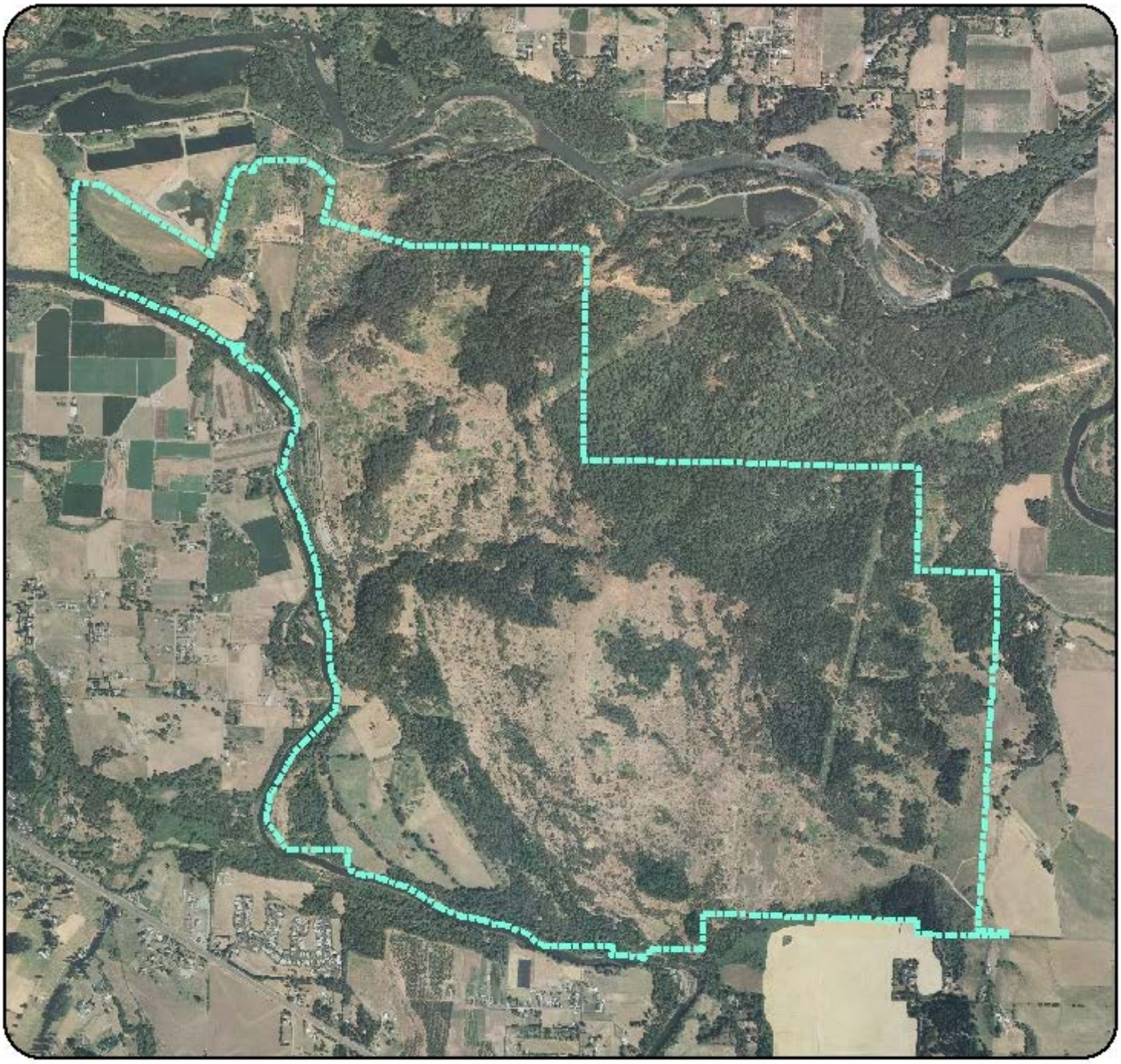
1996 Aerial Imagery

source:

HBRA Property Boundary



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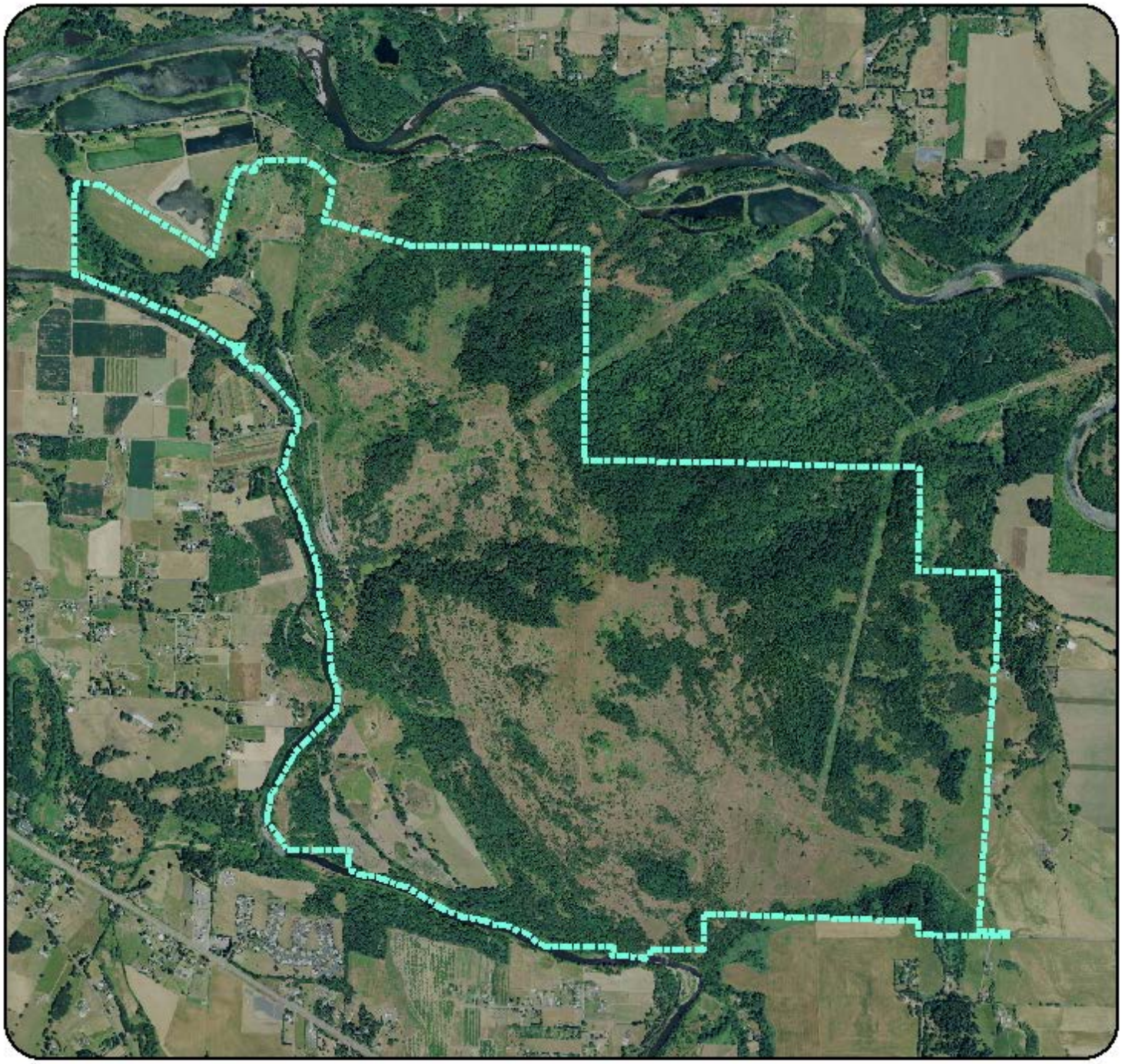
2005 Aerial Imagery

source:

HBRA Property Boundary



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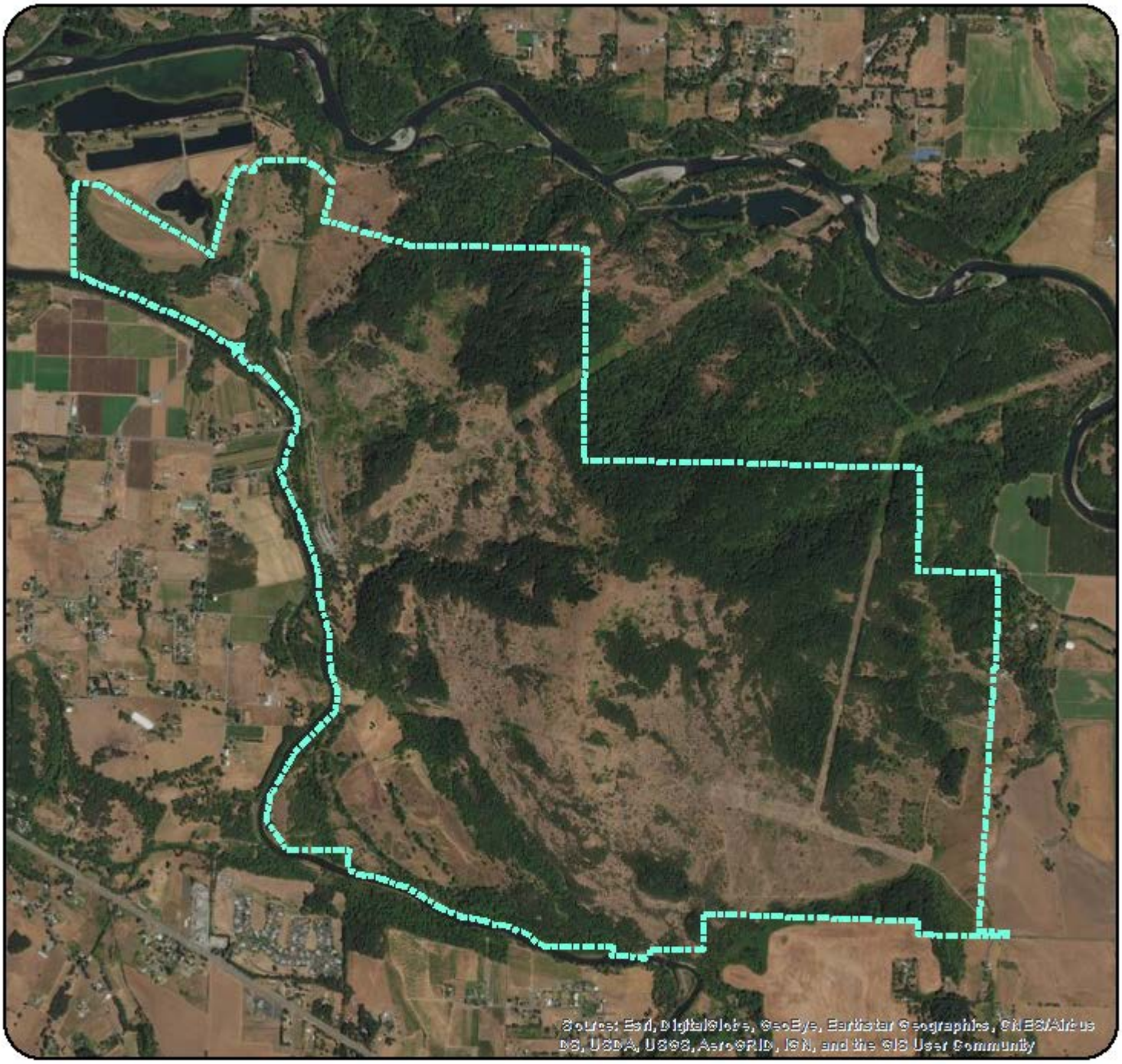
2009 Aerial Imagery

source:

HBRA Property Boundary



Miles
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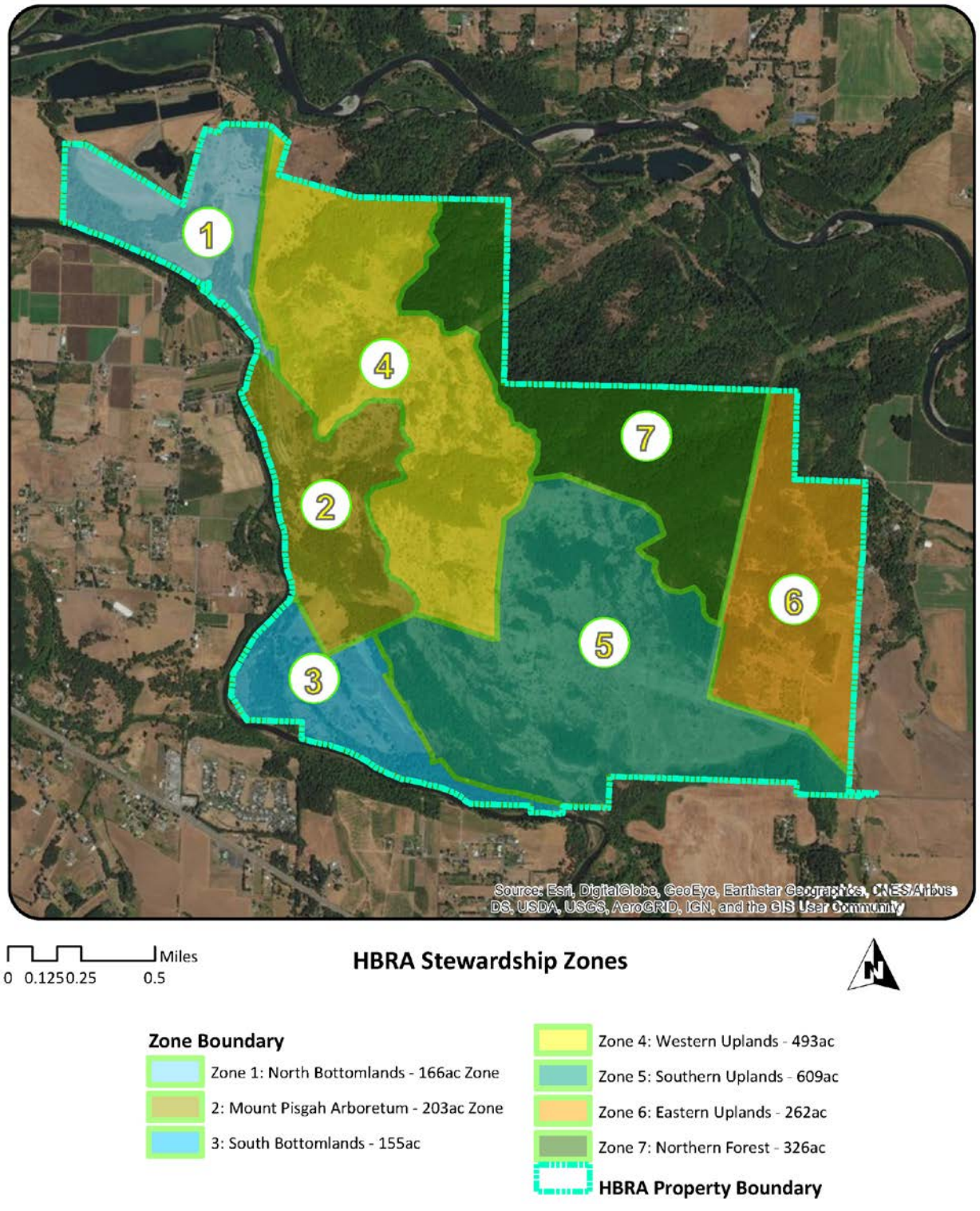
2016 Aerial Imagery

HBRA Property Boundary

Appendix E:
Park Wide and Management Unit Specific Work Plans
HBRA Habitat Management Plan

Introduction to Appendix E

This Appendix provides information on a Management Unit scale that is only provided on a park-wide basis in the body of this *Plan*. As described in Section 7.3 (pp. 54-58), the park is divided into seven Stewardship Zones, as shown below. The larger Stewardship Zones are further subdivided into multiple Management Units, although three of the Stewardship Zones (North Bottomlands, Mount Pisgah Arboretum, and South Bottomlands) consist of a single Management Unit. Note that the BPA power line easements, outside of the Mount Pisgah Arboretum, are displayed on a separate map and tables.



The maps and tables in this Appendix are listed in the order of the numbered stewardship zones. Within each Stewardship Zone, Management Unit-specific maps, if applicable, are listed alphabetically. Each map includes an inset map that shows the location of the Stewardship Zone and Management Unit in the context of the park as a whole. A map of all of the Management Units in HBRA is included in Chapter 10.

Each map page provides a comparison of mapped acres for three different time frames: Historic Condition (circa 1855); Existing Condition at the time the planning process began (2008); and the Desired Future Condition circa 2035.

Associated with each map is a set of tables. The first table is a tally of acres for both conservation targets and non-target map units for each of the three mapped time periods. Tallies of acreage changes are provided for the 1855-2008 and 2008-2035 time periods. For map units that represent habitat types, changes involving an increase in acreage are highlighted in black, and changes that involve a decrease in acreage are highlighted in red.

The second table is a set of projects, which represent the subset of projects presented in Chapter 10 that pertain to each Management Unit. In addition, to avoid unnecessary repetition, a separate table lists the projects that are applicable to all Management Units. The projects are grouped according to which of the three 5-year time intervals they are scheduled for implementation.

As noted in Chapter 3, the *Plan* will be implemented through an adaptive management process. As Lane County Parks and partners implement the strategies and projects, Parks staff and partners will evaluate the results and, if appropriate, consider alternative strategies or projects that may provide better results or be less costly to implement. It is likely that the projects contained in this set of work plans will be updated in the future, at least for each five year time interval, to incorporate previous experience and current knowledge.

It should be noted that the historic (1855) vegetation was reconstructed primarily from General Land Office survey data that focused on section lines and section corners, and was extrapolated to the interiors of sections. This means that both the locations of habitat transitions, and the granularity of the vegetation mosaic, are much more generalized that the Existing and Desired Future Condition maps, which are derived largely from aerial photography. Some conservation targets in this *Plan*, such as Buckbrush chaparral, were not documented in the historic vegetation mapping. In addition, apparent changes in acreage, such as apparent loss of target habitat types, may be an artifact of mapping precision rather than a reflection of actual habitat change. Thus, the Existing and Desired Future condition maps should also be taken as a generalization rather than precise representation of conditions on the ground, present and future.

Definitions of HBRA Vegetation Map Units

The following habitats or land cover types have been mapped within HBRA, and are shown on the maps in this Appendix as well as in Chapter 4:

Alder Forest: A specific sub-type of forested wetland, found only in a small portion of the SE corner of HBRA, dominated by red alder.

Buckbrush chaparral: This is a shrub-dominated community with few to no trees located on excessively drained to shallow soils on hot, dry hillside exposures and on gravel bars within the floodplain. The

principal shrub species is buckbrush, with associations of snowberry, tall Oregon grape, poison oak, and occasional Oregon white oak trees.

Conifer - Oak Woodland: A closed woodland comprised of a mix of Oregon white oak and conifers, particularly Douglas-fir and Incense cedar, occasionally also Ponderosa pine, in which the canopy cover of oak is less than 50%.

Forested Wetland: A forest dominated by Oregon ash, occurring on hydric soils and often adjacent to wet prairie.

Oak Woodland: Oak woodland is a sparsely treed community dominated by oaks in which tree crowns typically do not touch or form a continuous canopy cover, allowing sunlight to penetrate to the ground. Canopy cover in generally between 25% and 75%. Woodland can be divided in to open woodland (7-20 trees per acre) and closed woodland (20-100 trees per acre). Tree architecture is a mixture of open-grown oaks and more vase-shaped oaks whose canopies are constrained by nearby trees. Conifers, including Douglas-fir, ponderosa pine, and incense cedar, may be associated with oaks. The ground layer of grasses and forbs is broken up by tree shade and/or by the presence of dispersed or dense shrubs.

Oak-Conifer Woodland: Oak-conifer woodland is similar to oak woodland in general structure and composition, but has a significant, and typically increasing, cover of conifers, particularly Douglas-fir.

Oak-Ponderosa Pine Woodland: Ponderosa pine is an important component of an oak-pine woodland community that is found in several parts of HBRA, particularly on the south and east slopes of Mount Pisgah. Ponderosa pine, which is at the edge of its geographic distribution in the Willamette Valley, grows with, and has a similar ecological profile to, Oregon white oak. It is commonly associated with dry or rocky soils that historically were fire-influenced.

Pasture or Non-Native Grassland: This is an open grass-forb dominated vegetation type, with few or no trees, which have been cultivated and disturbed by agriculture in the past. As a result, the vegetation is dominated by non-native pasture grasses, and few native forbs are present.

Powerline Scrub: Vegetation under the BPA power lines is managed by BPA to be kept free of trees. In areas where the adjacent vegetation is forest, and the area within the power line right-of-way was forest prior to clearing and transmission line construction, the forest understory shrubs still predominate.

Riparian Bottomland Forest: Riparian areas encompass the land and vegetation adjacent to Willamette River channels, oxbow lakes, alcoves, backwater areas, and sloughs that are influenced by perennial or intermittent water, including periodic flooding during winter storms. Plant communities common within this system include Oregon ash - big leaf maple floodplain forest, black cottonwood bottomland forest, and willow shrub thickets.

Riparian Mixed Upland Forest:
Riparian Mixed Upland Forest is found on higher ground within the floodplain and hosts a mix of conifer including Douglas-Fir, Grand fir, and Incense Cedar and hardwood including bigleaf maple, bitter cherry, chokecherry, Oregon White Oak, and Pacific dogwood.

Savanna - Good Condition: This is a community with scattered open-grown trees that are not so dense as to break up the continuous grassland ground layer (savanna). The understory is dominated by grasses and forbs. The primary savanna tree species is Oregon white oak, but scattered conifers such as

ponderosa pine, incense cedar, and Douglas-fir may also be present, and would have been present historically as well. Canopy cover is generally between 5% and 25%, and tree density is typically fewer than 7 trees per acre.

Savanna that has been mapped as "good" condition typically has 90% of the habitat patch within the desired range for woody cover (5% to 25% cover), and high native grass/forb species richness (>40 species within a given habitat patch).

Savanna - Fair Condition: Savanna that has been mapped as "fair" condition typically has at least 50% of the habitat patch within the desired range for woody cover (5% to 25% cover), and moderate native grass/forb species richness (>20 species within a given habitat patch).

Savanna - Poor Condition: Savanna that has been mapped as "poor" condition typically has less than 50% of the habitat patch within the desired range for woody cover (5% to 25% cover), and low native grass/forb species richness (<20 species within a given habitat patch).

Scrub Wetland: This vegetation types occurs as a few small patches of hardhack-dominated shrubland, in some cases with a diversity of associated native herbaceous plants.

Upland Conifer Forest: : Within HBRA, Douglas-fir is the most common tree associated with conifer forest and is most often the dominant tree in the overstory, but grand fir and various hardwoods may be associated in lesser abundance. Areas mapped as forest In general, typically have a stand density of 100 to 200 trees per acre, and the canopy cover from trees occupying the overstory is greater than 75 percent. Most conifer forest within HBRA is 50-75 year-old second growth from logging in areas of historic mature forests, as well as conifer encroachment into former oak savanna and oak woodland over the last 5-7 decades. However, there are scattered older conifers, often "wolf trees" that were not removed during previous logging.

Upland Hardwood Forest: These are generally patches of upland forest dominated by bigleaf maple, occurring within a broader matrix of upland conifer forest.

Upland Prairie: This is a grass and forb-dominated plant community with few to no trees or shrubs, occurring on non-hydric soils. Because upland prairie occurs in a mosaic with savanna, the two community types are recognized as a combined conservation target in this Plan.

Wet Prairie: This is a grass and forb dominated community with few to no trees or shrubs, located on hydric soils that are saturated to the surface during the rainy season and dry during the summer.

Park Facilities – Historic: This is the area in and around the Kienzle House and barn, located in the North Bottomlands.

Parking Areas & Roads: This map unit includes both paved and gravel roads and parking lots, located in the Arboretum, North Bottomlands, and Southern Uplands Stewardship Zones.

Stewardship Facilities: This map unit includes structures and grounds associated with stewardship operations, located in the Arboretum, North Bottomlands, and South Bottomlands Stewardship Zones.

Event Facilities: This map unit is associated with the horse arena located in the North Bottomlands, operated by the Lane County Sheriff's Mounted Posse.

Quarry: Old quarries, developed before the park was established, are located on the lower Western and SW slope of Mt. Pisgah.

HBRA Habitat Management Goals

The 15 management goals, identified by number in the tables of projects in Appendix E, are described in greater detail in Chapter 6, along with the accompanying strategies for each goal.

- **GOAL 1:** Provide a safe and positive visitor experience in Howard Buford Recreation Area.
- **GOAL 2:** Educate park users about the unique natural values that make the HBRA and the broader Mount Pisgah area a priority for conservation.
- **GOAL 3:** Maintain and improve the park's trail system to minimize ecological impacts while providing views of and access to HBRA's diverse habitats.
- **GOAL 4:** Minimize adverse impacts of park management on conservation targets.
- **GOAL 5:** Restore and enhance prairie, savanna and oak woodland habitats by reducing encroaching woody vegetation.
- **GOAL 6:** Achieve significant restoration of prairie and savanna, oak woodland, and wet prairie habitats in HBRA.
- **GOAL 7:** Achieve significant restoration of chaparral habitat in HBRA.
- **GOAL 8:** Manage for diverse native plant communities within each conservation target habitat.
- **GOAL 9:** Increase the size of wet prairie habitat patches.
- **GOAL 10:** Locate and, to the extent feasible, reduce populations of feral or harmful non-native animal species impacting each conservation target.
- **GOAL 11:** Locate and reduce the presence of habitat-modifying, non-native plant species within each conservation target habitat.
- **GOAL 12:** Remove fish passage barriers from the lower mile of creeks and streams in HBRA that flow into the Coast Fork and Middle Fork of the Willamette River.
- **GOAL 13:** Improve ecological health of creeks and streams.
- **GOAL 14:** Improve ecological health of riparian floodplain habitats.
- **GOAL 15:** Manage habitats in the North Bottomlands Stewardship Zone to be mutually compatible with recreational activities identified in the 1994 HBRA Master Plan and the recommendations of the Large Events Task Force (2015).

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2018 - 2022			
Goal 1	1.1	visitor experience	o Project 1.1.3: Post Stewardship Program Project or Activity updates at Trail Head Kiosks to inform park visitors about area closures or habitat and vegetation management activity in progress in proximity to the trail.
	1.1	visitor experience	o Project 1.1.4: Establish criteria for trailside temporary signage ("sandwich board" or equivalent) to inform trail users of habitat or vegetation management activity in progress adjacent to the trail.
	1.1	visitor experience	o Project 1.1.5: Establish criteria to limit the installation of permanent signage along trails away from trailheads.
	1.1	visitor experience	o Project 1.1.6: Establish criteria to limit the use of flagging tape and the period it is posted in the field.
	1.1	visitor experience	o Project 1.1.7: Develop a riverfront trail plan to establish preferred routes to access the river for the public and for first responders (in the case of emergencies) while protecting sensitive habitats. Consider closing certain access points to the river during nesting season and other times when disturbance to wildlife will result in an adverse impact.
	1.1	visitor experience	o Project 1.1.8: Survey the riverfront and delineate sensitive habitat features.
	1.1	visitor experience	o Project 1.1.9: Improve parking areas, construct trails, and develop supporting infrastructure to improve access to the river.
	1.2	visitor experience	o Project 1.2.1: Develop vegetation management protocols for each parking area within the HBRA.
	1.2	visitor experience	o Project 1.2.2: Remove vegetation around parking areas as appropriate to maintain sightlines to enhance public safety and deter property crime.
	1.3	visitor experience	o Project 1.3.1: Post fire evacuation information at trailhead kiosks during the fire season (June-October).
	1.4	visitor experience	o Project 1.4.1: Gather data and interview trail users.

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	1.5	visitor experience	o Project 1.5.1: Survey trail segments for nearby hazards and clearly delineate areas of caution.
	1.6	visitor experience	o Project 1.6.1: Inventory patches of poison oak growing within 5' of the edge of all recreational trails.
	1.6	visitor experience	o Project 1.6.2: Remove poison oak growing within 5' of recreational trail edge.
	1.6	visitor experience	o Project 1.6.3: Maintain trail edges with mowing or clipping annually or at other appropriate time intervals.
	1.7	visitor experience	o Project 1.7.1: Develop a bench location plan that identifies appropriate locations to provide at least one bench or viewpoint per mile of trail along major trail corridors (trails 1, 2, 3, 5, and 6).
	1.7	visitor experience	o Project 1.7.2: Install benches at designated locations.
	1.7	visitor experience	o Project 1.7.3: Maintain viewpoints and benches.
	1.8	visitor experience	o Project 1.8.1: Prepare an "on leash policy".
	1.8	visitor experience	o Project 1.8.2: Collaborate with stakeholders and interested members of the public to identify areas within the park where dogs will be allowed to be off leash.
	1.8	visitor experience	o Project 1.8.3: Solicit input from park users through trailhead tabling and public open houses.
	1.8	visitor experience	o Project 1.8.4: Conduct a pilot implementation project to evaluate compliance and community support.
	1.8	visitor experience	o Project 1.8.5: Implement the approved policy.
Goal 2	2.1	all conservation targets	o Project 2.1.1: Develop signage and associated educational materials interpreting the park's natural values, and post at trailheads.
	2.1	all conservation targets	o Project 2.1.2: Maintain and update trail map to clearly indicate segments of closed trail.
	2.2	all conservation targets	o Project 2.2.1: Maintain a permanent 'notice' board at trail head kiosks to inform park users of temporary area closures in the park.

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	2.3	all conservation targets	o Project 2.3.1: Lead a series of tours that showcase the natural history of wildlife that reside within or pass through the HBRA.
	2.3	all conservation targets	o Project 2.3.2: Host a series of natural history talks that showcase species of wildlife that reside within or pass through the HBRA.
	2.3	all conservation targets	o Project 2.3.3: Post informational displays at trail head kiosks that encourage park visitors to be respectful of wildlife.
Goal 3	3.1	visitor experience	o Project 3.1.1: Construct and maintain seed removal stations at each trailhead including capacity to accommodate hikers, equestrians (horse trailers, horses, etc. at the east and north parking areas) and their dogs.
	3.2	all conservation targets	o Project 3.2.1: Conduct a pilot project to evaluate the affects of dogs upon the success of nesting species during the breeding season.
	3.2	all conservation targets	o Project 3.2.2: Conduct a pilot project to evaluate the impact of dogs upon habitat quality during structured periods of "off leash" activity.
	3.2	all conservation targets	o Project 3.2.3: Monitor wildlife species richness before and after implementation of the "on leash" policy.
	3.3	all conservation targets	o Project 3.3.1: Collaborate with Friends of Buford Park and Mount Pisgah Arboretum and other partners to utilize volunteers to preserve and enhance viewpoints.
	3.4	all conservation targets	o Project 3.4.1: Collaborate with groups such as the Friends of Buford Park, Mount Pisgah Arboretum, Northwest Youth Corps, equestrian groups, and other trail partners to develop an updated trail management plan with input from diverse group of stakeholders. Trail standards should seek to minimize impacts of trail infrastructure upon adjacent conservation targets. Plan should identify actions to address management of high use areas (such as the Summit and Swing Hill), to improve viewpoints or focal areas. The plan should evaluate the benefits and drawbacks of seasonal closure of trail segments that traverse sensitive regions of the park (with regard to habitat usage, e.g., nesting seasons, hydrology, soils, slope, etc.).

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	3.4	all conservation targets	o Project 3.4.3: Inventory the condition of all trails.
	3.4	all conservation targets	o Project 3.4.4: Inventory "rogue trails", analyze trail function, and identify management actions to reduce the impact to conservation targets from rogue trails while addressing the needs of park users that such trails support.
	3.4	all conservation targets	o Project 3.4.5: Identify trail segments that bisect conservation target habitats and measure the area of the habitat patch size to identify and evaluate areas where trails are undermining viability of conservation targets.
	3.5	all conservation targets	o Project 3.5.1: Measure the effectiveness of recommended BMP's and adjust the standards with consideration of monitoring results and data analysis.
	3.6	all conservation targets	o Project 3.6.1: Develop and implement a pilot project to explore the feasibility of producing native hay within HBRA.
	3.7	all conservation targets	o Project 3.7.1: Conduct a pilot project to evaluate measures to mitigate visitor impacts on wildlife habitat.
Goal 4	4.1	all conservation targets	o Project 4.1.1: Provide a copy of the ODOT BMP handbook & 'Stewardship Toolbox' to stakeholders, volunteer groups, and staff who assist with management of habitat within the park.
	4.2	all conservation targets	o Project 4.2.1: Designate a location to develop an equipment cleaning facility.
	4.2	all conservation targets	o Project 4.2.2: Construct a facility to clean and remove foreign material from equipment.
	4.3	all conservation targets	o Project 4.3.1: Identify needed equipment.
	4.3	all conservation targets	o Project 4.3.2: Acquire equipment.
Goal 5	5.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.3.1: Collaborate with research scientists at the UO or OSU to determine the appropriate amount of coarse woody debris to retain within restoration project areas of different habitat types.

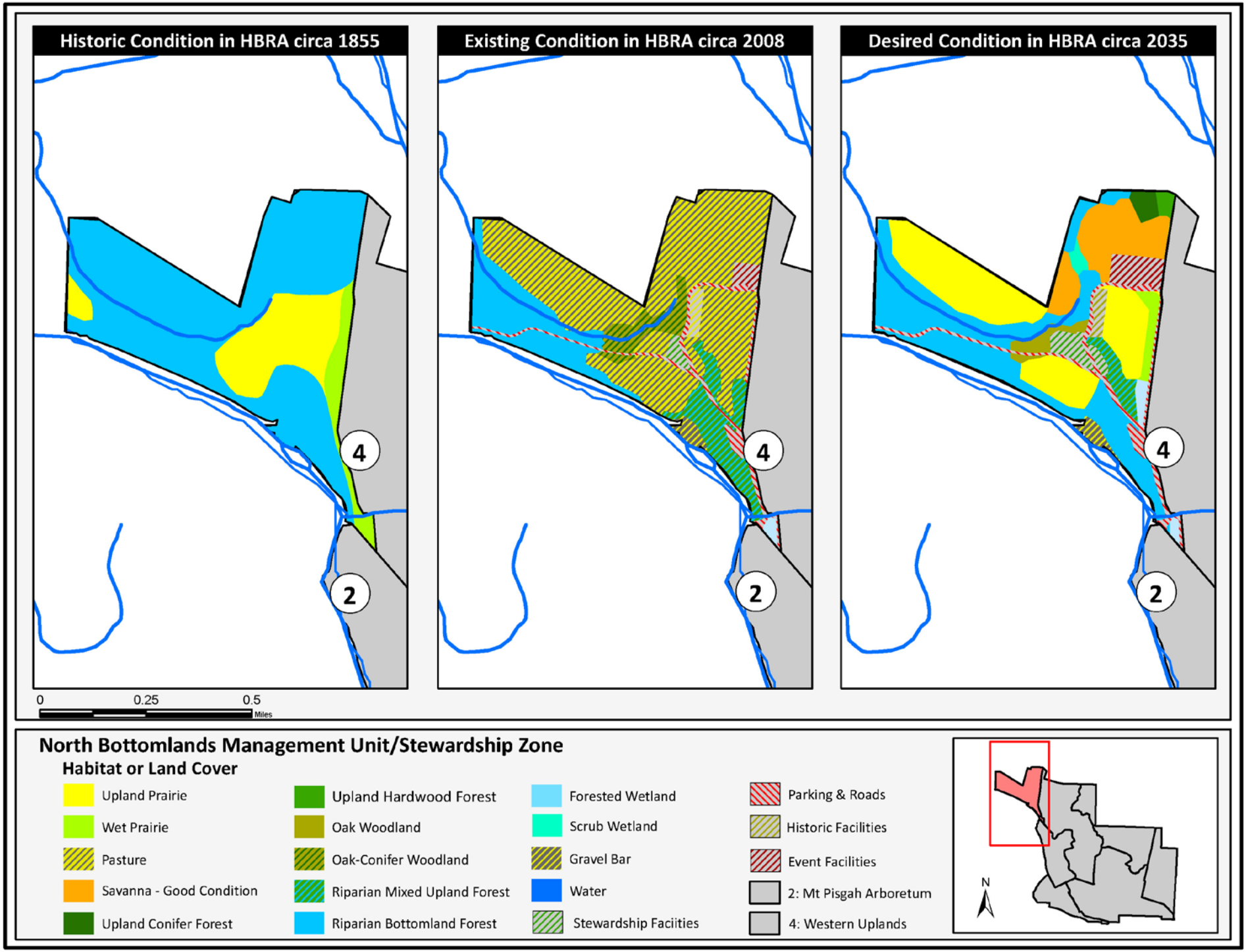
Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Goal 6	6.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.2.1: Collaborate with Oregon Department of Forestry to prepare a revised fire management strategy for the HBRA. (2019-20)
Goal 8	8.2	Oregon Vesper Sparrow	o Project 8.2.1: Survey for Oregon Vesper Sparrow during the breeding season and locate nest sites
Goal 9	9.2	Bradshaw's lomatium & wet prairie	o Project 9.2.1: Identify, assess, and inventory wet prairie within the greater Mt. Pisgah area.
	9.2	Bradshaw's lomatium & wet prairie	o Project 9.2.2: Convene property owners and stakeholders to discuss conservation easements, fee title acquisition, and property donation options.
	9.2	Bradshaw's lomatium & wet prairie	o Project 9.2.3: Collaborate with partners to use conservation easements to protect wet prairie on nearby private properties.
Goal 10	10.1	All conservation targets	o Project 10.1.1: Develop reporting system for park users to document sightings of non-native animals within the HBRA.
	10.1	All conservation targets	o Project 10.1.2: Acquire and deploy "trail cameras" located away from trails to discreetly monitor the HBRA for non-native animal species.
	10.2	All conservation targets	o Project 10.2.1: Collaborate with ODFW, neighbors, and partner agencies to monitor for the presence of non-native animals previously undocumented within the Greater Mount Pisgah Area.
	10.2	All conservation targets	o Project 10.2.2: Develop an 'EDRR most wanted poster' to communicate the species of interest to park users.
	10.3	All conservation targets	o Project 10.3.1: Create presentation and outreach materials.
	10.3	All conservation targets	o Project 10.3.2: Host educational presentations & distribute outreach materials that explain the issue.
	10.4	All conservation targets	o Project 10.4.2: Collaborate with ODFW to evaluate monitoring data to set tolerance thresholds to govern actions to manage non-native species within the HBRA.

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	10.4	All conservation targets	o Project 10.4.3: Where feasible, collaborate with ODFW, Oregon State Police, Lane County Animal Services to employ prescriptions to eliminate the threat of increased populations of non-native species listed on the 'EDRR most wanted poster' to HBRA conservation targets. When appropriate, collaborate with Lane County Animal Services to facilitate adoption of captured domestic animals such as cats.
Goal 11	11.1	All conservation targets	o Project 11.1.1: Update Invasive Species management and watch lists.
	11.2	All conservation targets	o Project 11.2.1: Monitor all Stewardship Zones for all invasive species noted on the EDRR watch list.
	11.2	All conservation targets	o Project 11.2.2: Collaborate with Partners to recruit and train volunteers to assist with monitoring activities.
	11.3	All conservation targets	o Project 11.3.1: Manage patches of invasive species adjacent to roads and trails and within parking areas and power line easements.
	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread within a Management Unit or through the HBRA.
	11.9	All conservation targets	o Project 11.9.1: Convene Partners, Stakeholders, and neighbors to identify invasive species management priorities for the Greater Mount Pisgah Area.
	11.11	All conservation targets	o Project 11.11.1: Collaborate with BPA to manage large areas within the powerline easement occupied by invasive species in conjunction with their three year system wide vegetation management cycle.
Goal 12	12.1	creeks & streams	o Project 12.1.1: Identify, assess, and inventory barriers to fish passage.
Goal 13	13.1	creeks & streams	o Project 13.1.1: Assess macroinvertebrate populations within streams.
	13.2	creeks & streams	o Project 13.2.1: Identify impacted stream corridors.
	13.2	creeks & streams	o Project 13.2.2: Secure resources to advance stream restoration.
	13.2	creeks & streams	o Project 13.2.3: Implement stream restoration projects.
Goal 14	14.4	Willamette Floodplain	o Project 14.4.1: Collaborate with partners to convene a round table of stakeholders and neighbors to discuss and identify floodplain enhancement and restoration opportunities within the Seavey Floodplain along the lower Coast Fork of the Willamette.

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	14.4	Willamette Floodplain	o Project 14.4.2: Collaborate with partners to convene a round table of stakeholders and neighbors to discuss and identify floodplain enhancement and restoration opportunities along the lower Middle Fork of the Willamette.
Projects Scheduled for Implementation 2023 - 2027			
Goal 1	1.1	visitor experience	o Project 1.1.3: Post Stewardship Program Project or Activity updates at Trail Head Kiosks to inform park visitors about area closures or habitat and vegetation management activity in progress in proximity to the trail.
	1.2	visitor experience	o Project 1.2.1: Develop vegetation management protocols for all parking areas within the HBRA.
	1.2	visitor experience	o Project 1.2.2: Remove vegetation to maintain sightlines to enhance public safety and deter property crime.
	1.7	visitor experience	o Project 1.7.3: Maintain viewpoints and benches.
Goal 9	9.2	Bradshaw's lomatium & wet prairie	o Project 9.2.3: Collaborate with Partners to use conservation easements to protect wet prairie on nearby private properties.
Goal 10	10.1	All conservation targets	o Project 10.1.3: Process data and identify the types of non-native animal species observed in and around HBRA.
	10.4	All conservation targets	o Project 10.4.1: Collaborate with ODFW to survey and monitor native and non-native wildlife game species within the HBRA.
	10.5	All conservation targets	o Project 10.5.1.: Collaborate with ODFW to trap and remove non-native animal species, such as Wild Turkeys, that pose the greatest threat to conservation targets and native animals that are known to occur within the greater Mount Pisgah area.
Goal 11	11.2	All conservation targets	o Project 11.2.1: Monitor all Stewardship Zones for all invasive species noted on the EDRR watch list.
	11.2	All conservation targets	o Project 11.2.2: Collaborate with Partners to recruit and train volunteers to assist with monitoring activities.
	11.3	All conservation targets	o Project 11.3.1: Manage patches of invasive species adjacent to roads and trails and within parking areas and power line easements.

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species as part of Management Unit specific restoration investments.
	11.4	All conservation targets	o Project 11.4.1: Manage or suppress species classified as "secondary invaders" along roads, trail corridors and within parking areas or powerline easements.
	11.9	All conservation targets	o Project 11.9.2: Collaborate with Partners to host an invasive species management workshop
	11.9	All conservation targets	o Project 11.9.3: Collaborate with Partners to secure funding to manage invasive species on adjacent lands.
	11.11	All conservation targets	o Project 11.11.1: Collaborate with BPA to manage large areas within the powerline easement occupied by invasive species in conjunction with their three year system wide vegetation management cycle.
Goal 12	12.2	creeks & streams	o Project 12.2.2: Secure resources to replace culverts or implement other retrofits to improve fish passage in the balance of sites identified during the inventory.
Goal 13	13.2	creeks & streams	o Project 13.2.2: Secure resources to advance stream restoration.
	13.2	creeks & streams	o Project 13.2.3: Implement stream restoration projects.
	13.3	creeks & streams	o Project 13.3.1: Coordinate with livestock producers to identify and evaluate opportunities to utilize grazing as a means to manage vegetation in a manner that enhances conservation target habitats.
	13.3	creeks & streams	o Project 13.3.2: Collaborate with a livestock producer(s) to implement a pilot project to assess the benefits of grazing in conservation target habitats including oak woodland, prairie, savanna, and wet prairie while minimizing adverse affects to creeks and streams.
Projects Scheduled for Implementation 2028 - 2032			
Goal 1	1.1	visitor experience	o Project 1.1.3: Post Stewardship Program Project or Activity updates at Trail Head Kiosks to inform park visitors about area closures or habitat and vegetation management activity in progress in proximity to the trail.
	1.2	visitor experience	o Project 1.2.1: Develop vegetation management protocols for all parking areas within the HBRA.

Howard Buford Recreation Area			Acres
Park-Wide Projects			**2214**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	1.2	visitor experience	o Project 1.2.1: Remove vegetation to maintain sightlines to enhance public safety and deter property crime.
	1.7	visitor experience	o Project 1.7.3: Maintain viewpoints and benches.
Goal 11	11.2	All conservation targets	o Project 11.2.1: Monitor all Stewardship Zones for all invasive species noted on the EDRR watch list.
	11.2	All conservation targets	o Project 11.2.2: Collaborate with Partners to recruit and train volunteers to assist with monitoring activities.
	11.3	All conservation targets	o Project 11.3.1: Manage patches of invasive species adjacent to roads and trails and within parking areas and power line easements.
	11.4	All conservation targets	o Project 11.4.1: Manage or suppress species classified as "secondary invaders" along roads, trail corridors and within parking areas or powerline easements.
	11.9	All conservation targets	o Project 11.9.2: Collaborate with Partners to host an invasive species management workshop.
	11.9	All conservation targets	o Project 11.9.3: Collaborate with Partners to secure funding to manage invasive species on adjacent lands.
	11.10	All conservation targets	o Project 11.10.1: Collaborate with Partners to assess mechanisms to fund an endowment.
	11.11	All conservation targets	o Project 11.11.1: Collaborate with BPA to manage large areas within the powerline easement occupied by invasive species in conjunction with their three year system wide vegetation management cycle.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
4
2
0
0.25
0.5
Miles
North Bottomlands Management Unit/Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Pasture
Savanna - Good Condition
Upland Conifer Forest
Upland Hardwood Forest
Oak Woodland
Oak-Conifer Woodland
Riparian Mixed Upland Forest
Riparian Bottomland Forest
Forested Wetland
Scrub Wetland
Gravel Bar
Water
Stewardship Facilities
Parking & Roads
Historic Facilities
Event Facilities
2: Mt Pisgah Arboretum
4: Western Uplands
N

Focal Conservation Target or Other Habitat Net Change: **North Bottomlands Stewardship Zone (166 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	2.1	2.1	2.1	-
Stewardship Facilities	0	1.7	4.6	1.7	2.9
Visitor Experience - Event Facilities	0	2.2	5.5	2.2	3.3
Visitor Experience - Parking Areas & Roads	0	9.3	9.3	9.3	-
Savanna	0	0.1	21.2	0.1	21.1
Upland Prairie	33.1	0	46.3	-33.1	46.3
Wet Prairie	10.6	0	3.3	-10.6	3.3
Oak Woodland	0	0	4.4	-	4.4
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	1.0	2.4	1.0	1.4
Riparian Bottomland Forest	122.3	26.9	53.3	-95.4	26.4
Upland Conifer Forest	0	8.9	2.5	8.9	-6.4
Upland Hardwood Forest	0	15.9	6.2	15.9	-9.7
Other non-target cover types	0.1	97.9	4.8	97.8	-93.0

Stewardship Zone	Management Unit	Acres
North Bottomlands	not applicable	**166**

Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Stewardship Activities completed 2008 - 2017			
			o Managed small patches of invasive species to suppress their spread.
			o Managed large areas occupied by invasive species.
			o Suppressed "secondary invaders" along roads, trail corridors and within parking areas.
			o Managed false brome.
			o Located and manage invasive species including English hawthorn, black walnut, common pear, myrobalan plum, and sweet cherry.
			o Prepared and incorporated protocols and conditions of use into special use permits for North Bottomlands events.
			o Defined and included best management practices for invasive plant treatments as a condition of use for event organizers.
			o Managed non-native blackberry and other invasive plant species within the North Bottomlands.
			o Coordinated with Partners and area farmers to manage old pastures for hay production.
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects.
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plans (2022).
	6.3	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.

Stewardship Zone	Management Unit	Acres
North Bottomlands	not applicable	**166**

Goal	Supporting Strategy	Benefitting Conservation Target	Project
	6.3	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie (2022).
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
Goal 9	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.1: Propagate seed and plugs of Bradshaw's lomatium at the Friends Native Plant nursery.
Goal 11	11.3	All conservation targets	o Project 11.3.1: Manage patches of invasive species adjacent to roads and trails and within parking areas and power line easements.
	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread.
	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
Goal 14	14.1	Willamette Floodplain	o Project 14.1.1: Survey the Thompson Slough channel corridor and adjacent floodplain and install dataloggers and staff gages within the lowest reaches of the floodplain.
	14.1	Willamette Floodplain	o Project 14.1.2: Monitor hydrology within the Thompson Slough channel corridor and adjacent floodplain.
	14.1	Willamette Floodplain	o Project 14.1.3: Monitor and document wildlife along Thompson Slough and in the adjacent floodplain.

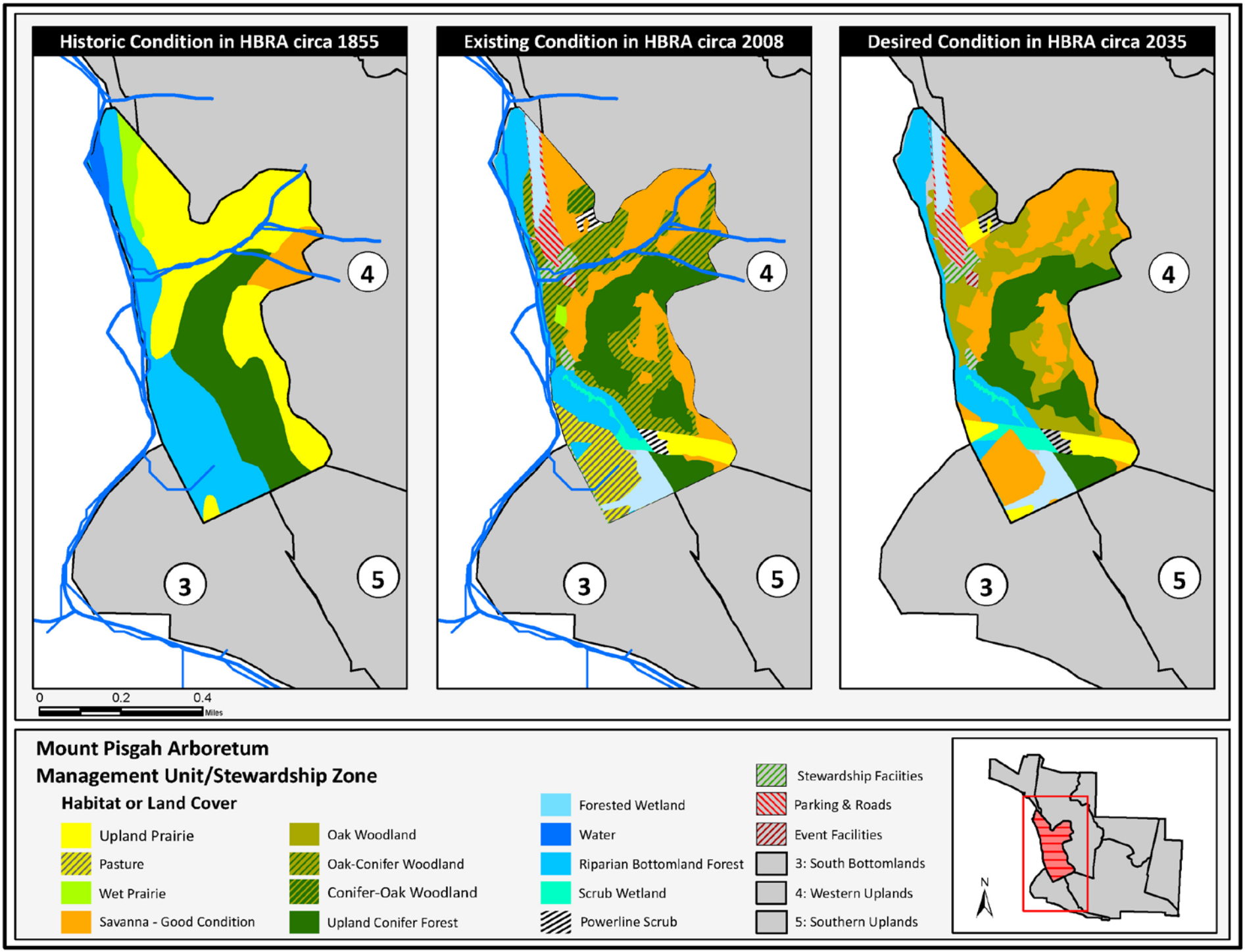
Stewardship Zone		Management Unit	Acres
North Bottomlands		not applicable	**166**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	14.1	Willamette Floodplain	o Project 14.1.4 Collaborate with Partners to design & permit prescriptions and develop site engineering plans to restore Thompson Slough channel corridor and adjacent floodplain.
	14.1	Willamette Floodplain	o Project 14.1.5: Manage invasive species within the Thompson Slough channel corridor and adjacent floodplain in preparation for site construction.
	14.1	Willamette Floodplain	o Project 14.1.6: Implement restoration plans including site construction along the Thompson Slough channel corridor and within the adjacent floodplain.
	14.2	Willamette Floodplain	o Project 14.2.1: Survey the sloughs and adjacent floodplain in proximity to the North Parking lot in the North Bottomlands and install dataloggers and staff gages within the lowest reaches of the floodplain.
	14.2	Willamette Floodplain	o Project 14.2.2: Monitor hydrology within the proximity to the North Parking lot in the North Bottomlands.
	14.2	Willamette Floodplain	o Project 14.2.3 Collaborate with Partners to design & permit prescriptions and develop site engineering plans to remove plugs and restore sloughs in proximity to the North Parking lot in the North Bottomlands.
	14.2	Willamette Floodplain	o Project 14.2.4: Manage invasive species within proximity to the North Parking lot in the North Bottomlands in preparation for site construction and grading associated with floodplain restoration.
	14.2	Willamette Floodplain	o Project 14.2.5: Implement restoration plans including site construction in proximity to the North Parking lot in the North Bottomlands.
Goal 15	15.1	visitor experience	o Project 15.1.1: Develop event protocols and conditions of use that can be incorporated into special use permits for North Bottomlands events.
	15.1	visitor experience	o Project 15.1.2: Define and include best management practices for invasive plant treatments as a condition of use for event organizers.
	15.2	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, wet prairie, & Willamette Floodplain.	o Project 15.2.1: Continue to treat non-native blackberry and other invasive plant species within the North Bottomlands.

Stewardship Zone	Management Unit	Acres
North Bottomlands	not applicable	**166**

Goal	Supporting Strategy	Benefitting Conservation Target	Project
	15.2	visitor experience	o Project 15.2.2: Construct seed removal stations at each trailhead that accommodate hikers, equestrians and dog walkers.
	15.2	visitor experience	o Project 15.2.3: Define and implement vegetation management objectives to facilitate recreation and enhance habitat in the North Bottomlands. (Examples may include controlling poison oak, deadly nightshade, and poison hemlock, or using vegetative barriers to impede entry into sensitive habitats.).
	15.2	visitor experience	o Project 15.2.4: Utilize trailhead temporary signage during North Bottomlands events ("sandwich board" or equivalent) to inform trail users of the importance of using seed removal stations to prevent movement of invasive weeds from event area into the natural areas of the park.
	15.3	visitor experience	o Project 15.3.1: Lane County park managers and partners reference the *Habitat Management Plan* and consider 'context sensitive' design alternatives when reviewing, approving and implementing infrastructure improvements in the North Bottomlands. (Examples may include renovation of Kienzle house and barn, trail and equestrian developments, etc.)
	15.3	All conservation targets	o Project 15.3.2: Identify potential negative conservation impacts of each priority improvement. Considering financial, logistical and technical feasibility and constraints, and design improvements to minimize negative impacts to park safety as well as adjacent habitats.
	15.4	visitor experience	o Project 15.4.1: Install temporary signage near future conservation project areas in the North Bottomlands that educate park users about the parallel goals to enhance conservation targets and continue recreation uses in the North Bottomlands.
	15.4	visitor experience	o Project 15.4.2: Staff booths at special events that educate the public on future conservation actions and ongoing recreation uses in the North Bottomlands.
	15.4	visitor experience	o Project 15.4.3: Install signage in appropriate locations that educate the public about County conservation goals in higher use recreation areas.

Stewardship Zone		Management Unit	Acres
North Bottomlands		not applicable	**166**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	15.4	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, wet prairie, & visitor experience, Willamette Floodplain.	o Project 15.4.4: Implement demonstration conservation projects in higher use recreation areas.
	15.5	All conservation targets	o Project 15.5.1: Collaborate with Friends of Buford Park & Mt. Pisgah to develop a lease agreement for the Native Plant Nursery facility. Consider expanding the footprint of the production area to afford ample acreage to support plant material production to advance implementation of the Habitat Management Plan as well as conservation actions by Rivers to Ridges Partners or other partners working in the Willamette Valley.
	15.6	All conservation targets	o Project 15.6.1: Coordinate with Partners and area farmers to manage old pastures for hay production.
	15.7	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, wet prairie, & visitor experience, Willamette Floodplain.	o Project 15.7.1: Develop conservation actions and best management practices (BMPs) for the North Bottomlands for a 100-foot riparian revegetation area adjacent to the Coast Fork Willamette River, in conjunction with planning for the Thompson Slough restoration project.
	15.8	visitor experience	o Project 15.8.1: Collaborate with Partners to design a trail through the North Bottomlands that addresses both ecological and visitor access goals.
	15.8	visitor experience	o Project 15.8.2: Collaborate with Partners to maintain a temporary mowed trail to evaluate and adjust the alignment.
	15.8	visitor experience	o Project 15.8.3: Collaborate with Partners to construct a permanent trail
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie (2022).
Goal 11	11.3	All conservation targets	o Project 11.3.1: Manage patches of invasive species adjacent to roads and trails and within parking areas and power line easements.
	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread.
	11.4	All conservation targets	o Project 11.4.1: Manage or suppress species classified as "secondary invaders" along roads, trail corridors and within parking areas.

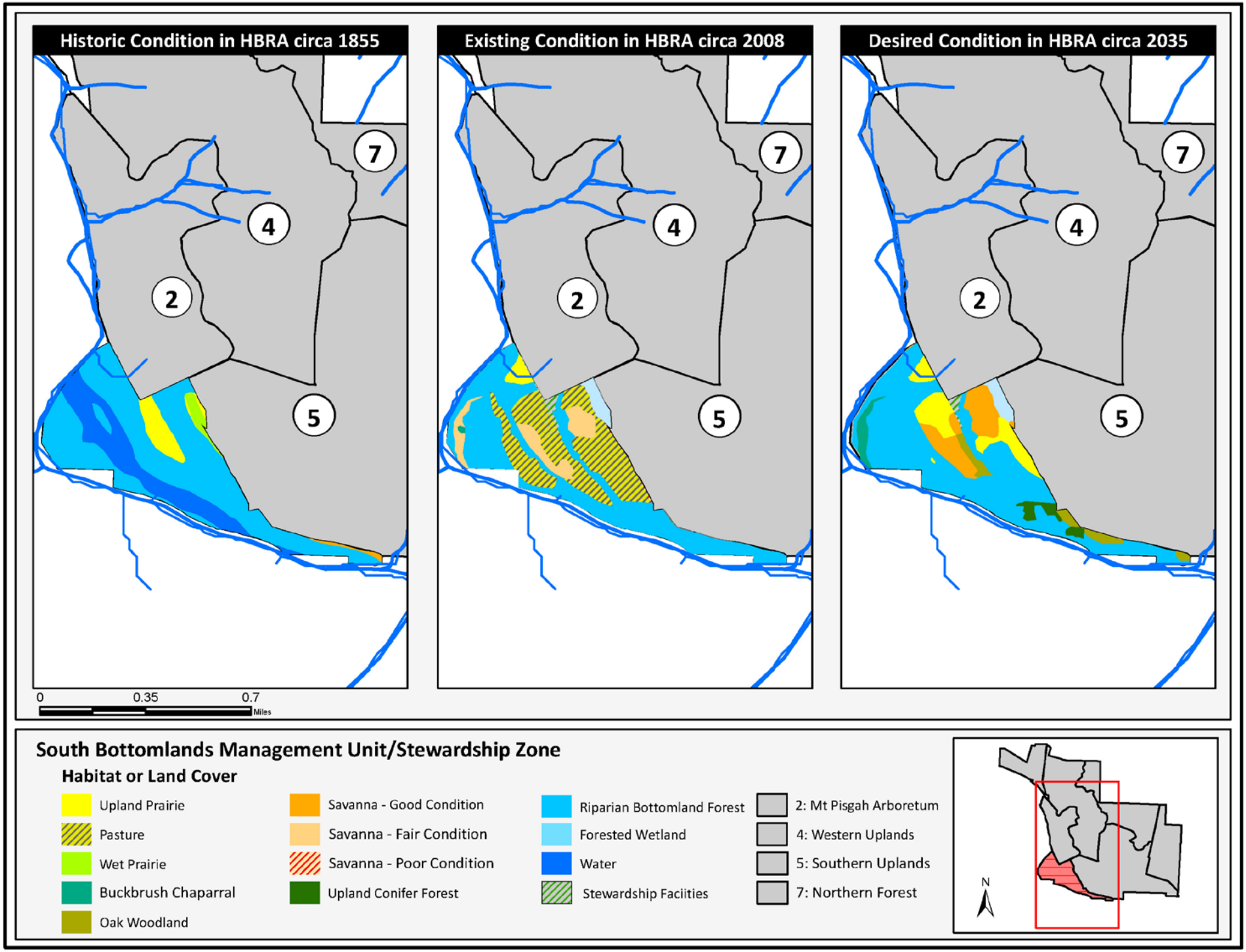
Stewardship Zone		Management Unit	Acres
North Bottomlands		not applicable	**166**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Goal 15	15.8	visitor experience	o Project 15.8.3: Collaborate with partners to construct a permanent trail.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
4
3
5
0
0.2
0.4
Miles
Mount Pisgah Arboretum
Management Unit/Stewardship Zone
Habitat or Land Cover
Upland Prairie
Pasture
Wet Prairie
Savanna - Good Condition
Oak Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Upland Conifer Forest
Forested Wetland
Water
Riparian Bottomland Forest
Scrub Wetland
Powerline Scrub
Stewardship Faciities
Parking & Roads
Event Facilities
3: South Bottomlands
4: Western Uplands
5: Southern Uplands
N

Focal Conservation Target or Other Habitat Net Change: **Mount Pisgah Arboretum Stewardship Zone (203 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	3.9	3.0	3.9	-0.9
Visitor Experience - Event Facilities	0	0.7	0	0.7	-0.7
Visitor Experience - Parking Areas & Roads	0	5.8	6.0	5.8	0.2
Savanna	7.2	45.9	69.0	38.7	23.1
Upland Prairie	75.0	0	1.0	-75.0	1.0
Wet Prairie	6.1	0.9	0	-5.2	-0.9
Oak Woodland	0	0.1	45.0	0.1	44.9
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	10.6	10.0	10.6	-0.6
Riparian Bottomland Forest	40.0	21.9	24.0	-18.1	2.1
Upland Conifer Forest	75.0	35.0	40.0	-40.0	5.0
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	78.5	5.3	78.5	-73.2

Stewardship Zone		Management Unit	Acres
Mt. Pisgah Arboretum		not applicable	**203**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2018 - 2022			
Goal 1	1.1	visitor experience	o Project 1.1.7: Develop a riverfront trail plan to establish preferred routes to access the river for the public and for first responders (in the case of emergencies) while protecting sensitive habitats. Consider closing certain access points to the river during nesting season and other times when disturbance to wildlife will result in an adverse impact.
	1.1	visitor experience	o Project 1.1.8: Survey the riverfront and delineate sensitive habitat features.
	1.1	visitor experience	o Project 1.1.9: Improve parking areas, construct trails, and develop supporting infrastructure to improve access to the river.
Goal 2	2.2	all conservation targets	o Project 2.2.2: Implement interpretive plan for 203-acre Arboretum lease area.
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Projects Scheduled for Implementation 2023 - 2027			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions within each management unit.
Goal 6	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and grind stumps of small trees along the edge of closed woodland and forest.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.

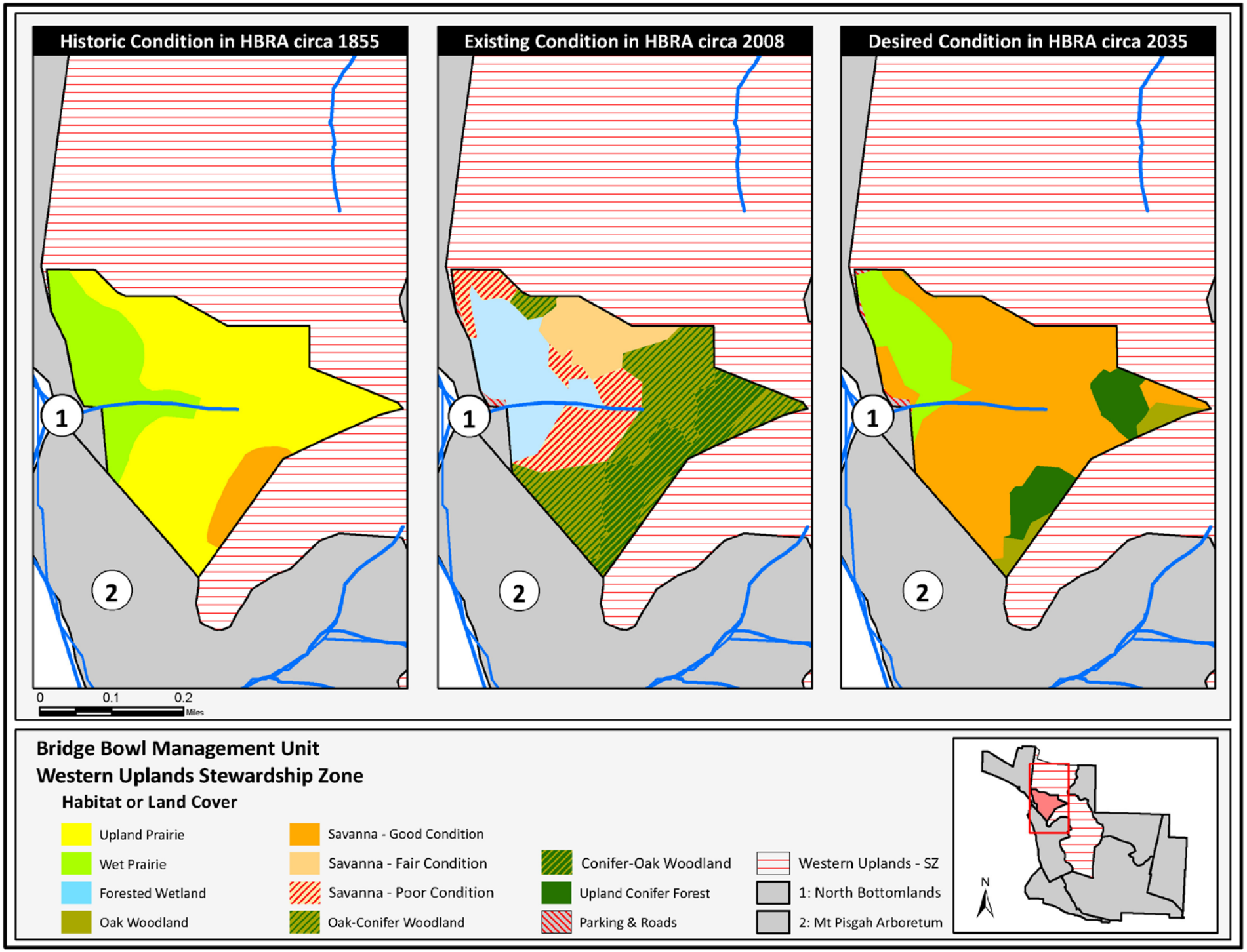
Stewardship Zone		Management Unit	Acres
Mt. Pisgah Arboretum		not applicable	**203**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Goal 9	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft plots within wet prairie restoration sites.
Goal 11	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread within Mt. Pisgah Arboretum or throughout the HBRA.
	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.5	All conservation targets	o Project 11.5.2: Intensively manage Maltese Star Thistle as part of Management Unit specific restoration investments.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Goal 12	12.2	creeks & streams	o Project 12.2.2: Secure resources to replace culverts or implement other retrofits to improve fish passage in the balance of sites identified during the inventory.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plan.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
4
2
5
0
0.35
0.7
Miles
South Bottomlands Management Unit/Stewardship Zone
Habitat or Land Cover
Upland Prairie
Pasture
Wet Prairie
Buckbrush Chaparral
Oak Woodland
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Upland Conifer Forest
Riparian Bottomland Forest
Forested Wetland
Water
Stewardship Facilities
2: Mt Pisgah Arboretum
4: Western Uplands
5: Southern Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **South Bottomlands Stewardship Zone (155 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	2.1	2.1	2.1	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	1.4	14.8	19.0	13.4	4.2
Upland Prairie	10.3	3.3	18.0	-7.0	14.7
Wet Prairie	3.2	0	0	-3.2	-
Oak Woodland	0	0	7.2	-	7.2
Buckbrush Chaparral	0	0.4	4.3	0.4	3.9
Forested Wetland	0	3.8	3.7	3.8	-0.1
Riparian Bottomland Forest	103.7	75.4	95.8	-28.3	20.4
Upland Conifer Forest	0	0	4.6	-	4.6
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	36.0	55.0	0.0	19.0	-55.0

Stewardship Zone		Management Unit	Acres
South Bottomlands		not applicable	**155**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o manage invasive species
			o restore floodplain connectivity
			o prepare and implement ecological burn plans
			o install woody plants to nurture desired future conditions
			o broadcast diverse seed mixes
Projects Scheduled for Implementation 2018 - 2022			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.
Goal 7	7.2	Buckbrush chaparral	o Project 7.2.2: manage invasive vegetation and broadcast seed or plant Buckbrush in designated areas of the South Bottomlands Stewardship Zone

Stewardship Zone		Management Unit	Acres
South Bottomlands		not applicable	**155**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 14	14.3	Willamette Floodplain	o Project 14.3.1: Survey the South Bottomlands sloughs and adjacent floodplain and install dataloggers and staff gages within the lowest reaches of the floodplain.
	14.3	Willamette Floodplain	o Project 14.3.2: Monitor hydrology within the South Bottomlands sloughs and adjacent floodplain
	14.3	Willamette Floodplain	o Project 14.3.3: Monitor and document wildlife along South Bottomlands sloughs and in the adjacent floodplain.
	14.3	Willamette Floodplain	o Project 14.3.5: Manage invasive species within the South Bottomlands sloughs and adjacent floodplain in preparation for site construction.
	14.3	Willamette Floodplain	o Project 14.3.6: Implement restoration plans including site construction along the South Bottomlands sloughs and within the adjacent floodplain.

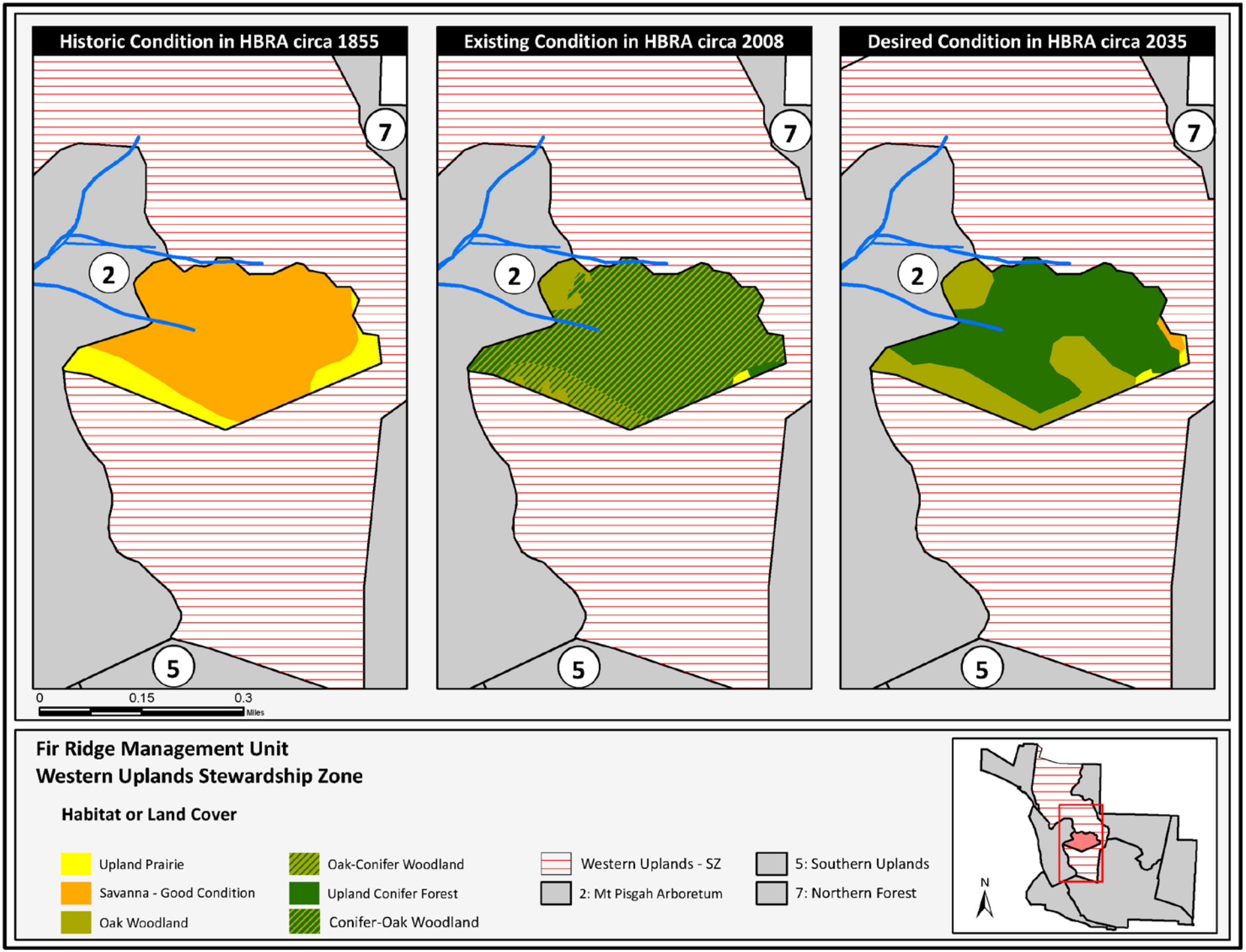

Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
1
2
0
0.1
0.2
Miles
Bridge Bowl Management Unit
Western Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Forested Wetland
Oak Woodland
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Oak-Conifer Woodland
Conifer-Oak Woodland
Upland Conifer Forest
Parking & Roads
Western Uplands - SZ
1: North Bottomlands
2: Mt Pisgah Arboretum
N

Focal Conservation Target or Other Habitat Net Change: **Bridge Bowl Management Unit (63 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0.4	0.4	0.4	-
Savanna	4.1	18.5	43.6	14.4	25.1
Upland Prairie	43.7	0	0	-43.7	
Wet Prairie	15.1	0	9.3	-15.1	9.3
Oak Woodland	0	0	2.6	-	2.6
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	12.9	0	12.9	-12.9
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0	0	7.0	-	7.0
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	31.1	0.0	31.1	-31.1

Stewardship Zone	Management Unit	Acres	
Western Uplands	Bridge Bowl	63	
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o Managed patches of invasive species adjacent to roads and trails and within parking areas and power line easements.
			o Managed small patches of invasive species to suppress their spread
			o Managed or suppress species classified as "secondary invaders" along roads, trail corridors and within parking areas
			o Intensively managed false brome
			o Project 1.1.1: Maintain a permanent 'notice' board at the three trailheads and within the Arboretum to inform park users of areas of project activity or closures. Parking Areas: includes West (Main/MPA) lot, North Lot, and East lot.
			o Project 1.1.2: Maintain and update the HBRA trail map to clearly indicate segments of closed trail.
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects .
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plans (2019).
	6.3	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.

Stewardship Zone		Management Unit	Acres
Western Uplands		**Bridge Bowl**	**63**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	6.3	oak woodland, Oregon Vesper Sparrow, other significant habitats, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie (2020).
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.3: Restore wet prairie(s) in identified project areas
	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.4: Restore wet prairie within the balance of areas identified under the scope of project 9.1.1
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft plots within wet prairie restoration sites.
Goal 11	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread.
	11.3		o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.

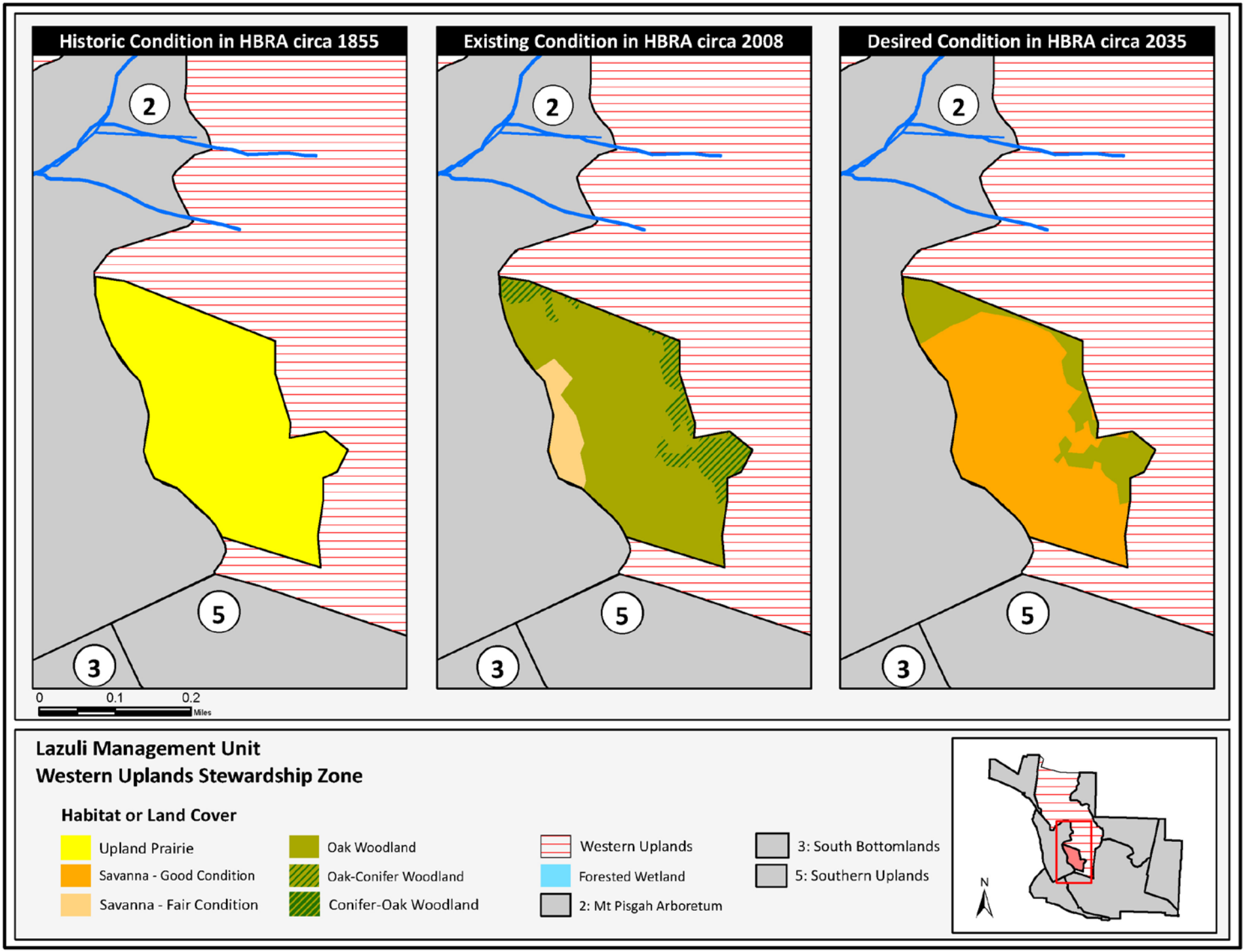
Stewardship Zone		Management Unit	Acres
Western Uplands		**Bridge Bowl**	**63**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie (2022).
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
2
5
0
0.15
0.3
Miles
Fir Ridge Management Unit
Western Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Savanna - Good Condition
Oak Woodland
Oak-Conifer Woodland
Upland Conifer Forest
Conifer-Oak Woodland
Western Uplands - SZ
2: Mt Pisgah Arboretum
5: Southern Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Fir Ridge Management Unit (46 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	38.5	0.0	0.5	-38.5	0.5
Upland Prairie	7.6	0.2	0.5	-7.4	0.3
Wet Prairie	0	0	0		
Oak Woodland	0	2.7	13.8	2.7	11.1
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0	0.4	31.3	0.4	30.9
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	42.7	0	42.7	-42.7

Stewardship Zone		Management Unit	Acres
Western Uplands		Fir Ridge	46
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.
Projects Scheduled for Implementation 2023 - 2027			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects.
Goal 6	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.

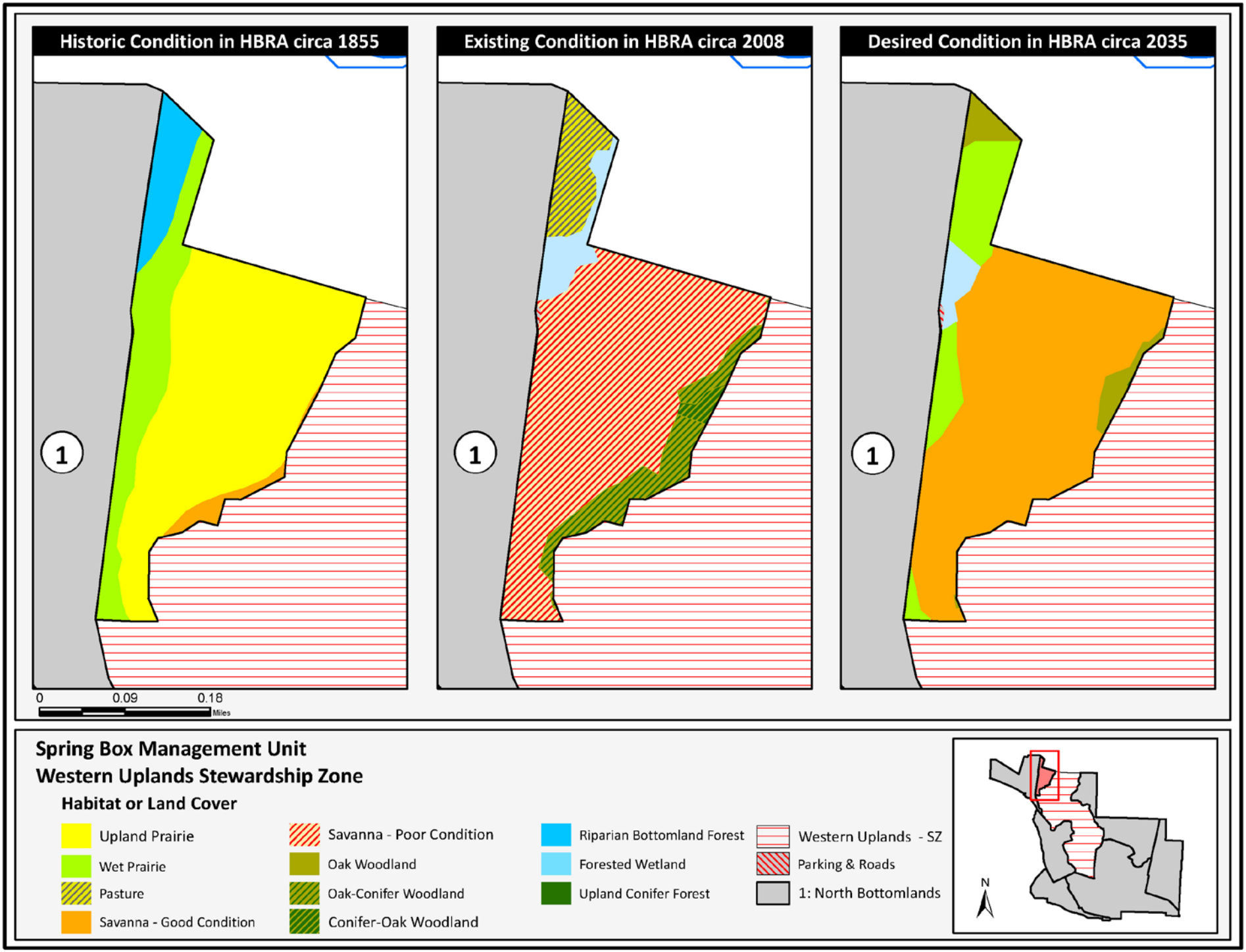
Stewardship Zone		Management Unit	Acres
Western Uplands		**Fir Ridge**	**46**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2028 - 2032			
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
2
5
3
0
0.1
0.2
Miles
Lazuli Management Unit
Western Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Savanna - Good Condition
Savanna - Fair Condition
Oak Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Western Uplands
Forested Wetland
2: Mt Pisgah Arboretum
3: South Bottomlands
5: Southern Uplands
N

Focal Conservation Target or Other Habitat Net Change: **Lazuli Management Unit (41 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	0	3.8	31.4	3.8	27.6
Upland Prairie	41.0	0	0	-41.0	-
Wet Prairie	0	0	0		
Oak Woodland	0	30.2	9.4	30.2	-20.8
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0	0	0	-	-
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	7.0	0	7.0	-7.0

Stewardship Zone		Management Unit	Acres
Western Uplands		**Lazuli**	**41**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o manage patches of Maltese starthistle.
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plans for the Lazuli MU (2022).
Projects Scheduled for Implementation 2023 - 2027			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects.
Goal 6	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.

Stewardship Zone	Management Unit	Acres	
Western Uplands	**Lazuli**	**41**	
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.5	All conservation targets	o Project 11.5.2: Intensively manage Maltese Star Thistle as part of Management Unit specific restoration investments.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.

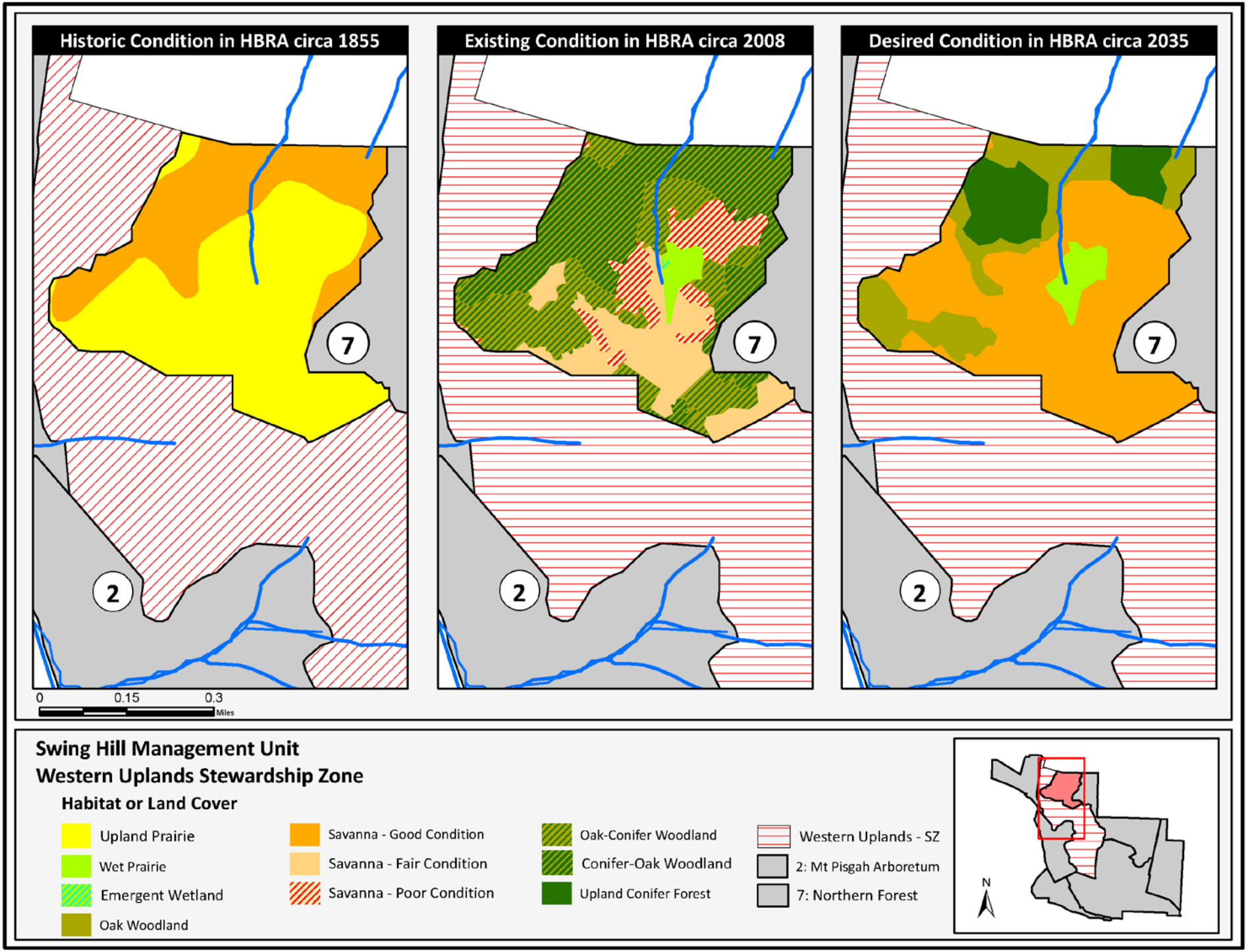

Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
1
1
1
0
0.09
0.18
Miles
Spring Box Management Unit
Western Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Pasture
Savanna - Good Condition
Savanna - Poor Condition
Oak Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Riparian Bottomland Forest
Forested Wetland
Upland Conifer Forest
Western Uplands - SZ
Parking & Roads
1: North Bottomlands
N

Focal Conservation Target or Other Habitat Net Change: **Spring Box Management Unit (43 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0.1	0.1	0.1	-
Savanna	1.2	31.3	33.3	30.1	2.0
Upland Prairie	29.2	0	0	-29.2	-
Wet Prairie	9.2	0	6.3	-9.2	6.3
Oak Woodland	0	0	2.3		2.3
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	2.5	1.3	2.5	-1.2
Riparian Bottomland Forest	3.7	0	0	-3.7	-
Upland Conifer Forest	0	0	0.01	-	0.01
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	9.5	0	9.5	-9.5

Stewardship Zone		Management Unit	Acres
Western Uplands		**Spring Box**	**43**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
		Savanna - 2012 projects	o manage blackberry (30ac)
		Oak woodland - 2012 projects	o manage blackberry (12ac)
		Savanna - 2013 projects	o broadcast simple seed mix (30ac)
		Oak woodland - 2013 projects	o broadcast simple seed mix (12ac)
		Savanna - 2014 projects	o prepare unit for ecological burn, ecological burn canceled (30ac)
		Oak woodland - 2014 projects	o Girdled select trees, removed small dimensional fir
		Savanna - 2015 projects	o implement ecological burn (30ac)
		Oak woodland - 2015 projects	o mow area (12ac)
		Savanna - 2015 projects	o broadcast diverse seed mix (30ac)
		Oak woodland - 2015 projects	o broadcasted seed & planted plugs (1ac)
		Savanna - 2016 projects	o install plugs of diverse forbs species (5ac)
		Savanna - 2017 projects	o manage invasive species (teasel) (5ac)
		Savanna - 2017 projects	o implement late season mow (15ac)
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
Goal 6	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas managed for oak woodland, prairie, savanna, and wet prairie.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.

Stewardship Zone		Management Unit	Acres
Western Uplands		**Spring Box**	**43**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.2: Secure resources to advance and support restoration of wet prairies.
	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.3: Restore wet prairie(s).
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft plots within wet prairie restoration sites.
Goal 11	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.

Stewardship Zone		Management Unit	Acres
Western Uplands		**Spring Box**	**43**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.

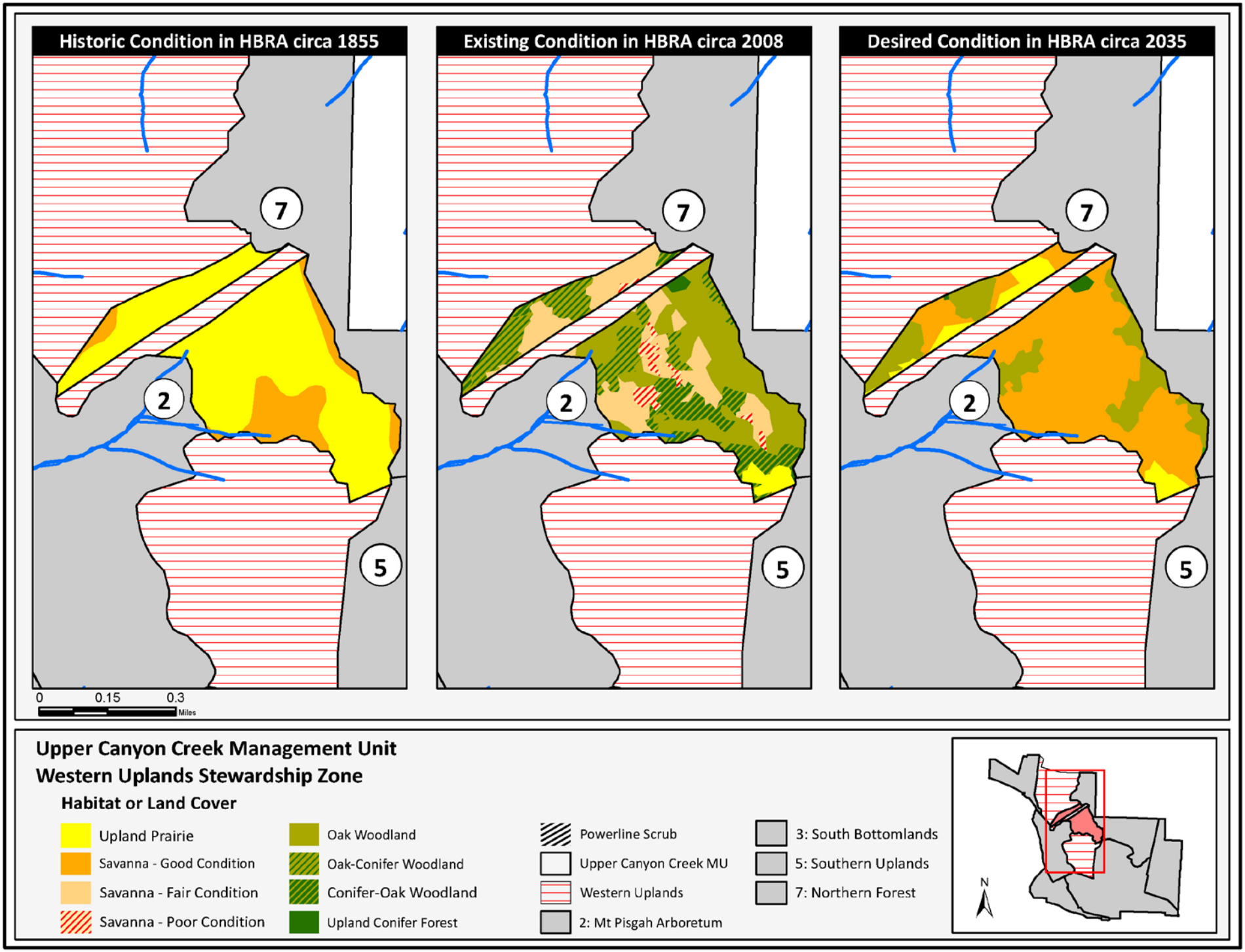

Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
2
0
0.15
0.3
Miles
Swing Hill Management Unit
Western Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Emergent Wetland
Oak Woodland
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Oak-Conifer Woodland
Conifer-Oak Woodland
Upland Conifer Forest
Western Uplands - SZ
2: Mt Pisgah Arboretum
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Swing Hill Management Unit (121 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	42.7	38.4	72.8	-4.3	34.4
Upland Prairie	78.2	0	0	-78.2	-
Wet Prairie		3.5	4.8	3.5	1.3
Oak Woodland	0	0	26.9	-	26.9
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0	0	16.4	-	16.4
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	79.1	0	79.1	-79.1

Stewardship Zone		Management Unit	Acres
Western Uplands		**Swing Hill**	**121**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions within Swing Hill MU.
	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects in Swing Hill MU as outlined in Appendix E.
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plan for Swing Hill MU (2021).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in Swing Hill MU.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.

Stewardship Zone		Management Unit	Acres
Western Uplands		**Swing Hill**	**121**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.3: Restore wet prairie in identified project areas within the Swing Hill MU.
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft plots within wet prairie restoration sites.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.4: Restore wet prairie within the balance of areas identified under the scope of project 9.1.1

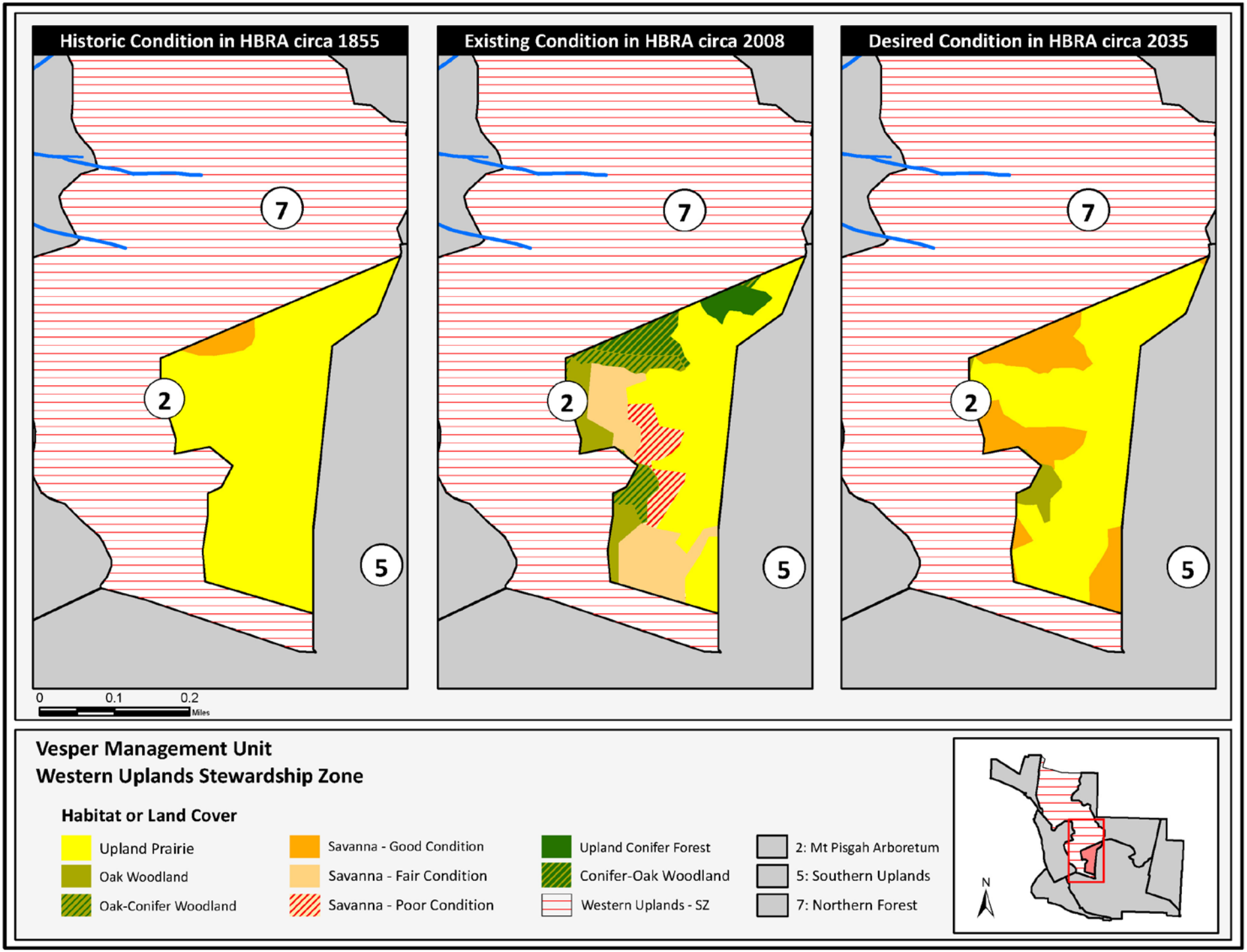
Stewardship Zone		Management Unit	Acres
Western Uplands		**Swing Hill**	**121**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
2
5
0
0.15
0.3
Miles
Upper Canyon Creek Management Unit
Western Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Oak Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Upland Conifer Forest
Powerline Scrub
Upper Canyon Creek MU
Western Uplands
2: Mt Pisgah Arboretum
3: South Bottomlands
5: Southern Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Upper Canyon Creek Management Unit (108 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	23.0	32.4	73.3	9.4	40.9
Upland Prairie	85.0	3.4	8.6	-81.6	5.2
Wet Prairie	0	0	0		
Oak Woodland	0	35.2	24.6	35.2	-10.6
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0	1.3	1.2	1.3	-0.1
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	35.7	0.3	35.7	-35.4

Stewardship Zone		Management Unit	Acres
Western Uplands		Upper Canyon Creek	108
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o manage invasive species
			o remove trees to establish desired future conditions
			o implement demonstration project including tours and presentations for the public and park users.
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Projects Scheduled for Implementation 2023 - 2027			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects.
Goal 6	6.1	All conservation targets	o Project 6.1.2: Prepare prescribed burn plans. (2024).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.

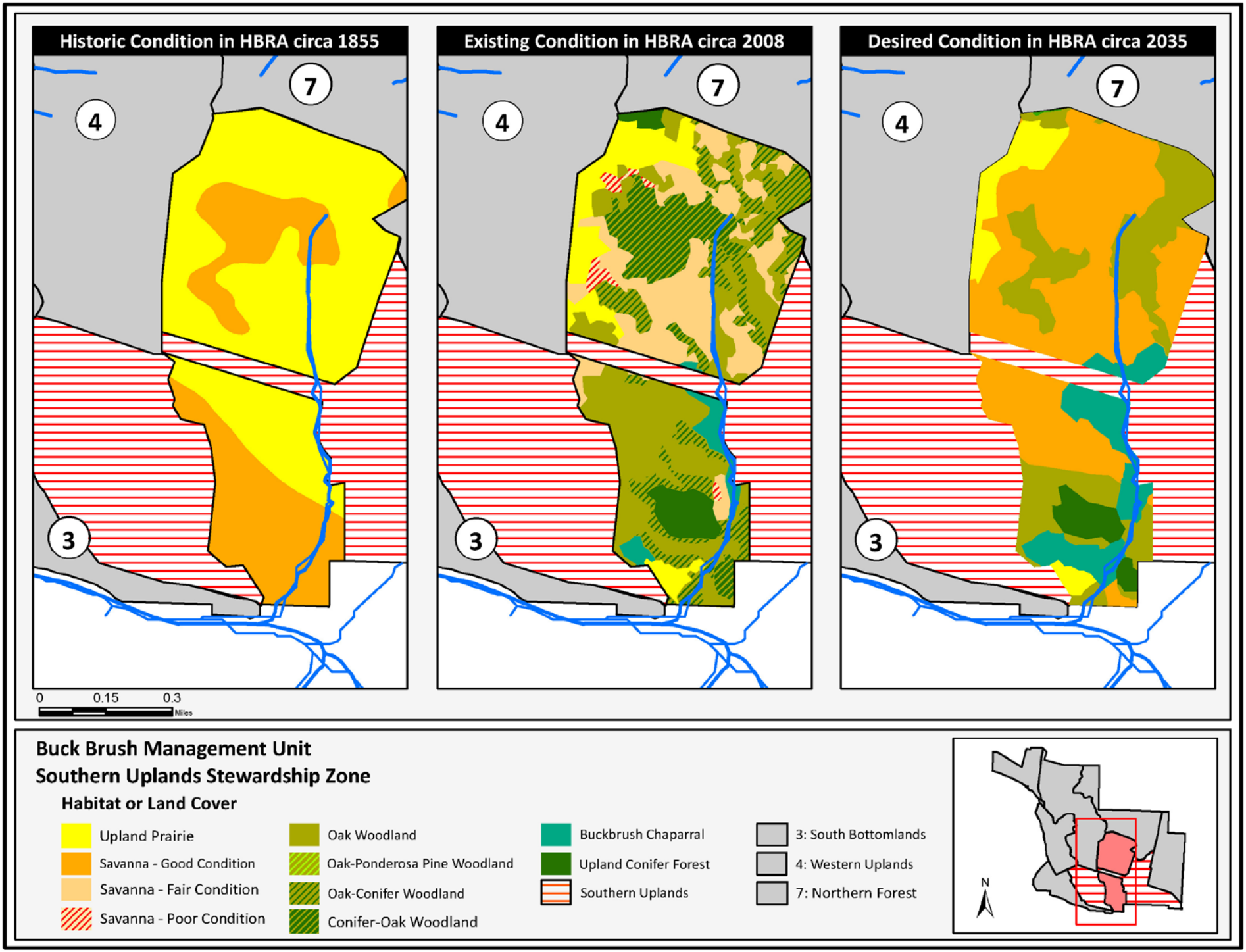
Stewardship Zone		Management Unit	Acres
Western Uplands		**Upper Canyon Creek**	**108**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burn
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
2
5
0
0.1
0.2
Miles
Vesper Management Unit
Western Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Oak Woodland
Oak-Conifer Woodland
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Upland Conifer Forest
Conifer-Oak Woodland
Western Uplands - SZ
2: Mt Pisgah Arboretum
5: Southern Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Vesper Management Unit (45 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	1.6	12.6	11.3	11.0	-1.3
Upland Prairie	43.4	20.8	31.8	-22.6	11.0
Wet Prairie	0	0	0		
Oak Woodland	0	3.6	1.8	3.6	-1.8
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0	1.7	0	1.7	-1.7
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	6.3	0	6.3	-6.3

Stewardship Zone		Management Unit	Acres
Western Uplands		Vesper	45
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o manage patches of Maltese starthistle.
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects.
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plans (2022).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burn
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.

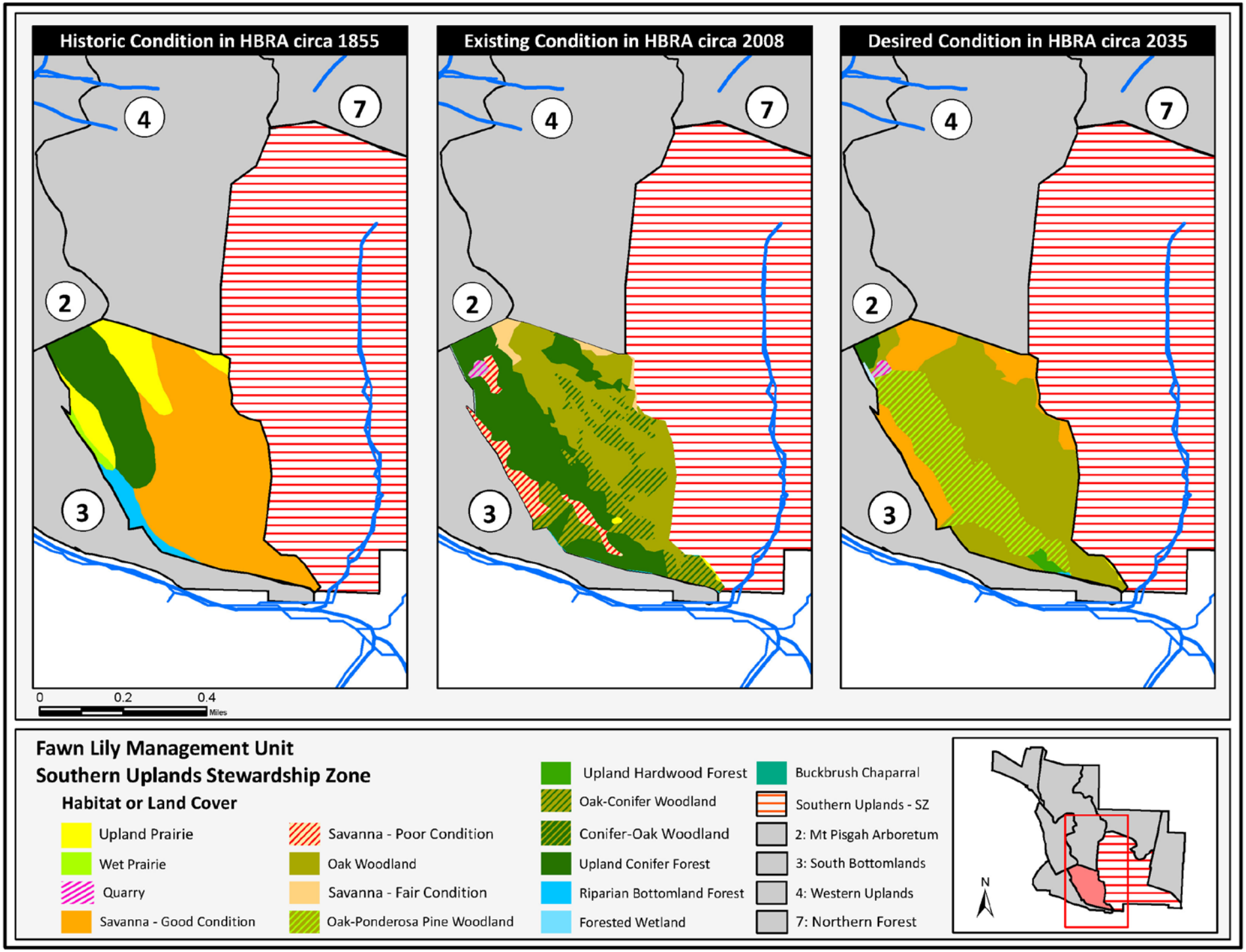
Stewardship Zone		Management Unit	Acres
Western Uplands		Vesper	45
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
Goal 11	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burn
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burn
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
4
3
0
0.15
0.3
Miles
Buck Brush Management Unit
Southern Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Oak Woodland
Oak-Ponderosa Pine Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Buckbrush Chaparral
Upland Conifer Forest
Southern Uplands
3: South Bottomlands
4: Western Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Buckbrush Management Unit (254 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	87.3	61.5	133.7	-25.8	72.2
Upland Prairie	166.4	29.5	16.4	-136.9	-13.1
Wet Prairie	0	0	0		
Oak Woodland	0	63.1	65.3	63.1	2.2
Buckbrush Chaparral	0	9.0	28.6	9.0	19.6
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0	11.2	9.8	11.2	-1.4
Upland Hardwood Forest	0	0	0.1	-	0.1
Other non-target cover types	0	79.5	0	79.5	-79.5

Stewardship Zone		Management Unit	Acres
Southern Uplands		Buckbrush	254
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o manage false brome (2008)
			o manage Maltese starthistle
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Projects Scheduled for Implementation 2023 - 2027			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects.
Goal 6	6.1	All conservation targets	o Project 6.1.2: Prepare prescribed burn plans (2025).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray regrowth of woody vegetation such as Armenian blackberry and Scotch broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.
Goal 7	7.1	Buckbrush chaparral	o Project 7.1.1: Prepare burn plan for buckbrush patches within the Buckbrush MU.
	7.1	Buckbrush chaparral	o Project 7.1.2: Collaborate with Oregon Department of Forestry East Lane District, Rivers to Ridges partners, and other fire management organizations to implement prescribed burns within at least 4 distinct units within the buckbrush chaparral habitat type. Units should be at least 5 acres and no larger than 13 acres in size. The size and form of unit will be determined with consideration of slope, aspect, and proximity to established control features such as Buckbrush Creek, Trail 3, Trail 5, & Trail 6.

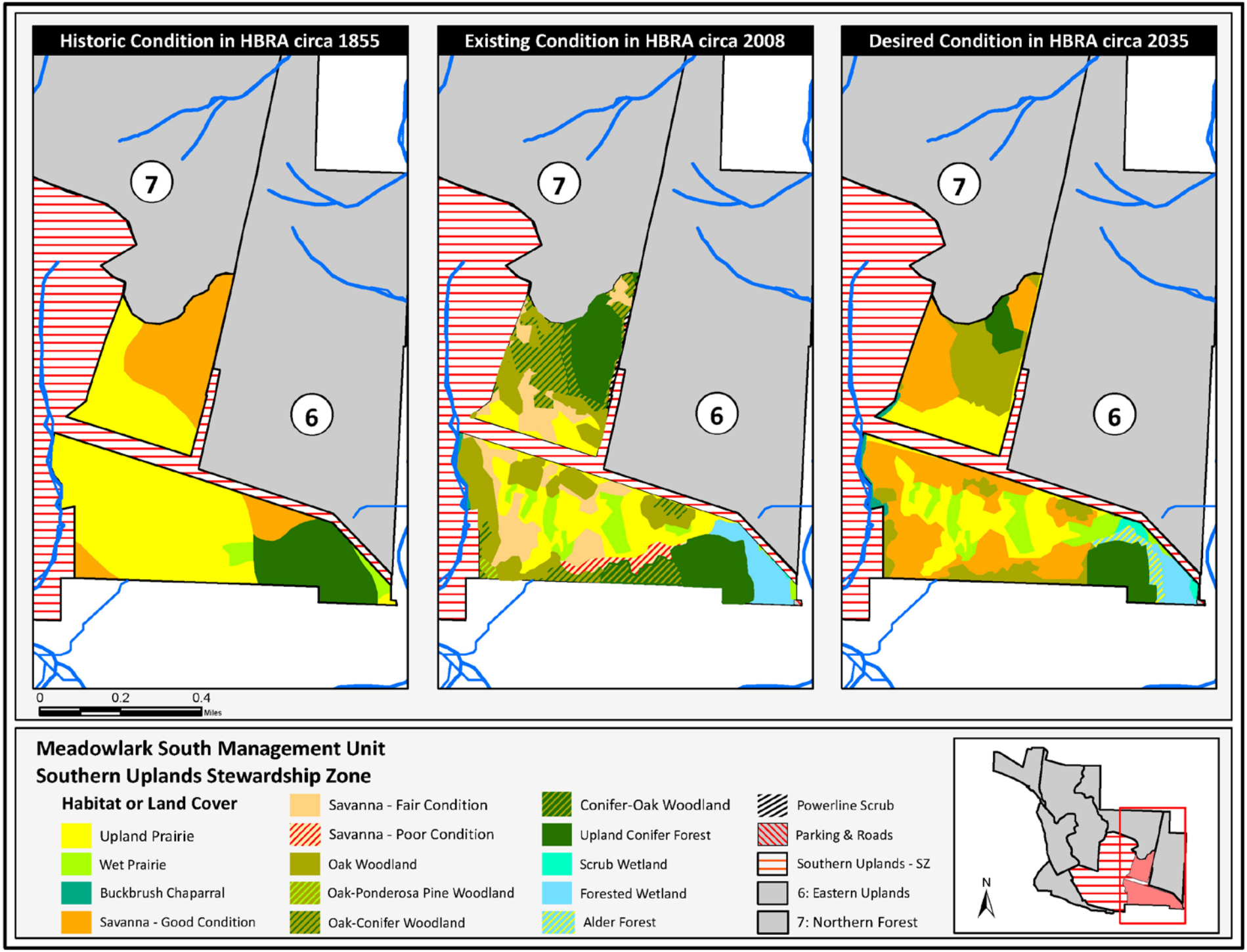
Stewardship Zone		Management Unit	Acres
Southern Uplands		**Buckbrush**	**254**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	7.2	Buckbrush chaparral	o Project 7.2.1: Manage invasive vegetation and broadcast seed or plant buckbrush in designated areas of the Buckbrush MU.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.5	All conservation targets	o Project 11.5.2: Intensively manage Maltese Star Thistle as part of Management Unit specific restoration investments.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burn
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
4
7
2
3
0
0.2
0.4
Miles
Fawn Lily Management Unit
Southern Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Quarry
Savanna - Good Condition
Savanna - Poor Condition
Oak Woodland
Savanna - Fair Condition
Oak-Ponderosa Pine Woodland
Upland Hardwood Forest
Oak-Conifer Woodland
Conifer-Oak Woodland
Upland Conifer Forest
Riparian Bottomland Forest
Forested Wetland
Buckbrush Chaparral
Southern Uplands - SZ
2: Mt Pisgah Arboretum
3: South Bottomlands
4: Western Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Fawn Lily Management Unit (139 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	84.6	13.2	22.6	-71.4	9.4
Upland Prairie	18.5	0.4	0.3	-18.1	-0.1
Wet Prairie	1.8	0.4	0	-1.4	-0.4
Oak Woodland	0	42.0	110.8	42.0	68.8
Buckbrush Chaparral	0	0.1	0.1	0.1	-
Forested Wetland	0	0.1	0.4	0.1	0.3
Riparian Bottomland Forest	5.9	0.1	0.1	-5.8	
Upland Conifer Forest	27.7	0	2.0	-27.7	2.0
Upland Hardwood Forest	0	0	1.0	-	1.0
Other non-target cover types	0	82.7	1.7	82.7	-81.0

Stewardship Zone		Management Unit	Acres
Southern Uplands		Fawn Lily	139
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o 2009: remove trees to establish desired future condition within 3ac treatment area.
			o manage invasive species
			o broadcast diverse seed mix and install plugs of native forbs
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Projects Scheduled for Implementation 2023 - 2027			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions within the Fawn Lily MU.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects as outlined in Appendix E.
Goal 6	6.1	All conservation targets	o Project 6.1.2: Prepare prescribed burn plans (2026).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 7	7.1	Buckbrush chaparral	o Project 7.1.2: Collaborate with Oregon Department of Forestry East Lane District, Rivers to Ridges partners, and other fire management organizations to implement prescribed burns within at least 4 distinct units within the buckbrush chaparral habitat type. Units should be at least 5 acres and no larger than 13 acres in size. The size and form of unit will be determined with consideration of slope, aspect, and proximity to established control features.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.

Stewardship Zone		Management Unit	Acres
Southern Uplands		**Fawn Lily**	**139**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.4: Restore wet prairie within the balance of areas identified under the scope of project 9.1.1
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.3: Plant plugs and broadcast seed of Bradshaw's lomatium within 1x100sq ft. plot within the balance of areas identified under the scope of project 9.1.1
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.5	All conservation targets	o Project 11.5.2: Intensively manage Maltese Star Thistle as part of Management Unit specific restoration investments.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burn
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.

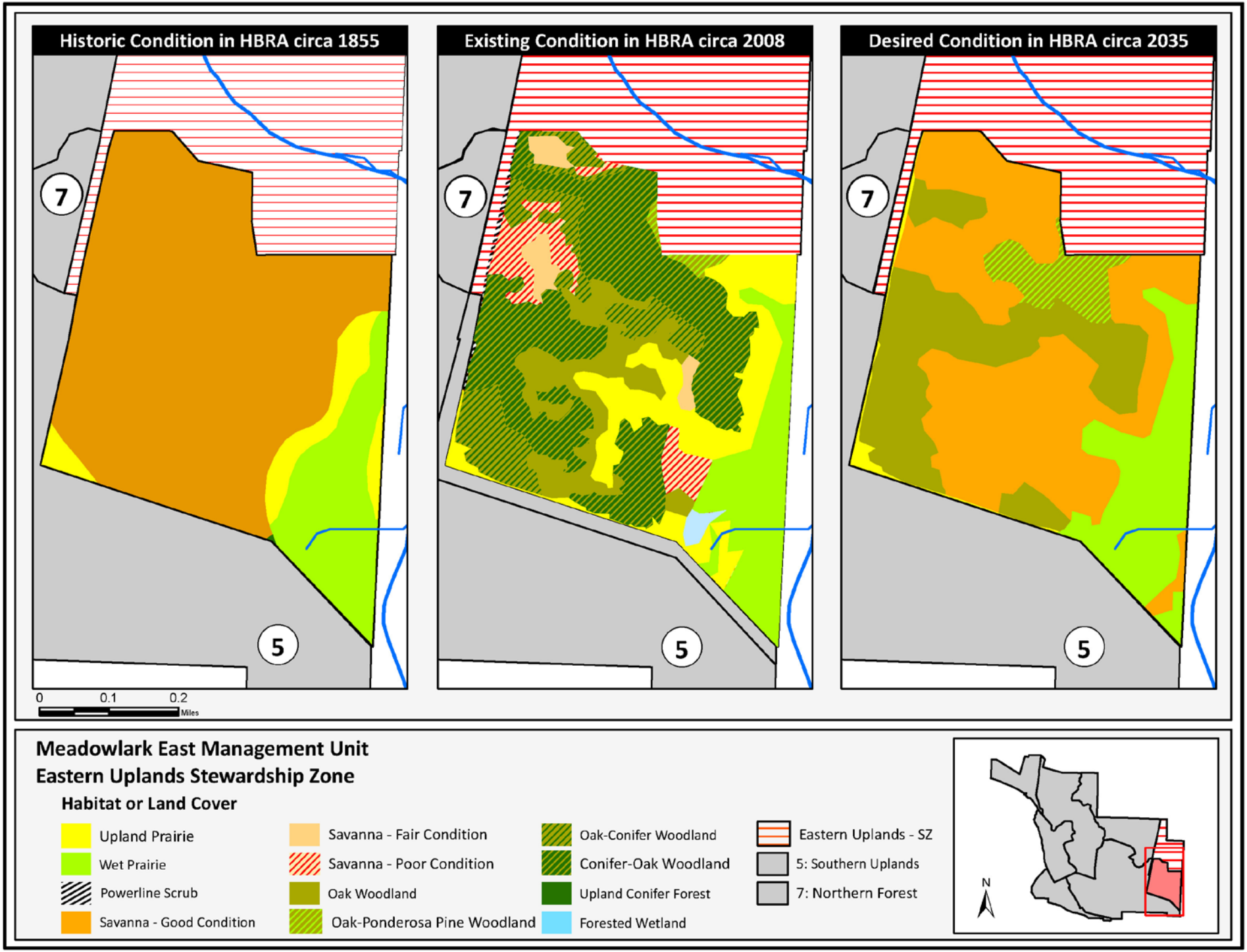

Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
6
0
0.2
0.4
Miles
Meadowlark South Management Unit
Southern Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Buckbrush Chaparral
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Oak Woodland
Oak-Ponderosa Pine Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Upland Conifer Forest
Scrub Wetland
Forested Wetland
Alder Forest
Powerline Scrub
Parking & Roads
Southern Uplands - SZ
6: Eastern Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Meadowlark South Management Unit (182 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0.1	0.3	0.1	0.2
Savanna	42.6	34.8	63.5	-7.8	28.7
Upland Prairie	108.3	38.4	42.4	-69.9	4.0
Wet Prairie	4.0	9.7	12.7	5.7	3.0
Oak Woodland	0	25.6	32.7	25.6	7.1
Buckbrush Chaparral	0	1.3	2.4	1.3	1.1
Forested Wetland	0	10.2	8.8	10.2	-1.4
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	27.1	27.4	17.1	0.3	-10.3
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	34.5	2.1	34.5	-32.4

Stewardship Zone		Management Unit	Acres
Southern Uplands		Meadowlark South	182
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o remove trees to establish desired future condition within oak woodland stand (2ac, 2008)
			o manage invasive species
			o prepare ecological burn plans and implement ecological burns
			o broadcast diverse seed mix following implementation of ecological burns
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions within Meadowlark South MU.
	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects as outlined in Appendix E.
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: prepare prescribed burn plans (2018).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.

Stewardship Zone		Management Unit	Acres
Southern Uplands		**Meadowlark South**	**182**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.3: Restore wet prairie(s) in identified project areas within the Meadowlark South MU.
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: Plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft. plots within wet prairie restoration sites.
Goal 11	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread within the Meadowlark South MU or throughout the HBRA.
	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.

Stewardship Zone		Management Unit	Acres
Southern Uplands		**Meadowlark South**	**182**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Goal 7	7.1	Buckbrush chaparral	o Project 7.1.2: Collaborate with Oregon Department of Forestry East Lane District, Rivers to Ridges partners, and other fire management organizations to implement prescribed burns within at least 4 distinct units within the buckbrush chaparral habitat type. Units should be at least 5 acres and no larger than 13 acres in size. The size and form of unit will be determined with consideration of slope, aspect, and proximity to established control features such as Buckbrush Creek, Trail 3, Trail 5, & Trail 6.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns in all areas of the park managed for oak woodland, prairie, savanna, and wet prairie.

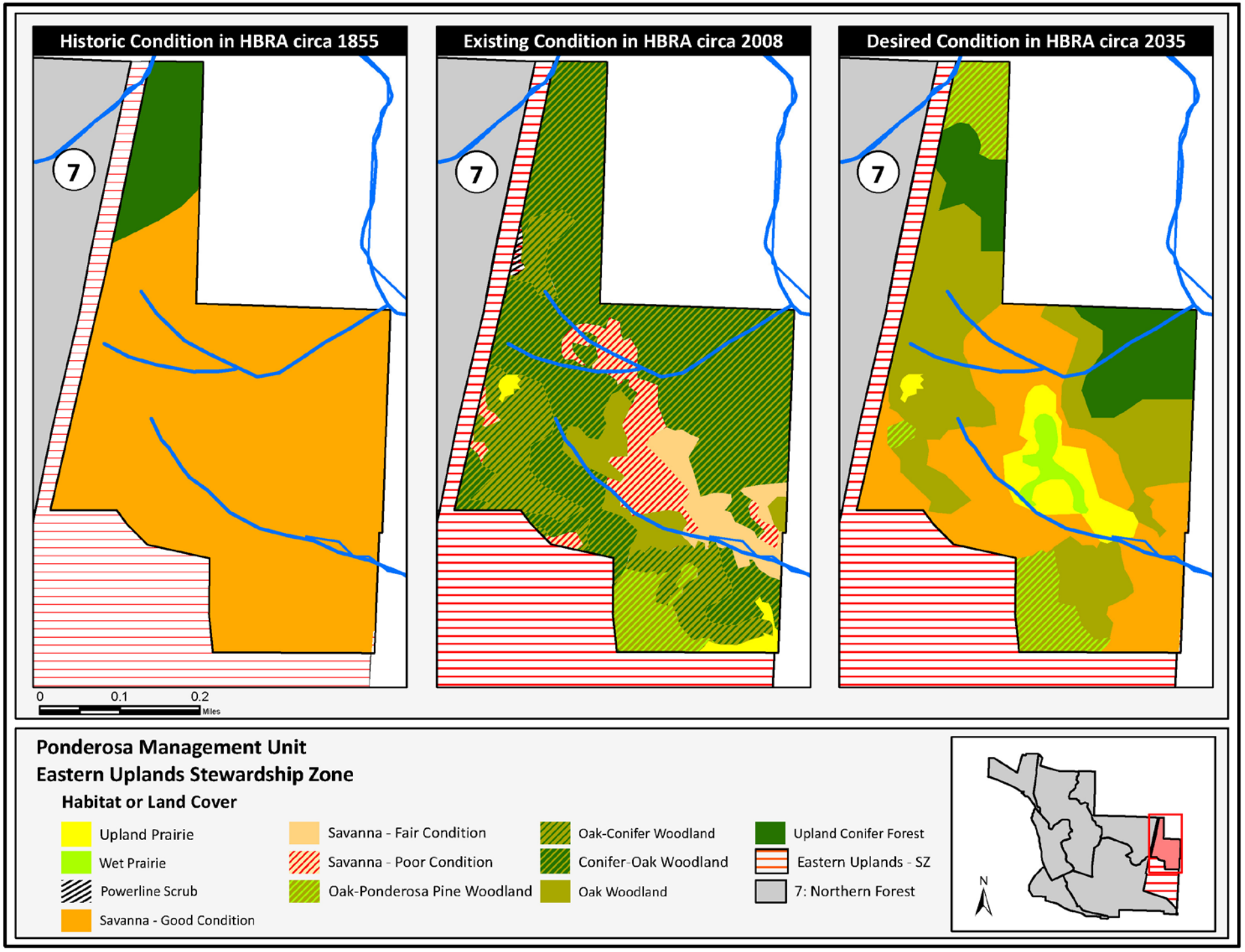

Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
5
0
0.1
0.2
Miles
Meadowlark East Management Unit
Eastern Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Powerline Scrub
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Oak Woodland
Oak-Ponderosa Pine Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Upland Conifer Forest
Forested Wetland
Eastern Uplands - SZ
5: Southern Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Meadowlark East Management Unit (143 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	109.3	12.9	69.3	-96.4	56.4
Upland Prairie	10.2	25.0	2.2	14.8	-22.8
Wet Prairie	23.1	19.5	25.3	-3.6	5.8
Oak Woodland	0	16.7	46.0	16.7	29.3
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	1.0	0	1.0	-1.0
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	0.1	0	0	-0.1	-
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	67.9	0	67.6	-67.7

Stewardship Zone		Management Unit	Acres
Eastern Upland & Lowland		Meadowlark East	143
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o managed false brome populations throughout the management unit (2008).
			o implemented ecological burns within wet prairie and savanna (30ac)
			o removed trees to establish desired future condition for oak woodland, savanna, and wet prairie. (25ac, 2012))
			o managed invasive species
			o implemented ecological burns within wet prairie and savanna (30ac)
			o removed trees to establish desired future condition for oak woodland, savanna, and wet prairie. (100ac, 2016)
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions within each management unit.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects.
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plans (2020).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.

Stewardship Zone		Management Unit	Acres
Eastern Upland & Lowland		**Meadowlark East**	**143**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within at least one 10-acre patches of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: Plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft. plots within wet prairie restoration sites.
	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom as part of Management Unit specific restoration investments.

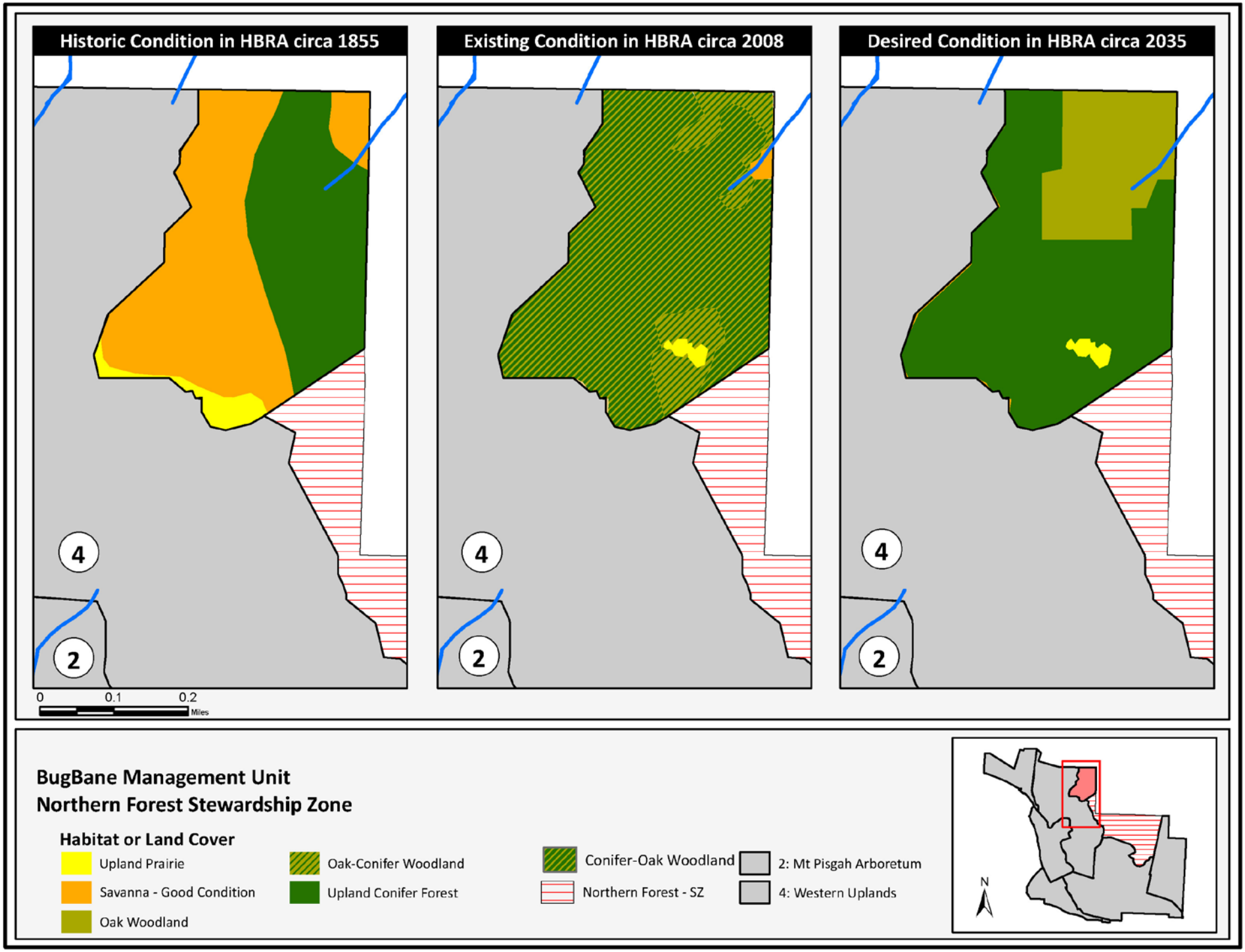
Stewardship Zone		Management Unit	Acres
Eastern Upland & Lowland		**Meadowlark East**	**143**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
7
0
0.1
0.2
Miles
Ponderosa Management Unit
Eastern Uplands Stewardship Zone
Habitat or Land Cover
Upland Prairie
Wet Prairie
Powerline Scrub
Savanna - Good Condition
Savanna - Fair Condition
Savanna - Poor Condition
Oak-Ponderosa Pine Woodland
Oak-Conifer Woodland
Conifer-Oak Woodland
Oak Woodland
Upland Conifer Forest
Eastern Uplands - SZ
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **Ponderosa Management Unit (109 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	98.0	16.8	35.8	-81.2	19.0
Upland Prairie	0	1.6	7.3	1.6	5.7
Wet Prairie	0	0	2.2	-	2.2
Oak Woodland	0	10.8	47.8	10.8	37.0
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	10.6	0.0	15.6	-10.6	15.6
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	79.3	0	79.3	-79.3

Stewardship Zone		Management Unit	Acres
Eastern Upland & Lowland		**Ponderosa**	**109**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o managed false brome populations throughout the management unit.
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
	5.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.2.1: Collaborate with partners to develop and conduct projects as outlined in Appendix E.
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.1: Prepare prescribed burn plans (2020).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns.
Goal 8	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.1: Remove and manage invasive species where cover is greater than 25% within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.1.2: Broadcast native seed mixes or install native plants to establish cover of native species within at least one 10-acre patch of oak woodland, prairie, savanna, and wet prairie.
	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.

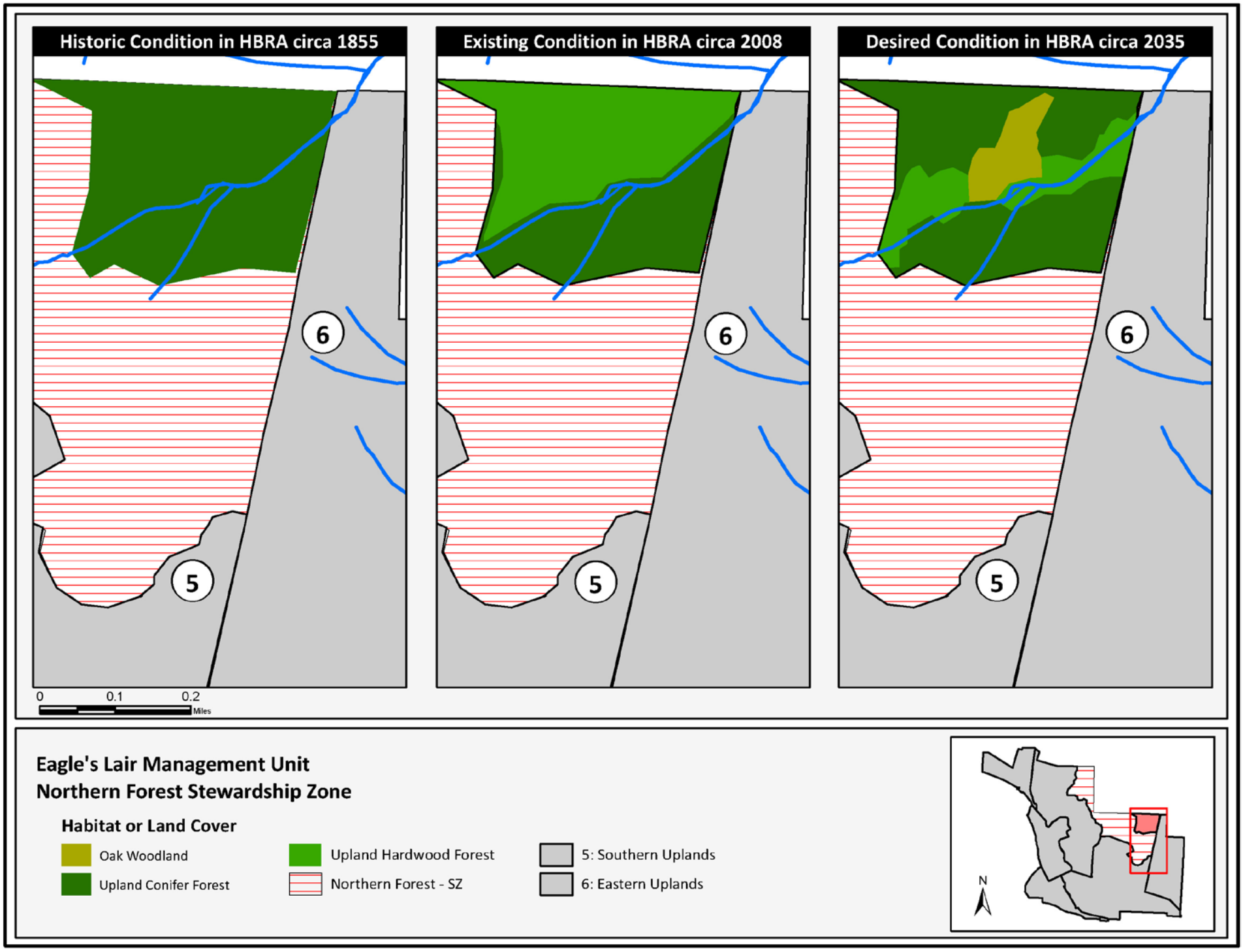
Stewardship Zone		Management Unit	Acres
Eastern Upland & Lowland		**Ponderosa**	**109**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: Plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft. plots within wet prairie restoration sites.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
4
2
0
0.1
0.2
Miles
BugBane Management Unit
Northern Forest Stewardship Zone
Habitat or Land Cover
Upland Prairie
Savanna - Good Condition
Oak Woodland
Oak-Conifer Woodland
Upland Conifer Forest
Conifer-Oak Woodland
Northern Forest - SZ
2: Mt Pisgah Arboretum
4: Western Uplands
N

Focal Conservation Target or Other Habitat Net Change: **Bugbane Management Unit (75 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	41.0	0.8	0.3	-40.2	-0.5
Upland Prairie	3.2	0.8	0.8	-2.4	-
Wet Prairie	0	0	0		
Oak Woodland	0	0	19.0	-	19.0
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	30.9	63.6	54.8	32.7	-8.8
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types	0	9.8	0	9.8	-9.8

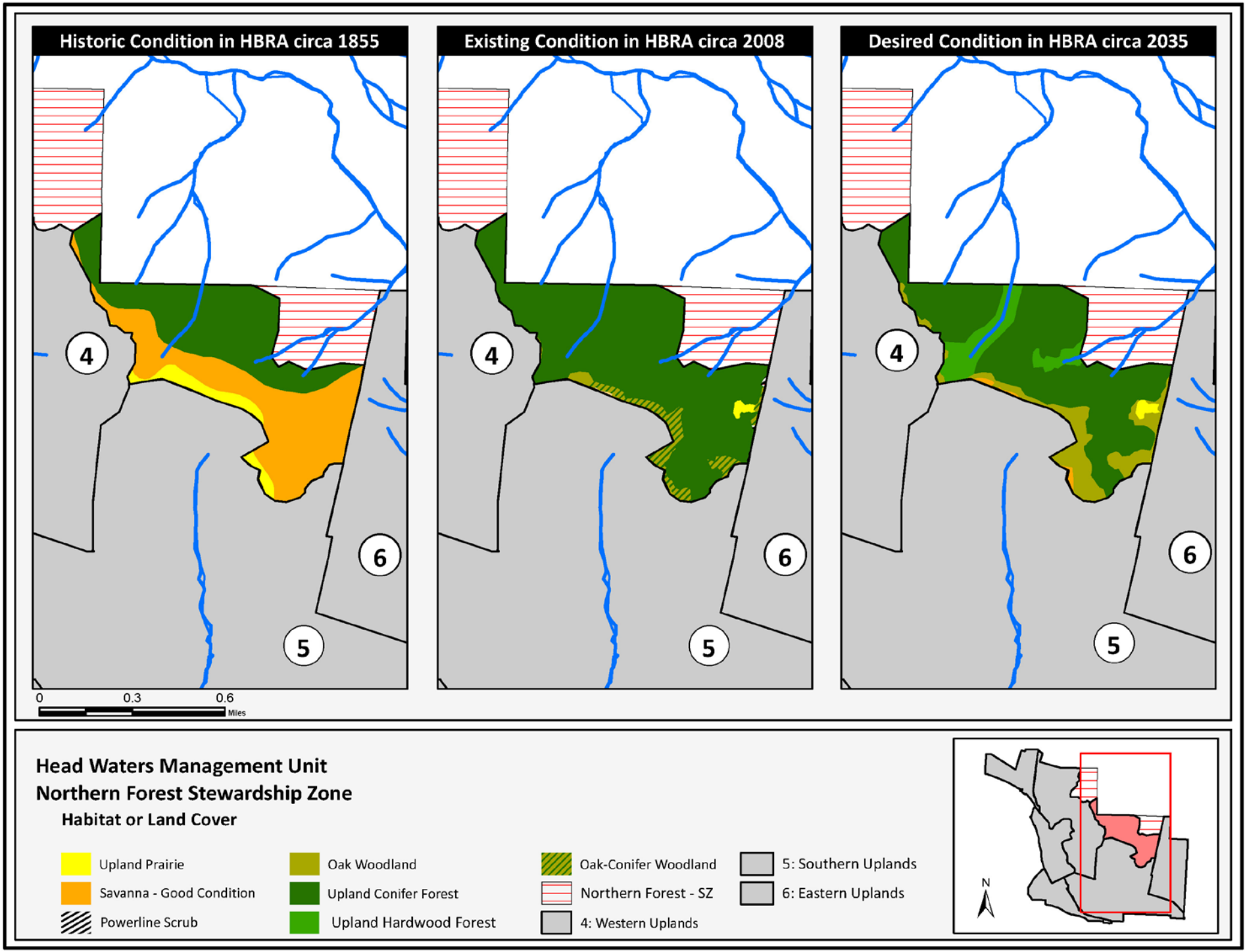
Stewardship Zone		Management Unit	Acres
Northern Forest		**Bugbane**	**75**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.1	All conservation targets	o Project 6.1.2: Prepare prescribed burn plans for the Bugbane MU (2023).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burn
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.

Stewardship Zone		Management Unit	Acres
Northern Forest		**Bugbane**	**75**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.4	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.4.1: Implement prescribed ecological burns.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie following annual stewardship actions including burning and mowing.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
6
5
0
0.1
0.2
Miles
Eagle's Lair Management Unit
Northern Forest Stewardship Zone
Habitat or Land Cover
Oak Woodland
Upland Conifer Forest
Upland Hardwood Forest
Northern Forest - SZ
5: Southern Uplands
6: Eastern Uplands
N

Focal Conservation Target or Other Habitat Net Change: **Eagle's Lair Management Unit (50 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	0	0	0	-	-
Upland Prairie	0	0	0	-	-
Wet Prairie	0	0	0	-	-
Oak Woodland	0	0	5.4	-	5.4
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	50.0	23.0	34.2	-27.0	11.2
Upland Hardwood Forest	0.0	26.7	10.1	26.7	-16.6
Other non-target cover types	0	0	0	-	-

Stewardship Zone		Management Unit	Acres
Northern Forest		**Eagle's Lair**	**50**
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.2: Identify areas where legacy trees are under immediate threat from encroachment of native vegetation or invasive species.
Projects Scheduled for Implementation 2023 - 2027			
Goal 11	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.3: Prepare prescribed burn plans for Eagle's Lair MU & Headwaters MU (2029).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 8	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.

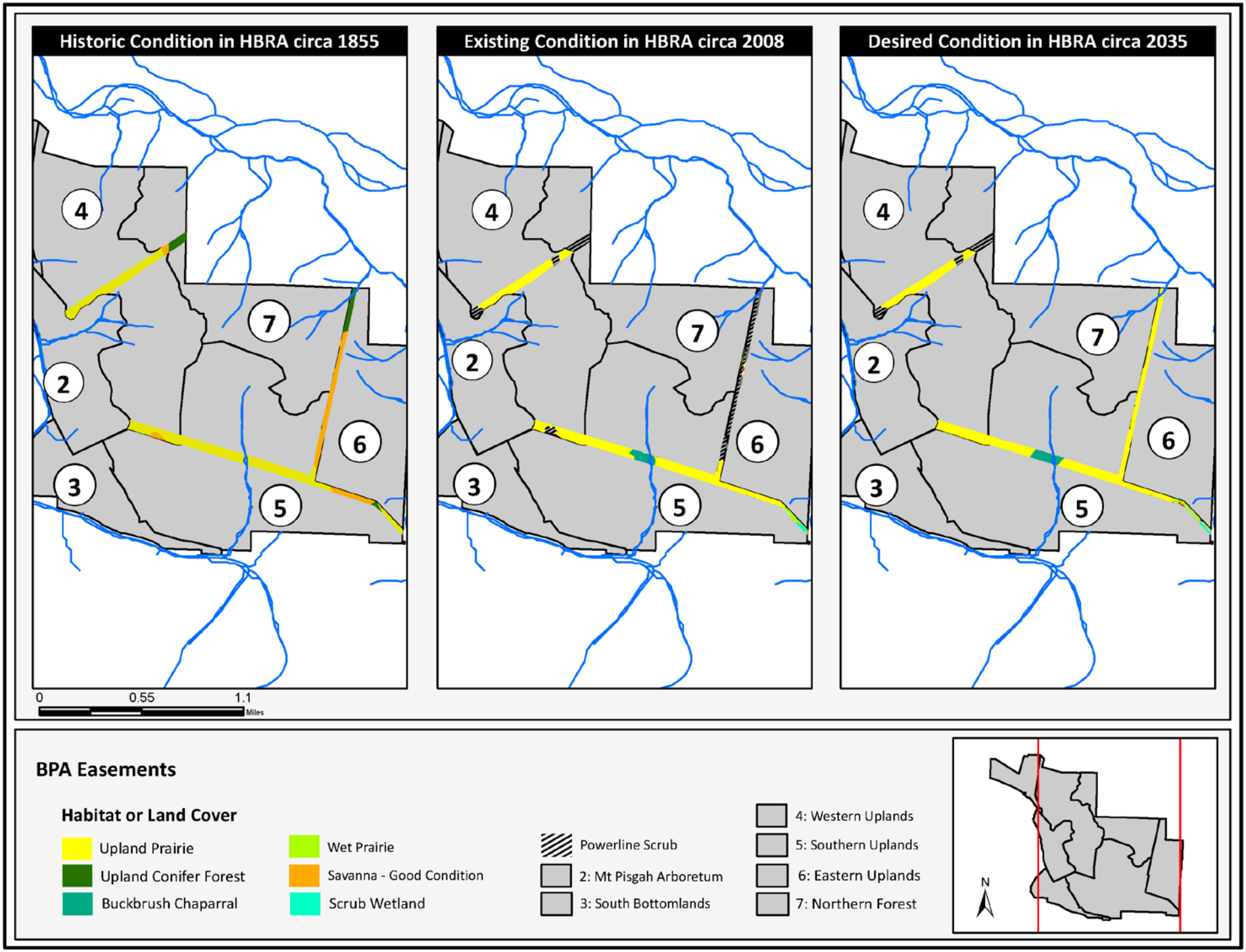

Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
4
5
6
0
0.3
0.6
Miles
Head Waters Management Unit
Northern Forest Stewardship Zone
Habitat or Land Cover
Upland Prairie
Savanna - Good Condition
Powerline Scrub
Oak Woodland
Upland Conifer Forest
Upland Hardwood Forest
Oak-Conifer Woodland
Northern Forest - SZ
4: Western Uplands
5: Southern Uplands
6: Eastern Uplands
N

Focal Conservation Target or Other Habitat Net Change: **Headwaters Management Unit (196 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	91.0	0.3	1.8	-90.7	1.5
Upland Prairie	14.1	1.7	2.0	-12.4	0.3
Wet Prairie	0	0	0	-	-
Oak Woodland	0	1.9	31.1	1.9	29.2
Buckbrush Chaparral	0	0	0	-	-
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	91.1	175.1	139.0	84.0	-36.1
Upland Hardwood Forest	0	0.2	22.2	0.2	22.0
Other non-target cover types	0	16.9	0	16.9	-16.9

Stewardship Zone		Management Unit	Acres
Northern Forest		Headwaters	196
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o managed false brome populations throughout the management unit.
Projects Scheduled for Implementation 2018 - 2022			
Goal 5	5.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 5.1.1: Remove woody vegetation as necessary to establish desired future conditions.
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.
Projects Scheduled for Implementation 2023 - 2027			
Goal 8	8.2	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.2.1: Annually steward high quality remnants of oak woodland, prairie, savanna, and wet prairie throughout the HBRA.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.1	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.1.3: Prepare prescribed burn plans for the Eagle's Lair MU & Headwaters MU (2029).
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
	8.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 8.3.1: Broadcast native seed mixes or install native plants to enhance the diversity and cover of native species within low quality patches of oak woodland, prairie, savanna, and wet prairie throughout the HBRA following annual stewardship actions including burning and mowing.
Goal 11	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.5	All conservation targets	o Project 11.5.1: Intensively manage false brome.
	11.6	All conservation targets	o Project 11.6.1: Identify areas of occupation and implement treatments to manage shining geranium, reed canary grass, and tansy ragwort, among other species growing within vicinity of rare, sensitive, and listed plants and animals.

Stewardship Zone	Management Unit	Acres
Northern Forest	**Headwaters**	**196**

Goal	Supporting Strategy	Benefitting Conservation Target	Project
	11.7	All conservation targets	o Project 11.7.1: Identify areas of occupation and implement treatments to manage English hawthorn, domestic apple, black walnut, common hazel, common pear, myrobalan plum, and sweet cherry.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.


Historic Condition in HBRA circa 1855
Existing Condition in HBRA circa 2008
Desired Condition in HBRA circa 2035
4
7
2
6
3
5
0
0.55
1.1
Miles
BPA Easements
Habitat or Land Cover
Upland Prairie
Upland Conifer Forest
Buckbrush Chaparral
Wet Prairie
Savanna - Good Condition
Scrub Wetland
Powerline Scrub
2: Mt Pisgah Arboretum
3: South Bottomlands
4: Western Uplands
5: Southern Uplands
6: Eastern Uplands
7: Northern Forest
N

Focal Conservation Target or Other Habitat Net Change: **BPA Powerline Easements (75 acres)**	Extent circa 1855 (ACRES)	Extent circa 2008 (ACRES)	Projected Extent circa 2035 (ACRES)	NET CHANGE 1855-2008 (ACRES)	NET CHANGE 2008-2035 (ACRES)
Visitor Experience - Park Facilities - Historic	0	0	0	-	-
Stewardship Facilities	0	0	0	-	-
Visitor Experience - Event Facilities	0	0	0	-	-
Visitor Experience - Parking Areas & Roads	0	0	0	-	-
Savanna	16.3	0	0	-16.3	-
Upland Prairie	51.7	46.9	61.2	-4.8	14.3
Wet Prairie		1.4	2.1	1.4	0.7
Oak Woodland	0	0	0	-	-
Buckbrush Chaparral	0	3.7	4.7	3.7	1.0
Forested Wetland	0	0	0	-	-
Riparian Bottomland Forest	0	0	0	-	-
Upland Conifer Forest	7.0	0	0	-7.0	-
Upland Hardwood Forest	0	0	0	-	-
Other non-target cover types (incl. Powerline Scrub)	0	23.0	7.0	23.0	-16.0

Stewardship Zone	Management Unit	Acres	
Multiple SZ's	BPA Power Line Easements	75	
Goal	Supporting Strategy	Benefitting Conservation Target	Project
Summary of Projects completed 2008 - 2017			
			o managed Maltese starthistle
			o treated blackberry and Scotch broom with mowing and herbicide applications
Projects Scheduled for Implementation 2018 - 2022			
Goal 6	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 9	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.1: Identify areas where wet prairie was filled, drained, or modified.
	9.1	Bradshaw's lomatium & wet prairie	o Project 9.1.3: Restore wet prairie(s) in identified project areas within the Meadowlark South MU.
	9.3	Bradshaw's lomatium & wet prairie	o Project 9.3.2: Plant plugs and broadcast seed of Bradshaw's lomatium in 5x100sq ft. plots within wet prairie restoration sites.
Goal 11	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread.
	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2023 - 2027			
Goal 6	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.

Stewardship Zone	Management Unit	Acres	
Multiple SZ's	BPA Power Line Easements	75	
Goal	Supporting Strategy	Benefitting Conservation Target	Project
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 11	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread.
	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.
Projects Scheduled for Implementation 2028 - 2032			
Goal 6	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.1: Use mechanical or manual methods to remove and/or masticate woody vegetation along the edge of closed woodland and forest.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.2: Once vegetation is cleared, spot spray or remove regrowth of woody vegetation such as Armenian blackberry and Scot's broom.
	6.3	oak woodland, Oregon Vesper Sparrow, Prairie & Savanna, and wet prairie	o Project 6.3.3: Flush cut and paint or grind stumps of small trees along the edge of closed woodland and forest.
Goal 11	11.3	All conservation targets	o Project 11.3.2: Manage small patches of invasive species to suppress their spread.
	11.3	All conservation targets	o Project 11.3.3: Manage large areas occupied by invasive species.
	11.8	All conservation targets	o Project 11.8.1: Identify areas of occupation and implement treatments to manage non-native blackberry species and Scotch broom.