Hendricks Park
Forest Management Plan

City of Eugene Public Works Department
Prepared by David Reed & Associates
January 2000

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Prepared by:

David Reed & Associates
Salix Associates
Sperry Tree Care Company
Whitey Lueck

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Acknowledgements

Department Advisory Committee

Rich Aaring, Rhododendron Society Appointee
Kat Beal, Widlife/Natural Interests Appointee
Diana Bus, Voter Pool
Stan Cook, Tree-related Profession Appointee
Richard Cundiff, Laurel Hill Neighborhood Appointee
Bob Frazer, Immediate Neighbor Appointee
Ron Friedland, Park Patron Appointee
Jim Gent, Immediate Neighbor Appointee
John Moriarty, Tree-related Profession Appointee
Sandy Tepfer, Fairmount Neighborhood Appointee

City of Eugene Staff

Johnny Medlin, Maintenance Planning Manager, Public Works Department
Tim Rhay, Parks Operations Manager
Mark Snyder, Urban Forester
Michael Robert, Hendricks Park Lead Worker/Head Gardener, Rhododendron Garden
Andrea Riner, Park Planning Manager
John Etter, Park Planner
Robin Hostick, Park Planner
Kristi Morris, Administrative Aide
Carrie Jennings, Senior Office Supervisor

Facilitators

Paul Hoobyar, Watershed Initiatives
John O'Connor, John O'Connor Consulting

Consulting Team

David Reed, David Reed & Associates
Bruce Newhouse, Salix Associates
Dick Brainerd, Salix Associates
Nathaniel Sperry, Sperry Tree Care Company
Whitey Lueck, Naturalist
Scott Ferguson, Individual Tree Selection Managment, Inc.

Project Assistance

Alan Schloss, Consulting Hydrologist, HydroProcesses
Nancy Gronowski, City of Portland Parks and Recreation

Editing, Design and Map Production Consultant

Chris Orsinger, Communication Strategies

Contents

Note: A Supplemental Report to the Forest Management Plan For Hendricks Park is available from the City of Eugene Public Works Department. It contains reports and planning documents upon which the Forest Management Plan is based. Included are a Chronology of Hendricks Park, a Natural Resources Report, a Soils Report, an Assessment of Stand Conditions, a Storm Drainage Report, a Survey of Adjacent Property Owners and Bibliography.

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CHAPTER 1: Executive Summary & Plan Overview

Purpose of the Management Plan

Why a Forest Management Plan for Hendricks Park?

Hendricks Park is Eugene's first city park, acquired in 1906. Located along the Southeast Hills ridgeline, the 78-acre park is one of the most treasured places in our community (see Map 1: Base Map after page 2). As with many urban parks acquired at the turn of the century, decades of human activities and a maturing forest have created controversial issues related to the management of Hendricks Park.

Acquired in 1906, Hendricks Park was Eugene's first city park.

In response to citizen concerns over falling trees, the city retained a consultant to perform a visual hazard survey of trees abutting park structures and along the park's eastern edge. Subsequently, the city removed a number of trees, further evaluated 57 trees, and invited public comment on a proposal to remove 18 trees considered "potentially hazardous." Based on public concern for removing these trees, the city formed an ad-hoc committee to review the process leading up to the proposed removal of trees. After the committee's deliberations, a decision was made to remove six trees in the park, which also generated public controversy.

Throughout the decision making process, a number of citizens expressed concern for the lack of adequate information to justify removing potentially hazardous trees, as well as a lack of long term goals for managing the park. The city had not yet developed a master plan or formal management plan for the century-old Hendricks Park. In 1997, the ad-hoc committee recommended that the city allocate funds to develop a long-range management plan for the park. The Eugene City Council appropriated funds to hire a consultant, and in 1998 appointed a Department Advisory Committee to help develop the framework for the *Hendricks Park Forest Management Plan*.

David Reed

David Reed

Storms in Spring 1999 toppled trees in Hendricks Park, damaging the 1930s-era picnic shelter.

Shortly after the consultant began work in 1999, two spring storms uprooted 32 trees and caused two broken treetops in the park. Two large trees destroyed the historic picnic shelter, a number of trees fell on private property, and four homes were damaged. These storm events underscored the need for a long-range management perspective and provided an excellent laboratory for research and information gathering for the plan.

Plan Objectives

The *Hendricks Park Forest Management Plan* is designed to accomplish the following objectives:

1. **Resource Inventory.** Identify and assess forest stand conditions, plant and wildlife populations, and assess natural processes and other significant resource values.
2. **Impact Assessment.** Identify and assess adverse impacts of on-site and off-site activities on the park's natural resources.
3. **Resource Management.** Recommend a preferred management option. Prescribe how to protect, enhance, and maintain a healthy urban forest based on scientific principles and urban ecosystem management concepts.
4. **Visitor Management.** Identify preferred types and levels of recreation and education for the park. Develop standards for park improvements, management actions, and uses.
5. **Risk Management.** Examine forest conditions after recent storms, identify underlying processes and risk factors, and recommend guidelines for hazardous tree management.
6. **Implementation**. Develop policies and recommend management strategies and specific actions to implement the plan.

Methodology & Organization of the Plan

After three months of deliberation, a ten member Department Advisory Committee (DAC) identified ecological, human use, and administrative issues. The DAC also developed the following vision statement for the natural forested area of Hendricks Park.

HENDRICKS PARK FOREST VISION STATEMENT

The natural forested area of Hendricks Park provides unique ecological, historical, educational, recreational, and aesthetic resources for our human and natural communities. The enjoyment and the understanding of these resources within this dynamic forest community enrich our lives. Stewardship of the forested area of Hendricks Park shall respect scientific knowledge and the forest's natural processes, as it conserves and restores these resources for present and future generations.

Department Advisory Committee, July 29, 1998

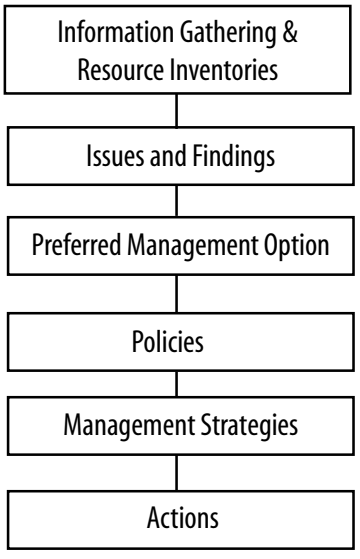
Vision Statement

In July 1998, the city hosted an open house in the park to seek public input and validate the work of the DAC. These efforts provided a framework and a scope of work for hiring a consultant to prepare the *Hendricks Park Forest Management Plan*.

Developing the Plan

The planning process involved six major steps (Figure 1). Resource inventories and data were analyzed and distilled into findings, from which key issues were identified. Past policies were reviewed, and a policy framework was prepared for the plan including a preferred forest management option and policy goals. Specific management strategies and projects were identified to implement the plan. The DAC, consultant, and staff met frequently throughout the planning effort. Therefore, this plan reflects an interdisciplinary team effort.

FIGURE 1: Development of the Management Plan



Ecosystem Management Focus

As directed in the DAC's vision statement, the plan is grounded in ecosystem management. Ecosystem management can be defined as a "holistic approach to natural resource management, which integrates human, biological, and physical dimensions of the landscape" (U. S. Forest Service, 1994). The following principles guide the application of ecosystem management to this project:

- Ecosystems are constantly changing.
- Humans are part of and have influenced ecosystems.
- Ecosystems must be viewed from a variety of scales.
- Ecosystems must be viewed over a long time period. It may take years or decades for effects of ecosystem management to be noticeable.

Scope of the Plan

Plan focuses on the forested area and to a lesser degree on the Rhododenron Garden.

While most of the park is forested, approximately twelve acres are intensively managed as a Rhododendron Garden (see Map 1: Base Map). The plan is comprehensive in scope and responds to findings and issues for the entire park. However, the focus is on the interior forest, picnic grounds, and staging area of the site and to a lesser degree on the Rhododendron Garden.

Management Issues & Findings

From evaluation and distillation of extensive research efforts and information gathering, the DAC, staff, and consultants identified 51 individual findings. The findings provided the basis for framing eight strategic management issues. Issues and findings are defined as follows.

Finding: A statement of fact,deduction, or presumption.

Issue: Problems, opportunities, or situations which require a decision, solution, or action of some type within a reasonable time frame.

Figure 2 on the facing page summarizes the key issues and related findings identified in the planning process. These issues and findings are the basis for a new mission and direction for the Hendricks Park forest. They provide a snapshot of the current forest conditions based on analysis of facts, translated into the most important issues to be addressed in a preferred management option for the park.

FIGURE 2: Summary of Findings and Issues

OVERALL THEME: Active Forest Management is Needed

- Invasive vegetation dominates the forest understory and alters natural processes.
- Existing oak woodland may disappear.
- The unstable saddle area is subject to future uprooting of trees and represents potential risk.

ISSUE #1: Park and forest mission is unclear

- Forest management is not currently a priority in Hendricks Park.
- Demands on staff exceed abilities to maintain a healthy urban forest.

ISSUE #2: Forest resources have high community value

- Hendricks Park has potential for becoming an old growth forest.
- The forest is in remarkably good condition given existing and past disturbances.
- Rare plants are found in the park.
- Educational and research opportunities are excellent.

ISSUE #3: Human activities impact forest resources

- Misfits and intrusions include a radio tower, abandoned restroom, off-site storm drainage, and unplanned trails.
- Other impacts include yard debris and other encroachments along the park edge, soil compaction, unleashed pets, off-road vehicles, vandalism, aging infrastructure and past construction activities.

ISSUE #4: Resource protection must be balanced with human use

- Parking often cannot accommodate visitor use. Group events sometimes exceed infrastructure capacity and cause conflicts among users.
- Preferred recreation uses and limits of acceptable change must be addressed to determine thresholds for public use.

ISSUE #5: Access is good but also a constraint

- Park roads, pedestrian entries, and the trail system provide good access.
- Park roads are extensions of the neighborhood road system; traffic impacts the park by creating conflicts with pedestrians, bicyclists, and park traffic.
- Restrooms are not accessible to persons with special mobility needs.
- Unplanned trails may confuse visitors and degrade forest resources.

ISSUE #6: The community values natural areas

- Eugene residents strongly support natural areas and their protection and management.
- Walking, hiking, picnicking, and nature recreation are highly valued recreation uses.

ISSUE #7: Potential exists for an urban laboratory

- Natural processes and forest dynamics create a superb opportunity to demonstrate "state of the art" urban forest management practices.
- The park has a manageable scale, special resource values, volunteer and community support, and legacy as the first city park.

ISSUE #8: Ridgeline connection is needed.

- Forest fragmentation occurs north of the park because of urban development.
- Excellent potential exists for connecting to natural areas south of the park.

Policy Framework

This section summarizes the recommended policy framework for the *Hendricks Park Forest Management Plan,* including proposed management units, the preferred option for managing the forest, a management statement, and five guiding policies.

Management Units

The park's vision statement projects an enduring image of the future of the forest, with natural processes conserved and restored for the enjoyment and understanding of present and future generations. To achieve this vision, this plan recognizes that a blanket management approach would not take into consideration different levels of recreational use and the varied forest ecosystem conditions. The plan recommends dividing the forest into three units: the Saddle Management Unit in the heart of the park, the Douglas-fir Forest Management Unit consisting of the interior forest habitat, and the Oak Forest Management Unit comprising an oak woodland on the western edge of the park (see Figure 7: Management Units on page 8).

Management Options

"Integrated Forest Management" option was selected.

The consultants identified four management options as logical approaches to implement the vision statement. The plan selects the fourth option, termed Integrated Forest Management, as the most ecologically sensitive, realistic, and achievable management alternative (see Chapter 7). This preferred management direction includes designating the forested area as a demonstration natural area, managing toward an old growth forest, protecting and enhancing the existing oak woodland, creating a more windfirm and stable saddle area, and developing an aggressive program to remove invasive vegetation, especially English ivy.

Management Statement and Policies

The following management statement and five major goals provide the policy framework and rationale for managing the forest. These policy statements are derived from past policy planning (see Chapter 3), the new vision statement, analysis of the latest resource inventories, and the key findings and issues described above.

Forest Management Statement

HENDRICKS PARK FOREST MANAGEMENT STATEMENT

Manage the forested area of Hendricks Park as a demonstration urban natural area, achieving a healthy, resilient, and sustainable forest by applying, testing, and assessing the most advanced ecosystem management principles and practices adapted to varied environmental conditions of the site; for the purpose of protecting natural resources, providing for appropriate passive recreation use, education and research, and historical preservation. An integrated approach will be taken with emphasis on adapting to the requirements for managing toward an old growth forest, restoring an oak forest, creating a more windfirm and stable saddle area, and removing invasive vegetation.

The following are the five overriding policies for implementing the management statement. For each of these goals, more detailed policy objectives are provided in Chapter 7.

Policy 1: Maintain a healthy urban forest by protecting, repairing, restoring, and creatively managing valuable natural resources and successional processes.

Policy 2: Balance resource protection with the most appropriate level and type of public use and infrastructure.

Policy 3: Promote education opportunities and forest management research, and apply successful methods and practices to similar natural areas of the Eugene Park and Open Space system.

Policy goals guide implementation.

Policy 4: Maintain an inviolate, harmonious, and ecologically sound interface between the park edge and adjacent private properties.

Policy 5: Connect Hendricks Park with the Ridgeline Trail System and natural areas to the south which constitute the regional ecosystem.

Plan Highlights

The *Hendricks Park Forest Management Plan* makes a number of recommendations related to natural resources, visitor use, and management of Hendricks Park. Ten strategies and 77 specific actions provide the framework for implementing the plan (see Chapter 7).

1) Implement an Integrated Forest Management Program.

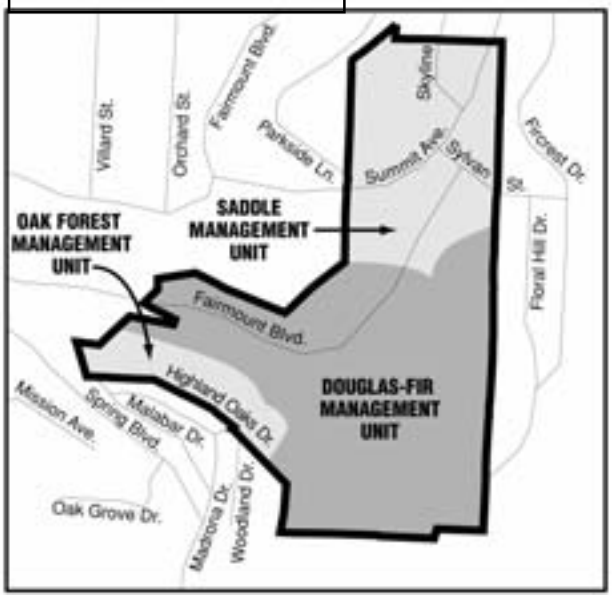
Identify, monitor, and minimize hazardous tree potential as much as practicable and apply remedial measures such as crown thinning in high risk areas, and reforest with more windfirm trees. Manage as a demonstration Willamette Valley urban forest emphasizing species diversity, natural succession, and managing toward an old growth forest. Undertake an aggressive program of ivy removal and control to restore the native habitat. Restore and enhance the oak forest by actively managing as a distinctive forest landscape pattern. Develop a demonstration native garden in the heart of the park.

Manage the park to grow an old-growth forest.

2) Create Management Units

Three management units and four subzones will provide the framework for adapting forest management to the different stand conditions and desired public use (see Map 7: Management Units, after page 80).

FIGURE 3: Management Units



Saddle Unit – The heart of the park includes picnic areas and the Rhododendron Garden. The Saddle Unit contains four subzones:

- *Picnic Shelter Subzone* – the immediate area around the picnic shelter, which has sustained significant damage from recent storms;
- *Picnic Grounds Subzone* – the central part of the developed area of the park, which receives high use, functions as the staging area and trailhead for the park and has received some damage in recent storms;
- *Rhododendron Garden Subzone* – the garden showcases ornamental and native plants. Some mature trees are declining along the south slope; and
- *Northwest Forest Subzone* – the small stand of Douglas-fir trees in the northwest part of the Rhododendron Garden which should be managed similarly to the interior forest.

Douglas-fir Forest Unit – the interior forest; and

Oak Forest Unit – an oak woodland adjacent to the interior forest.

3) Manage Recreation to Protect Natural Resources

Emphasize forest- oriented recreational use.

Shift park use toward forest-oriented and dependent activities such as walking, hiking, picnicking, and nature enjoyment. Manage the heart of the park as the major staging area including a trailhead for the Ridgeline Trail System, and an orientation center for the forest and garden. Improve recreation facilities and trails by correcting drainage problems, accelerating trail maintenance, and designating an official trail system (see Map 8: Conceptual Plan, page 102). Open panoramic views from the park, sensitively pruning vegetation. Monitor recreation use and carrying capacity. Designate trails that are fully accessible to persons with special mobility needs.

4) Establish an Interpretive, Education, and Research Program

Develop an on-site interpretation program telling the story of the vision, goals, and progress of the forest management program. Prepare brochures, maps, and interpretive signs. Develop a volunteer program for hosting guided walks. Promote Hendricks Park as an urban forest laboratory. Consider the park as a training and information center for park staff and interpretive naturalists. Make research plots permanent sites for monitoring and measuring forest change. Develop an advisory group of researchers and scientists to coordinate research activities.

5) Increase Staffing, Funding, and Resource Support

Hire a staff person to apply for and manage an extensive grant program. Establish a *Friends of Hendricks Park Foundation* and support fundraising to implement projects. Establish "first win" goals. Raise forest management and restoration to a higher level of priority.

6) Implement Park-Sensitive Transportation Management

Conduct a traffic study and prepare alternative solutions for reducing non-park traffic. Ban commerical trucks from park roads. Install traffic calming measures. Promote use of transit, pedestrian, and bicycle access. Explore feasibility of park-and-ride options.

Address traffic impacts.

7) Address Physical Misfits and Intrusions

Mitigate stormwater drainage from Highland Oaks Drive. Screen and buffer the radio tower at the summit. Replace decayed and damaged roadside barriers and keep in uniform size, design, and scale. Request EWEB to upgrade reservoir facilities. Upgrade trailhead entries.

8) Implement Design Standards for Built Facilities.

Develop design guidelines and standards for structures, signs, and infrastructure including choice of materials, colors, and scale suited to the site. Assure restrooms are accessible to persons with special mobility needs. Enhance park entryways, especially with signage suited to the park atmosphere.

9) Implement Stewardship Management of the Park Edge

Develop a partnership with adjacent property owners to "adopt the forest edge" and work toward mutual goals. Assess and monitor encroachments of private use onto parkland and aggressively take action if required to restore integrity of the park edge. Prepare a boundary survey of the entire park. Monitor all proposed urban development around the park, and establish a 50-ft. set back zone for new garages and habitable structures on adjacent private property.

10) Obtain Habitat and Trail Connection to the Ridgeline Open Space System

Acquire an easement for a trail connection to Dillard Ridgeline Park. Acquire land for wildlife habitat connections.

Connect the park with the Ridgeline Trail system.

Conclusion

Hendricks Park is one of the most important natural and cultural resources in Eugene and the surrounding metropolitan area. The *Hendricks Park Forest Management Plan* includes a conceptual framework to guide future master planning, rehabilitation, restoration, and upgrading of park facilities and infrastructure. Implementing this plan's recommendations will protect the park's forest resources and advance urban ecosystem management practices within the Eugene Parks and Open Space System, as well as throughout the Pacific Northwest.

CHAPTER 2: History of Hendricks Park

Introduction

This chapter describes the landscape setting of Hendricks Park in the community and provides an overview of the natural and development history of the park.

Landscape Setting

Hendricks Park consists of a 78-acre forested area, which lies along a ridge of the Eugene southeast hills that extends north to the Willamette River (see Map 2: Context Aerial Photo and Map 3: Ridgelines & Hydrology). Located less than a mile and a half from downtown, the park is part of a much longer forested ridge that is one of the city's most prominent landmarks and, therefore, a major part of its identity.

The 78-acre Hendricks Park, with its visible ridgeline, is part of Eugene's identity.

Hendricks Park is best known for its Rhododendron Garden, which has an international reputation and has been the featured garden for conventions of the American Rhododendron Society about every ten years. Throughout the natural forested area, an extensive trail system provides excellent opportunities to experience and learn about a western Oregon coniferous forest ecosystem.

Plans call for ultimately connecting Hendricks Park with Eugene's ridgeline open space and trail system in the south hills, through acquisition of land and easements.

Natural History

To better understand the present landscape character of Hendricks Park and how it might appear in the future, it is important to understand the history of this changing landscape over time.

David Reed

The forested ridgeline contained in Hendricks Park is visible from much of central Eugene.

Forty Million Years Ago

Forty million years ago, most of what is now the Willamette Valley lay just off the west coast of an earlier version of North America. During this volcanically active period, large amounts of ash were deposited in the sea that eventually accumulated in deep sediments (Orr et. al, 1992).

Volcanic ash settled in seabed deposits, which were uplifted to become part of the park's geology today.

In time, the hardened seafloor sediments were pushed upward by movements of the Earth's crust, and the western part of Oregon appeared above water for the first time. After many millions of years of erosion, we see today the remnants of that seafloor in Hendricks Park.

Most of the park's rocks are what geologists now call the Eugene Formation, which is composed of soft sedimentary rocks formed from deposits on the ancient sea floor. Volcanic basalt outcroppings can also be found scattered elsewhere in the park.

Fifteen Thousand Years Ago

Fifteen thousand years ago, the Pacific Northwest was at the peak of the last glacial advance of the Ice Age. From Eugene north to Portland, the Willamette Valley was not glaciated. Research indicates the landscape at that time was quite open, with scattered groups of trees such as subalpine fir and mountain hemlock, which today are found only at higher elevations in the Cascade Mountains (Whitlock, 1992). These trees were interspersed with grassy meadows where Ice Age mammals such as mastodons and giant ground sloths grazed. By this time, the topography of the Hendricks Park area was probably very much as it is today.

Courtesy of Lane Co. Historical Museum.

Shown is the open grassland habitat that existed in Hendricks Park circa1909. The south slope of Skinner's Butte (in distance) is also in grassland. This open landscape may have resulted from Native American use of fire to improve game and plant food production. These open areas have since succeeded to Douglas-fir forest or oak woodland.

Eight Thousand Years Ago

After the end of the Ice Age (about 10,000 years ago) average annual temperatures rose considerably until they even exceeded current temperatures. The vegetation in this part of the Willamette Valley at that time reflected the climate that was both warmer and drier than today. Douglas-fir had arrived, but rather than form a closed canopy as we see now in Hendricks Park, the forest was more open, with plenty of sunlight to support abundant grasses and other herbaceous plants in the understory below (Worona, 1993).

Early hominids evolved in eastern Africa, where open landscapes facilitated easy travel and supported hunting and gathering economy (Wilson, ed. 1993). As humans migrated to more temperate areas where the vegetation grew more thickly, they learned to periodically set fire to the

Courtesy of Lane Co. Historical Museum.

A view of McClure and Friendly Halls at the University of Oregon, with Hendricks Park on the horizon (circa 1910). Open areas of grass remained where the Rhododendron Garden is now located, and in the southwestern corner of the park.

landscape to maintain a more open character. Although it is difficult to prove, it is likely that Native Americans were already leaving their mark in the Hendricks Park area with the use of fire to keep the landscape even more open than it would have been naturally (Boyd, 1985).

Euro-American Settlement

Despite the slightly cooler and moister climate of the last few millennia, local Native Americans (most recently the Kalapuya) were apparently able to keep the landscape quite open, even if fires weren't possible every year. Therefore, early settlers in this part of the Willamette Valley often described the landscape as "park-like" with vast stretches of treeless prairie on the valley floor, grading into oak and conifer savannas in the surrounding hills.

Federal surveys in the 1850s indicate the landscape was very open with scattered oaks, fir and pines.

In the early 1850s, federal surveyors recorded the area's vegetation, soils, water bodies, and other natural features. From these notes, researchers have reconstructed in some detail the landscape of the Hendricks Park area a century and a half ago.

The landscape was, in fact, very open with scattered Oregon white oak, Douglas-fir, valley ponderosa pine, and California black oak rising above a carpet of grasses and wildflowers (Johannessen et. al., 1971). The landscape supported a great variety of animals, from monarch butterflies and acorn woodpeckers to elk and grizzly bear.

Courtesy of Lane Co. Historical Museum.

View from the southwestern tip of Hendricks Park toward the northeast (circa 1904). Foreground is grassland with young Oregon white oak (less than 40 years old). Junction of Fairmount Blvd. and Summit Avenue just visible at right, with grass and oak covered hillside beyond.

Early 1900s

Absence of fire caused once- treeless hillside to succeed into forest.

The fire-friendly Kalapuya culture ultimately collapsed in the first half of the 1800s due primarily to diseases introduced by Euro-Americans. The absence of Kalapuyan-set fires, coupled with the rarity of lightning-caused fires in the Willamette Valley, allowed the largely treeless hillsides surrounding Eugene to begin filling in with shrubs and trees from the nearest seed sources (Cole, 1977). At the Hendricks Park site, the spread of woody plants was probably slowed initially by settlers' sheep and cattle that grazed the new seedlings.

In the 1900s as Eugene grew and land uses changed, Oregon white oaks increased in the area currently occupied by the Rhododendron Garden and along the ridgetop at the southwest corner of the park. Elsewhere in the park, hundreds of young Douglas-fir trees grew from seeds that blew onto the grasslands. These seeds apparently came from the few large Douglas-fir in the southeast part of the park from pre-settlement days. The site of Hendricks Park, which had been only sparsely covered with trees for many centuries, gradually became a forest.

Courtesy of Lane Co. Historical Museum.

View from Hendricks Park of Skinner Butte (circa 1908). University of Oregon campus in center. Trunks of Douglas fir (40-50 years old) in foreground, wih younger firs (20-25 years old) just downslope.

Early photographs show stands of Douglas-fir well established by the time the Hendricks family donated land for the park in 1908 (see photo, right). Dozens of young oaks also appear in a 1908 photograph taken on the southwest ridge of the park, near an old oak tree (see photo, below).

At least through the 1950s, land east of the park was utilized largely for orchard crops. Despite the abrupt eastern edge of Hendricks Park where it abutted adjacent orchards, the forest edge appears to have remained intact throughout this period.

Courtesy of Lane Co. Historical Museum.

By the time this 1908 photograph was taken, the park's historic grassland was succeeding to Douglas-fir forest. Young and some mature Douglas fir had become established.

Courtesy of Lane Co. Historical Museum.

This 1908 photograph shows an old oak which still survives on the southwest ridge of the park. Willamette Valley Oak Savanna and Oak Woodlands are considered "globally endangered," with less than one percent remaining intact.

This 1952 aerial photograph shows urban development encroaching on the park's western boundary, while the Laurel Hill Valley, east of the park, was still predominantly in agriculture.

While the area east of the park remained in agriculture until fairly recently, by the 1950s urban development was approaching the park's other edges (see aerial photgraph above), replacing orchards and native plant communities with houses landscaped primarily with non-native ornamental plants.

Today

Topography of the Hendricks Park area has changed little in the last few thousand years. The park sits astride a gentle ridge that extends south from the "saddle" where Summit Avenue meets Floral Hill Drive, then continues southwest to a small promontory where an observation tower once stood (see Map 4: Topography of Hendricks Park). The land slopes steeply to the east toward Laurel Hill valley. To the west, the steep hillside is gently furrowed with several small, seasonal streams. Elevations range from a low point of 560 feet near the park entrance on Summit Avenue to the 910-foot summit at the southern edge of the park.

Because of the park's shape and ridgeline orientation, most of the land faces either east or west, although a sizable portion is north-facing in the southwestern area of the park. The only south-facing slopes are at the Rhododendron Garden and at the southwest part of the park. Both of these warmer, drier sites were colonized by Oregon white oaks, which are more tolerant of drought than Douglas-fir.

Most of the park's undisturbed soils are moderately drained despite their relatively high clay content. However, in areas that have been compacted or where the grade has been changed, the soils are less permeable and there is more runoff.

Trees and Shrubs

Except in a few areas of the park where Oregon white oaks persist, the forest canopy is almost entirely Douglas-fir, with an abundance of bigleaf maples in the middle canopy. In this mixed fir and maple forest, the shrub canopy is dominated in most areas by osoberry and snowberry, with some western hazel and vine maple.

In addition to woody plants typical of the upper Willamette Valley, non-native plants have become naturalized in the park. For example, on the lower west flanks of the site, European horsechestnuts grow in the middle canopy where the fir overcanopy is not quite as dense. Elsewhere in the park, sweet cherry, an escaped form of the domestic sweet cherry, is quite common in the middle canopy. And at the promontory at the southwest corner of the park, Scots broom has recently appeared among the oaks.

Wildflowers and Grasses

In the Eugene area, most native forests of this type have a rich herbaceous layer consisting of ferns and a great variety of wildlflowers such as wood violet, bleeding heart, fringecup, and several members of the lily family, including trillium and starflowered Solomon's seal. However, in Hendricks Park the forest floor is covered in many places almost exclusively with English ivy. A popular viney groundcover plant in Eugene's cultivated landscapes, this European native may have been purposely introduced to the park earlier in this century. More likely, though, it spread into the park from ivy plants growing in nearby yards and birds eating the fruit. Whatever its source, over the past few decades English ivy has overrun much of the forested area of Hendricks Park. The dense shade created by this vigorous groundcover has effectively eliminated many herbaceous plants that once carpeted the for-

Michael Robert

Invasive English ivy is a severe problem in the park, eliminating the low-growing native plants on the forest floor.

est floor in the spring. Because the ivy lacks natural controls such as insects, animals, and other competitors with which it evolved in Europe, it spreads vigorously and constitutes a serious threat to integrity of the forest ecosystem.

English ivy may be reducing establishment of young trees

Perhaps due in large part to the presence of ivy, few young trees can be found in the park's forest areas. Douglas-fir is unable to germinate on humus-rich, heavily shaded forest soils. Bigleaf maple, on the other hand, is adept at germinating under such conditions, and the species is relatively common in the middle canopy, likely having become established before the ivy was ubiquitous. However, very few maple seedlings are present in the park today.

Because the park is largely separated from other native forest communities by urban development and gardens filled with non-native plants, there are few seed sources for native shade-tolerant trees. For example, under optimum conditions, grand fir might eventually become established under the fir canopy, to theoretically replace the firs as they die out over many years. The natural introduction of other native plant and animal species is similarly affected by the park's relative isolation.

Courtesy of Lane Co. Historical Museum.

A 1908 photograph shows a recent road cut in Hendricks Park. Pleasure driving had become a pastime. Cars use some of these roads to this day, while others have become part of the trail system.

Development history[1]

In 1906, Thomas and Martha Hendricks donated 47 acres of land to the City of Eugene. Subsequently the city acquired an additional 31 acres from Colonel and Angie Smith, and the site became Eugene's first city park. The Hendricks' noted that "such park should be procured at the present time when the same is available in its natural state, to be reserved for the future generations of the city of Eugene as a Public Park open to all of the inhabitants thereof and of the surrounding country . . ." The donors also stipulated in the deed that the park was to be "named and known forever as Hendricks Park."

The advent of the automobile created a new national pastime of pleasure driving, and between 1906 and 1911, the first roads were built up to and throughout the park. These roads provided opportunities for splendid views of the growing city below and the distant Coburg Hills and Cascade Mountains. Early photographs indicate one of the first park roads led to a rocky promontory in the southwest corner of the park, where the oak tree photographed in 1908 still stands. Parts of this early road system now function as trails throughout the forest.

Another early addition to the park was an animal enclosure of deer and elk. Over the years birds, sheep, and other animals constituted a small zoo lasting until 1972. First situated north of Summit Avenue where the Rhododendron Garden is now located, the exhibit was later moved south of Summit Avenue where the maintenance facilities currently exist.

Through the years, other improvements were made in the park, mostly in the saddle area near the intersection of Summit Avenue and Floral Hill Drive. Wells were drilled for drinking water, swings were erected, and a picnic shelter was built in 1938 as a Works Progress Administration project. Sometime between 1925 and 1936, an observation tower was erected at the southwest corner of the park, near the old oak tree mentioned above.

Rhododendron Garden

Later, part of Hendricks Park began to develop in a new direction with the opening of the Rhododendron Garden in 1951. Founding members of the Eugene Chapter of the American Rhododendron Society formed a partnership with the City. The garden was developed in the open area where captive deer and elk had kept the ground free of brush beneath a canopy of Oregon white oaks and Douglas-fir. The City installed a water system, paths, and roads, and the Society donated plants. Over time, rare species and locally hybridized rhododendrons, as well as other exotic plants, were donated to create an internationally renowned garden of over 5,000 plants covering several acres.

Michael Robert

Park visitors enjoy the Rhododendron Garden on a Spring day

Major park improvements were made between 1967 and 1970. Summit Avenue was realigned and new park roads were built. In the Rhododendron garden, a shop, restroom, and a new entrance were developed. Pedestrian lighting, automatic irrigation, and new pathways were added, and a restroom was built in the interior forest. About this time, proposals were considered for developing group camping and picnic facilities in the forest. In 1970, the Ribbon Park Association (incorporated in 1962 to acquire and develop land for hiking and riding trails) built a path from the park south to 29th Avenue.

Other minor improvements have been made in more recent years.

Michael Robert

The Hendricks Park picnic shelter, built in 1938 as a federal Works Progress Administration project, was destroyed by two falling trees in Spring 1999. The stone fireplace escaped damage, and the shelter is being rebuilt.

Tree Hazards

In the late 1990s, the City identified potentially hazardous trees along the east side of the park, and began removing and topping trees. A number of citizens questioned taking down these trees. Associated with the tree removal effort, the City also corrected a number of drainage problems by constructing curbs along park roads and installing pipes to control water run-off.

In 1999, high winds uprooted a number of trees throughout the park, mainly near the historic picnic shelter, in the Rhododendron Garden, along Summit Avenue, and in the interior forest. Two large fir trees destroyed the picnic shelter. A number of trees fell on adjacent private properties and on some houses.

Clearly, Hendricks Park is at a crossroads in its history. This long-term management plan represents a commitment of the city and a group of concerned citizens to not only help overcome threats, but to develop a vision and implementing tools for achieving a healthy urban forest for present and future generations.

David Reed

Stem failure of a Douglas-fir near Summit Ave. caused by the March 2, 1999 storm.

[1] This history of Hendricks Park has been compiled from several sources of information including City files, personal interviews, and published documents cited on pages 103-104. Some inconsistencies were noted in reconstructing events and dates. However, discrepancies and inaccuracies are believed to be relatively minor in this brief chronicle of the park's history.

CHAPTER 3: Past Policy Planning

Introduction

This section reviews past policy planning related to Hendricks Park, which provides an important foundation for the management plan.

Related Eugene Policy Plans

Summarized here are regional, local, and neighborhood plans that provide past and current policy implications for the *Hendricks Park Forest Management Plan*. These plans reflect the high priority the Eugene community has, over many years, placed on scenic, recreational, and habitat values of natural areas and open space, and on a connecting ridgeline trail system.

Eugene has valued natural areas, open space and the ridgeline trail system.

South Hills Study (1974)

In 1974, the City Council adopted the South Hills Study which not only provided the catalyst for acquisition of Eugene's extensive ridgeline open space and trail system, but also established density and development standards for residential development. Policies relevant to Hendricks Park include:

- Managing the South Hills for passive recreation by providing trails, viewpoints, and natural areas.
- Preserving natural conditions and habitat values by applying sensitive standards for recreation development.
- Limiting hillside development to a density of five units per acre.
- Protecting significant views.
- Reviewing proposed development for potential linkages between park sites, particularly south of Hendricks Park.

Laurel Hill and Fairmount Refinement Plans (1982)

Adopted in 1982, the *Laurel Hill Refinement Plan* established goals for preserving tree lines fringing the hills, conserving trees and vegetation, and preserving topographical features with sensitive subdivision development. For sites above 500 feet in elevation, the plan incorporates provisions of

the *South Hills Study* and establishes a policy limiting density to five units per acre. The *Fairmount/University of Oregon Special Study* was also adopted in 1982, with the goal of preserving and enhancing livability by maintaining a balance between open spaces, parks, and urban development.

Metro Area General Plan (1987)

Updated in 1987, the *Eugene/Springfield Metro Area General Plan* established a number of policies which support hillside open space acquisition and preservation (Policy C-18, C25-27), as well as linkages (Policy F-4).

Eugene Parks and Recreation Plan (1989)

Adopted in 1989, the *Eugene Parks and Recreation Plan* formulated a number of policies and actions for protecting and managing natural areas, with emphasis on passive recreation opportunities in the south hills and extension of the Ridgeline Trail System (see map excerpted from the 1989 plan on facing page). These specific actions were proposed for Hendricks Park:

- Develop a master plan to reduce automobile impact on the Rhododendron Garden and other park activities.
- Develop a small-scale playground.
- Redesign and improve irrigation in the garden.
- Remodel the Rhododendron Garden.

Natural Resources Special Study (1990)

The *Eugene/Springfield Natural Resources Special Study* (1990) inventoried significant upland, wetland, and riparian areas in the metropolitan area. The Laurel Hill site (E38) was identified as a significant upland area, which includes Hendricks Park. The site received a moderate to high rating for significant wildlife habitat, and a high rating for flora and variety of habitat.

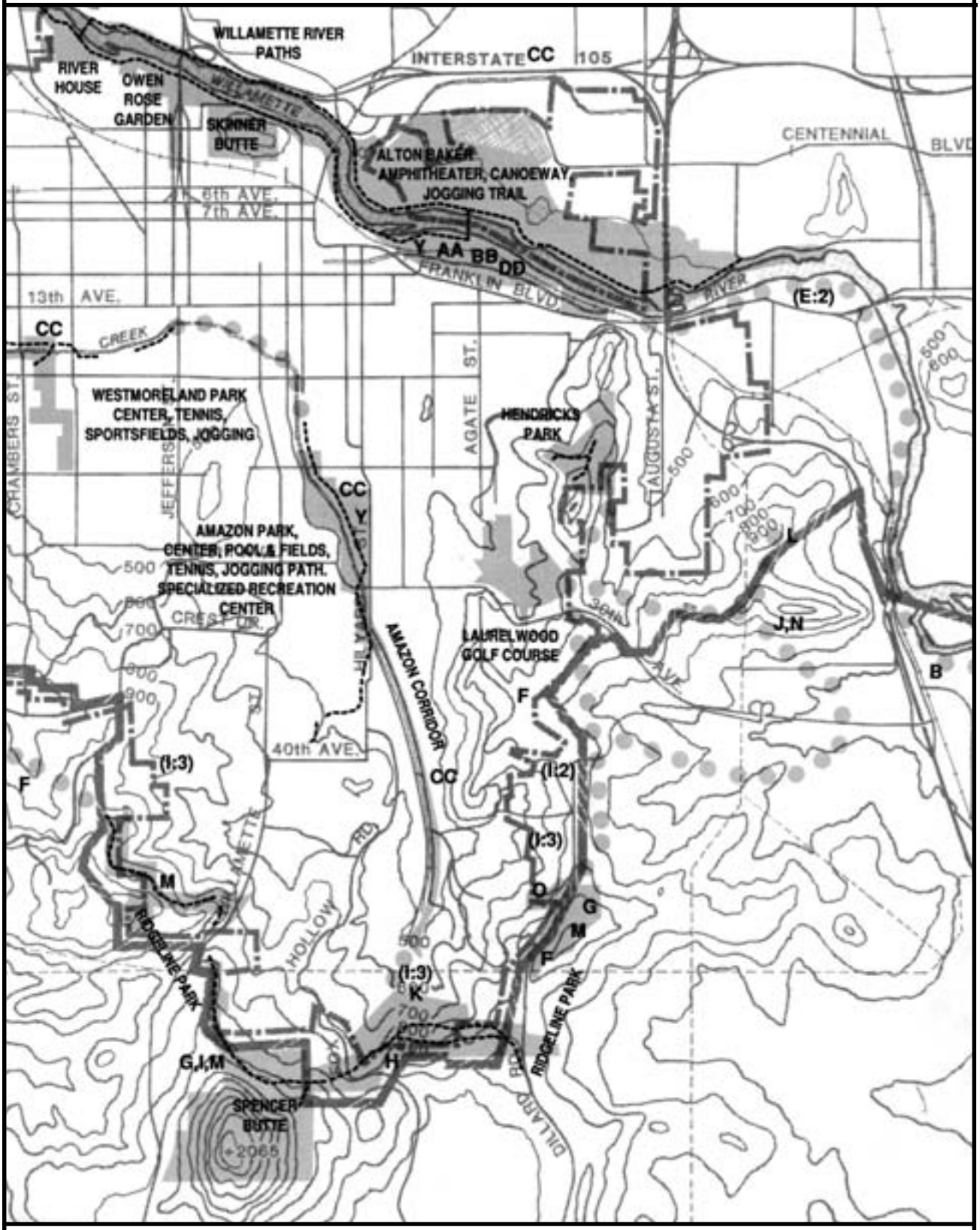
Eugene Growth Management Policies (1998)

After extensive citizen involvement, in 1998 the City of Eugene adopted nineteen policies for guiding growth decisions for the next ten to fifteen years. Policy 18 calls for increasing "the amount and variety of parks and open spaces." For Hendricks Park, especially relevant actions emphasize acquiring properties that will provide connections for continuous open space, and raising passive recreation and nature viewing to a higher priority.

Draft TransPlan (in progress)

An updated draft of the *Eugene-Springfield Transportation System Plan* (May 1999) classifies Summit Avenue as a neighborhood collector, which extends through the core of Hendricks Park. An on-street bike route is proposed through the park from Fairmount Boulevard to Floral Hill Drive.

FIGURE 4: 1989 Eugene Parks & Recreation Plan



This map excerpted from 1989 *Eugene Parks & Recreation Plan*, City of Eugene. Shaded blocks are public parks. Shaded dotted lines indicate approximate areas where trail easement acquisitions were planned.

Planning for Hendricks Park

Several plans have guided management decisions in Hendricks Park, although there is no record of an officially adopted master plan. Over the years, these planning efforts have been the basis for park improvements, which have concentrated primarily on the Rhododendron Garden and picnic area. The following plans have shaped policy direction and management decision-making in Hendricks Park.

Ribbon Park Association (1962)

In 1962, a group of citizens formed the Ribbon Park Association for the purpose of creating a "ribbon trail" to connect existing and future ridgeline parks. Over time, the group expanded its vision to include trail connections to Fern Ridge and the Willamette River, with approval by the City Planning Commission and acceptance by the Eugene City Council. Several outdoor groups including the Obsidians, Eugene Hunt Club, Scouts, and others made exploratory hikes, cleared and marked trails, researched legal and land acquisition issues, and prepared maps. By 1972, the Association had built the "Ribbon Trail" between Hendricks Park and East 29th Avenue. This trail is shown on a 1971 map in the city's files, and the trailhead appears on the base map for Hendricks Park. Legal opinions indicate that the City

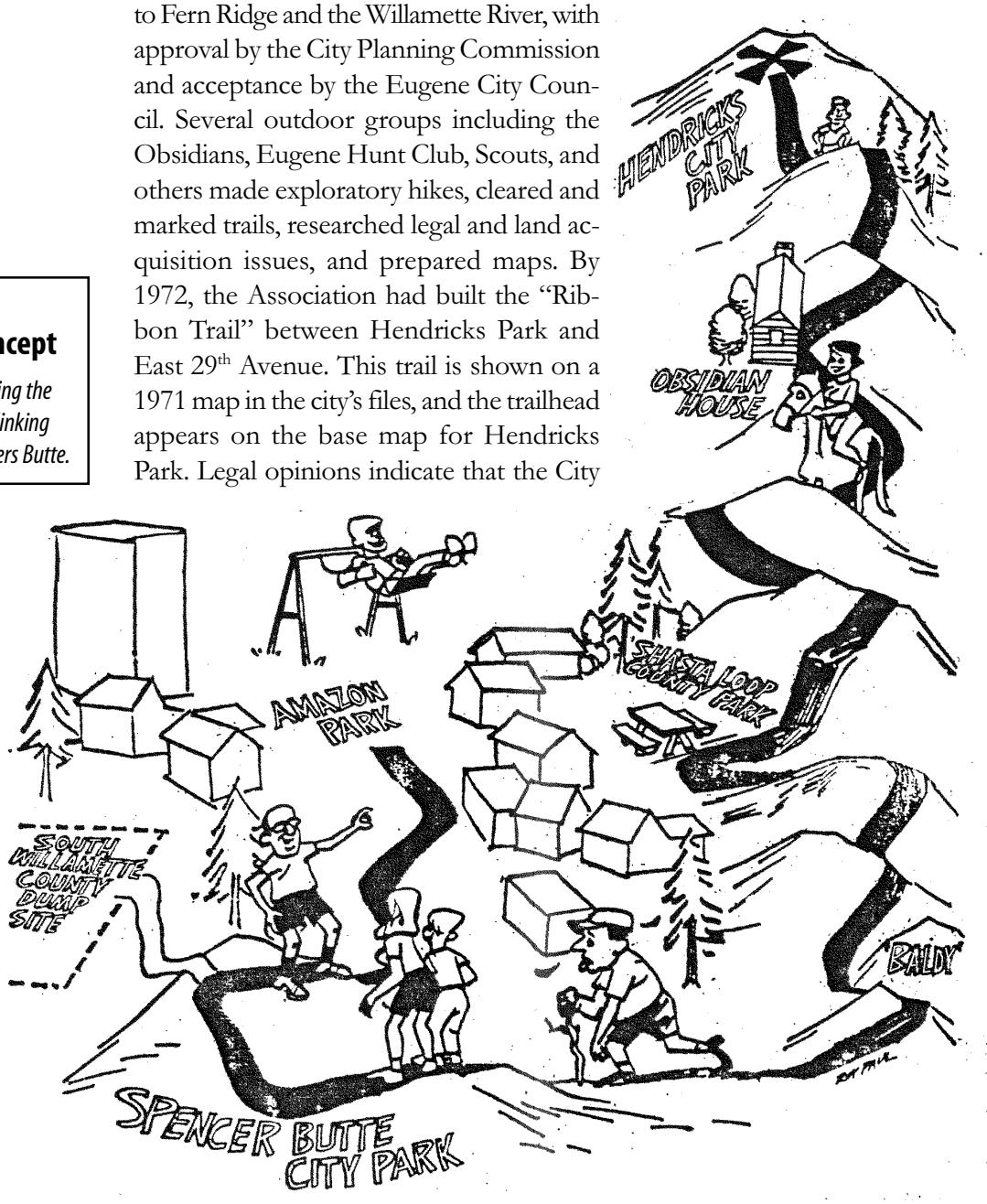


FIGURE 5:
Ribbon Trail Concept

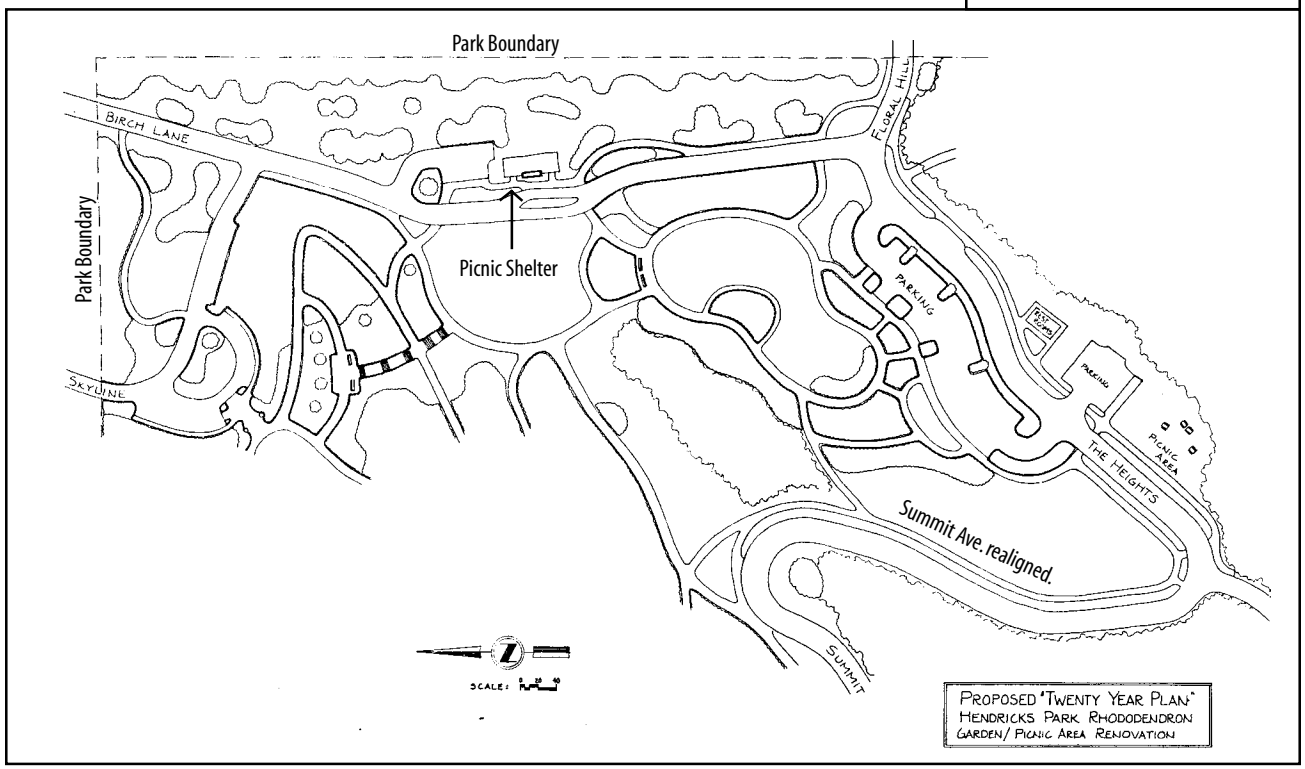
A 1967 diagram showing the Ribbon Trail Concept, linking Hendricks Park to Spencers Butte.

of Eugene has not established any property rights in this trail because formal easements were not obtained from property owners.

Rhododendron Garden Resource Committee (1985)

In 1985, the Rhododendron Garden Resource Committee adopted a purpose statement for the garden. The committee refined a garden development plan prepared by George Jette, and developed thirteen recommendations addressing infrastructure needs, public use areas, grouping of plants, and entrances and edges of the park and garden. The Committee emphasized the need for a long-range master plan incorporating its vision, which evolved into a proposed "Twenty-Year Plan for Hendricks Park Rhododendron Garden/Picnic Area Renovation (see below). This plan proposed relocation of the existing parking lot and picnic area to an area along Fairmount Boulevard near the existing rock restroom, to accommodate expansion of the Rhododendron Garden. The Committee also recommended eliminating Summit Avenue in the heart of the park, entering near the existing park entrance and connecting with Fairmount Boulevard in a switchback alignment, which would connect with the new parking lot. In response to the plan, some refinements were subsequently made to the park's infrastructure, but the road alignment, parking changes, and garden expansion were not implemented.

FIGURE 6: 1985 "20-year Plan" for Rhododendron Garden



Development Plan for Hendricks Park (1986)

In 1986, the manager of Hendricks Park prepared an extensive twenty-year plan for horticulture, turf, and irrigation within the park and garden. This plan is significant because it was the first comprehensive planning effort for the park. The document contains extensive mapping of the forested area

ecosystem, a classification of types and distribution of public use for the site, and an assessment of infrastructure needs including the forest trails.

Rhododendron Garden Tree Management Plan (1988)

In 1988, an ad hoc group working with the city's principal landscape architect prepared a tree management plan. This plan focused on health and management of the tree canopy in the Rhododendron Garden. Drought and root zone compaction were noted as contributing to "stress in some fir trees." The draft also noted the effects of English ivy and uncontrolled runoff on forest health, and advocated tree removal only when trees exhibited substantial decline or hazardous conditions. A recommendation was made to develop a forest management plan for the entire park.

Hendricks Park Management Manual (1988)

In addition, growing out of its efforts to prepare a tree management plan, the ad hoc group prepared a management manual for Hendricks Park. This manual is considered a significant policy document because it defined the park's purposes, and outlined specific management guidelines. Of particular importance is the emphasis on simple, forest-related uses such as walking, jogging, picnicking, and nature contact. The manual advocated conservation of the wooded skyline, and a trailhead for the Ridgeline Trail System. The manual also recognized the "Native Ridgeline Forest" as a special component of the park. Recommendations included keeping the native forest undeveloped, and to remove ivy and other non-native vegetation.

Managing Diseased Trees in Hendricks Park (1997)

A 1997 tree hazard survey resulted in a plan to manage diseased trees in Hendricks Park.

In 1997, after a consultant completed a perimeter tree hazard survey for the east perimeter of the park, and following several months of community discussion about how best to manage hazardous trees, the city prepared a fact sheet "Managing Diseased Trees in Hendricks Park." The fact sheet outlined specific recommendations including a plan for removing 19 trees posing varying degrees of hazard, in three phases. A recommendation was made to appoint an advisory committee, hire a consultant to develop a forest management plan, and develop a strategy for forest ecosystem restoration.

SUMMARY

Past plans stress active management of the native ridgeline forest.

Clearly, regional and local plans show an evolving policy, emphasizing increasingly the preservation and management of Eugene's natural areas and open space resources. While there is no adopted physical plan for Hendricks Park, a number of planning efforts stress the importance of actively managing the native ridgeline forest as a special resource, and encouraging appropriate passive and nature recreation use. Emphasis is also placed on Hendricks Park functioning as a trailhead and connecting with the Ridgeline Trail System.

CHAPTER 4: Inventory and Assessment

Introduction

This chapter presents an overview of the significant natural resources and forest processes within Hendricks Park, and results of the inventory and assessment phase of the planning process. Off-site factors such as land use and zoning are also addressed, which although external to the park, indirectly affect its management.

Chapter 4 also describes the results of the opportunities and constraints analysis, which assesses the aesthetic, satisfaction, and human experience dimensions of forest management. The findings from this chapter set the stage for subsequent analysis of park use and current management (Chapter 5) and risk management and assessment (Chapter 6). Finally, this information and subsequent chapters provide the framework for selecting a preferred management option, and developing plan goals, strategies, and actions (Chapter 7).

Existing Natural Resources

Geomorphology

Hendricks Park is part of the ridgeline that provides a natural border along the south and southeast part of Eugene known as the South Hills. The tree-covered hills are the nearest ridges seen from the valley floor in downtown Eugene. Conversely, the park provides panoramic views of the valley. The South Hills ridgeline is connected to the larger system of foothills that extends westward to the Coast Range, eastward to the Cascades, and southward to the Calapooya Mountains.

The developed part of the park lies in the main saddle, with the ridgeline climbing southward to a smaller upper saddle and continuing beyond the park to the south. Another ridge continues toward the southwest ending at a knoll at the park boundary. A slump-bench with a steep escarpment and toe-slope exists in the southeast part of the park, which likely represents an ancient slide. Gradients in Hendricks Park are mostly less than 30 percent.

An ancient slide exists in the southeast part of the park.

Soils

The soils of Hendricks Park are typical for foothills in the southern Willamette Valley. According to the Soil Survey of Lane County (NCRS, 1981), for much of the central, western, and northern part of the park, the soils mapped are moderately deep, well drained, and have moderately slow permeability. The depth to bedrock is 20-40 inches, and the depth to the water table is more than six feet (see *Hendricks Park Forest Management Plan Supplemental Report* for additional information on soils).

At the toe of the Rhododendron Garden, as well as the opposite side of Summit Avenue, the soils mapped are deep, somewhat poorly drained, and have moderately slow permeability. The water table is perched from two to three feet deep from December to March. Depth to bedrock is 40 to 60 inches.

Along the ridge in the southwest portion of the park, soils mapped are shallow, stony, well drained, and have slow permeability. In the southeast portion of the park, in the vicinity of the ancient slide, the soil mapped has moderately slow permeability, runoff is rapid, and the hazard of water erosion is high.

In the southeast part of the park, the soils mapped contain intermingled soils, and characteristics include slow to very slow permeability, susceptibility to compaction when wet, and susceptibility to seepage. The water table is perched on an impermeable layer only one to two feet deep for some soils in this area from December to April. Localized soil conditions may not necessarily reflect the characteristics of mapped soil types. Mapped soil types have small inclusions of other soils that are too small to map. These inclusions may be shallower, more poorly drained, or have other characteristics that make them very different from mapped soils.

Human activities have caused extensive soil compaction.

Most importantly for Hendricks Park, human impacts can greatly alter soil properties. There is high probability that soils in the park have been affected by compaction from automobiles, parking lots, trails and picnic areas, irrigation pipe installation, other underground utilities, and extensive human use over many decades. Moderate erosion is present in several areas of the park along small, deeply incised drainageways, and minor, localized erosion occurs along some trails.

The *Hendricks Park Forest Management Plan Supplemental Report* includes limitations for recreation use as specified in the soil survey.

Hydrology

Principal hydrologic features of Hendricks Park are two northerly-flowing drainages located in the south-central portion of the park (See Map 4, Hydrology and Ridgelines). These small creeks generally flow during months of high rainfall, and are dry during the summer drought months. In many places, they are incised up to three or four feet deep from erosion, primarily from a high velocity of water runoff that enters the park from the surrounding neighborhood (this is discussed in detail on page 47.

A third natural drainageway probably existed at one time where Summit Avenue is now located—at the bottom of a small "valley." Seasonal seepage occurs in several areas in lower portions of the Rhododendron Garden on the south-facing slopes of the valley, and on east slopes below the picnic shelter. In both instances, irrigation may contribute water to the seeps. Another wet area is on east slopes in the southeast portion of the park.

A wetland delineation in 1996 (on file at the City of Eugene) concluded that no jurisdictional wetlands are present in the park. The *Hendricks Park Forest Management Plan Supplemental Report* includes information related to water table depth and duration.

Natural Resource Inventory

This following section presents a summary of the park's forest conditions, vegetation, fungi, and wildlife, most of which is derived from "Natural Resources of Hendricks Park" (Salix Associates, 1999), contained in the *Hendricks Park Forest Management Plan Supplemental Report*.

Forest Types

Two forest types are present in Hendricks Park. A mature Douglas-fir forest occupies most of the park, and smaller areas of Oregon white oak forest occur along the ridge in the southwest part of the park and within the Rhododendron Garden in the northern part of the park.

David Reed

A trail through the mature Douglas-fir forest in Hendricks Park.

Douglas-fir Forest

Large trees that are approximately 100 years old dominate the Douglas-fir forest. A few older trees, ranging up to 250 years old, emerge above the younger, even-aged layer in the southwest portion of the park. Low on their trunks, old branch stubs provide evidence that these older trees grew scattered in an open landscape where the lower limbs were not shaded out by adjacent trees until recently. The trees of the younger age class have smooth trunks up to a height of 50 feet or more. These trees grew up in a dense stand in which heavy shading caused the lower branches to die early on, and then rot and break off at the trunk.

Most Douglas-fir trees in the park are approximately 100 years old; a few trees range up to 250 years old.

Beneath much of the Douglas-fir overstory, a subcanopy consists of shade-tolerant bigleaf maple and non-native sweet cherry trees. A few young grand fir trees have become established on the ridge south of Floral Hill Drive, but are not present elsewhere. The shrub layer in the Douglas-fir forest is generally quite open with osoberry, snowberry and hazelnut the

most common species. English ivy and other introduced species heavily impact the herb layer, which nevertheless still contains many native understory species.

Forest Development Stages (Oliver and Larson, 1996) describe four stages of forest development:

Four stages of forest development

Forest initiation: Trees colonize a site following a disturbance.

Stem exclusion: As trees grow larger, the canopy closes, reducing light to the understory. Colonization by new species stops. Understory vegetation is diminished.

Understory re-initiation: As the overstory grows older, shade-tolerant trees, shrubs and herbs begin growing in the understory.

Old growth: Overstory trees die from time to time, allowing understory trees to grow into gaps in the overstory.

In Hendricks Park, the Douglas-fir forest is in the understory re-initiation stage. Bigleaf maples and sweet cherries have seeded in and grown into a distinct mid-canopy layer in many stands, and understory shrubs and herbs have established in most areas that are not mowed or gardened. English ivy competition and possibly the lack of nearby seed sources have limited reproduction of shade tolerant conifers such as grand fir and other understory shrub and herb species, stalling the development of the forest into the late-successional or old-growth stage.

David Reed

Big-leaf maple (on left) is a common native tree found in the understory of the Douglas-fir forest.

Does Hendricks Park contain old growth?

Franklin, et al. (1986) recognized four characteristics of old growth Douglas-fir forests in western Oregon:

1. Two or more species of live trees with a wide range of ages and sizes, including at least eight trees per acre with diameters greater than 32 inches;
2. A deep, multi-layered canopy;
3. Large conifer snags; and
4. Large logs.

In Hendricks Park, the Douglas-fir forest is mature, with a structure and composition similar to other forests of its age and topographic position in the southern Willamette Valley (Cole 1977; Vander Schaaf 1977;

Franklin and Dyrness ca. 1988). This forest does not yet have the characteristics of old growth forest. Large old trees are uncommon, and tree species diversity is low because few shade tolerant species have had time to establish and grow into the canopy. The canopy is one- to two-layered in most places and large snags and downed logs are very rare.

Hendricks Park does not yet contain old-growth.

As the forest stands in Hendricks Park age, they will change in structure and species composition. In the Douglas-fir stands, the overstory trees will continue to grow for up to several more centuries if there are no major disturbances; however, tree death and forest disturbance are inevitable, shaping and altering the stand development process. Trees will die from time to time due to disease, insects and windthrow, opening gaps in the forest canopy and creating snags and large, downed logs. Gaps will allow more light to penetrate into the understory, providing shade tolerant tree species the opportunity to grow into the overstory layers, and increasing the vertical structure of the forest. These developments will mark the transition of the forest from the understory re-initiation stage to the old growth stage of stand development.

Large disturbances that kill many trees are now very uncommon in the southern Willamette Valley. It is possible that several centuries will pass before a catastrophic disturbance (e.g., windstorm or fire) kills a large portion of the trees in the Hendricks Park. In the meantime, smaller disturbances will periodically impact the forest, killing one or a few trees at a time, and creating small to medium-size gaps in the canopy. This process will result in a revolving patchwork of forest stages in the park (Spies and Franklin 1989). The Columbus Day storm of 1962 and the windstorms of early 1999 illustrate that disturbances have and will continue to shape the character of the forest.

Recent storms illustrate that disturbance will continue to shape the forest.

In the absence of disturbance, a forest dominated by shade-tolerant grand fir might be expected to develop on the site. A more likely scenario, however, would be an old growth forest with several dominant tree species including Douglas-fir, grand fir, bigleaf maple and perhaps others, with gaps in earlier successional stages resulting from small disturbances.

Predicting the future state of the forest is difficult. No native, old growth forests exist in the Willamette Valley foothills for comparison. These easily accessible forests were the first to be logged. Human impacts ranging from the introduction of non-native plants to global climate change will affect forest development patterns in unpredictable ways. It is probable, however, that at some time in the future a catastrophic disturbance will return the entire system to an earlier stage of development.

No native, old-growth forests remain in the Willamette Valley foothills.

Oregon White Oak Forest

Oregon white oak forests occur on mostly south-facing slopes on the ridgeline in the southwest part of the park, and in the Rhododendron Garden. Drier conditions in these areas initially favored the establishment of

Douglas-fir could shade out Oregon white oaks over time.

David Reed

Healthy Oregon White Oak woodland native plant communities have become rare in the Willamette Valley.

oak over Douglas-fir. However, Douglas-fir may become established in the shade of the oaks, grow taller than the oaks and eventually shade them out. In fact, the oak forest of the southwest corner consists of many younger trees that have established since the mid-1800s with a few large, older trees scattered through the stand. Several mature Douglas-fir trees have emerged from the oak canopy at the ridgeline, and a few Douglas-fir saplings are present in the understory. Camas is abundant in parts of the oak forest, a legacy of the prairie and savanna communities that existed before the trees occupied the site. Invasive understory plants such as English ivy and Himalaya blackberry may be preventing establishment of Douglas-fir beneath the oaks. The understory of the Rhododendron Garden is primarily lawn and planted ornamentals.

Isolation

The Hendricks Park forest is almost entirely separated from other forested areas except for a narrow connection through privately owned land to the south. For any ecosystem to maintain its health over time, it needs to interact with adjacent and related biotic systems. Isolated ecosystems tend to become less diverse as local extinction exceeds inflow of new individuals and species.

Flora

Plant Communities

As previously mentioned, in most of Hendricks Park the Douglas-fir forest has an understory canopy of bigleaf maple and sweet cherry. Dominant species of shrubs and herbs vary throughout this forest. The most common dominant shrubs are osoberry, hazelnut and snowberry. The most common dominant herbaceous plants are English ivy, sword fern, star-flowered Solomon's seal, false Solomon's seal, and Himalaya blackberry. In the absence of the non-native species, a native plant community in much of the forest might include Douglas-fir, bigleaf maple, osoberry, sword fern, star-flowered Solomon's seal, and false Solomon's seal (see Table 1).

In the Oregon white oak forest, Osoberry and Himalaya blackberry are the primary shrub dominants. English ivy, Leichtlin's camas, wild cucumber and bedstraw are dominants in the herbaceous layer. In some smaller areas, Scot's broom and licorice fern are dominant. A potential native community in much of this oak forest might be Oregon white oak, osoberry, Leichtlin's camas, wild cucumber, and bedstraw.

Appendix B includes a complete list of common and scientific names of plants and plant communities found in the park.

Non-Native Species

The forest understory has been significantly impacted by invasive ornamental species from residential landscaping adjacent to the park, or by unwanted yard trimmings which are discarded inside park boundaries (see Table 2). Many less invasive species have been introduced by birds in their droppings, or by squirrels as food caches, and a few may have been blown in by wind or originally may have been planted in the park as ornamentals. Construction and use of roads and trails through the park provide conditions favoring the introduction and spread of invasive species. Of the 198 native and naturalized vascular plant species inventoried in Hendricks Park, about 60% are native species, and 40% are introduced (i.e., escaped, naturalized, non-native species). In this latter category, 20 species are considered "invasive" (see discussion below).

The forest understory has been significantly impacted by invasive ornamental plant species.

The most invasive species tend to form near-monocultures and outcompete native vegetation. English ivy is an enormous problem in Hendricks Park, and elsewhere in the region. Only about three of the 55 forested acres in the park are free of English ivy. An additional seven acres have a low level of invasion. The remaining 45 acres are heavily dominated by ivy in the understory. These areas tend to have few native herbaceous species, and almost no regeneration of coniferous trees.

English ivy is an enormous problem in Hendricks Park.

TABLE 1: COMMON NATIVE SPECIES IN FOREST COMMUNITIES IN HENDRICKS PARK

DOUGLAS FIR FOREST

Trees

Douglas-fir, bigleaf maple

Shrubs and Small Trees

Osoberry, California hazel, snowberry

Forbs

Western sword fern, star-flowered Solomon's seal, false Solomon seal, fringecups, candyflower, sweet cicely, baneberry, Hooker's fairybells, spring beauty, small-flowered nemophila, white fawn lily, Pacific sanicle, western trillium

Graminoids

Alaska oniongrass, Columbia brome, Dewey's sedge, Henderson's sedge

OREGON WHITE OAK FOREST

Trees

Oregon white oak

Shrubs and Small Trees

Osoberry, poison-oak, snowberry, Pacific serviceberry, California hazel, Douglas' hawthorn, tall Oregon-grape, Lewis' mock orange, Nootka rose, ocean-spray

Forbs

Leichtlin's camas, wild cucumber, bedstraw, licorice fern, small-flowered nemophila, sweet cicely, candyflower, Pacific hound's-tongue, Pacific sanicle, Oregon iris

Graminoids

Blue wildrye, Columbia brome, California brome

"Map 5: Ivy Cover" shows the extent of the park's ivy-dominated areas.

Other invasive species, which currently are major problems in the park, include: sweet cherry, herb-Robert and Himalaya blackberry. Other invasive species are present in significant and increasing populations, but not a major problem. They include: Norway maple, horse chestnut, European mountain-ash, California bay laurel, English hawthorn, Scot's broom, English holly, English laurel, Portugal laurel, spurge laurel, nipplewort, lesser celandine, creeping buttercup, bittersweet nightshade, greater periwinkle and lesser periwinkle.

TABLE 2: INVASIVE VASCULAR PLANT SPECIES DOCUMENTED IN HENDRICKS PARK

Botanical Name	Common Name
Acer platanoides	Norway maple
Aesculus hippocastanum	Horse chestnut
Crataegus douglasii x monogyna	(Hybrid hawthorn)
Crataegus monogyna	English hawthorn
Cytisus scoparius	Scot's broom
Daphne laureola	spurge laurel
Geranium robertianum	Herb Robert (Stinky Bob)
Hedera helix	English ivy
Ilex aquifolium	English holly
Lapsana communis	Nipplewort
Prunus avium	Sweet or Mazzard cherry
Prunus laurocerasus	English laurel
Prunus lusitanica	Portugal laurel
Ranunculus ficaria	Lesser celandine
Ranunculus repens	Creeping buttercup
Rubus discolor	Himalaya blackberry
Solanum dulcamara	Bittersweet nightshade
Sorbus aucuparia	European mountain-ash
Umbellularia californica	California bay laurel
Vinca major	Greater periwinkle
Vinca minor	Lesser periwinkle

Another invasive, non-native species which is not yet documented in Hendricks Park, but which currently is invading similar habitats nearby in the region, is false brome. False brome can devastate herbaceous species diversity, particularly in partly shaded forest habitats and open meadows.

Table 3 lists common native vascular plants found in Hendricks Park. The following plant lists can be found in Appendix B: 1) existing native and naturalized, non-native species in the park, 2) existing and potentially-occurring native species in the Douglas-fir and oak forest habitats, and 3) invasive species.

Rare Species

Tall Bugbane, a rare plant

One rare plant species was discovered in the park. A population of approximately 200 plants of tall bugbane (*Cimicifuga elata*) was found in the southeast portion of the park. Tall bugbane is a federal "Species of Concern" and a state "Candidate" for listing.

FUNGI

The survey of fungi yielded 101 species. Of these, 48 species are terrestrial, 33 grow on wood, 12 are epiphytic lichens, and ten others grow on other substrates. Because of the dry fall in 1998 when the survey was conducted, it is expected that many more species will be discovered in future surveys. A complete list of fungi species is in Appendix B.

Dominating much of the forest, the English ivy monoculture probably plays a role in decreasing species diversity of plants, and thereby may also reducing the diversity of potential mycorrhizal fungi which otherwise might be present (Camacho, pers. comm.)

TABLE 3: Common Native Vascular Plants of Hendricks Park

Botanical Name	Common Name
TREES	
Acer macrophyllum	Bigleaf maple
Pseudotsuga menziesii	Douglas-fir
Quercus garryana	Oregon white oak
SHRUBS	
Actaea rubra	Baneberry
Corylus cornuta var. californica	California hazel
Oemleria cerasiformis	Osoberry
Rubus parviflorus	Thimbleberry
Symphoricarpos albus	Snowberry
HERBS	
Adenocaulon bicolor	Pathfinder
Athyrium felix-femina	Lady fern
Bromus vulgaris	Columbia brome
Camassia leichtlinii	Leichtlin's camas
Cardamine nuttallii var. nuttallii	Spring beauty
Carex deweyana	Dewey's sedge
Carex hendersonii	Henderson's sedge
Claytonia perfoliata	Miner's lettuce
Claytonia sibirica	Candyflower
Elymus glaucus	Blue wildrye
Erythronium oregonum	White fawn lily
Galium aparine	Bedstraw or cleavers
Ligusticum apiifolium	Celery-leaved lovage
Maianthemum (Smilacina) stellata	Star-flowered Solomon's seal
Maianthemum (Smilacina) racemosa	False Solomon's seal
Marah oregana	Wild cucumber
Osmorhiza chilensis	Sweet cicely
Polypodium glycyrrhiza	Licorice fern
Polystichum munitum	Western sword fern
Prosartes disporum hookeri	Hooker's fairybells
Rubus ursinus	Trailing blackberry
Sanicula crassicaulis	Pacific sanicle
Tellima grandiflora	Fringecups
Trillium ovatum	Western trillium
Trillium albidum	Sessile trillium

Three species of fungi were documented that are parasitic or partly parasitic on conifers: artist's conk, pine conk (also called red ring rot) and cubical butt rot.

Wildlife and Wildlife Habitat

Water, food and cover (for hiding, resting and breeding) are primary needs of wildlife. In addition, many species need connection to other habitat areas for breeding, genetic exchange, foraging and migrating. The following paragraphs describe and analyze habitats in Hendricks Park.

Wildlife Habitat Description

The primary habitat in Hendricks Park is coniferous-deciduous forest, with an overstory almost entirely of Douglas-fir, and a subcanopy of bigleaf maple and sweet cherry. The majority of the forest is either lacking a significant shrub layer, or merely has a few scattered osoberry, western hazelnut, baldhip rose or vine maple. The herbaceous layer is overwhelmingly dominated by English ivy, resulting in low diversity of native species on the forest floor.

In the southwest portion of the park on the ridge top, the Oregon white oak forest has a significant shrub layer comprised of the following: osoberry, snowberry, Himalaya blackberry, western hazelnut and occasionally sweet cherry seedlings. In the Rhododendron Garden, the oak overstory has an understory of rhododendrons and other ornamental species.

Water

Lack of permanent water limits wildlife.

In the Rhododendron Garden, a small artificial pond is the only permanent water source in the park, although it occasionally may freeze during cold weather. Small pockets of surface water exist seasonally just east of the upper saddle, along the north-south trail in the southeast portion of the park, and along Fairmount Boulevard and the closed road above where they cross two small drainages. Water was noted in hollows of two tree bases during field work, possibly providing a small amount of breeding habitat for Pacific tree frogs and aquatic insects.

The lack of permanent water in the park is a limitation for animals that need nearby water to drink or for breeding (such as amphibians and aquatic invertebrates). Squirrels in the park probably obtain water in the summer from the artificial pond in the Rhododendron Garden, and from ponds, bird baths, irrigation puddles, or pet watering dishes at neighborhood residences. Because of their mobility, birds are less limited by the lack of water in the park. The lack of water also limits insects that have an aquatic larval stage, reducing food resources for insect-eating animals such as swallows, swifts and bats.

Native Plant Diversity

Many animals feed primarily on plants, and some native species have evolved closely with native plant species and depend on them for food. For example, many butterfly species rely on specific plants as larval hosts (see table in Supplemental Report). Diversity of plant species, especially those with fruits, nuts, or other seeds, provides good food for birds, squirrels and other animals. Diversity also provides a variety of habitats for insects, which in turn provide food for birds, bats and small mammals. English ivy outcompetes native plants in the forest understory that would otherwise provide a variety of food for invertebrates, amphibians, reptiles, and small mammals. Douglas-fir, bigleaf maple, Oregon white oak and osoberry are common native tree and shrub species in the park, which provide seeds and fruits for birds and squirrels. A few other native wildlife food plants are present in small numbers.

Structural Diversity

Layers of tree, shrub and herbaceous vegetation create structural diversity in a forest. Many animals spend part or all of their lives in certain layers, and the presence of more than one layer provides habitat variety accommodating a wider diversity of animal species. Excellent tree cover exists in the forested area of the park for certain insects, birds that dwell in the canopy, bats, and squirrels (possibly other small, arboreal mammals are present). The lack of a significant shrub layer is a limitation for birds and small and medium sized mammals which dwell (or partly dwell) close to the forest floor. Causes of the reduced shrub layer include not only the closed Douglas-fir canopy, which does not allow enough light to permit a dense shrub layer, but also the additional shade provided by sweet cherry and bigleaf maple, and shade and competition from English ivy. The rarity of special habitat features such as snags, logs, rock, and brush piles further limit wildlife habitat in the park.

A minimal shrub layer limits habitat for birds and small mammals. Snags and downed logs are also rare habitat features.

Impacts on Native Species

Human presence, especially chasing, yelling, or harassment, is disturbing to many species of native animals. Cats and dogs are widely known to pursue and prey on birds, rabbits, squirrels, chipmunks and other rodents, as well as amphibians and reptiles (National Audubon Society, 1999). Predation and harassment by pets may keep populations of some species low, and keep other species from entering the park.

David Reed

Dogs off-leash in Hendricks Park can impact wildlife.

Table 4 summarizes the effects of humans, pets and non-native wildlife species on native species (Castillo, Campbell and Robert, pers. comm.).

TABLE 4: EFFECTS OF NON-NATIVE WILDLIFE & HUMANS ON NATIVE WILDLIFE

Species	Detrimental Effects on Native Wildlife
House Cat and Feral Cat	Prey extensively on ground nesting and feeding birds, small mammals, occasionally small herptiles.
European Starling	Extremely competitive with native cavity nesters (birds and mammals) for cavities. Also, compete with other birds for food.
Eastern Fox Squirrel	Probably competitive with Western Gray Squirrels for food and territory, and other cavity nesters for space. May be a serious problem, but not well documented.
Domestic Dog	Chase, harass and sometimes kill small mammals and reptiles.
Humans	Chasing, yelling, rock-throwing, B-B gun shooting, trapping, catching by hand, accidental pesticide contamination, etc.
House Sparrow	Probably competitive with native songbirds for food, nesting habitat. Generally not viewed as a serious problem.
Norway Rat	May be competitive with cavity dwellers. Eat birds and eggs, mollusks, amphibians, reptiles, small mammals.
Invertebrates	(Several species of Eurasian slugs, snails, earthworms, flies, European Cabbage Moth and European Honeybee, etc.) Effects of competition on native species largely unknown.

Wildlife officials do not often receive much support from the public for control of non-native species, because it involves trapping and either killing or moving the non-native animals. Because of a lack of information, the general public often views non-native wildlife species equal to native species, and is not aware of their detrimental impact on native species and ecosystems. In urban areas, support for wildlife control usually exists only when there is a nuisance problem, and again, there is often little or no distinction by the public between native and non-native species.

Connectivity

Hendricks Park is nearly an "island" of wildlife habitat.

Habitat connectivity through "corridors" is important for many species of wildlife. Lack of sufficient connectivity can result in reduced accessibility and use of habitat. Connectivity facilitates movement of animals to new forage areas, finding mates (and facilitating gene pool exchange to prevent inbreeding which results from isolation), migrating and post-breeding dispersal. Hendricks Park is at the north end of a ridge, and it is surrounded by urban residential development. Except for connection of undeveloped land bordering the south end, the park is nearly an "island" of habitat. There is, however, some connectivity in the tree canopy in several directions from the park, facilitating movement of birds and arboreal mammals (squirrels, chipmunks, etc.). Birds and insects can also utilize connections to the Willamette River, north and east of the park.

Wildlife Species Present

A large number of bird species are present in Hendricks Park, but few amphibian, mammal, or reptile species are documented (see Table 5, next page). No information is available for invertebrates (insects, mollusks, crustaceans, etc.). The overwhelming dominance of English ivy lowers native plant diversity, and may be a reason for low number of species present in the park. The Appendix contains a complete list of species documented and potentially occurring in the park.

Ninety-one species of birds are known to use Hendricks Park, 88 of them are native species, and three are introduced species: Rock Dove, European Starling and House Sparrow. Sixty-nine species are known to breed in the park. A complete list of species is provided in Appendix B.

Eighty-eight native bird species were documented in the park.

Only two amphibians and two reptile species are documented in the park: Pacific tree frog, common garter snake, ensatina (a species of salamander), and northwestern garter snake. Other species may be present (see the *Supplemental Report*), but they probably exist in low numbers because of habitat limitations. Surveys for herptiles have not been done in the park.

Few mammals are known to use Hendricks Park, but again, no surveys have been conducted. Perhaps the most common mammal present is the western gray squirrel, which was found throughout the park. They are classified as "Sensitive - Undetermined" by the Oregon Department of Fish and Wildlife (ODFW) under the Oregon Endangered Species Act. The presence of non-native eastern fox squirrels may be detrimental to western gray squirrels, as they occupy similar ecological niches, and may compete for territories, nesting cavities and food.

Western Gray Squirrel is the park's most common mammal.

Other mammals recorded in the park include black-tailed deer, Norway rat, raccoon and Townsend's chipmunk. Additional species are likely to be recorded if systematic surveys are conducted. As with other types of wildlife, habitat limitations probably keep mammal diversity and populations low.

People-Wildlife Conflicts

Currently, people feeding deer and raccoons is thought to be responsible for creating the most significant wildlife-related problems in the Hendricks Park area (Campbell, pers. comm.). Feeding accustoms wildlife to people, and the more they become familiar, the more potential there is for conflict (e.g., they are encouraged to stay around yards, look for food, and fight with pets). In some areas, deer have been known to stomp pets and chase people, but this has not been reported in the Hendricks Park area.

A few complaints are received each year by ODFW when squirrels feed on ornamental fruit trees in yards, and when Northern Flickers (a bird in the Woodpecker family) drum on eaves or other residential structures to proclaim territories to attract mates.

TABLE 5: Wildlife Species Documented in 1999 in Hendricks Park

BIRDS

American Crow
American Robin
Bewick's Wren
Black-capped Chickadee
Black-headed Grosbeak
Black-throated Gray Warbler
Brown Creeper
Brown-headed Cowbird
Bushtit
Cassin's Vireo
Cedar Waxwing
Chestnut-backed Chickadee
Chipping Sparrow
Cooper's Hawk
Common Raven
Dark-eyed Junco
Downy Woodpecker
European Starling
Evening Grosbeak
Golden-crowned Kinglet
Hammond's Flycatcher
House Finch
Hutton's Vireo
Nashville Warbler
Northern Flicker
Orange-crowned Warbler
Pacific-slope Flycatcher
Pileated Woodpecker
Pine Siskin
Red-breasted Nuthatch
Ruby-crowned Kinglet
Rufous Hummingbird
Scrub Jay
Song Sparrow
Spotted Towhee
Steller's Jay
Swainson's Thrush
Townsend's Warbler
Tree Swallow
Turkey Vulture
Varied Thrush
Vaux's Swift
Violet-green Swallow
Warbling Vireo
Western Tanager
Western Wood Peewee
Wilson's Warbler
Winter Wren
Yellow-rumped Warbler

AMBHIBIANS AND REPTILES

Common Garter Snake
Ensatina
Northwestern Garter Snake
Pacific Tree Frog

MAMMALS

Black-tailed Deer
Eastern Fox Squirrel
Norway Rat
Raccoon
Townsend's Chipmunk
Western Gray Squirrel

Land Use Planning and Off-Site Factors

Hendricks Park is an integral part of the fabric of the city; therefore, land use decisions and the environment external to the park have a major bearing on future management. Outlined here are the major factors that should be addressed in the *Hendricks Park Forest Management Plan*.

Jurisdictional Boundaries

Lands bordering the south and southeast of the park are outside city limits. This is significant because proposed development would be subject to the requirements for annexation, and urban services would need to be extended or provided. In part, this is a factor in the largely vacant and natural condition of the area south of the park.

Lands south and southeast of the park would need to be annexed to accommodate urban use.

The Urban Growth Boundary extends south beyond 30th Avenue, and therefore a large area south of the park could be urbanized in the future. Growth has been occurring in the Moon Mountain area to the southeast, and given the proximity to downtown and natural amenities of the area, development activity will probably continue in this part of the Laurel Hill Valley.

Zoning

Hendricks Park is zoned *Public Land*. However, based on proposals in the current draft of the Eugene Land Use Code Update, there may be opportunities in the future to change the zoning designation of the park to reflect its special qualities. Either the "*Natural Resource Zone"* or the proposed "*Parks and Open Space Zone"* may be more appropriate to the desired role and function of the park (see Chapter 5).

Current zoning fails to recognize the special role and function of the park.

Areas north, east, and south of the park are zoned *"Suburban Residential."* Here, density requirements are lower than other residential zones in the city, for the purpose of creating a more "semi-rural environment." Given the number of environmental features and constraints associated with large vacant parcels to the south, it appears likely that hillside development will be lower density than the maximum five units per acre permitted in the area (Bishow, pers. comm.)

Area west of the park is zoned "*Low Density Residential"* and the maximum density permitted is 10 units or less per gross acre. This area is built out.

Surrounding Land Use and Ownership

Single family residential use almost completely surrounds the park, except for the vacant land to the south. Many of the 68 adjacent tax lots are large, and most houses are set back from the park or distanced by topographic relief and/or vegetation buffers. A vacant eight-acre tract and two other sizable lots join the southern boundary of the park.

Opportunities & Constraints Analysis

An evaluation was made of attributes, opportunities, and constraints of the park to understand to what degree the site functions in a harmonious, ecologically responsible manner. In this context, human, physical, natural, and natural-appearing aspects of the park were examined as a basis for determining ecological significance and compatibility. This approach assumes that integrated ecosystem management requires a holistic approach, and therefore human satisfactions, experiences, and uses (or misuses) are important, as are the health and condition of the physical environment. In other words, attitudes and values reflect behavior, which in turn either respects or negatively impacts the forest environment.

Attributes and Opportunities

Attributes and opportunities are defined as the qualities, characteristics, and potentiality of the built and natural environment in the park. The assessment reflects application of park design principles, as well as analysis of resource values and condition. These results are summarized in a map included in Appendix C.

Image and Arrival

Four park entrances provide little sense of park entry and function more as extensions of neighborhood streets.

A positive image and arrival occurs at the Summit Avenue entrance with park signage, pathways, forest and meadow, and pedestrian-scale lights creating strong, harmonious elements. Fairmount Boulevard, Skyline Boulevard, Birch Lane, and Floral Hill Drive entries function more as extensions of neighborhood streets and have less of a sense of park entry. In the heart of the park, the visitor is not well oriented to the site's features, which affects the park's legibility. This aspect of park design and visitor management is important because of the porosity of the park to the automobile, and park roads that function more as extensions of the city's street system. If park entry and its special characteristics are not acknowledged, then motorists are more likely to speed through the park, fail to appreciatate park and forest values, and disregard the hazard to park visitors who walk on these narrow roads.

David Reed

The Summit Ave. entrance creates a positive image.

Sense of Place

The main saddle area has the strongest sense of place because of the historic picnic shelter and rock fireplace,* picnic grounds, and Rhododendron Garden. The latter has evolved with sensitivity and artistic design along the south-facing slope northwest of the saddle. A strong sense of place also exists at the intersection of trails in the upper saddle, because of the opening in the canopy and serenity of the area framed by maple trees, oaks, and conifers. Some misfits reduce scenic and ecological integrity of this area.

David Reed

The rock fireplace in the Picnic Shelter (being restored) provides a strong sense of place.

Viewpoints

Potential panoramic views of the valley, hills, and mountains exist throughout the park. However, unlike early years before the site was heavily wooded, most views are concealed by foreground vegetation, especially during the growing season. These viewpoints occur at the Rhododendron Garden parking lot, above the EWEB reservoir in the southwest corner of the park, along the east ridgeline trail and the Ribbon Trail, and at the oak knoll on the west ridgeline.

Most panoramic views are hidden by foreground vegetation.

David Reed

From the east ridge, a rare view to the foothills of the Cascades.

Scenic Integrity

In addition to areas discussed above, other parts of the park also have high scenic integrity. These include Fairmount Boulevard and the upper loop road (now closed to vehicles), the oak knoll and woodland on the western ridgeline, and the south and southeast part of the park with several very large Douglas-fir trees and a diverse understory.

* Hendricks Park and the picnic shelter are both listed in the Oregon Cultural Resource Inventory as having historic significance. The shelter, built in 1938 as a Works Progress Administration project, is described as having "National Park" architectural style, and the stone fireplace as one of its "outstanding decorative features." Destroyed in the March 2nd storm, the shelter will be replaced according to the original architectural style. The fireplace was not damaged.

Forest Resource Values

As this planning effort has determined, Hendricks Park has outstanding natural resource values and processes that are significant to the community. With sensitive management and protection, they will continue to increase in importance. The park is a good example of a Douglas-fir forest in the Willamette Valley foothills that is slowly acquiring characteristics of an old growth forest. The ancient slide in the southeast area of the park represents an excellent opportunity for geologic interpretation. Charcoal can be found at the base of very old Douglas-fir trees, very possibly from fires set by Kalapooya Indians prior to Euro-American settlement. Invasive vegetation is affecting ecological health and diversity of the forest floor, and community volunteers provide hours of labor to help remove and control this urban intrusion. These varied forest conditions and values offer superb opportunities for research, education, and demonstration of restoration and enhancement practices.

The park offers superb opportunities for forest research, education and restoration.

Access

A major attribute of the park is its accessibility. This is due to an extensive trail system throughout the forest, walkways in the Rhododendron Garden, the upper park road now functioning exclusively as a paved pathway through a cross section of the forest, and several park roads including the scenic travelway along lower Fairmount Boulevard. There are pedestrian connections to adjacent neighborhoods on all sides of the park. The park and many of its features are accessible to persons with disabilities and to older adults.

Opportunity Areas

Three opportunity areas: 1) the summit, 2) the upper saddle, and 3) west of the picnic grounds.

Three locations have been identified as "opportunity areas" because of their potential for enhancing functions of the park.

The first area is the summit near the southern boundary. Not only is this area ecologically rich with high quality understory and several dominant Douglas-firs, but a typical trail user will desire to experience the highest point on the site. Unfortunately, several intrusions exist in this area: a radio tower with an "outhouse" appearance "celebrates" the high point, and the summit is located adjacent to the southern park boundary and nearby residential structures.

David Reed

The Upper Saddle area is an "opportunity area" where several trails intersect.

The second "opportunity area" is the upper saddle area, where the abandoned restroom is located. This area has high interpretive value because of its strong sense of place, and intersection of major trails.

The third "opportunity area" is within the transition zone of the main saddle, west of the picnic grounds. If additional parking and/or a future maintenance/administrative facility should be required, this area could likely absorb additional human intrusions without major ecological impact on park and forest values. The former wildlife pens and current use as park maintenance and storage facilities have already impacted this area.

Constraints

As identified in this analysis of Hendricks Park, constraints have the following characteristics:

> "…improper uses of the land are disturbing not only esthetically but practically, for an unsuitable use senselessly forced upon a landscape generates frictions that may not only destroy the most desirable qualities of the landscape area, but preclude proper function as well." (Simonds, 1961)

In this sense, every human action (or inaction) modifies the character of the landscape, and should be scrutinized for suitability and ecological harmony. Constraints are described in this section and summarized on a map included in Appendix C.

Traffic, Circulation, and Parking

David Reed

Vehicle congestion during high use periods is a problem. Picnic area parking lot shown.

While the park is very accessible, the automobile is a disruptive factor because of conflicts with pedestrians and park users. The five park roads function essentially as extensions of residential streets, and sustain significant non-park use. Frequently speeds exceed safe limits and are a potential danger to pedestrians. During site assessments for this plan, several vehicles were observed ignoring stop signs, and creating potential danger to pedestrians in crosswalks. Rarely do motorists yield to pedestrians, as signage requires. Many pedestrians are inclined to walk along park roads, especially near the picnic shelter and along the Rhododendron Garden on Birch Lane.

Areas with varying degrees of conflict have been identified at almost all road intersections including Summit Avenue and Birch Lane at the picnic shelter, Floral Hill Drive and Fairmount Boulevard at the picnic area parking lot, and Birch Lane and Skyline Boulevard at the Rhododendron Garden. Other conflicts exist along the Fairmount Boulevard travelway because of sharp curves and minimal pavement width. At the picnic shelter, first time users often come to a complete stop at the top of Summit Avenue as they seek orientation to park features.

Automobiles disrupt park use.

David Reed

The Skyline Blvd. entrance leads to a parking area for the Rhododendron Garden, and can cause conflicts between neighborhood traffic and park visitors.

The intersection south of the picnic grounds is awkward because Fairmount Boulevard, Floral Hill Drive, a private driveway, the parking lot entry, and two trailheads all intersect at essentially the same location. When the parking lot is full, especially when group functions take place, this intersection can become congested and sometimes reach gridlock. Vehicles may park along the lot entry and along Fairmount Blvd, and no turn-around option is available inside the lot. Other adverse impacts from automobiles include roadside erosion, drainage problems, soil compaction, and littering.

Parking bays along Fairmount Blvd. sometimes attracts undesirable uses.

Parking at the Rhododendron Garden conflicts with traffic intersecting at the Skyline Boulevard entry to the park. On the south side of Fairmount Boulevard, several parking bays attract users who sit for extended periods–sometimes overnight–in parked cars, and sometimes litter. People accessing forest trails from these parking areas causes bank erosion.

David Reed

Unofficial trails impact ecological resources.

The park can not accommodate the number of bus groups that tour the park and gardens. Only one designated parking area functions satisfactorily, located on the Birch Lane hill opposite the gardens. Buses have difficulty negotiating both the garden and picnic grounds parking lots. Much of the time the park functions satisfactorily in spite of these conflicts. However, these problems can become severe, especially during peak use periods when parking lots become full. Moreover, as use of Hendricks Park increases in the future, these deficiencies will be more critical. These observations point to the need to address carrying capacity in this planning process (see page 57).

Trail Use and Impacts

The extensive forest trail system is considered a major constraint to park use and ecological health. Three kinds of trails exist: (1) official trails, (2) unofficial trails, and (3) shortcuts and off-trail meanders. Throughout the forest, the informal trails create considerable ecological impacts such as soil compaction, exposed tree roots, erosion, drainage problems, and damage to sensitive areas of the forest floor. Lack of signage and information exacerbates the situation. Bicycle use of unpaved trails is prohibited, but still occurs and can cause significant trail damage during the wet season if the prohibition is not regularly enforced.

Storm Drainage and Erosion

At the intersection of Highland Drive and Cresta De La Ruta, a 12" storm drain daylights on the southwest edge of the park. High velocity stormwater has created a deep, eroded channel with a steep gradient down through the western part of the forest. Some recent windblown trees have fallen along this channel. The drainage creates ponding on the forest trail and roadsides below, although a culvert was installed in the spring of 1999 to alleviate the problem. (See *Hendricks Park Forest Management Plan Supplemental Report* for complete field report and possible solutions).

David Reed

Stormwater originating off-site has eroded a deep gully in the park.

Infrastructure Maintenance

Much of the park infrastructure is old, deteriorating, and in need of repair. Across an upper trail in the forest interior, an exposed and breached drainage pipe causes erosion. Several pipes are malfunctioning on other trails, and cause erosion and sedimentation. Water bars are needed along trails in several locations. Though not impacting forest health, several log barriers along park roads are deteriorating, and recent replacements have not been executed with the same sense of artistic design and consistency in dimension, which creates disharmony.

Invasive Vegetation

English ivy may cause trilliums, other native wildflowers to decline.

Introduced plant species are degrading the park's native plant communities, especially species that live on the forest floor. English ivy and other invasive species are beginning to form dense carpets that exclude other vegetation and could cause long-term decline of trillium and other native herbaceous plants, as well as interfere with regeneration of trees such as Douglas-fir. From a user perspective, a monotonous forest landscape is less interesting than one with biodiversity.

Shelter Area Impacts

The picnic shelter area and small parking lot are sandwiched between the road intersection and the eastern park boundary, which compresses a high volume of human and vehicular use into a small area. Impacts from this use include soil compaction, exposed tree roots, and runoff including oils from the parking lot. Large group events also have the potential for impacting nearby residents.

Unstable Main Saddle Area

Chapter 6 presents a report on the unstable stand conditions of the saddle area, describes the potential for wind accelerating as it funnels up the Summit Avenue corridor, and the propensity for turbulence on the leeward side of the saddle.

David Reed

Infrastructure maintenance has been deferred.

Main saddle is prone to falling trees due to wind funnelling up Summit Avenue.

Because of the strong cultural and social attachment to this area resulting in extensive human use, there is high potential for conflict with the need to stabilize and restore this area to a desired equilibrium. This has implications for current maintenance management practices such as type and frequency of mowing, vegetation replacement choices, and irrigation.

David Reed

A radio tower that appears like an outhouse, located on the highest point on the park, is a physical misfit that should be screened or eventually relocated.

Physical Misfits and Intrusions

The most significant misfits are: the radio tower building at the southern summit in the park, nonfunctional stonework, an abandoned restroom building intruding on the upper saddle, EWEB reservoirs in need of paint and fence repair along the adjacent forest trail, and the small swing with a cross-bar bolted to adjacent Douglas-fir trees. In the Rhododendron Garden, the park restroom and office building preempts one of the most dramatic viewpoints in the park. The maintenance area and storage yard is exposed and in open view from Fairmount Boulevard. Unpainted bollards have odd shapes, are anchored at odd angles, and generally represent incongruous entries that detract from the recreation experience.

Edge/Boundary Conditions

Boundaries of the park are not well defined, making the site vulnerable to a number of activities by adjacent property owners that, intentionally or not, either have encroached on the park, or cause speculation that encroachment has occurred. Unfortunately, no ground survey has formally established boundary locations.

David Reed

A private garden may extend across the park boundary. A formal survey would clarify confused boundaries.

Public parks are considered inviolate lands in perpetuity. While minor encroachments may not appear significant, the cumulative effect of private use of parkland over time can be a significant breach of the public trust.

Some degree of reason is called for in this assessment. For example, when invasive vegetation such as English ivy and blackberries encroach on adjacent properties, efforts of homeowners to suppress park vegetation and en-

croach on parkland through revegetation and landscaping may be fairly benign. Frequently these residents are good neighbors and support park staff in maintaining appropriate uses of the park.

It should also be recognized that although English ivy has entered the park from adjacent residential landscaping, it is now pervasive, and ivy from the park is now encroaching on adjacent yards that have no ivy.

Poorly defined park boundaries make park vulnerable to private encroachments.

Activities considered to have the most negative ecological impacts on the park include the following:

- on the park side of Highland Drive, a privately paved parking area is used for residential parking
- consistent dumping of yard debris continually introduces invasive and ornamental vegetation such as periwinkle into the forest
- private driveways confuse the public, create trespass problems for homeowners, and cause ecological impacts such as roadside erosion and contaminated runoff
- a house was built in the public right of way on a stub-out street, creating a barrier to pedestrian access, a structure was built on park property, and the natural drainage was intercepted and disturbed
- a rock terraced garden was built on the east side of the park which appears to be on park property
- an adjacent lot was excavated and the discarded material appears to have been deposited within the park boundaries

Fragmentation/Connectivity

In the 1970s, the Ribbon Trail Association blazed a trail south of Hendricks Park to 29th Avenue, which is an important link in connecting the park with Skyline Park farther to the south. However, this activity did not acquire trail easements, and the legality of the current extension is uncertain. This connection has been a plan recommendation for a number of years. The corridor has high ecological integrity and it is important to maintain connectivity south of the park (see graphic, page 24).

In the 1970s, the Ribbon Trail Association blazed a trail south to 29th Ave.

Hendricks Park is a relatively short distance from Alton Baker Park and the Knickerbocker bike bridge across the Willamette River. However, urban development has caused considerable fragmentation between the two parks. Franklin Boulevard is a major barrier.

FINDINGS

1. Most of Hendricks Park consists of even-aged Douglas-fir with an understory canopy of bigleaf maple, oak and sweet cherry, representing a relatively uniform Douglas-fir forest. It will eventually develop into an old growth forest. It is generally in a healthy and stable condition.

2. English ivy is an invasive plant dominates almost 95 percent of the forest understory, climbing trees, significantly reducing botanical diversity of the forest floor and hindering regeneration of conifer trees.

3. A significant population of tall bugbane (*Cimicifuga elata*), a rare plant, exists in the Hendricks Park forest.

4. An oak woodland, a remnant of pre-settlement vegetation, exists in the southwest portion of the forest and has ecological and habitat value.

5. Hendricks Park has a large number of bird species present, but few amphibian, mammal, or reptile species. This is because of extensive human use and impacts, and because of a lack of perennial water, little woody debris and snags, and low amount and diversity of understory vegetation.

6. Hendricks Park lacks connectivity to the ridgeline forest system, which further limits presence of wildlife.

7. Pets off leash and human harassment adversely impacts wildlife in the park.

8. Much of Hendricks Park has high scenic and ecological integrity, with features characteristic of a relatively young Douglas-fir upland forest enhanced by contrasting topographic relief. Resource carrying capacity of the park must be addressed to determine limits of acceptable change to the forest resulting from public use.

9. Ecological and scenic quality of the park is diminished by physical misfits, such as the radio building at the south summit, and by disturbances from human activities in the park, such as erosion from informal trails. Off-site impacts also affect the scenic quality, such as storm water run-off, invasive vegetation, and incongruent practices of some adjacent residents who place yard debris along the park edge.

10. Several areas have a very strong sense of place including the picnic shelter, forested picnic grounds, and the Rhododendron Garden. The trail intersection in the upper saddle has strong elements of an enclosed opening.

11. Potential panoramic viewpoints exist in the park, but most are concealed by vegetation. One is obstructed by the park office and restroom structure, and another is impacted by the EWEB reservoir and damaged fencing.

12. Access to and within the park is excellent due to its extensive road system, paved trail, and forest trails. This is also a major park deficiency because of conflicts between vehicles and pedestrians, and non-park traffic. Circulation and capacity problems exist at the picnic area parking lot, and ecological impacts are created by an informal forest trail system.

13. The Summit Ave. entrance has an excellent sense of image and arrival, but other entries represent mostly extensions of residential streets. Little information is available to the visitor related to history and values of the park.

14. Forest stand instability and compressed human use in the saddle area presents a potential conflict with efforts to restore the site to a desired equilibrium.

15. Much of the park's infrastructure is old, deteriorating, and in need of repair. Drainage pipes create erosion and drainage problems.

16. Cumulative impact of private activities along the park edge has affected the functionality and ecological integrity of the park. These include encroachments into the park and discarded yard debris. Undefined park boundaries compound the problem.

17. Hendricks Park functions as an unconnected node on the ridgeline, with potential for connections at least south to 29th Avenue, and for on-street connections to the Willamette River and Alton Baker Park.

CHAPTER 5: Current Park Use & Management

Introduction

Chapter 4 provides baseline information on the nature, condition, and significance of the forest resources of Hendricks Park. Since the primary goal of this plan is to maintain a healthy urban forest, it is imperative that public uses are compatible with forest protection.

Public uses should be compatible with forest protection.

Keeping in mind the findings generated by the resource inventory and assessment in Chapter 4, this chapter examines the role and function of Hendricks Park, describes current park use, looks at recreation trends and needs, and recommends preferred uses for the forested area of the park. Additionally, this chapter reviews current park management to help determine if there is a gap between future requirements for public use and resource management, and the present level of staffing, funding, maintenance and operations.

Role and Function of Hendricks Park

The 1906 acquisition of Hendricks Park represents Eugene's earliest commitment to preserve and provide public access to the extensive forested ridgeline, which surrounds much of the south and southeast parts of the city. Since then, over 700 acres of ridgeline open space have been added to the park system, including a recent 35-acre portion of Moon Mountain southeast of Hendricks Park. Although relatively small in size compared to other ridgeline parks in the South Hills, Hendricks Park has special characteristics that give it a distinctive role in the open space system.

The 1989 Eugene Parks and Recreation Plan classifies Hendricks Park as a *metropolitan park,* defined as a large urban park with a wide variety of park and recreation functions serving the entire metropolitan area. The Eugene plan, however, does not include a classification for *natural resource areas, preserves,* and *open space*, as recommended by the National Recreation and Park Association in its recent publication *Park, Recreation, Open Space, and Greenway Guidelines.* The guidelines suggest using this classification type for natural resource sites with unique geologic features; ecosystems with biodiversity and sustainability missions; forests and woodlands; wildlife habitat; and areas having rare, threatened or endangered species.

Hendricks Park is currently classified as a "metropolitan park."

The following assessment was made to evaluate the appropriateness of the current classification of Hendricks Park as a *metropolitan park*.

1. Location and Accessibility: Extraordinary opportunities exist for public use and enjoyment enhanced by proximity to the community and access to and throughout the park. Hendricks Park is a toehold on the Eugene ridgeline, within walking distance of the Willamette River, Alton Baker Park, and downtown Eugene.

2. History: The park is an historical and cultural treasure as Eugene's first city park and part of the "soul" of the community. The historic picnic shelter is a "core" value, as is the scenic beauty of the forest and cultural values associated with the Rhododendron Garden which has been in existence for nearly half a century and is recognized internationally.

3. Resource Values: The community has valued this representative upland forest for almost a century. Users are attracted to the park's ridgeline location and its contrasting topography, its opportunity for a varied outdoor experiences, and its natural beauty. Hendricks Park is recognized for its biodiversity, ecological quality, and potential for ecosystem management.

4. Uses Supported by Other Parks: Five neighborhood parks, one large community park (Amazon), a metropolitan park (Alton Baker), and Laurelwood Golf Course are within the vicinity of Hendricks Park (see Map 2: Context Aerial Photo). Therefore the park can logically focus on forest dependent, passive outdoor recreation uses because more intensive and active recreation opportunities are available nearby.

5. Manageability: Hendricks Park is a manageable unit because of its size and scale. Moreover, on-site management provides the oversight, maintenance, and operational functions to protect, enhance, and service the park and visitors. The potential exists for applying the most advanced resource management practices, and to meet research and demonstration goals.

6. Proprietary Interest: Almost 70 homes surround the park, and most residents have a deep attachment to the park, as do the thousands of visitors each year. Hendricks Park creates neighborhood and community pride.

7. Educational Values: Because of its location, access, and qualities, the park functions as a research and training site. Park staff and community volunteers have undertaken forest restoration projects. Potential is high for educational and interpretive activities.

8. A Changing Forest Landscape: Recent storms have provided insight to the dynamic nature of the park's forested areas. Invasive, non-native vegetation such as English ivy and blackberries are also

impacting the forest. There is a community desire to manage the forest using the most current and science-based practices.

Based on this analysis, it is concluded that Hendricks Park is misclassified as a metropolitan park because it has a unique role and function, and because the park has special natural resource and community values.

Hendricks Park would be more appropriately classified as a natural resource area, rather than a metropolitan park.

Current Park Use

It is natural for popular parks and forested areas to attract large numbers of users and for the public to expect these places to accommodate their recreational needs and interests. Increasingly, park managers struggle to balance recreational use with resource protection, to avoid conflicts and competition among user groups, and to encourage the most appropriate uses.

This section examines current use of the forested area of Hendricks Park, and develops criteria for determining the type and level of preferred use. This careful approach to use is essential so that resource functions and values of the forest are not compromised, and management creates the optimum atmosphere for harmonious use of the site and its resources.

David Reed

Hendricks Park is one of the city's most visited parks.

Little visitor-use data is available to support recreational use assessment; therefore findings are based largely on personal observation and experience of the consulting team, input from the Departmental Advisory Committe, and interviews with management staff. However, a recent survey noted that Hendricks Park was among the city's most visited parks in 1994. Only the river parks and Amazon Park ranked higher (Williams Research, 1994).

For the picnic areas and natural forest of Hendricks Park, recreational uses tend to be relatively passive, including biking, exercising and playing with pets, nature enjoyment and appreciation, picnicking, pleasure driving

TABLE 6: Primary Forest Recreation Activities in Hendricks Park

Walking and hiking

Running

Nature enjoyment and appreciation

Picnicking

Exercising and playing with pets

Pleasure driving through the forest

Biking

Most current recreational uses are relatively passive.

Table 7: Current Group Use in Hendricks Park

Birthday celebrations
Company picnics
Family reunions
Graduation parties and picnics
Memorial services
Organized runs
Weddings

Note: These uses do not include those in the Rhododendron Garden

through the forest, running, walking and hiking.

While individuals or small groups frequently undertake these activities, many uses involve large, organized groups representing substantial numbers of people. These include birthday celebrations, company picnics, family reunions, graduation parties and picnics, memorial services, organized runs, and weddings.

These groups may also play volleyball in the picnic grounds or engage in other spontaneous activities as part of group events. Both the picnic shelter and picnic grounds may be reserved for group use, but by policy the staff does not schedule groups larger than 50 persons in each area. No limits are placed on the size of groups that can spontaneously use the picnic grounds. By policy, organized runs are not permitted on forest trails and park roads.

Extensive community education and research opportunities

A third type of park use centers on education and research. Extensive support is provided to educational institutions and many community groups and organizations. User groups include volunteers, students, research scientists, youth groups, neighbors, scouts, gardeners, and non-profit associations. Uses include field trips, forest research, youth job training, and volunteer work such as invasive weed control and forest restoration activities. University and college students increasingly conduct environmental research in Hendricks Park, which could provide useful baseline information and ongoing monitoring of forest conditions.

Prohibited Uses

Uses disallowed by ordinance include camping, bicycling on unpaved trails, pets off leash, and playing amplified music. There is also a night curfew, which is difficult to enforce because of the number of roadways through the park.

Incompatible or Conflicting Use

Large groups without permits occasionally exceed the capacity of existing parking facilities, which can preempt others from using the picnic grounds and accessing the staging area and trailheads of the forest. Spontaneous playground activities such as volleyball can disrupt family picnics due to the relatively small size of the picnic grounds. Organized runs can bring noisy activities into the park and conflict with those seeking solitude and tranquility, although such events occur only a few times a year. Most spontaneous runners use paved areas, and therefore generally do not conflict with other user groups, other than motorists navigating the park's winding roads. Occasionally motorbikes access hiking trails in the forest.

The most incompatible use in the park is the frequent underage consumption of alcohol and vandalism to park infrastructure and vegetation. These activities can be very destructive.

As a part of this planning effort, the consultants surveyed residents living adjacent to the park (see Survey of Adjacent Residents, *Hendricks Park Forest Managment Plan Supplemental Report*). Respondents perceived that speeding vehicles, after-hour use, loud parties, and amplified music are conflicting uses. Some neighbors expressed concern over behavior described as "hanging out" in vehicles frequently parked in bays along Fairmount Boulevard.

Resource Carrying Capacity

For purposes of the *Hendricks Park Forest Management Plan*, resource carrying capacity is evaluated against three kinds of "thresholds:"

- **Natural Resource Thresholds** are exceeded when recreational use creates adverse effects on resource quality and unacceptable amounts of deterioration occur (also referred to as "limits of acceptable change").
- **Infrastructure Thresholds** are crossed when recreational use cannot be accommodated without harming the facility or significantly affecting the quality of the recreation experience.
- **Visitor Experience Thresholds** are exceeded when the quality of the recreation experience is adversely affected, often due to conflicts between users or from users observing deteriorating natural resource conditions such as erosion.

On occasion, the park's carrying capacity appears to be exceeded.

From the resource inventory and assessment from Chapter 4, staff and consultants identified areas within the park where carrying capacity appears to have been exceeded. To more accurately determine a preferred carrying capacity for the park, additional data will be required including the number of park users, type of use for different areas, and how users perceive the quality of their experiences. Moreover, monitoring will be required to determine impacts on resource quality, such as recording the frequency that parking capacity is exceeded, identifying the resource and impacts, and assessing how the quality of recreation experience is affected.

Interim Carrying Capacity Observations

Overuse and overcrowding have been observed in the picnic grounds and around the picnic shelter. Impacts on resources include soil compaction, trampled vegetation, roadside erosion, and exposed roots. Desired levels of peak use are increasingly exceeded and are frequently associated with spontaneous, unscheduled group activities such as birthday parties, extended family gatherings, and associated play activities such as volleyball.

Limiting the size and types of large groups using the park could help address these problems. Changes in configuration and location of the picnic area parking lot should also be examined to improve function and capacity. Off-site parking alternatives should also be explored.

Limiting the size and type of large groups could help prevent overuse, overcrowding and forest impacts.

Once authorized forest trails are upgraded through trail surfacing and drainage improvements, and after informal trails are effectively closed, the park's carrying capacity can then be evaluated more accurately. Then, effects of use on resources and the quality of the recreational experience can be determined.

Current Forest Management

This section describes the level and allocation of current management resources expended on Hendricks Park. While most of the operating budget supports maintenance of the Rhododendron Garden (70%), duties and responsibilities extend to the rest of the park and the natural forest. Citywide crews (Turf and Grounds, Irrigation, and Urban Forestry) also provide maintenance support.

Seventy percent of the operating budget for Hendricks Park supports the Rhododendron Garden.

Staffing

Hendricks Park is staffed by two full time gardeners, supplemented by one part-time park specialist. Additional staff are added during summer peak use. Work-study students and volunteers also help meet staffing demands.

Over the past several years, assistance has been provided by many groups including university and college students and instructors, community service groups, the National Guard, municipal court offender work crews, non-profit conservation organizations, master gardeners, and youth crews involved in job training.

Park Maintenance and Operations

Exclusive of the Rhododendron Garden, maintenance and operation functions in Hendricks Park are routine and typical for a park of this size. Given the dual responsibilities for the garden and the rest of the park, the latter is maintained in remarkably good condition and reflects high involvement of community volunteers. Maintenance activities are listed below.

Turf Maintenance and Irrigation: Manual, reel, and rough mowing is performed around the picnic shelter and in and around the picnic grounds. An irrigation system is maintained around the picnic shelter.

Facility Maintenance: Maintaining park infrastructure and buildings includes: custodial maintenance and repairs to the restrooms and picnic shelter; road maintenance including drainage improvements, debris and weed removal; mainte-

nance, repair and replacement of roadside barriers; fixture repair, maintenance, and construction such as signs, drinking fountains, and garbage receptacles.

Grounds Maintenance: Major grounds maintenance activities include routine litter pick-up and removal; repairs caused by vandalism; and removal and control of invasive vegetation from roads and public use areas (see Natural Resource Management below).

Hazardous Tree Management: In the past, park staff has been primarily responsible for visual inspection of potentially hazardous trees; when work is required, it has been contracted out. Over the last several years, with increased emphasis on risk management, more responsibility for this function has been assumed by the city's Urban Forestry program.

Volunteer Program and Job-Training: An extensive volunteer and youth job-training program augments the park maintenance and operations program.

Visitor Management: Policy enforcement, monitoring suspicious park behavior, and public relations are high priorities in Hendricks Park. These efforts help maintain a safe and relatively problem-free park environment. Park staff also handles the rental and reservations of the picnic shelter.

In addition to the horticulture requirements of the Rhododendron Garden in Hendricks Park, staff is also responsible for landscape maintenance and volunteer coordination in nearby Washburne Park.

Natural Resource Management

Over the years, in spite of limited staff and resources, a number of restoration and enhancement activities have been undertaken throughout the park and natural forest, largely with assistance of volunteers and subsidized youth employment programs. Projects have included the following:

- Restoration and stabilization of the ancient slide in the southern part of the forest;
- Removal of English ivy from tree trunks;
- Removal of invasive vegetation and replacement with native plants and forest topsoil with additions of rotting logs for habitat structure;
- Control of erosion and sedimentation from water run-off;
- Establishment of prototype forest restoration sites; and
- Distribution of educational materials about native and non-native plants.

Management and protection of the forest is limited by funding and staffing constraints.

To the credit of on-site staff, much has been learned by keeping abreast of advanced ecosystem management practices, undertaking experimental projects, and maintaining an extensive resource management library. The demands for routine park maintenance, however, have sharply limited these efforts. Monitoring the park and forest edge is a major responsibility because of the potential impacts of yard debris and other forms of encroachment. However, engaging adjacent property owners and taking remedial action is very time consuming.

From this review, it is concluded that it has not been feasible to actively manage and protect forest resources in Hendricks Park, because of insufficient time, money, and personnel.

Forest Recreation Management

Deferred maintenance prevents desired forest recreation levels.

In Hendricks Park, forest recreation management is largely limited to assuring appropriate public use of the forest, trails and resources. For example, park staff try to keep bicycles and organized runs off unpaved trails. Maintaining and improving trails, maintaining informational signs, eliminating and controlling informal trails, and otherwise enhancing the forest recreation experience are often deferred projects. As recreational use increases, these conditions will worsen unless there are increases in management resources including financial support.

Recreation Trends and Needs

Before considering the preferred uses for Hendricks Park, it is helpful to consider local, statewide, and national trends in outdoor recreation.

Local Trends

Citizens strongly support acquisition of natural areas and ridgeline connections.

In 1994, the City of Eugene conducted a customer satisfaction survey for parks and recreation services (Williams Research, 1994). Respondents were only "somewhat satisfied" with the amount of land preserved as natural areas. Respondents also indicated very strong support for acquiring additional natural areas such as extension of the Ridgeline Trail.

In 1998, Eugene voters approved a $25.3 million bond measure that included $3.7 million for ridgeline park acquisitions. This measure's 2-1 margin of success indicates considerable public support for natural area protection.

Neighborhood Surveys

To obtain neighborhood input in developing the management plan for Hendricks Park, a survey was mailed to 68 adjacent property owners (see *Hendricks Park Forest Management Plan Supplemental Report*). The executive committee of the Laurel Hill Neighborhood Association also completed a questionnaire.

Adjacent Property Survey

Most respondents perceived "trees falling on property" as a potential impact from the park, although only one-third considered the impact as "very important." Respondents also expressed concerns for impacts to the neighborhood, including noise from park users, park traffic, trespassing on private property, and vandalism. In addition, adjacent property owners indicated concerns about after-hours use, speeding vehicles, mountain bikes on unpaved trails, unleashed pets, and, to a lesser degree, park littering.

Adjacent residents are concerned about potential for park trees to fall on their property.

A significant number of residents expressed interest in forming partnerships with the city to manage the park edge (40 percent), and an equal number expressed a tentative interest if provided with information on what a partnership would actually entail.

Laurel Hill Neighborhood Association Survey

Nine executive committee members of the Laurel Hill Neighborhood Association completed a neighborhood survey to determine interests and concerns related to the *Hendricks Park Forest Management Plan*. These respondents did not have the same perceptions as residents living next to the park. No park use was rated as having an impact on the Laurel Hill area other than "traffic through the neighborhood," which was considered to be a "low impact."

For activities inside the park, respondents rated "speeding vehicles in the park" as a very high concern (an average of 2.5 of 3 possible points), and some degree of concern for pets off leash, littering, and bicycles on unpaved trails.

Laurel Hill neighbors have great concern for speeding vehicles.

The Laurel Hill respondents have a high degree of support for the following:

1) Maintaining Hendricks Park in as natural a condition as possible;

2) Exploring traffic calming strategies in the park;

3) Controlling non-native vegetation such as English ivy;

4) Considering the pros and cons of road closure alternatives; and

5) Increasing emphasis on education and nature interpretation in the park.

Respondents were not supportive of "selectively opening views of the valley and hills."

Hendricks Park Survey

Visitors enjoy the natural beauty and tranquility of Hendricks Park.

During the spring of 1997, visitors to the Rhododendron Garden were provided an opportunity to participate in a self-administered survey. Over 300 questionnaires were completed, and while the garden was the focus of the survey, the responses provide insight to benefits enjoyed by park users. Clearly, relaxing and enjoying the park's natural beauty and tranquility were important values expressed by the respondents. It is significant that over one-third of the visitors were nonresidents.

Statewide Trends

The demand for outdoor recreation in Oregon has increased steadily over the past 20 years. According to the *Oregon Statewide Comprehensive Outdoor Recreation Plan* (1994-1999), an increasingly urban population is turning more and more to the out-of-doors for relaxation and education. However, the Plan emphasizes that the supply of public land available for recreation has generally remained static. With greater demand, two major issues have emerged:

1) Increasing recreational use is creating adverse impacts on ecosystems on existing public lands, resulting in degradation of the resource and considerable demands placed on land managers to protect these resources.

2) User conflicts are more frequent as more people share a static resource, with different perceptions of what is an appropriate recreation setting for their uses, and what is acceptable behavior.

Walking, running, picnicking, unpaved trail use, and nature observation are leading outdoor recreation activities among Oregonians .

The Oregon Parks and Recreation Department surveyed households throughout the state in 1993, and found that the leading community outdoor recreation activities were walking and running, picnicking, unpaved trail use, and nature and wildlife observation. The *Oregon Statewide Comprehensive Outdoor Recreation Plan* noted that more emphasis is needed to protect the scenic and ecologically significant areas that will sustain greater outdoor recreational use in the future. Voters approved ballot Measure 66 in 1998, which was to have appropriated $44 million from state lottery revenues for state park acquisitions and improvements, and $44 million for salmon restoration.

Nationwide Trends

A 1998 survey indicates nationwide participation in 36 outdoor recreation activities. The Roper-Starch survey found walking for fitness and recreation as the top ranked activity. Picnicking, visiting cultural sites, hiking, wildlife viewing, and running all ranked in the top ten activities.

The Roper-Starch survey asked Americans what they wanted out of their outdoor experiences. Respondents listed fun, relaxation, stress relief, and experiencing nature as the most frequently motivations and benefits from participating in outdoor recreation activities. Competition was the least perceived benefit.

Summary

Eugene citizens strongly support natural areas and natural resource management. An increasing number of city residents enjoy resource-based passive recreation activities such as walking, hiking, picnicking, and experiencing nature. This is consistent with state and national trends for these kinds of outdoor recreation pursuits.

Preferred Uses of Forested Areas

Recreation planners and geographers throughout Europe, Canada, and the United States over the last twenty years have developed a sophisticated approach to evaluate how suitable a particular landscape is for a variety of recreational uses.

Preferred uses of forest should be based on capability and suitability analysis.

The first step is to determine the **capability** of a site to support recreational use, apart from institutional, political, or economic constraints. By focusing on resource attributes and values, the resource manager can directly assess the ability of the site to support recreational use, apart from external factors such as funding (see Table 8, next page).

The second step incorporates the varied constraints or imperatives believed to be relevant in determining the **suitability** of the site to support specific recreation activities. Suitability factors include the agency's mission, the site's natural resources and unique role, as well as the management resources required to support the uses (see Table 9, page 65).

This two-step approach provides an opportunity to isolate the many complex variables that must be considered in determining the preferred use of a public resource area, and in a systematic and comprehensive manner. Therefore, clear rationale can help educate the public as to why the site lends itself more to some recreational uses, while others may be eliminated or discouraged by management.

TABLE 8: Recreation Capability Assessment For Hendricks Park

	Community Need	Park Size	Topography	Metro Function	Ecological Compatibility
Education	High	High	High	High	High
Hiking & walking	High	High	High	High	High
Job training/volunteering	High	High	High	High	High
Jogging	High	High	High	High	Moderate
Mountain biking	High	Low	High	High	Low
Nature enjoyment	High	High	High	High	High
Organized group events	High	Moderate	Low	High	Low
Playground activities	High	Moderate	Low	High	Low
Picnicking	High	High	Low	High	Moderate
Pleasure driving	Moderate	Low	High	Moderate	Low
Research	High	High	High	High	High
Walking/playing with pets	Moderate	Moderate	N/A	High	Low

Ratings:

High capability: Activities are highly supported by the criteria
Moderate capability: Activities are moderately supported by the criteria
Low capability: Activities are not supported by the criteria

Definitions:

Community need: There is a known expressed demand for the use in the community.
Park size: The park is adequate in size to support the use.
Topography: The park is able to accommodate the use without major site disturbance.
Metro function: The use is considered to be appropriate in metro parks and open space areas.
Ecological compatibility: The use has limited impact on the health and resilience of forest resources.

Recreation Capability Assessment :

Determines the ability and capacity of a site to support current recreational uses, using specific criteria focused on the resource values and characteristics of the site. By rating the recreational activities now accommodated in Hendricks Park, it is concluded that most uses meet the capability criteria.

SOURCE: David Reed & Associates, 1999.

TABLE 9: Recreation Suitability Assessment For Hendricks Park

	Forest Dependent	Forest Compatible	User Compatible	Mission/ Vision	Site Unique	Resource Requirements
Education	High	High	High	High	High	High
Hiking & walking	High	High	High	High	High	High
Job training/volunteering	High	High	High	High	High	Low
Jogging	Moderate	Moderate	Moderate	Moderate	Moderate	High
Mountain biking	High	Low	Low	Moderate	Low	Low
Nature enjoyment	High	High	High	High	High	High
Organized group events	Low	Low	Low	Low	High	Low
Playground activities	Moderate	Moderate	High	Low	Low	Low
Picnicking	High	High	High	High	High	Low
Pleasure driving	High	Low	Low	Low	High	Low
Research	High	High	High	High	High	High
Walking/playing with pets	Low	Low	Low	Low	Low	Moderate

Ratings:

High suitability: Activities are highly supported by the criteria
Moderate suitability: Activities are moderately supported by the criteria
Low suitability: Activities are not supported by the criteria

Definitions:

Forest dependent: Experiences and benefits are derived primarily from the forest environment.
Forest compatible: The use is harmonious with the forest environment.
User compatible: The use is harmonious with other uses.
Mission/vision: The use is suited to the purpose of the park.
Site unique: There are few alternative sites to accommodate the use.
Resource requirements: Maintenance and operations support required to support the use.

Recreation Suitability Assessment :

Applies more discrete management criteria that determine actual suitability of the site to support current recreational uses. By rating these more specific criteria, it is concluded that several recreational activities in Hendricks Park should be closely evaluated or perhaps even eliminated.

SOURCE: David Reed & Associates, 1999.

Preferred Forest Uses: The types of recreation use which are considered most appropriate for the forested area of Hendricks Park are those which are forest dependent or related, resource-based, and primarily passive in nature. These activities include: (1) nature enjoyment and appreciation, (2) walking and hiking, (3) research and education, (4) picnicking, (5) biking on paved trails, and (5) job training and volunteering.

TABLE 10: PREFERRED FOREST USES OF HENDRICKS PARK

Nature enjoyment and appreciation
Walking and hiking
Research and education
Picnicking
Biking on paved trails
Job training and volunteering

Uses of the park that should be discouraged include driving for pleasure, group activities with more than 50 persons, organized runs, and exercising or playing with pets off leash.

FINDINGS

Below are specific "findings" distilled from the analysis of the role, current uses, and present forest management of Hendricks Park. These findings provide the essential results of the park assessment that have guided policy development and other management directions as discussed in Chapter 7.

Role and Function of the Park

1. Hendricks Park is misclassified as a metropolitan park because it functions as a special natural resource area with characteristics that do not fit the metropolitan park classification type.
2. Hendricks Park is a microcosm of Eugene's ridgeline open space system, with potential to function as a prototype natural area.
3. Hendricks Park is a historical and cultural treasure, and can be described as part of the "soul" of Eugene.
4. Many nearby parks provide opportunities for active and intensive recreation uses that Hendricks Park need not duplicate.
5. The park's location and accessibility is extraordinary, and it has the potential to connect through the privately-owned ridgeline forest south to 30th Avenue.

Current and Preferred Park Use

1. Passive recreation activities are the predominant uses of the park. However, group events in the picnic grounds and shelter area typically are not forest-related, and these activities often damage root systems, trample vegetation, and create soil compaction.
2. Education, research, and resource-based recreation are the most suitable uses of the forested areas of Hendricks Park.
3. Eugene residents strongly support acquisition, protection, and management of natural areas. Walking, hiking, picnicking, and experiencing nature are highly valued.
4. Based on observations, the carrying capacity of forest resources and facilities is exceeded on occasion. Changes in configuration and location of the main parking lot and off-site parking alternatives could reduce site impacts and improve efficiency, requiring modest financial impacts. These options should be explored.
5. Neighbors are concerned about speeding vehicles through the park, littering, pets off leash, and bicycling on unpaved trails.
6. Adjacent residents have several concerns which are perceived to impact them directly: potentially hazardous trees, noise from park users, traffic through the neighborhood, trespassing on private property, and vandalism.

7. The Laurel Hill Neighborhood Association supports maintaining Hendricks Park in a natural condition, exploring traffic calming and road closure alternatives in the park, controlling non-native vegetation, and placing more emphasis on education and nature interpretation. Caution should be taken in opening views from Hendricks Park, due to potential visual impacts on the neighborhood.

8. Some park users have a concern for patrons "hanging out" in parking bays along Fairmount Boulevard. Dogs have been observed running loose in the forest, trampling vegetation and disturbing wildlife.

Park and Forest Management

1. On-site management is responsible for a safe, reasonably well maintained park environment, and a number of demonstration forest restoration projects.that are supported by extensive volunteer and community involvement.

2. It has not been feasible to actively manage and protect forest resources in Hendricks Park because of insufficient staff and funding. Trail maintenance and other visitor management improvements have been deferred.

CHAPTER 6: Forest Health & Safety

Introduction

This chapter presents an assessment of forest health and safety conditions and an overview of hazard tree management in Hendricks Park. Two issues are addressed: 1) factors affecting tree health and stability, and 2) public safety and risk management.

Forest Health

From existing paths, roads, and north-south transects spaced 150 feet apart, forest trees were visually evaluated for several months during 1999 to determine extent of disease, insect damage, and stability. It is important to note that native insects and diseases play integral roles in the ecological functioning of Pacific Northwest forests.

Disease

In Hendricks Park, tree vigor and extent of defect and disease are typical for a forest stand of this age, given past and current site conditions. During the visual evaluation described above, no unusual outbreaks were found. In general, the Douglas-fir forest stand is healthy with low to average disease prevalence. Two commonly found diseases include *Phellinus pini* (red ring rot), and *Phaeolus schweintzii* (cubical butt rot). There was no evidence of *Phellinus weirii* (laminated root rot), and only one instance of *Armillaria mellea* (shoestring rootrot).

In general, the forest is healthy.

Phellinus pini is a fungus that infects the tree through wind-carried spores entering through old wounds and branch stubs. Over time, the tree becomes structurally weak, eventually leading to stem failure. Due to the slow acting nature of the disease, it is very difficult to assess the extent of disease from external indicators alone.

Phaeolus schweinitzii infects the tree's root system and extends into the tree trunk. Spores infect roots and root systems that have been weakened by natural conditions such as soil saturation or fire, or by human-caused activities such as soil compaction or construction of paths, roads, or irrigation systems. The disease is confined to heartwood, spreading gradually from smaller to larger roots. On trees with extensive decay, butt swell is evident accompanied by a brown, felt-like fungus appearing at the base of the tree.

Insects

Insect damage is believed to be insignificant in Hendricks Park, based on visual assessment. In a few trees, extensive bark beetle damage was observed, including in one large tree in the southwest corner of the Rhododendron Garden that recently died. Otherwise, no unusual outbreaks were detected. Bark beetle infestation is common in forests with trees under significant stress (Oregon Dept. of Forestry, 1987).

Damage due to insects is minimal.

Because of the low to average incidence of diseases and insects, no significant problems are anticipated for many years in Hendricks Park, assuming there is no unusual event such as major windthrow, prolonged drought, or wildfire.

Drainage Impacts

Hydrology, drainage and erosion are significant factors in tree health and stability. As noted in Chapter 4, two areas in the interior forest have significant drainage problems. In the southeast part of the park, a drainage culvert crosses a forest trail. The culvert has malfunctioned, creating a gully and overland flow. Two fir trees within the drainage are in declining health, and two upturned stumps are in the same location. Throughout the park, other culverts have been broken or breached at the joints, increasing the potential for adverse impacts on the health and vigor of surrounding trees.

Drainage problems affect tree health and stability.

On the west side of the park, wind recently uprooted two trees along the gully created by the storm drain that daylights in the park east of Highland Oaks Avenue and extends downhill to Elk Drive. One of the trees was a large, dominant Douglas-fir with root rot, likely caused by artificially saturated soils from the storm drain. Midway downhill, water from the drainage collects along the paved trail and Fairmount Boulevard.

David Reed

Shown are tree roots exposed by trail use. Soil compaction can affect tree health and vigor.

Construction, Maintenance and Park Use

Construction activities can affect tree health or vigor by damaging roots when excavating and backfilling, by changing natural drainage patterns, and by causing soil compaction. Road cut and fill impacts are evident along Fairmount Boulevard, in the Rhododendron Garden, and along many of the forest trails (several are former roads). A number of trees are declining and dying in these areas. Two trees were recently uprooted adjacent to the cut required to site the rock restroom.

In February 1999, the city retained an arborist to inspect a large Douglas-fir tree that was uprooted next to the parking lot at the picnic shelter (see Halstead, 1999 in *Hendricks Park Forest Management Plan Supplemental Report*). It was concluded that disease was not a factor in the tree overturning. Rather, the causal factors were described as chronic soil compaction from the nearby asphalt parking lot and water-saturated soils. These conditions restricted the

ability for the roots to grow and mature. In turn, the tree's anchoring was weakened.

An extensive number of utility corridors traverse the park. Many do not serve the park directly. In the Rhododendron Garden and the picnic shelter area, installing irrigation systems has required trenching and site disturbance within the root zones of trees. The health of some trees has likely been affected by these activities.

Decades of recreational use, park maintenance activities, and utility maintenance have created cumulative impacts on parts of the forest, especially around the picnic shelter. These activities have exposed tree roots, compacted soil around the root zones of trees, required tree pruning and removal, and has weakened stability of the forest stand.

Tree pruning and removal have reduced stability of the forest.

Over the years, many trees have been removed in the park for public safety and utility maintenance purposes. These activities also have created substantial soil compaction due to the sheer weight of fallen trees and the associated impact of maintenance vehicles.

Windthrow Analysis

Windstorms on February 7 and March 2, 1999 caused windthrow (uprooting) of thirty-two large Douglas-fir trees in the park. These storm events provided an opportunity to examine the vulnerability of the Hendricks Park forest to wind disturbance (see Ferguson, 1999 in *Hendricks Park Forest Management Plan Supplemental Report*). From this new on-site information, underlying risk factors were identified. Each windthrown tree provided useful information for additional understanding of site conditions and tree health, and helped experts assess the future risk of individual trees to windthrow.

David Reed

Douglas-fir trees uprooted by the March 2, 1999 storm on the south side of Summit Ave.

Risk Factors

Three factors pre-dispose trees in Hendricks Park to windthrow: 1) stand exposure, 2) stand conditions, and 3) soil limitations. These three factors are described as the "windthrow triangle" (Mitchell, 1998; R.J. Strathers et al, 1994).

Stand Exposure: Typically, wind flows over a hill, accelerating as it ascends the windward slope and causing turbulence (roller eddies) on the leeward slope. In Hendricks Park, the topography and

orientation and opening created by the Summit Avenue main entrance increases the velocity of winds from the southwest. This is known as a "venturi effect." Near the picnic area, the narrow band of trees bears the brunt of this accelerated wind.

Stand Conditions: In Hendricks Park, several conditions make parts of the forest stand prone to windthrow. These include a number of large and maturing Douglas-fir trees with some disease and defect, past hazard tree removals that have opened the stand and created newly exposed edge trees, and soil disturbance and compaction from road and trail development.

The "windthrow triangle" evaluates stand exposure, stand conditions, and soil limitations.

Soil Limitations: Soils in the saddle area are poorly to moderately drained, and moderately shallow. In the developed part of Hendricks Park, foot traffic and maintenance activities have compacted the soil, reducing infiltration and redirecting subsurface flow. Natural drainage patterns have been changed such as runoff from park roads and trails (although some remedial work has been done recently). Saturated soils are far less stable, and increase the probability of windthrow, especially for trees with weakened root systems.

Risk Assessment by Area

Three areas were identified as primary areas of concern with respect to windthrow risk in Hendricks Park: (1) the saddle where the picnic shelter is located; (2) north and south of the picnic shelter on the eastern edge of the park; and (3) the Rhododendron Garden. By adapting the windthrow triangle (Mitchell, 1998), it is possible to determine risk hazards for each of these areas as shown in Table 11 (see facing page).

Saddle Zone (Picnic Shelter Area)

The forest stand around the picnic shelter is unraveling.

From the Risk Assessment matrix in Table 11 (facing page), the forest stand appears to be unraveling around the picnic shelter, where Summit Avenue terminates in the main saddle of the ridge. This was particularly evident after the 1999 spring windstorm when four large-crowned firs fell at the west edge of this area, destroying the shelter and removing much of the wind protection. Many of the remaining trees have small crowns that have been damaged by excessive sway in the depleted stand. These small-crowned trees lack vigor, which is a key factor in the ability of trees to adapt to wind stress. Improving vigor of tree crowns may be impractical,

David Reed

Trees near the picnic shelter in the Main Saddle Zone bear the brunt of winds funneling up Summit Avenue.

although other remedial measures, such as crown thinning, can assist in making the remaining trees more windfirm.

North/South Shelter Zone

During the two windstorms in 1999, several trees fell and impacted four houses on the leeward side of the stand, both north and south of the shelter. This zone is considered very unstable because of the wind funneling from Summit Avenue, and turbulence that occurs over the ridge. Trees are more densely grouped and better adapted than those in the immediate area of the shelter.

Although better adapted, trees north and south of the picnic shelter are also unstable.

Rhododendron Garden Zone

Several trees in the Rhododendron Garden were also uprooted during the 1999 windstorms. A number of other trees here have died, and some are in decline. Here on the lower slope, shallow soils and poor drainage restrict tree anchorage. Wind funneling through the Summit Avenue corridor exposes the south-facing slope of the Rhododendron Garden to significant forces. Over 30 years of horticultural activity has likely increased the risk of windthrow within the garden. These activities include soil compaction from human use, construction of pathways, trenching to accommodate an extensive irrigation system, and overland drainage of water diverted by Skyline Boulevard.

Shallow soils and horticultural activity in the Rhododendron Garden have increased the risk of windthrown trees.

Table 11: Risk Assessment of Three Stand Zones

	Stand Zone		
Risk Factor	Main Saddle	North and South of Picnic Shelter	Rhododendron Garden
Exposure	**Moderate & High** Topographic Location Wind funneling from Summit Avenue	**Moderate** Topographic Location Wind funneling from Summit Avenue	**Moderate** Topographic Location Wind funneling from Summit Avenue
Soils	**High** Some partially restricted (slightly flattened root systems) Some severely restricted by water	**Low-Moderate** Root partially restricted (soil limitations)	**Low** Anchorage restricted (shallowness/stoniness) & poor drainage at lower slope
Stand Hazard	Damping & protection reduced by last two storm events (loss of 3 large trees)	Wind force reduction and damping occur within stand Grouped trees are well-adapted	Douglas-fir have grown singly or in small groups Well-adapted

Other Risk Areas

High, medium, and low risk zones were identified for the remainder of the park, as follows (see Map 6: Risk Zones).

The east park perimeter south of the Summit Ave.-Floral Hill Drive intersection is a high risk zone.

High Risk Potential (H1 - Park Perimeter): Where residences are adjacent to the park, potential for risk is considered high, especially on the eastern edge of the park south of the intersection of Summit Avenue and Floral Hill Drive. It is possible that some of these areas could be placed in the moderate risk category as this plan is implemented and additional monitoring and evaluation is underway.

Moderate Risk Potential (M1 - Park Roads, High-Use Trails): Trees near park roads and trails have damaged root zones due to excavation and trenching, which constitute a moderate risk potential. Several large Douglas-fir trees have dead branches up to five inches in diameter and 20 feet in length, overhanging trails and roads.

Low Risk Potential (L1-Interior Forest, Low-Use Trails): Windthrow is a natural and ecologically desirable forest process that creates gaps, structural diversity, and downed logs. Major windstorms have occasionally uprooted trees in the interior forest, and will again in the future. Where risk is minimal, these snags or downed trees should be retained to stabilize and enrich the soil and to provide habitat. Trees adjacent to low-use forest trails should be routinely monitored for decay, decline, leaning, dead branches, defects, and cavities.

Individual Tree Analysis

The two windstorms in 1999 provided an opportunity to examine downed trees, exposed root wads and soils, and the condition of the remaining stands in the three high risk zones outlined above. Summarized here are the results of these site inspections (see Ferguson, 1999 in *Hendricks Park Forest Management Plan Supplemental Report*).

Soil Depth, Moisture, Root Health

Some trees uprooted in the 1999 storms had healthy root systems, others did not.

Particularly in the Rhododendron Garden and in the wet areas adjacent to the picnic shelter, several of the larger windthrown trees displayed shallow, pan-shaped, and unbalanced root systems. General vigor and condition of the root masses appeared poor with black, anaerobic soil conditions possibly linked to construction impacts, human compaction, and poor drainage. Many of the downed trees were full-crowned. Wetland plants indicate that naturally wet conditions exist in several areas of the Rhododendron Garden, and north of the picnic shelter parking lot.

In contrast and as evidence of the complexity and unpredictability of trees vulnerable to windthrow, soil conditions and root health appeared entirely different for trees that fell and struck the picnic shelter. These trees were well developed, and appeared to have good support from large and vigorous root mass. They were probably vulnerable to windthrow because

they were "flagship" trees on the windward edge of the stand, and their large crowns acted as sails that gathered the wind—and force—to topple them.

Size and Vigor of Tree Crowns

Of all individual tree characteristics, large crown size was most closely associated with windfall. This is important because several trees with extremely poor crown health remained standing south and east of the picnic shelter, and may be within one year of dying.

Large crown size was most closely associated with windfall.

Tree Defect and Rot

Unlike root vigor and development, the presence of defect and rot in the stand appeared to have relatively little influence on windthrow, with two notable exceptions. One tree with stem failure had advanced heart rot, but no other trees showed evidence that approach this advanced state. The other rot-related tree had advanced cubical butt rot.

Human Activities

Many of the windthrown trees can be correlated with one or all of the following adjacent features or conditions: roads, pathways, irrigation systems, run-off, past hazardous tree removals, compaction, and trenching activities. These stresses illustrate the interrelated factors in forest health and how human activity and disturbance can increase the risk of trees falling in windstorms.

Many uprooted trees were stressed from human activity.

Increased Exposure/Stand Disturbance

Clearly, recent storms and windfalls have created new stand conditions, which now predispose certain trees to future windthrow. Especially due to the March 1999 windstorm, many of the remaining trees in the picnic shelter area are now in more exposed positions, and they have only just begun to adapt to their new environment.

Irrigation

Alan Kanaskie, forest pathologist with the Oregon Department of Forestry, states:

> "Douglas-fir as a rule do not tolerate 'wet feet.' Whether by flooding, raised water table during wet years, or excessive irrigation, damage or death can occur because of too much water." (Kanaskie, pers. comm.).

Douglas-fir do not tolerate "wet feet."

Peter Torres, in a 1997 research paper, asserts:

> "In the Willamette Valley, Douglas-fir and similar species have adapted to drought, but irrigation and other common cultural practices, including mulching and nitrogen fertilization, can force the growth cycle to continue through the dry summer."
>
> "A tree which is forced to maintain the growth process becomes more susceptible to disease and insect attack …." (Torres, 1997)

In both the Rhododendron Garden and in shrub beds around the picnic shelter, broadcast irrigation directs water toward tree stems. The stems collect and direct a significant portion of the water to the base of the trees and saturates the root zones of Douglas-fir. Over the years, the park's irrigation system has been upgraded and the regimen continuously modified to conserve more water. Improvements include topical and deep, occasional watering; relocating ornamental plants away from large trees; and redirecting sprinkler heads where possible.

Nevertheless, windthrow evidence has shown that root growth and health has been impacted by poor drainage and excess moisture in the developed areas of Hendricks Park, especially in the unstable area around the picnic shelter.

Irrigation is likely to be contributing to the decline of Douglas-fir and oak trees.

Irrigation is likely a contributing factor to tree decline of Douglas-fir and oak trees in several developed areas of Hendricks Park. This conclusion is based on the following:

- Windthrow analysis and observations in Hendricks Park over an eight month period;
- Review of similar windthrow events in other communities;
- Opinions of professional experts including the state forest pathologist; and
- Review of related academic literature.

Since it is the one risk factor that can be totally controlled, irrigation practices should be carefully evaluated, monitored, and where possible, reduced or eliminated.

Hazardous Tree Management

What Constitutes a Human Safety Hazard?

The preceding section identified several key factors that can increase the likelihood of trees to fall– weather, diseases, insects, age of trees, soils, exposure, forest stand conditions, and human disturbance. These factors interact to create degrees of hazard. To place this fact into the proper context for resource managers, the following statement is important.

> "All standing trees, alive or dead, within areas occupied by people, structures, and property, present some level of hazard. Hazard exists when a tree of sufficient size and mass to cause injury or damage is within striking distance of any object of value (target). Hazard increases with increasing tree defect, potential for failure, potential for damage, and target value. Management actions are taken to mitigate the hazard when risks (the product of damage potential and consequences of damage) are unacceptable." (Harvey and Hessburg, 1992)

In the past, when risk was considered unacceptable, the most common response has been to remove the tree identified as hazardous. This study has concluded that past tree removals have weakened the stability of the stand and actually increased the risk of windthrow.

Past tree removal probably weakened stand stability.

Hazardous Tree Management Options

Hazardous tree management is clearly moving from the tendency to focus on removal of "defective" trees to a more holistic approach of sustainable forest (vegetation) management. By identifying, understanding, and recording the natural and human processes that are at work, the long-term consequences of remedial actions can be more accurately assessed.

Managing hazardous trees requires a holistic approach.

With this in mind, five remedial management options were evaluated to determine the "Best Management Practices" for Hendricks Park given the study's windthrow analysis, findings, and conclusions (see "Assessment of Forest Stand Conditions," *Hendricks Park Forest Management Plan Supplemental Report*). Five options were evaluated:

1) **Crown thinning,** removing up to 30 percent of the live branches of large trees, rated highest because it increases safety without further disturbance of the stand or increasing risk of unintended consequences. This method is preferred for dominant trees considered to be high-risk because of advanced stem rot, exposure to wind, or poor soil conditions.

Crown thinning is the preferred management option for high-risk trees.

2) **Topping and snag creation** for wildlife purposes increases safety, but has impact on individual trees and stand stability. In highly visible areas, this method may not be aesthetically pleasing if it is not executed well. For these reasons, topping rated low.

3) **Edge feathering** is a technique for selectively removing trees along the stand boundary is rated low because the Hendricks Park stand is greatly altered, already somewhat "feathered." Therefore the effects would be unpredictable.

4) **Individual tree removal** rated low as a management option. This method can further disturb the stand, and increase the risk of unintended consequences such as windfall on adjacent properties or loss of vigor in remaining trees. For very high-risk trees, this option is considered a "last resort."

5) **No action**, particularly in high-risk zones, is unacceptable as a hazardous management option because it does not improve safety.

For a sound hazardous tree management program in Hendricks Park, it was concluded that the best over-all solution is to conservatively use a mix of all of these options, with the exception of edge feathering.

Action within the next five years is critical to stabilize the main saddle area, which is highly prone to windthrow.

Chapter 7 outlines the recommended strategies and prescriptions for hazardous tree management. Appendix D contains a hazardous tree "decision guide" for determining when and how to apply these methods in Hendricks Park. Action within the next five years is critical for stabilizing the main saddle area, which is highly prone to windthrow.

State of the Art Hazardous Tree Management

Past efforts to manage hazardous trees in Hendricks Park have relied primarily on accepted methods for inspecting and rating individual trees for potential risk, and then removing trees considered to present the highest risk to public safety. The factors used to rate trees include height, diameter, structure, vigor, insects and disease, soil problems, and proximity to "targets."

A more holistic approach to hazardous tree management assesses stand conditions and the health of individual trees.

As the 1997 fact sheet indicates by its title ("Managing Diseased Trees in Hendricks Park"), using this approach by itself tends to isolate structural and pathological deficiencies as a major criterion for managing hazard trees. In fact, as determined by post storm analysis conducted as a part of this planning effort, healthy and sound trees can topple, and diseased and even leaning trees may withstand high winds. The more holistic approach to hazardous tree management acknowledges conditions of the entire stand—the grouping, exposure, age, health, and soil limitations of the entire forest stand—as well as the attributes of individual trees.

Moreover, by focusing management on removal of trees rated as hazardous, windthrow risk may actually be increased by destabilizing the forest stand itself. Therefore, this planning effort has concluded that stand analysis, especially incorporating Mitchell's windthrow triangle, must be combined with individual hazard ratings as a "Best Management Practice" for managing hazard trees in Hendricks Park.

FINDING

The policies, strategies, and prescriptions of the *Hendricks Park Forest Management Plan* should supersede previous recommendations and polices related to managing hazardous trees in Hendricks Park.

CHAPTER 7: Hendricks Park Forest Management Plan

Introduction

This chapter presents a future vision, policy framework, and implementation plan for managing the Hendricks Park forest. Outlined here are several management options that were considered, and the preferred management option is described. Policies provide overall direction for the plan.

The plan identifies ten strategies and 77 actions.

To implement the management plan, ten strategies are recommended, 77 specific actions are outlined, and ten top priority actions are identified. Future research needs are also listed. A conceptual site plan and map provide a framework for future development of a master plan for the park. The Habitat Management Plan in Appendix A provides more specific guidelines for implementing strategies and actions relating to habitat enhancements.

Management Plan Vision

The vision statement for Hendricks Park, prepared by the Department Advisory Committee, recognizes the ecological, educational, recreational, and aesthetic resources of the forested area. It is restated below:

HENDRICKS PARK FOREST VISION STATEMENT

The natural forested area of Hendricks Park provides unique ecological, historical, educational, recreational, and aesthetic resources for our human and natural communities. The enjoyment and the understanding of these resources within this dynamic forest community enrich our lives. Stewardship of the forested area of Hendricks Park shall respect scientific knowledge and the forest's natural processes, as it conserves and restores these resources for present and future generations.

The vision statement recognizes ecological, educational, recreational and aesthetic values.

Forest Management Options

A range of options was considered for managing the forested area of Hendricks Park (see *Hendricks Park Management Plan Supplemental Report*). Three options were identified based on findings of the inventory and assessment phase of the planning process. All the options would require management of hazardous trees, as well as a major effort to control English ivy that has invaded the forest floor and overrun trunks of trees.

Option 1 - Savanna Restoration: This option would return the forest to the prairie and scattered oak and conifer landscape that likely existed when settlers arrived in the mid-1800's. Extensive management intervention would be required, and fire suppression could not continue.

Three management options were evaluated.

Option 2 - Succession Manipulation: This option would accelerate natural succession toward an old growth forest. This option requires a management approach that would move toward a site-appropriate, old growth forest composed of a variety of tree species and ages, multiple canopy layers, and a diverse understory.

Option 3 - Minimal Action: With minimal action, natural processes would be allowed to function, eventually attaining an old growth forest that is characterized by large, dominant conifers and existing shrub and herb layers.

In analyzing these options, full implementation Option 1 - Savanna Restoration was deemed impractical because it would remove the existing forest and exotic vegetation and discontinue fire suppression in an urban setting. Features of all three options formed the basis for the preferred management option: "Integrated Forest Management."

Preferred Option: Integrated Forest Management

The preferred "Integrated Forest Management" option blends the best of the three options that were evaluated.

In reviewing the management options outlined above, it was concluded that a blend of the options would address the different forest conditions, opportunities and use in Hendricks Park. The resulting "Integrated Management" approach is the preferred direction for managing the forest, because management objectives can be adapted to the forest dynamics and distinctive landscape characteristics of the park. Most importantly, this scheme will assure a "vision of success" that is feasible and practical.

Management Units

Three management units are recommended.

Based on existing resource values and use patterns, the Plan recommends dividing the park into three management units: (1) the Saddle Management Unit, (2) the Douglas Fir Management Unit, and (3) the Oak Forest Management Unit (see Map 7: Management Units).

Saddle Management Unit

The saddle area and its eastern edge are the most unstable parts of the forest, as evidenced by trees which blew down and destroyed the picnic shelter and fell along Summit Avenue in Spring 1999. Here, park roads intersect, and infrastructure functions as the major staging area for the entire park. Management opportunities exist for stabilizing and restoring this part of the forest, and for accommodating appropriate recreational use.

Because the saddle area has interrelated and interdependent characteristics, four subzones are identified for management:

Picnic Shelter Subzone 1 – The subzone north and south of the picnic shelter has the highest potential for additional *windthrow* (trees damaged or uprooted by wind) because of wind-exposed Douglas-fir trees. This area should receive top priority for remedial measures to address public safety due to its proximity to adjacent homes and properties. Because of its visibility, this subzone has high public education potential for forest restoration and revegetation, and for demonstrating creative use of native plants.

Picnic Grounds Subzone 2 – The central part of the developed area of the park sustains high recreational use. Windthrow has occurred along Summit Avenue and near the rock restrooms. This subzone also serves as the transition area between the Rhododendron Garden and the natural forested area, and as a staging area for public use of the park. A trailhead for future Ridgeline Trail connections could originate here.

Rhododendron Garden Subzone 3 – The health of some mature oak and Douglas-fir trees is declining within the south slope of the Rhododendron garden. The south slope should be carefully monitored and evaluated. The garden provides a showcase of valuable ornamental plants within a native landscape.

Northwest Fir Forest Subzone 4 – Within the northwest part of the park, a small stand of mature Douglas-fir trees does not receive the same level and type of maintenance as the nearby Rhododendron Garden. This subzone should be managed similarly to the Douglas-fir Forest Management Unit.

Douglas-fir Forest Management Unit

The interior forest is a unique urban resource—a young, maturing forest generally in a healthy and stable condition, and sustaining relatively low-impact recreational use. This largely intact natural forest provides an opportunity to apply adaptive management as the forest advances through natural succession toward an old-growth forest. Given urban influences and past history, this resource is remarkably intact, despite invasive vegetation. Its potential value is even higher if actively managed as a special ecosystem. The eastern edge of this management unit has special management requirements because of windthrow potential near houses and private property. However, to remain stable, this area should be managed as an integral part of the stand.

Apply adaptive management as Douglas-fir forest advances to old-growth condition.

Oak Forest Management Unit

Without management, it is possible that over time this distinctive vegetation type could be lost to conifers overtopping oak trees, thereby reducing species diversity in the park. This area should be restored because it likely represents an oak woodland habitat that was present at the time of European settlement in the upper Willamette Valley.

The oak forest should be restored and interpretive features added.

Policy Framework

Five management policies and 33 management objectives

This section presents the policies for the *Hendricks Park Forest Management Plan*, which provide a framework for a management statement, specific management goals and objectives, and plan implementation.

Policy 1: Maintain a healthy urban forest by protecting, repairing, restoring and creatively managing natural systems and successional processes.

1.1 Apply integrated resource management strategies to achieve a healthy old growth forest, restore and enhance the oak woodland, and to create a more stable and windfirm environment.

1.2 Repair and restore damaged, weakened, or fragmented natural systems, placing a high priority on improving hydrologic conditions in the park, and developing an aggressive strategy for controlling and removing invasive vegetation, especially English ivy.

1.3 Manage for a multi-storied forest with high species diversity including conifers and broadleaf trees, and a species-rich understory of shrubs and herbs. Encourage structural and spatial diversity with a mosaic of mature forest and gaps in a variety of successional stages.

1.4 Place a high priority on risk management strategies in the Saddle Management Unit and along the eastern boundary of the forest, especially for the first five years of plan implementation.

1.5 Remove hazardous trees in applicable areas of the Saddle Management Unit only after conducting a thorough windthrow analysis and ISA hazard evaluation of the stand, and after eliminating all other remedial alternatives (see "Decision Guide" in Appendix D).

1.6 Improve breeding and feeding habitat for wildlife.

1.7 Work toward a vision of success using strategies that are targeted and practical, require low maintenance, and achieve results.

1.8 Avoid traversing the park with municipal utilities that are not park related; also minimize stormwater runoff into the park from the surrounding neighborhoods. If utilities must be installed, require special standards for construction and maintenance.

Policy 2: Balance resource protection with the most appropriate level and type of public use and supporting infrastructure.

2.1 Encourage resource-based, passive recreation activities suited to the forest environment such as walking, bicycling on paved

surfaces, picnicking, and enjoyment and appreciation of the natural environment.

2.2 Discourage incompatible uses within the forest environment such as loose pets, bicycling on unpaved trails, and large group events that disturb wildlife, exceed parking capacity, and create excessive soil compaction.

2.3 Maintain location, size, and scale of infrastructure that is suited to the "resource carrying capacity" of the park.

2.4 Recognize the unique role of the forested area of Hendricks Park and avoid duplicating park facilities such as large playgrounds that can be provided in nearby neighborhood, community, and metropolitan parks.

2.5 Manage Picnic Shelter Subzone 1 and Picnic Grounds Subzone 2 of the saddle area as a transition zone between the Rhododendron Garden and natural forest and as a parking/staging area and trailhead to future connection with the Ridgeline Trail System.

2.6 Explore options for reducing the impact of vehicular traffic through the park.

2.7 Explore alternatives to on-site parking such as public transit and park-and-ride options.

2.8 Provide opportunities to experience panoramic views.

2.9 Maintain the interior forest free of human intrusions except for small scale and sensitively designed interpretive and informational signs, bird feeding and watering stations to enhance wildlife viewing, and simple features such as benches.

2.10 Provide accessibility to persons with special mobility needs to the maximum degree that is feasible and practicable.

2.11 Achieve the most harmonious relationship between the natural forest environment and the design and choice of materials for supporting infrastructure; develop strategies for removing and/or correcting current intrusions and misfits in the park and forest environment.

2.12 Apply ecological management principles to maintain the official forest trail system; remove trails that lead users into sensitive resource areas or that adversely impact forest conditions.

2.13 Integrate and coordinate goals and functions of the Rhododendron Garden with those of the park and forest.

Policy 3: Promote education and forest management research, and apply successful methods and practices to similar natural areas of the Eugene park and open space system.

3.1 Actively engage schools, colleges, and universities in educational, monitoring, and research activities.

3.2 Create public interest in understanding forest management goals and activities through interpretive signs, exhibits, programs, and information distribution.

3.3 Within Picnic Shelter Subzone 1 and Picnic Area Subzone 2 of the Saddle Management Unit, demonstrate use of native plants in a garden setting, and provide education and awareness of urban ecosystem management.

3.4 Apply successful ecosystem management methods and practices to other applicable areas of the Eugene park and open space system.

Policy 4: Maintain an inviolate, harmonious, and ecologically sound interface between the park edge and adjacent private properties.

4.1 Avoid private encroachments on parkland, including boundary adjustments except for extraordinary and compelling reasons.

4.2 Enforce existing regulations and ordinances to maintain stewardship and integrity of the park edge.

4.3 Establish a partnership with adjacent property owners to meet mutual resource management objectives along the park edge, and to actively engage the neighborhood in promoting forest ecosystem management.

4.4 Discourage public uses that adversely impact abutting residences; avoid impacts to the park caused by off-site sources of non-native vegetation and runoff.

4.5 Encourage adjacent residents to avoid using invasive vegetation and to prevent runoff into the park.

4.6 Maintain appropriate setback requirements for adjacent new development.

Policy 5: Connect Hendricks Park with the Ridgeline Trail System and natural areas to the south, which constitute the regional ecosystem.

5.1 Acquire property to connect Hendricks Park with natural areas to the south, including the Ridgeline Trail System, Moon Mountain area, and the Russell Creek basin (also referred to as the Lane Community College basin) in order to provide biological connections, increase protected wildlife habitat, and provide additional recreation opportunities.

5.2 Assure that future urban development adjacent to the park is compatible with the *Hendricks Park Forest Management Plan*.

5.3 Promote trail connection to the Knickerbocker Bridge and Alton Baker Park.

Management Statement

The management statement responds to the policy framework outlined in the previous section, and provides the basis for the strategies, actions, and prescriptions to implement the *Hendricks Park Forest Management Plan*. The management statement translates the park's vision statement (see page 3) into action.

The management statement translates the park vision into action.

MANAGEMENT STATEMENT FOR THE HENDRICKS PARK FOREST

Manage the forested area of Hendricks Park as a demonstration urban natural area. Achieve a healthy, resilient, and sustainable forest by testing, assessing, and applying the most advanced ecosystem management principles and practices adapted to varied site conditions. Protect natural resources by providing for appropriate passive recreation use, education and research, and historical preservation. Take an integrated management approach, adapting to the requirements for managing toward an old growth forest, restoring an oak forest, creating a more windfirm and stable saddle area, and removing invasive vegetation.

Management Visions, Resource Objectives, Strategies and Actions

This section defines a vision and associated resource management objectives for each management unit. Also outlined are major strategies and actions required to implement the preceding policies. The Habitat Management Plan in Appendix A provides the more prescriptive guidelines that augment these recommended actions. Note that Strategy 1 is organized according to the three management units.

Strategies and actions implement the plan.

STRATEGY 1 - Implement Integrated and Adaptive Native Habitat Management.

Saddle Management Unit (SMU)

Vision

A more open, less dense forest evolves with relatively few, older windfirm trees including some residual old growth Douglas-fir. Some trees die or are downed by windthrow; some may be removed if hazardous. A more diverse tree canopy emerges including pine, cedar, oak, maple, and fir. A demonstration native plant garden is intermixed with high value ornamentals planted in the past. Exotics die out or, where feasible, are removed and are replaced by native herbs, shrubs, and low-stature trees around the picnic shelter. The area around the restroom and picnic area (east and west of Fairmount Blvd) is restored to natural forest and meadow. Adaptive management responds to uncertainty and unpredictability of the forest.

David Reed

A view of the main saddle area.

Hazardous tree management, public safety, visitor management, forest restoration and native plantings are priorities in the main saddle area.

Top Management Priorities

Emphasis is placed on hazardous tree management, public safety, visitor management, forest restoration, and creative use of native plants (in addition to management of the showcase Rhododendron Garden). This area functions as the orientation, education, and interpretive center and as a trailhead for the Ridgeline Trail System.

Resource Management Objectives

1. In areas identified as having highest windthrow risk, mitigate by crown thinning 12-15 exposed trees. Tree removal should be undertaken only when tree decline, mortality, and windthrow risk create hazardous conditions.

2. Rapid and aggressive adaptive management is critical in the first five years to stabilize this area.

3. In the Picnic Shelter Subzone 1, immediately eliminate irrigation and gradually replace ornamental plantings with a demonstration native plant garden. Temporarily water lightly only to maintain ornamental plants that cannot be relocated, and to establish new native plants.

4. In Subzones 1, 2, and 4 (Picnic Shelter, Picnic Grounds and Northwest Fir Forest) revegetate with native plants and gradually remove existing non-native trees to restore integrity of the forest, concurrent with public education.

5. Restore and reclaim high impact public use areas surrounding the shelter and picnic grounds by reducing compaction and impervious cover.

6. Provide public use opportunities for education, understanding, and appreciation of forest ecosystem management objectives of the park including a demonstration native garden, garden touring, and picnicking.

7. Create a more harmonious relationship between existing recreation facilities and infrastructure and the park and forest environment, with special attention to design, scale, and choice of materials.

STRATEGY 1.1 - Identify, monitor, and minimizes windthrow potential as much as practical by applying remedial measures.

Actions

1. Develop a comprehensive risk/safety management plan. Consider strategies such as posting warnings to vacate the site during periods of high wind and developing an education program on forest dynamics for adjacent residents.

2. Initiate annual monitoring and inspections of tree health, vigor, and stability by the urban forester.

3. Continually monitor the stand vigor and health, removing trees only when they are considered hazardous due to death, rot, or structural defect, with special attention to soil-saturated areas. Focus attention on high use areas and stationary targets (see Decision Guide in Appendix D).

4. Use crown thinning as the primary remedial windthow abatement measure in the high risk zones near targets. In the Picnic Shelter Subzone 1, crown thin approximately 12 to 15 trees with a maximum of 30% canopy removal.

5. Monitor and evaluate area north of the picnic shelter in Subzone 1; use crown thinning as a first mitigation measure. Provide additional treatment to potentially hazardous trees if required.

6. Eliminate irrigation in the Picnic Shelter Subzone 1, with the exception of minimal, hand watering to maintain existing ornamentals and establish new native plants (see Strategy 1.2, Action #3).

7. As an alternative to tree removal, when alleviating windthrow hazards, consider creating snags (habitat trees) in accordance with the Habitat Management Plan (see Appendix A).

8. Minimize compaction through the following actions:

   (a) Develop a long-range plan for relocating the picnic area parking lot to protect tree root systems and restore the high visibility site.

   (b) Remove the picnic shelter parking lot and restore with native vegetation.

   (c) For high use areas, explore soil compaction reduction measures such as organic mulching.

   (d) Establish low growing vegetation in the picnic area to direct the flow of pedestrians and park users, but maintain clear lines of sight and visibility.

   (e) Reclaim area around root zones of trees adjacent to the parking lot, and provide more permeable soil conditions such as mulched pathways.

   (f) Discourage large group events and high impact activities such as volleyball.

   (g) Develop special standards for infrastructure construction and maintenance, minimizing disturbance to forest cover and the root zones of trees.

9. For purposes of safety, make a request to the Planning Commission to consider a setback requirement on adjoining private properties, prohibiting new habitable dwellings and detached garages within 50 feet of the park property line.

10. For purposes of safety within Picnic Shelter Subzone 1, as large Douglas-fir trees die or are removed, replace with only lower stature and more windfirm tree species such as Oregon white oak, bigleaf maple, Oregon ash, and Pacific madrone. Plant site-appropriate shrubs such as Pacific serviceberry, mockorange, ocean spray, and Oregon grape. Avoid planting large trees near roads or walkways. Remove Douglas-fir trees that regenerate naturally. Within a 50 feet zone along the eastern park edge, plant trees that will not exceed 30 feet at maturity such as dogwood, yew, and vine maple.

STRATEGY 1.2 - Manage entire Saddle Unit as an integrated Unit, including the Rhododendron Garden, Picnic Shelter Area, and Picnic Grounds.

Actions

1. Develop a plan for the picnic shelter and picnic grounds to support these functions: the major staging area for the park, a trailhead for the Ridgeline Trail System, a demonstration native plant garden, and an orientation center for the forest and garden.

2. Develop a plan for using the picnic shelter partly as an interpretive and education center for the park, emphasizing the goals of managing for a healthy urban forest, native habitat, and Rhododendron Garden.

3. Remove ornamentals east of Birch Lane and Floral Hill Drive to the degree practicable, and establish a demonstration native plant garden with interpretive information. Incorporate a wide diversity of Willamette Valley plant species appropriate to the site.

Douglas-fir Management Unit (FMU)

Vision

Manage toward a healthy old growth forest characterized by a multi-storied stand consisting of conifer and broadleaf species native to the Willamette Valley, a rich understory of native vegetation, and some gaps with high species and structural diversity. Natural processes prevail in this forest: species migration, growth, competition, predation, mutualism, death, and soil development. What is now a relatively young forest with little diversity will mature into one that is rich and diverse in a mosaic of species groups that represent a range of successional stages. Emphasize adaptive management to control and remove non-native vegetation, and respond to potential for windthrow on the eastern park boundary.

Top Management Priority

Forest ecosystem management is the top priority, while providing for public use related to appreciation, enjoyment, and understanding of the forest environment.

For Douglas-fir unit, ecosystem management is top priority, while providing for appreciation of forest environment.

Resource Management Objectives

1. Restore integrity of the native forest. Move over time toward a site-appropriate, old growth forest composed of multiple canopy layers, a variety of tree species and ages including conifers and broadleaf trees, and a diverse herbaceous understory.

2. Facilitate natural succession by introducing shade tolerant native species, and removing and controlling English ivy and other invasive vegetation as the highest priority. Concurrently develop a public education program, and train and involve volunteers to the most practical degree. Plant only native forest species.

3. Gaps (tree canopy openings) are ecologically important because they provide structural and species diversity, and naturally occur with forest succession. Allow natural processes to approach an equilibrium of patches of diverse vegetation. Keep free of non-native vegetation, and plant native shrubs having high wildlife values.

David Reed

Downed logs will be allowed to remain to provide wildlife habitat, soil nutrients and other benefits .

4. Allow snags, logs, and downed woody debris to accumulate naturally in the forest. To augment habitat values, create snags when feasible.

5. View the eastern park boundary as an integral part of the natural forest and integrate with forest management objectives of the larger stand.

6. Identify trees that have special aesthetic, ecological, and educational values such as a relict oak, Douglas-fir, or snag, and designate as legacy and wildlife trees.

7. Provide interpretive and educational opportunities for public understanding, awareness and appreciation of the resource management program.

STRATEGY 1.3 - Make ivy removal and control the highest forest management priority (after safety).

Actions

1. Initiate an aggressive program to remove English ivy and other invasive, non-native species that threaten the integrity of the forest. Follow guidelines contained in the Habitat Management Plan in Appendix A.

2. Propose a city ordinance to ban English ivy in all new landscape plans; use Portland ordinance and experience as a guide; develop a public awareness program.

3. Explore feasibility of an ordinance to ban sale of English ivy and Herb Robert.

STRATEGY 1.4 - Manage forest as a demonstration Willamette Valley urban forest park, emphasizing species diversity and natural succession.

Actions

1. Identify and mark trees with special merit as wildlife and legacy trees, and which deserve recognition for long-term special protection and public education.

2. Implement actions to enhance vegetation restoration and wildlife habitat enhancement in accordance with the Habitat Management Plan in the Supplemental Report including the following:

    a. Leave standing dead trees and logs as wildlife habitat; promote coarse woody debris.

    b. Enhance and promote wildlife habitat by retaining snags and logs; create snags only under limited conditions as prescribed in the Habitat Management Plan.

    c. Convert, modify, or enhance abandoned structures for wildlife habitat; consider potential for the A-frame abandoned restroom to function as a bat habitat, and explore placing a guzzler on the abandoned drinking fountain creating a water source where the former drinking fountain once existed.

    d. Aggressively keep existing canopy openings free of Himalaya blackberry and other non-natives.

    e. Manage and maintain the upper saddle as a meadow opening with oaks and maples around the edges; in conjunction with public education, consider gradually removing trees that are shading out the oaks; establish native grasses and forbs.

3. Manage gaps in accordance with the Habitat Management Plan in the Supplemental Report.

4. Catastrophic events (wind, fire, earthquake, insects and disease) in the future could kill trees over a large area of the park. If such an event occurs, a range of responses could be considered depending on the nature of the catastrophe, and the desired outcome. For example, upland prairie and oak savanna could be restored, a new Douglas-fir forest could be planted, or a hands-off approach could be taken.

STRATEGY 1.5 - Manage the eastern edge as an integral part of the natural forest; identify, monitor, and minimize windthrow potential as much as possible by applying remedial measures.

Actions

1. Continually monitor vigor and health of edge trees along the park boundary, with particular attention to newly formed and exposed edge trees. Respond to potential hazard trees by creating snags where it can be done without creating a hazard, by crown thinning, or by removing trees as they show significant signs of decline and risk.

2. Replace hazardous trees that die or are removed with lower stature trees such as madrone, oak, ash, and maple; carefully evaluate and monitor areas where stems are exposed by past tree removal or windthrow.

3. Identify diseased trees with potential for becoming snags.

Oak Forest Management Unit (OFMU)

Vision

This remnant oak forest represents a forest type that was more common at the time of Euro-American settlement and is now uncommon in the Willamette Valley. This oak forest provides habitat for native plants and animals found nowhere else in the park. A small opening at the west end of the ridge is restored to native, dry-site grasses, wildflowers, and shrubs. To preserve this rare forest type, Douglas-fir and other aggressive trees are removed to maintain oaks as the dominant overstory trees, and non-native invasive species are removed from the understory to allow native shrubs and herbs to recover.

Top Management Priority

Restoration of oak forest is top priority for this managment unit.

Restoration of the remnant oak forest ecosystem is the top priority, while also striving to provide opportunities for visitors to understand, appreciate and enjoy this unique forest environment.

Resource Management Objectives

1. Actively manage the oak forest to preserve this important Willamette Valley vegetation type by preventing Douglas-fir regeneration.

2. Remove and control invasive and other non-native vegetation.

STRATEGY 1.6 - Restore the Oak Forest by actively managing as a distinctive ecosystem.

Actions

1. Undertake actions as outlined in the Habitat Management Plan in the Supplemental Reports, including removing invasive vegetation from the oak forest and maintaining it free of invasives.

2. Prevent Douglas-fir regeneration by selectively removing existing trees, and create snags as outlined in the Habitat Management Plan guidelines.

All Management Units (AMU)

STRATEGY 1.7 - Continually inspect park trees for vigor, health & safety.

STRATEGY 1.8 - Increase the rate of ivy removal in all management units to the degree achievable and practical.

STRATEGY 1.9 - Retain as much biomass (downed logs, etc) as possible.

STRATEGY 1.10 - Develop a comprehensive risk/safety management plan.

STRATEGY 1.11 - Monitor natural resources including plant and animal pest species in support of management goals, strategies and actions.

David Reed

English ivy removal will be a priority in all management units.

STRATEGY 2 - Manage Recreation to Protect Natural Resources.

STRATEGY 2.1 - Shift park use toward forest-oriented and dependent activities.

Actions

1. Establish a public awareness and interpretive program that addresses how park users can protect park and forest resources while continuing to use and enjoy the park.
2. Develop adjustments in current policy to encourage only passive recreation and resource-based uses.
3. Consistently enforce pet leash regulations throughout the park and forest (except in the Rhododendron Garden where pets are not allowed).
4. Explore reclassifying the park with a less intensive designation, or consider applying the Natural Resource zoning designation (for the portion outside the Rhododendron Garden).
5. Prepare and adopt a master plan for the park, using the concepts on page 102 as the framework for preferred physical elements. The master plan will guide future planning, enhancement, restoration, and rehabilitation decisions in the park including recreational facilities, traffic management, parking, trail management, drainage improvements, and management support facilities such as park shops, offices, and maintenance operations.

STRATEGY 2.2 - Improve recreation opportunities, facilities and trails consistent with resource values.

Actions

1. Correct drainage problems along trails, in the parking lot, and along park roads.
2. Accelerate trail maintenance to include surfacing, edging, and culvert repair and replacement.
3. Designate and promote an official forest trail system. Remove and restore all unofficial trails and desire lines by installing barriers and revegetating.
4. Leave large downed logs across forest trails, leaving adequate space for ease of passage by trail users of all ages and abilities.

5. Designate trails that are fully accessible to persons with special mobility needs, i.e., paved or finely graveled trails that are suitable in grade.

6. Maintain integrity of tree roots when constructing and maintaining trails.

7. Open selected panorama views from the park, sensitively thinning and pruning vegetation where required.

STRATEGY 2.3 - Monitor recreation use and carrying capacity.

Actions

1. Establish baseline recreation use survey to determine type and location of use, size of group, visit duration, frequency, and place of residence.

2. Design and initiate a program to routinely and systematically monitor natural resources, and to sample and measure recreation use impacts.

3. Change and/or develop recreation policies when resource impacts warrant.

STRATEGY 3 - Establish an Interpretive and Educational Program.

STRATEGY 3.1 - Develop an on-site interpretation program conveying the vision, goals and progress of the forest management program.

Actions

1. Create a theme: e.g. "Learning from the Forest" and provide information, education, and awareness in the saddle area (Subzones 1 and 2) as a staging and interpretive center.

2. Develop a wildlife and wildlife habitat brochure for neighbors and park visitors.

3. Develop a volunteer program for hosting guided walks to include Eugene geology, biology, natural history, and ecosystem management efforts in Hendricks Park.

4. Develop a self-guided nature walk with signs and brochures.

STRATEGY 3.2 - Promote Hendricks Park as a unique urban forest laboratory.

Actions

1. Reach out to local schools, colleges and universities and promote field trips, student projects and studies.
2. See Strategy 1.2, Action 2.
3. Consider Hendricks Park as a training and information center for park staff and interpretive naturalists.
4. Form a reconstituted ad hoc Department Advisory Committee to promote education and awareness of forest ecosystem management programs in Hendricks Park, as well as other forested areas of the Eugene park and open space system.

STRATEGY 4 - Establish a monitoring and research program.

Actions

1. Re-measure the permanent vegetation plots every five years, and tree plots every 10 years.
2. Develop an advisory group of researchers and scientists to coordinate research activities in the park.
3. Create an archive of resource management events and activities, and enter this in a database program.
4. Prepare a research and monitoring report every five years, and prepare brief annual progress reports and a newsletter.
5. Establish and maintain an urban forest management library.

STRATEGY 5 - Increase staffing, funding, and resource support.

Actions

1. Hire a staff person and make grant writing and management the major responsibility, to include generating funds to support the position.
2. Establish a "Friends of Hendricks Park" foundation, using the Goodrich Endowment as seed money to support fund-raising to support projects.
3. Establish "first win" goals to promote doable, high profile, initial projects, and celebrate when objectives are achieved (e.g. achievement of ivy removal targets).
4. Raise forest management and restoration to a higher level of priority, reflecting an integrated approach throughout the entire park.

STRATEGY 6 - Implement park-sensitive transportation management.

Actions

1. Conduct a traffic study and prepare alternative solutions for reducing non-park traffic.
2. Ban large trucks from park roads, especially the portion of Fairmount Boulevard within the park boundary.
3. Install traffic calming measures at pedestrian crossings.
4. Consider closing Fairmount Boulevard during night hours to reduce after-hour use of the park.
5. Promote use of transit, pedestrian, and bicycle access; explore park-&-ride feasibility and bus parking.

STRATEGY 7 - Address Physical Misfits and Intrusions.

Actions

1. Mitigate impacts of stormwater drainage from Highland Oaks Drive to prevent further erosion, sedimentation, and hydrologic destabilization of the forest (see "Report on Stormwater Erosion" in *Hendricks Park Forest Management Plan Supplemental Report*).
2. Screen the radio tower at the summit so that it does not detract from the quality of the forest experience.
3. Replace decayed and damaged roadside barriers; keep roadside barriers uniform in size, design, and scale; avoid use of treated utility poles.
4. Request EWEB to upgrade and repair reservoir facilities and fencing, and to maintain to park standards. Assure that all utility maintenance activities in Hendricks Park conform to the goals and strategies of this plan.
5. Upgrade motor vehicle barriers at trailheads to be more aesthetic and inviting to the pedestrian.
6. Reduce the number of "poled" trees and apply guidelines from the Habitat Management Plan to improve the appearance and functionality of the existing poled trees. (A poled tree is one which has had its top removed. A number of trees in the Main Saddle Management Zone have been topped to reduce hazardous conditions and to also function as habitat trees.)

STRATEGY 8 - Implement Design Standards for Built Facilities.

Actions

1. Develop design guidelines and standards for structures, signs, and infrastructure including choice of materials, colors, scale, suited to the site.
2. Make restrooms, parking facilities, and selected trails accessible to persons with special mobility needs.
3. Enhance park entryways with signs which have human scale, suited to the park atmosphere.

STRATEGY 9 - Implement Stewardship Management of the Park Edge

Actions

1. Prepare a property line survey of the park boundary. Clearly sign and tag the property line.
2. Develop a partnership with adjacent residents to "adopt the forest edge" and work toward mutual goals of ecosystem co-management.
3. Assess existing encroachments into the park, make efforts to remediate with adjacent homeowners, and aggressively take action, if appropriate, to restore integrity of the park edge.
4. Routinely monitor the park edge to assure park boundaries remain intact, and aggressively remediate encroachments.
5. Monitor all proposed urban development adjacent to the park for maximum compatibility.

STRATEGY 10 - Obtain habitat and trail connections to the Ridgeline Open Space System.

Actions

1. Acquire a trail connection easement to Dillard Ridgeline Trail, Moon Mountain, and LCC basin.
2. Acquire land for wildlife habitat connections.

Top Action Priorities

The actions shown in the chart below have been identified as the most important for implementing the *Hendricks Park Forest Management Plan*. They are ranked in order of priority.

Top Action Priorities			
Priority	**Strategy #**	**Action#**	**Description**
1	1.1 1.5 1.7 1.10	1-10 1-3	Identify, monitor, and minimize windthrow potential and apply remedial measures; recognize that first five years are the most critical for stabilizing windthrow-prone areas.
2a	9	1-4	Perform a boundary survey, and concurrently develop an ongoing partnership with adjacent and neighborhood residents to address such issues as habitat management, invasive plants, non-native plants and animal species, and public use.
2b	1.4 1.6 1.8	1-4 1,2	Develop and begin implementing a vegetation management plan to include major commitment to removal of English ivy and other non-native species from the forest.
2c	7	1	Mitigate the stormwater drainage problem from Highland Oaks Drive.
2d	2.2	1-3	Correct drainage problems along forest trails, parking lot, and park roads; accelerate trail maintenance; and designate and promote an official forest trail system.
3	5	1-4	Increase staffing, funding, and resource support to implement the Forest Management Plan.
4	2.1 2.2	1-5 3	Develop a plan to discourage large group events and high-impact recreation activities; designate and publicize the official trail system.
5	1.2	1	Prepare a plan and begin establishing a native plant garden within the Saddle Management Unit.
6	10	1, 2	Acquire easements for the Ribbon Trail extension.

Future Research and Monitoring

Several tasks are considered vital to the continued success of forest management in Hendricks Park. However, these actions were not completed because of lack of funds and time. It is recommended that the following actions be undertaken in the future.

1. Monitor permanent forest vegetation plots and bird point count plots, and archive data in a secure location.
2. Collect tree safety data annually, including mapping, analyzing, and monitoring tree hazard conditions and windthrow risk.
3. Monitor tall bugbane population.
4. Monitor ivy control areas and other invasive species to determine success of removal, re-colonization rate by ivy, and by natives.
5. Inventory mammals, amphibians, reptiles, and invertebrates of the park.
6. Inventory bryophytes (mosses and liverworts).
7. Establish a functional GIS system for Hendricks Park within the City's system.
8. Conduct a cultural resource inventory, including archeological research.
9. Conduct a comprehensive recreation use survey.
10. Conduct further research on impacts of irrigation on tree health and decline in the Rhododendron Garden.
11. Research feasibility of an ivy ordinance.
12. Research current methods for reducing soil compaction in urban forests.

Conceptual Plan Recommendations

As discussed in Chapter 3, in 1985 a long-range conceptual plan was prepared for the developed area of Hendricks Park (see page 25). Comparing planning concepts of the *Hendricks Park Forest Management Plan* with the previous "Twenty Year Plan," it is apparent that the 1985 plan's recommendations are inconsistent because of the proposal to expand the Rhododendron Garden into the picnic area. However, several aspects of the older plan have merit and should be considered in developing a long-range plan for Hendricks Park.

Attributes of the 1985 plan that should be considered when preparing a new long range plan include: (1) identification of the existing picnic grounds parking lot as the most strategic area of the park; (2) the proposal to relocate the parking to an area near the rock restrooms, and (3) realignment of Summit Avenue in a switchback arrangement with Fairmount Boulevard. These concepts should be considered because of the potential for reclaiming the heart of the park for more appropriate uses and the opportunity to reduce funneling of wind along the existing alignment of Summit Avenue.

The *Hendricks Park Forest Management Plan* recommends consideration of the following concepts as a framework for preparing a long-range master plan for Hendricks Park. A description of each concept is included in Table 12 on the next page. Each numbered feature is illustrated on "Map 8: Conceptual Plan," which follows page 102.

TABLE 12: KEY TO MAP 8 - CONCEPTUAL PLAN

Trail System

#1 Identify the preferred trail system for the forested area of the park and recommend decommissioning, revegetating and restoring all unwanted trails. Reclaim the overgrown oak knoll trail along the historic looped road through the oak woodland and include as part of the formal trail system.

#2 Designate the paved trail as the fully accessible trail; identify the lower unpaved trail parallel to Fairmount Boulevard as an "Opportunity Area" to study as a future addition to create a looped accessible trail.

Parking

#3 Explore as an "Opportunity Area" the proposal originally described in the Rhododendron Garden Twenty Year Plan to relocate the existing picnic ground parking lot, creating a more efficient and functional staging area for the park and forest, and reclaiming the heart of the park for orientation and picnicking.

#4 Remove the picnic shelter parking lot and revegetate.

#5 Develop a "Park-and-ride" option for peak days, such as the garden tour days, to off-set distance from the relocated central parking lot.

Picnic Shelter Orientation Center

#4 Expand the picnic shelter's function to also orient and educate visitors, utilizing interpretive information as an element of a staging area and trailhead for the park and forest.

Central Office, Site Manager's Residence, Shops, and Nursery Complex

#6 Explore the feasibility of a new park office more centrally located near the existing maintenance center, including a small residence for a site manager with a park sensitive design.

#6 Consider a full scale nursery to support the Rhododendron Garden and the native plant garden.

#6 Consider a new shop facility, screened and buffered, to support the garden, park, and forest management program.

Viewpoints

#7 Add an observation platform to the top of the restroom in the Rhododendron Garden.

— Identify locations for viewpoints along existing trails.

Fairmount Boulevard and Skyline Boulevard

#8 Explore the feasibility of closing these two roads in the future to emergency use only, along with further traffic study.

Floral Hill Drive

#9 Consider relocating the trailhead entrance near the Floral Hill Drive intersection to resolve conflicts between private and public access to the forest.

Ribbon Trail

#10 Extend the proposed Ribbon Trail from Hendricks Park to Dillard Ridgeline Park.

Entry Upgrades

— Create human scale and park/forest-sensitive support facilities at all park and trail entries (signs, bollards, etc.).

Upper Saddle

#11 Restore the gap in the Upper Saddle as soon as possible because physical misfits and intrusions detract from this area's valuable "sense of place." Consider conversion of the closed restroom to bat habitat and reclaim abandoned drinking fountain for a more appropriate function (e.g., a wildlife "guzzler" for birds; topographic relief sculpture of area, etc.).

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A complete bibliography is included in the *Hendricks Park Forest Management Plan Supplemental Report.*

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Appendix A

Hendricks Park Habitat Management Plan

Hendricks Park Habitat Management Plan

Prepared by Salix Associates, December 1999

Contents

I. Native Plant Nursery

Goal 1: *Establish a native plant nursery in Hendricks Park.*

a. Establish a native plant nursery and small indoor seed cleaning and storage area in the current storage and maintenance area of the Park, for propagating native plants to use in restoration.

b. Collect nearby native seeds and cuttings, and as opportunities arise, introduce expected species into suitable habitats in the park (as seeds or starts from the native plant nursery) to increase species diversity. The table of "potentially-occurring species" can be used as a guide for introducing species that are not known to occur in the park, but which would be expected.

c. Use seeds, cuttings and divisions from sources within or as close as possible to Hendricks Park to protect local genetic integrity. A radius of 5 miles is the recommended maximum collection distance. If sources for needed species are not available in that radius, proceed farther, but limit propagation from sources within the southern Willamette Valley.

II. Native Plant Garden

Goal 1: *Using the forester's recommendation to terminate irrigation in the saddle as an opportunity, establish a native plant garden in that location as a transition between the formal "woodland" style rhododendron garden to the north and the natural, native forest to the south. Use the garden as a demonstration of how natives can be used in residential (or similar) landscaping settings, and if possible, as an educational tool regarding local ecological processes in the neighboring forest and prehistoric and current ethnobotanical uses.*

a. Plant a native plant demonstration garden using the highest proportion possible of native species, and not using irrigation (except in small, localized amounts in the first season to establish perennials if needed).

b. Arrange native plantings somewhat formally (similar to the rhododendron garden) to demonstrate their use in a garden setting.

c. Plant as many species as possible from lists of hummingbird, butterfly, and native bee food plants (elsewhere in this report).

d. Any specimen ornamental plants that currently are in the garden and are infeasible to move shall be allowed to remain at the discretion of the head gardener.

e. Install interpretive signage that identifies each species, it's role in the ecosystem, and ethnobotanical or other interesting information.

III. Non-Native Species

A. English Ivy

Goal 1: *Eradicate English ivy from the Hendricks Park by 2010*

Philosophy: Keep the focus on restoring habitat for native plants. Start slow, experiment, record results, adapt methods to findings, propagate native species for replanting when/where needed, continue monitoring over time.

a. Conduct ivy removal between June 1 and January 1 in 1999 - 2010, then follow-up removals between July 1 and January 15 in years thereafter to minimize damage to native plants. Avoid steep slopes in wet weather.

b. Remove ivy from tree trunks - high priority, to keep ivy from flowering and fruiting.

c. In general, follow the following standard practice: protect each ivy-free area by removing ivy invading at the edges, working outward into the ivy in bands around the ivy-free area, enlarging the area each year. This will maximize the ability of native species to recolonize cleared areas.

d. Start slow and assess how the herbaceous layer responds in different circumstances. In fall of 1999 and summer and fall of 2000, remove patches (test plots) in isolated areas and in areas adjacent to trails with trailside weeds present (herb-Robert and nipplewort), areas with some herbaceous native present, and areas with none present. Expect and prepare for possible invasion of other weedy species in ivy removal areas. Experiment in at least one area with cutting rather than pulling ivy, and follow up in June (just after the spring "flush" of growth) to cut resprouts.

e. Record results at each sample plot, and proceed with more removal in 2000 and thereafter based on results of test plots.

f. Haul away ivy immediately after it is removed, or pile in small piles to compost in place if feasible.

g. If native seed or plant starts are needed to supplement natural native plant regeneration, proceed with ivy removal only as fast as dictated by the amount of native plant materials which are available for planting (and fast enough to "hold the line" on ivy free areas). Use on-site propagated plants first, then use commercially or volunteer propagated plants or seeds if necessary, if they are collected from the south and southeast hills area of Eugene.

h. Continue annual follow-up ivy pulls to get starts which reappear in cleared areas and to clear new areas.

i. Continue to monitor restoration areas and record results in writing and on a map showing where ivy has been removed.

j. Utilize volunteers and community groups as much as possible. The scale of the task will necessitate a significant multi-year city funding commitment of at least 10 years until the area is cleared of ivy, then volunteers may be able to maintain the area free of ivy.

B. Other Invasive Species

Goal 1: Minimize or eliminate as many invasive, non-native species from the Park as possible.

a. Gradually remove invasive species in order of priority shown on the invasive species list, followed by removal of all other non-native species to the greatest degree possible, concurrent with public education.

b. Minimize ground disturbing activities, particularly during the growing season: Jan. 1 - July 30. Whenever ground disturbing activities occur (ivy removal, windthrow, construction, etc.), anticipate colonization by invasive, non-native species and eradicate founding populations before they spread.

c. Do not plant more natives if an ample native plants or seed bank exists *in situ* for natural revegetation.

d. Research and experiment control methods for herb-Robert, nipplewort, sweet cherry. Experiment with hand pulling and backpack propane torching (when damp or wet), and solarization (in sunny areas, if any) as preferred control options for herbaceous species and seedlings. Consider limited, topical herbicide use when other methods are infeasible.

e. Record results of all control efforts.

f. Survey at least once per year (in spring) for population status of all invasive species, and respond swiftly to control of invasions in previously weed-free areas and invasions by previously undocumented species.

IV. Rare Plants

Goal 1: Try to maintain one or more populations of tall bugbane in the park.

a. Maintain the gap with tall bugbane free of non-native, invasive vegetation.

b. Manage tall bugbane to be a dominant in at least one gap, and present in one or two other suitable gaps.

c. If conditions change radically (landslide, forest fire, disease, global warming, etc.), review and update these policies and actions to try to achieve the goal.

d. Collect seed, propagate, and plant seedlings of tall bugbane in the Native Plant Garden and/or other areas of the park with suitable habitat. Offer surplus plants for use on other public or private land with suitable habitat preferably within 2 miles of the Park, or farther if close sites not available.

e. Girdle, crown-thin, and/or remove small trees so as to preserve and increase light in the gap where the population is located. Increasing shade will reduce flowering and fruiting, and lower the overall vigor of the plants.

Goal 2: Judiciously introduce populations of other rare species if ethical and available, if suitable habitat available.

a. Be extremely judicious in this practice, making sure that plants are propagated with all necessary permission, permits, and support from local plant ecologists, including NPSO input.

b. If seed is available from nearby populations of wayside aster (perhaps near Spencer Butte), introduce this species in suitable habitat in the park.

c. Consider introduction of other rare species, although no suitable habitat is known to exist in the Park for other species with state or federal status besides *Aster vialis*.

Goal 3: Identify and maintain populations of uncommon plants in the Park.

a. Inventory, map and monitor population locations and sizes of uncommon plants in the Park, particularly those threatened by park uses or natural processes (shading, etc.). Uncommon plants are in one to several highly restricted occurrences and are present in small numbers.

b. Maintain populations of uncommon plants free of invasive vegetation. Consider trimming or transplanting of other natives which threaten to outcompete any populations.

c. Propagate uncommon species and introduce new populations in suitable habitats if feasible.

V. Habitat Diversity

Goal 1: Restore and enhance the Douglas-fir forest in the park to increase native plant and wildlife habitat diversity.

a. Remove invasives and other non-natives (as previously discussed).

b. After suitable areas have been cleared of English ivy, introduce 50 grand fir seeds, collected as locally as possible (perhaps Skinner's Butte or Spencer Butte), in each of 3 places in the forest (spaced well apart from the location where they exist on the ridge near the eastern boundary). Repeat seeding of the same areas 3 years in a row to attempt to get germination in a good year. Bury the seeds to minimize consumption by animals.

c. Introduce seedlings of grand fir, bigleaf maple, cascara buckthorn, Pacific dogwood, Pacific yew and as subcanopy replacements for sweet cherry as it is removed. Consider replacing some areas of sweet cherry subcanopy with a shrub layer instead of a tree subcanopy layer.

d. Increase the number and diversity of native shrub and herb species with food value for native wildlife (see the lists of existing and expected native species with food plant values). Plant some shrubs in dense patches to encourage bird nesting.

e. Recognize gaps as important elements of habitat diversity.

1. Inventory and map gaps. Monitor for new gap creation after severe wind storms.

2. Monitor every other year for gap creation, vegetation development (% cover herbaceous, shrub, seedling/sapling, etc.), and invasive species.

3. Allow gaps to revegetate naturally (but see #5 below).

4. Maintain gaps free of non-native vegetation.

5. Introduce native wildlife food plants into at least 3 gaps, e.g.: bitter cherry, cascara, straggly gooseberry, red flowering currant, Scouler's willow and blue elderberry.

6. Target approximately 10% of forest area in gaps in various states of revegetation at any one time. It is likely that the natural rate of gap formation in the Park will be sufficient to maintain an adequate gap inventory over the long term.

7. Restore the gap in the upper saddle area.

    a. Remove Himalaya blackberry and other invasive species.

    b. Create snags from the coast redwoods and giant sequoias that are crowding Oregon white oaks and shading the opening. Educate the public beforehand as to the high value of a small remnant of native, natural heritage (the forest zone), the value of snags for wildlife, and the impacts that these planted non-natives can have: crowding out the oaks and shading (herbaceous and shrubby) gap vegetation needed by wildlife.

    c. Reduce size of asphalt to minimum size needed.

    d. Restore vegetation using plants appropriately adapted for a small forest opening (*Fragaria vesca, Sidalcea virgata, Elymus glaucus, Iris tenax, Aquilegia formosa, Ranunculus occidentalis, Eriophyllum lanatum, Bromus vulgaris, Amelanchier alnifolia, Holodiscus discolor, Ribes sanguineum, Ceanothus sanguineus, Philadelphus lewisii, Lonicera ciliosa, Lonicera hispidula*, etc.). Plant full sun species in north portion of meadow, part-shade species on south side of meadow. Plant with grasses and forbs in the inner areas, and shrubs around the margins.

    d. Add bird guzzler and/or pond as discussed below.

Goal 2: Enhance habitat for snag- and cavity-dwelling species (e.g., Downy Woodpecker, Red-breasted Nuthatch, Red-breasted Sapsucker, Olive-sided Flycatcher, several bat species, Western Gray Squirrel, Townsend's chipmunk, etc.)

a Inventory existing snags to determine numbers per acre, location, species, size and condition.

b. Target a minimum inventory of 2 snags per acre greater than 14 inches dbh and 10 feet tall (approximately 110 snags total in the Douglas-fir and Oak Forest Management Units).

c. When selecting trees for snag creation, prioritize large Douglas-firs with pine conk (red ring rot). Trees with cubical butt rot are not as suitable for tall snags, as they may not stand long. Instead, create short snags (approximately 5' - 15', or as appropriate) from these trees.

d. Limit snag creation in or upwind of windthrow hazard areas only to trees proposed for removal to alleviate hazardous conditions.

e. Avoid creating snags in scenic or high use areas such as picnic areas, trails or roads, or near neighboring properties. Label naturally-created snags in visible areas with "Wildlife Tree" signs.

f. If a snag presents a hazard to adjacent properties, trails, or other park facilities, top the snag so as to leave it as tall as possible while eliminating the hazard.

g. Create half of the snags in groups of 3 to 5, with 1 or 2 green trees separating the snags to minimize increased wind exposure. Disperse the remaining created snags throughout the forest.

h. Create snags by topping or girdling just below the live crown. Leave a jagged surface on the top of topped snags to enhance the entry of rot into the heartwood of the tree. Consider inoculating with a heart rot fungus if accelerated decomposition is desired.

i. Carve cavities in 25% of newly-created snags to accelerate introduction of wood-rotting fungi and formation of functional cavities. Check with Willamette National Forest and Eugene District Bureau of Land Management wildlife biologists for advice on using "Tim Brown" chain saw techniques to create cavities and other snag enhancements for wildlife (e.g., slots for bat roosting), and/or using explosives to top trees. If trees are topped with a chain saw, cut multiple furrows into the top to create a jagged surface.

j. Evaluate and remove as necessary snags with insect infestations that might threaten living trees in the Park.

k. Consult Thomas et al (1979) and Brown (1985) for other snag creation guidelines.

Goal 3: Recognize logs as valuable habitat for insects, amphibians, woodpeckers, chipmunks and other wildlife.

a. Leave logs on the forest floor to provide wildlife habitat. When logs must be moved (to unblock trails, roads, etc.), attempt to reposition them to block nearby unofficial trails whenever possible. A log loader operating only on paved roads or trails could be used to place logs adjacent to roads in unofficial trails (or on the forest floor if no unofficial trails are nearby). (Do not drag or haul logs across the forest floor.) Example: place as many Douglas-fir logs from recent storms as possible so as to block off and close "unofficial" trails while at the same time providing habitat.

b. Carve wildlife cavities in half of the newly-placed logs (following Tim Brown's methods, see note under "snags").

c. Evaluate and remove as necessary snags which have insect infestations that might threaten living trees in the Park.

Goal 4: Restore the oak forest in the southwest portion of the park.

a. Remove invasives and other non-natives, as previously discussed.

b. Selectively girdle (near the top) to create snags from mature Douglas-fir which are beginning to overtop Oregon white oaks on the southwest ridge, or in other places where overtopping is occurring.

c. If trail is restored, be sensitive to uncommon plants present on the flat rock area at the end of the ridge (i.e., *Saxifraga*).

d. Develop a plan to eliminate non-native grasses, and restore native grasses at the opening at the west end of the southwest ridge.

Goal 5: *Restore a native upland prairie/oak savanna in the opening west of the rock restroom to create habitat for insects, songbirds, and other small meadow species.*

a. Remove non-native vegetation in the opening, including coast redwoods and giant sequoias that are crowding Oregon white oaks and shading the gap, concurrent with public education.

b. Replace lawn and lawn weeds with native grasses and forbs appropriate for an open meadow/oak savanna (full sun, part shade along edges.)

c. Replant with a mixture of forbs and grasses listed on the oak savanna/upland prairie list (see "Natural Resources of Hendricks Park" in the *Hendricks Park Forest Management Plan Supplemental Report*).

d. Create 20' tall snag from recently-dead Douglas-fir located near trail southwest of rest rooms.

e. Install interpretive signage for the prairie/savanna.

f. Develop a management plan for the area, which will probably include mowing (which should be timed late enough to allow native seed production).

Goal 6: *Increase availability of permanent water sources for wildlife in the park.*

a. Create small ponds near the rock restroom, in upper saddle and in Rhododendron Garden to provide drinking water for many species of wildlife, and possible egg-laying habitat for Pacific tree frog, roughskin newt, long-toed salamander, possibly other amphibians, and habitat for dragonflies, damselflies, mayflies and other aquatic insects. Post "Habitat! Please stay back/no dogs" sign (or something similar) and create barriers to keep dogs and people out. Carefully design to maximize safety and habitat values. Monitor for Eastern Bullfrogs and remove immediately if found.

b. Create bird guzzlers, as discussed in a later section, which also will benefit dragonflies and other insects. Arrange for the volunteer who monitors bird feeders to also monitor guzzlers (see "feeder"recommendations).

Goal 7: *Enhance habitat for butterflies. (May also benefit other native insect species.)*

a. Plant butterfly larval host plants (see "Natural Resources of Hendricks Park" in the *Hendricks Park Forest Management Plan Supplemental Report*) in the native plant garden, the lower rest room savanna/ prairie restoration area, the upper saddle opening, in gaps and along forest edges.

b. Plant numerous native wildflower species for adult nectaring plants that will bloom throughout the summer, especially in the native plant garden, and where needed to replace non-natives in gaps.

Goal 8: *Enhance habitat for native bees. (Note: "Honeybees" or European honeybees are not native to our area.)*

a. Construct bee houses (piece of 4x4 with holes) for orchard mason bees (see "Natural Resources of Hendricks Park" in the *Hendricks Park Forest Management Plan Supplemental Report*).

b. Plant native species known to attract native orchard mason bees and bumblebees (see "Natural Resources of Hendricks Park" in the *Hendricks Park Forest Management Plan Supplemental Report*).

Goal 9: *Create habitat for reptiles and amphibians.*

a. Make small rock piles and wood piles (branches, small logs), to provide cover, thermal protection and foraging habitat. Locate in sunny areas as much as possible, in upper saddle opening, in other gaps away from heavy use trails, adjacent back yards and other high human and pet use areas.

b. Lay plywood scraps (e.g., 2' x 2' or 4' x 4') in "remote" areas as above, where sun is available. Stencil: "Snake and salamander habitat: Please don't disturb our home!" or similar.

c. Allow accumulation of logs, and manage as described previously.

Goal 10: *Enrich and diversify habitat for birds.*

a. Plant native plants which provide food for birds (see list in "Natural Resources of Hendricks Park" in the *Hendricks Park Forest Management Plan Supplemental Report*).

b. Convert old rock fountain in the upper saddle to a bird guzzler (watering fountain) that discourages human use; build new bird guzzlers in Rhododendron Garden and main saddle native plant garden.

c. Construct small bird feeders at feeding stations in the native plant garden in the saddle area, the upper saddle area, the Rhododendron Garden, and/or the lower rock bathroom area. Stock feeders with black oil sunflower seed or a mix suitable for local species (not all mixes are appropriate, seek advice from Dan Gleason, Lane County Audubon). Seek donation of seed, and construction, installation and monitoring of feeders from Lane County Audubon and Wild Bird Center (and possible limited assistance from ODFW). Request that Audubon solicit for a nearby volunteer who regularly walks in the park to adopt the filling and monitoring of the feeders. Locate away from residences, and away from dense undergrowth where predation by cats may be a problem. Consider placement of benches to facilitate observation, but far enough away so as not to disturb feeding birds. Consider loan or rental of binoculars to visitors as a service at park headquarters.

d. Locate additional songbird nest boxes throughout the park for chickadees, nuthatches, wrens, etc. Make openings smaller than 1.5 inches to prohibit use by European Starlings.

e. Install one or two swallow houses in the lower portion of the Rhododendron Garden or near the picnic shelter.

f. Locate three Western Screech-owl nest boxes in the forest at least 200 feet in from edges to deter use by European Starlings. Clean out annually, and monitor for use by European Starlings. If confirmed, remove starlings or move box.

g. Plant hummingbird nectar plants (see "Natural Resources of Hendricks Park" report in the *Hendricks Park Forest Management Plan Supplemental Report*), especially in the new native plant garden in the saddle area, and also in the upper saddle opening, other gaps and along forest edges.

Goal 11: Create and enhance bat habitat.

a. Consult experts (Stu Perlmeter, Pat Ormsbee, Bruce Campbell, etc.) about the feasibility of conversion of the old bathhouse in the upper saddle to a "bathouse." This could include unblocking upper windows, installing rough cut lumber hanging vertically (not flat) on ceiling for bats to hang on (if needed), loosening shingles to create gaps or installing new shingles with spacers to provide gaps underneath. If it could be done reasonably, consider crown thinning trees to the south to allow more light to hit south side of building. Install new grates over foundation vents to keep out rodents and opossums.

b. Build bat roosting structures, including imitation bark "sleeves" on trees, bat houses (see BCI bathouse book), bat boxes, and snags with cavities (as above); create "bat flaps" carved in bark of snags (per Tim Brown methods previously mentioned). Locate structures following ODFW guidelines (see "Natural Resources of Hendricks Park" report in the *Hendricks Park Forest Management Plan Supplemental Report*). A bathouse could be located in sunny area near saddle, in the lower Rhododendron Garden, and/or in the north part of the upper saddle opening (if the restroom conversion is infeasible due to excessive shade or other other factors, or in addition to the conversion).

Goal 12: Minimize chemical contamination of habitats.

a. Avoid use of chemical pesticides and fertilizers to the greatest degree possible to minimize poisoning of soil organisms, insects, amphibians, birds and other animals. Continue consultation with leading authorities for advice on lowest impact alternatives.

VI. Fire Management

Goal 1: Develop a fire management plan for Hendricks Park, including at least the following items.

a. Assess existing and potential fire hazards in Hendricks Park.

b. Identify park resources (rare plant population, structures, etc.) and adjacent properties which might be susceptible to damage from fire or fire control efforts.

c. Identify water sources and access routes.

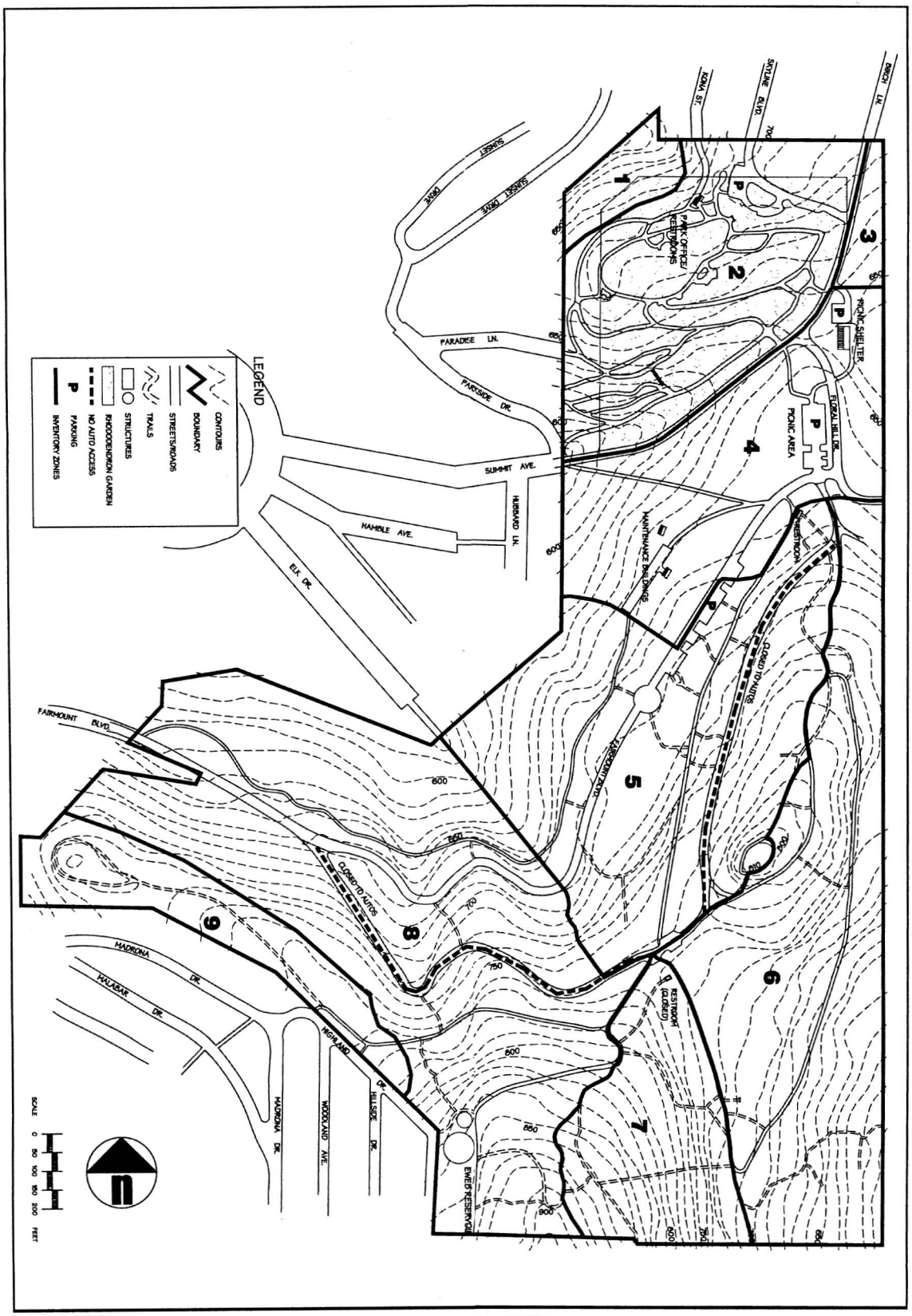
d. Identify strategies for reducing potential hazards in and adjacent to the Park. Avoid excessive vegetation management, and strive to preserve native plant communities whenever possible.

e. Identify potential fire control alternatives and strategies.

f. Identify potential recovery alternatives, focusing on restoration of native plant communities.

Appendix B

Hendricks Park Vascular Plant, Fungi & Wildlife Lists



SHEET TITLE		HENDRICKS PARK	DESIGNED: REY, J.B.
FILE NO. 1A	Hendricks Park forest and the trees	MANAGEMENT PLAN	DATE: 6/22/96
SHEET NO. 3 OF 6		RESOURCE INVENTORY ZONES	DRAWN BY: NOEL LAU DATE: 4/20/99
			SCALE: relative