

Bezell Memorial Forest

Stewardship Management Plan



Prepared for the
Benton County Parks Department

July 11, 2001



ITS Management, Inc.

ACKNOWLEDGMENTS

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CHAPTER 1: Introduction

This chapter describes the vision for the Beazell Memorial Forest, states the purpose of this plan, outlines the planning process used in plan development, and details plan implementation and administration.

Vision for the Beazell Memorial Forest

When Fred and Dolores Beazell acquired an old farm and 586 acres of forest, fields, and open meadows in the upper Kings Valley drainage in 1966, they wished to have and create a beautiful and peaceful natural environment, where they could observe birds and other wildlife, help heal the land from past harsh logging, and tend and nurture a young and growing forest.

Alfred “Fred” Beazell designated Benton County to be the beneficiary of this land prior to his death in April of 2000. He became inspired to give his land to the County to create a memorial forest to honor his beloved late wife, Dolores May (Anthony) Beazell¹. He came to trust that Benton County Parks would be the best future stewards of the property, and would treat the forest with the same care and respect that he had over the past 35 years. He believed that the County’s demonstration and environmental education programs would encourage others to become better caretakers of our important natural resources.

Charles Ross, a long-time friend of Mr. Beazell, played a pivotal role in the acquisition of the property. In Mr. Ross’ early capacity as OSU Extension Service forester, phone conversations influenced Mr. Beazell to seek out forest land in the Kings Valley area. As their friendship developed, Charles was influential in showing that selective logging could lead to a healthy and productive forest. He advocated for the Benton County Parks Department, as the best manager for the memorial forest that Mr. Beazell sought.

As his thinking on stewardship evolved, Mr. Beazell came to envision a memorial forest that could provide habitat for wildlife, be kept healthy and productive, and serve as a model for others. He wanted visitors to be inspired by the forest, and to have the opportunity to learn about forests, their natural functions, and proper land stewardship. He understood that cutting trees could provide revenue for the property to be self-sustaining, and that careful management could help perpetuate the property’s special qualities.

Few of Mr. Beazell’s wishes are formally documented. In giving the property to the County, his Will provided little specific guidance for it’s development and management. Work compiled for his estate provides the best indication of Mr. Beazell’s wishes (Latham, 2000):

- While the value of his gift was considerable (near six million dollars), Mr. Beazell clearly understood that the County could not accept a gift that would impose a financial burden on future taxpayers. It was intended that the property be self-supporting.

¹ Fred Beazell decided the property should be named the “Dolores May (Anthony) Beazell Memorial Forest”. After his death, Mr. Beazell’s estate recommended, and the Benton County Commissioners agreed, to adopt the name “The Beazell Memorial Forest, established in memory of his wife, Dolores, by A. Fred Beazell, July 18, 2000” .

- He was reconciled to the reality that cutting trees was the only feasible way to pay for property operating costs.
- Maximizing timber production was **not** to become a dominant objective. Providing public access, on a day-use and nature-oriented basis, was his primary objective.
- He was willing to leave decisions about tree cutting and property operations to County managers, including “how much was enough” revenue to be generated. He clearly wanted to minimize the necessary cutting, to keep it as ecologically sound and environmentally sensitive as possible, and to use the revenue only for **this** property.

Benton County and the Parks Department share and will perpetuate Mr. Beazell’s vision. Creating a passive day-use recreation site will provide a place for people to hike, observe nature, and appreciate the rich diversity of this natural resource. Active conservation forestry demonstrations will show visitors ways that recreation, wildlife habitat, open space protection, and working forests can go hand in hand. Protecting the resource, valuing biological diversity, maximizing ecosystem health, and maintaining the site’s aesthetic appeal will be top priorities. Environmentally sensitive harvest techniques will serve to maintain forest health, improve tree quality, and help support park management.

To demonstrate Benton County’s commitment to conservation forestry, the Beazell Memorial Forest will be certified as “well managed” under the SmartWood Program, an independent forest certification program accredited by the international Forest Stewardship Council². SmartWood’s independent third-party assessment assures that management meets stringent standards for environmental sensitivity, sustainability, and community and social concerns.

Purpose of the plan

The purpose of this plan is to enable and help implement the vision of Fred Beazell and Benton County. It will guide Parks Department managers in the development of visitor facilities, and in the integrated and ongoing management of site resources. Because the property has an active stewardship focus — protection as well as the active management — baseline information is required on the full array of site resources, as a means of gauging progress towards protection and restoration goals. Accurate resource information and comprehensive management policies are critical to ensure the responsible and long-term stewardship of this extraordinary property.

The plan also responds to the County’s overall strategic mission of “making Benton County a better place to live”, and the overarching goal to “promote a safe and nurturing environment where families and individuals can thrive and prosper.” In particular, the plan addresses the mission of the Parks Department:

“Benton County Parks Department serves the interests and pursuits of Benton County and residents by providing access to natural, historic, and recreational areas and conserving, restoring, and developing parkland investments.”

² ITS Management is certified under the SmartWood Resource Manager Program. This plan meets SmartWood standards for “well managed” forests (SmartWood, 1999).

Specifically, the Plan serves to:

- inventory and assess property resources
- guide facility development and property management
- describe resource management practices to be used
- provide a comprehensive policy framework to guide future management decisions
- establish monitoring and evaluation protocols

Planning process

The planning process involved six major steps (Figure 1). Resource assessment, policy development, and recommended actions were considered within four general resource areas: recreation and visual resources, wildlife and fisheries resources, vegetation and botanical resources, and timber resources.

FIGURE 1. Management Planning Tasks



A team approach was used for resource inventory and assessment, and developing recommended actions. Professionals from conservation forestry, wildlife management, fisheries, rare plant conservation, and landscape architecture disciplines participated (see acknowledgements). The team leader and coordinating author worked directly with County Parks staff to articulate park goals and objectives. Inventories were conducted to provide general baseline inventories on a wide spectrum of property resources.

Public input was actively solicited throughout the planning process. Informational public meetings were held at the 30% and final draft plan phases. Public tours were hosted at the 50% and 100% draft phases. Public comments were actively solicited at the 50% and 90% phases, and were addressed in subsequent plan drafts. Minutes from each of the public meetings are found in Appendix L, and summarize much of the public comment received.

The public input schedule was as follows:

March 14, 2001	Introductory meeting Parks Advisory Board	Kings Valley School
April 7, 2001	Public Field tour	Beazell Memorial Forest
April 11, 2001	50% review-Parks Advisory Bd.	Avery Building, Corvallis
May 9, 2001	90% review-Parks Advisory Bd.	Kings Valley School
June 23, 2001	100% review and site tour	Beazell Memorial Forest
July 6, 2001	Public comment deadline	
July 11, 2001	Final draft plan approved- Parks Advisory Board	Avery Building, Corvallis
August 21, 2001	Plan adopted by BOC	Benton Plaza, Corvallis
October 2, 2001	Conditional Use Permit for Recreational Use approved- B.C. Planning Commission	Benton Plaza, Corvallis

Implementation

Following the 14 day public comment period, the final draft plan will be approved by the County Parks Advisory Board and the County Parks Department. The approved plan will be presented to the County Board of Commissioners for final adoption.

The adopted plan will be implemented by County Parks staff, who will be also be responsible for ongoing monitoring and evaluation.

Planning and administration

The ultimate decisions on resource policy and management direction rest with the Benton County Board of Commissioners. Once adopted, any changes to the Beazell Forest Stewardship Management Plan will require a public hearing and ratification by the County Commissioners.

The Benton County Parks Department staff is responsible for implementing the provisions and recommendations of the plan, and for initial facility development and ongoing management. They receive input and guidance from a citizen advisory Parks Advisory Board. The public is invited to attend park board and County Commission meetings. The County Parks office can provide schedule information (541-766-6871).

Parks staff may engage other resource professionals as necessary, to supplement their expertise and/or work force. Guidance from, or oversight by, appropriate resource professionals will be sought for any resource improvements or modifications.

Revenue

Development and operation of the Beazell Memorial Forest is intended to be self-sustaining. Funds for the facility will be derived from timber sales associated with forest resource improvements. Additional funding, including grants, cost-sharing, and gifts in kind, may be sought for facilities development. As adopted by the Benton County Board of Commissioners on July 18, 2000, any income produced from the property will be used exclusively to sustain its development, operation, and administration.

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CHAPTER 2: Executive Summary

The Executive Summary includes the Management Statement for the Forest, basic management goals, an overview of guiding policies, and a summary of recommended actions. Additional details and supporting information can be found in full text of the Plan.

This Stewardship Management Plan is a policy oriented, conceptual framework for managing the Beazell Memorial Forest — its streams, riparian woods, upland forest, and open spaces. It assesses the condition and health of the Forest’s ecosystems, and provides baseline information on fisheries, wildlife, vegetation and rare plants, and forest composition and structure. The Plan articulates a future vision of the forest, with specific management goals that will help realize this vision. Critical management issues are identified, supported by findings of fact, and followed by specific strategies and recommendations for active management. Conceptual plans for visitor facilities and a trail network and are presented.

Management Statement

The Beazell Memorial Forest will be managed for environmental education and research opportunities.

As a demonstration forest and open space area, progressive ecosystem management practices will be used to protect, conserve, and restore the natural, scenic, outdoor recreation, and wildlife values of the site.

Emphasis will be placed on restoring the Douglas-fir/oak forest and oak savanna ecosystems through conservation-based forest management, as well as accommodating passive day-use recreation such as hiking, wildlife viewing, and scenic enjoyment.

The desired future forest will feature mixed species stands of older, larger trees, with sufficient harvesting and regeneration to assure adequate younger stands to balance the age of the forest.

Built facilities will be minimal, primarily designed to support public access, parking, and visitor information, including environmental and cultural education. Development and operation of the park will be at little or no cost to taxpayers.

Background

Fred Beazell designated Benton County to be the beneficiary of his 586 acre property in Kings Valley prior to his death in April of 2000. He gave the land to the County to create a memorial forest to honor his beloved late wife, Dolores May (Anthony) Beazell. He trusted that the Benton County Parks Department would be a good steward of the property, as he had been over his 35 years of ownership. He envisioned public hiking trails, and active demonstration and environmental education programs that would encourage others to become better caretakers of our important natural resources.

In discussions with Benton County Parks Department prior to his death, Mr. Beazell supported the County's requirement that the property be self-supporting, and that timber harvest proceeds pay for park development and operations. He wanted to minimize the necessary cutting, and to keep harvests as ecologically sound and environmentally sensitive as possible.

Philosophy

The underlying philosophy for the Beazell Memorial Forest is of conscientious stewardship of the rich array of property resources. A balanced approach gives ecosystem protection and restoration, community and social benefits, and sustainable harvest levels equal consideration. Current best management practices for conservation forestry and biological resource protection will be employed.

This plan helps implement the vision of Fred Beazell and Benton County. It guides Parks Department managers in developing visitor facilities, and in the integrated and ongoing management of site resources. It also provides baseline resource information for long-term monitoring of resource protection and restoration goals.

Specific management goals include:

- Provide opportunities for public enjoyment and appreciation of the property, and minimize negative impacts on the resource
- Develop a program of education and demonstration offerings to increase public understanding of the forest
- Actively promote diverse wildlife habitats to support a wide range of native biodiversity
- Reverse trends of habitat loss, and actively restore degraded habitats
- Use and demonstrate environmentally sensitive management and harvest techniques to restore habitat, maintain forest health, improve tree quality
- Maintain a conservative harvest level to provide ongoing funding for park management
- Adapt management over time to changing knowledge and resource conditions

Management Policy Overview

A detailed policy framework guides future managers, and ensures a consistent long-term management approach. Key elements include:

Recreation and Visual Resource Management

The Beazell Memorial Forest emphasizes dispersed, day-use opportunities, with a focus on hiking and nature appreciation. Recreational use does not impact sensitive areas, wildlife and fish habitats, cultural sites, or other resources. Horses and mountain bikes are allowed only on specified trails and during appropriate use periods. Opportunities for public education are actively promoted.

Wildlife and Fisheries Resource Management

Active management improves habitat conditions and protects the biological resources of the Beazell Memorial Forest. Sensitive sites are protected from incompatible uses. Wildlife and fish habitat improvements promote species diversity, and ensure that populations of indigenous species are maintained.

Vegetation and Botanical Resources

Maintaining the biological richness and native diversity of the Beazell Memorial Forest is a key priority, and involves active and diligent management. Oak savanna and woodlands are restored or rehabilitated by controlling conifer encroachment. Invasive exotics are controlled to improve degraded habitats and create a species mix indigenous to native Oregon oak, Douglas-fir and mixed woodland communities.

Timber Management

Maintaining long-term productivity and improving the biological integrity of entire forest ecosystems is the emphasis of management of the Beazell Memorial Forest. The desired future forest features mixed species stands of older, larger trees, with sufficient harvesting and regeneration to assure adequate younger stands to balance the age of the forest. Timber harvests are both even-aged and uneven-aged to help create structures that benefit wildlife and native biodiversity. Harvest levels are based on forest health and other ecological goals, and are not revenue driven. Lands on which other resource values exceed timber values are removed from the timber management base, or receive substantially modified practices. Light-touch, environmentally sensitive logging practices are used, including horse logging for demonstration purposes and as appropriate.

Monitoring and Assessment

Regular monitoring of management practices and their results is necessary to best achieve ownership objectives. Monitoring serves as the basis for evaluating and modifying the management plan, including how the forest changes in response to public use and restoration activities.

Revenue

Development and operation of the Beazell Memorial Forest is intended to be self-sustaining. Funds for the facility are derived from timber sales associated with forest resource improvements. Any income produced from the property is used exclusively to sustain its development, operation, and administration.

Recommended Actions

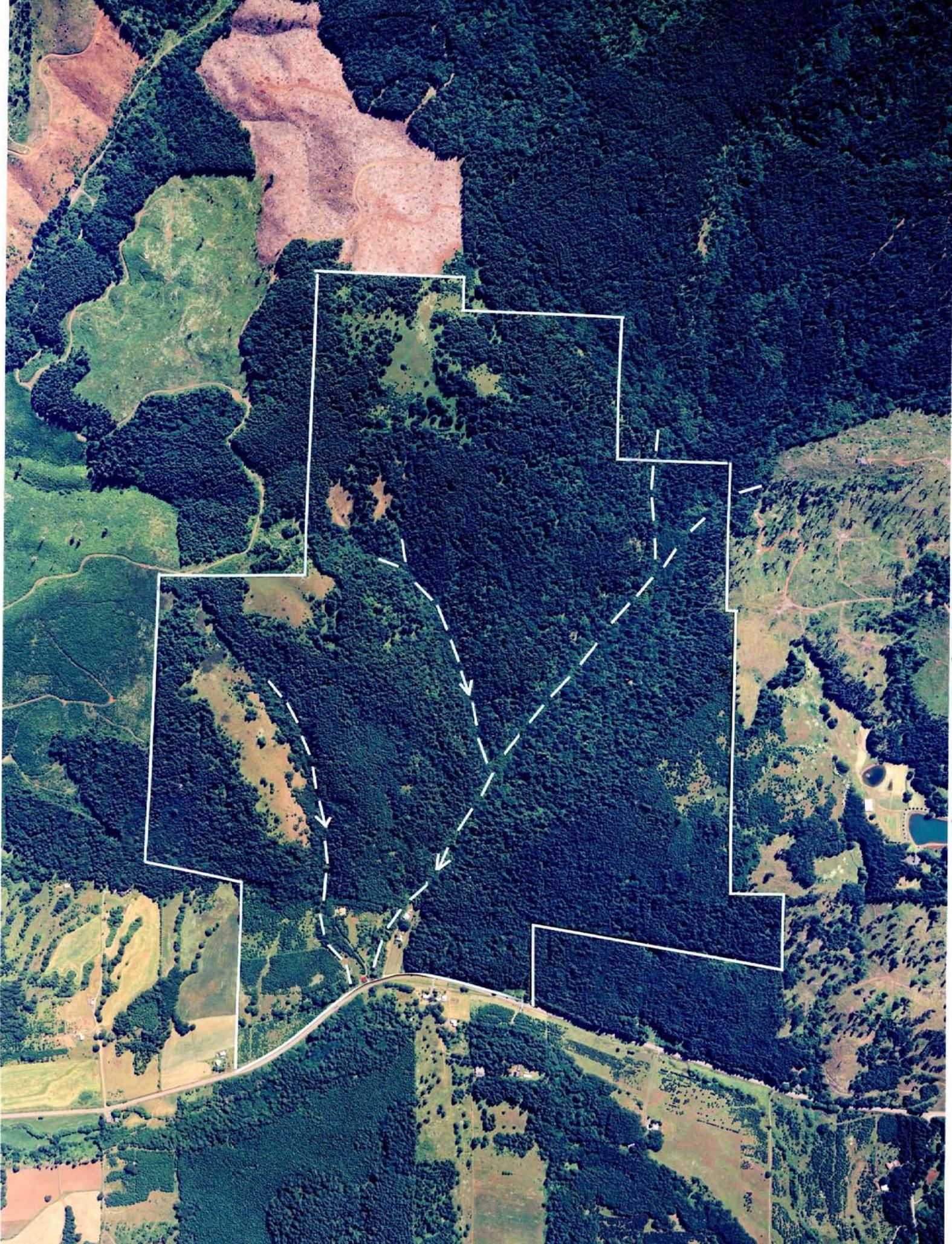
1. ***Facilities:*** Develop public parking, restroom, and toilet facilities. Develop a network of hiking trails, picnic areas, and other visitor services.
2. ***Education and Interpretive Plan:*** Develop a program for environmental, historic, and cultural education. Create demonstrations, materials and facilities to implement education and interpretive plans, initiate linkages with various user groups, and publicize these programs.
3. ***Oaks:*** Cut fir that are crowding out centuries-old Oregon white oak.

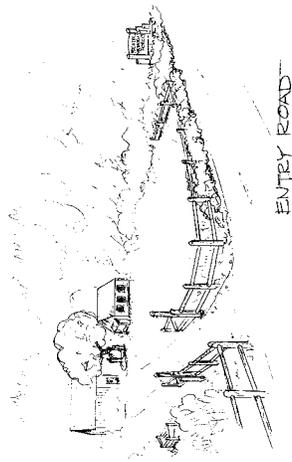
4. **Meadows:** Stop loss of open meadows by cutting encroaching Douglas-fir regeneration and Scotch broom. Restore meadows to encourage native plants by mowing, cutting or burning.
5. **Access:** Upgrade forest management road system. Mark and sign property boundaries. Work cooperatively with neighboring landowners.
6. **Tree harvest:** Begin a harvesting program for management demonstration. Priorities include saving oak and other hardwood species, thinning overstocked stands, and providing additional structure for wildlife habitat.
7. **Control of invasive exotic species:** Control invading Scotch broom, thistle, Himalaya blackberry and false-brome by cutting, burning, or targeted herbicide application.
8. **Stream restoration:** Remove barriers to fish passage, add woody debris to stream channels for fish habitat, and plant conifers in riparian zones.
9. **Fire Management Plan:** Work with the Oregon Department of Forestry to develop fire management plans for wildfire control and prescribed burning.

Supporting information

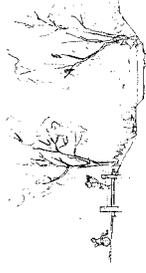
The full Stewardship Plan contains a recreation facilities plan, and outlines potential interpretive themes for an education and interpretive program. Also included are detailed reports on biological site resources, including a rare plant inventory, wildlife and fish habitat assessments, a timber inventory summary, and a mycological report.

For additional information contact the Benton County Parks Department at (541) 766-6871.

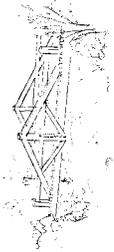




ENTRY ROAD



POND/WILDLIFE VIEWING PLATFORMS



PEDESTRIAN & MAINT. BRIDGE

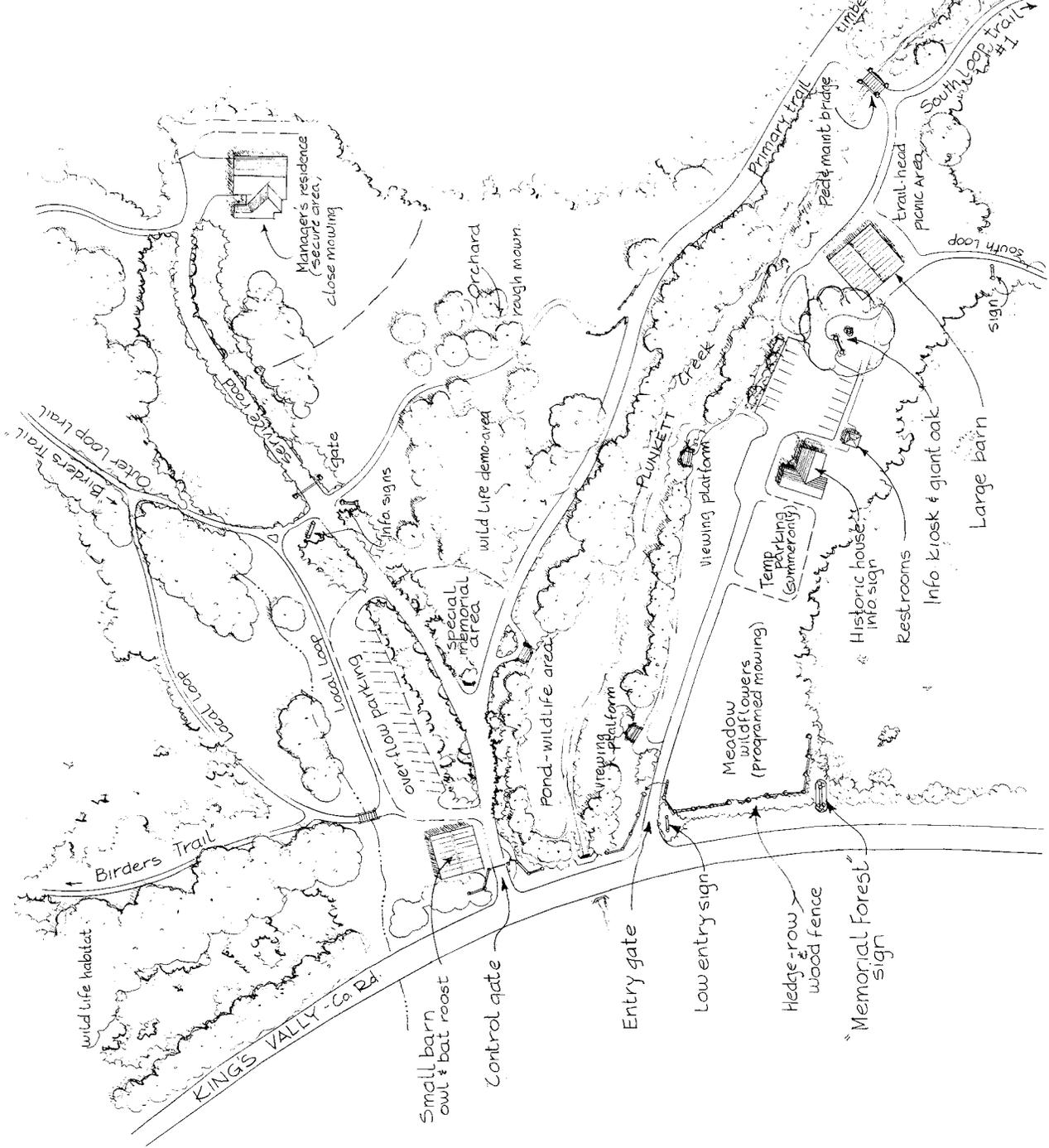
BASE FACILITIES PLAN

DOLORES MAY (ANTHONY)

BEAZELL MEMORIAL FOREST



John R Stewart
Landscape Architect 6-12-01



Benton County

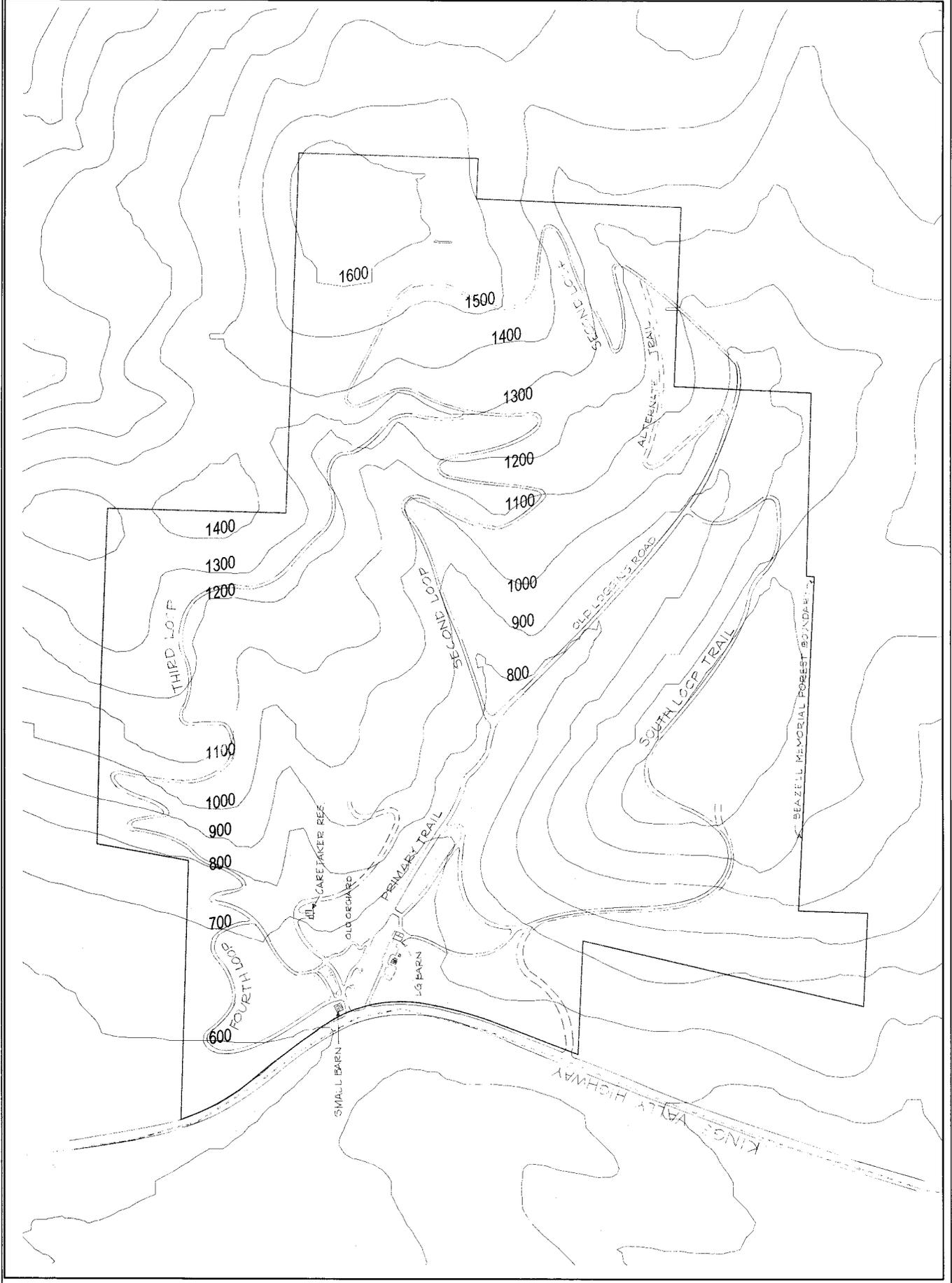
BEAZELL
MEMORIAL FOREST
TRAIL PLAN

U.S. 724



300 0 300 Feet

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For official labels, take only the trail
plan from the appropriate County Department.



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CHAPTER 3: Context and Current Resource Conditions

This chapter provides a historical background for the Beazell Memorial Forest, summarizes the socio-economic context, and reviews the current condition of property resources.

History¹

Until the early 1800's the Kings Valley area was part of the home range of a local band of the Luckiamute Indian tribe. The area was settled by several members of the King family, who arrived from Missouri in 1846. The Beazell site is part of the original Hayworth Donation Land Claim, settled in 1849.

Isaac King, whose claim lay immediately to the north, acquired the property from Job Hayworth in 1855, adding to the King's growing farming and livestock operation. Following Isaac's death in the late 1860's, title to the land eventually passed to Lazarus Van Bebber, King's father-in-law. Van Bebber farmed the land with the help of Isaac's son, Samuel, who lived with Van Bebber. In 1886 Van Bebber transferred title of the property to Ashnah Plunkett, who by then had been living on the property with her husband James for some time. They reportedly built the existing farmhouse, the "Plunkett House," in the early 1870's. In the deed to Ashnah Plunkett, Van Bebber retained a life estate to reside in the northeast room of the house, although in which house is unclear (another house of unknown age once existed near the barn). James Plunkett was a "drummer boy" at nearby Fort Hoskins, and had married Ashnah Norton in 1864. The Plunkett family occupied the house for nearly a century, until the death of James and Ashnah's son Henry in 1961.

Early farms of Kings Valley were primarily sheep and cattle operations, with wheat and oats grown on tillable valley bottoms and middle slopes. Farms often included a variety of vegetables and fruit and nut trees for subsistence use, as well as for sale. The Plunketts farmed and hayed the western fields, and kept livestock into the 1950's. A small orchard is located near the barn. Forests were harvested to clear land and for farm lumber and fuel needs. Rex Clemens established an early sawmill, reportedly on Plunkett Creek, although its exact location is unknown. Fred Beazell purchased the property in 1966. Active farming of most fields had been curtailed some years earlier.

Historic Vegetation Patterns

In the early 1800's the landscape at Kings Valley was strikingly different than that which is seen today. Conditions mirrored those found throughout the Willamette Valley and western Oregon. Four major vegetation types occurred in the area: prairie, riparian forest, upland forest, and open woodland. At that time, all of these types were present at the Beazell site.

Settlers were most attracted to the prairie — open grasslands found from the floodplain margins to the hillsides of most valleys of the area. Isolated groves of trees were primarily white oak and Douglas-fir. This prairie condition had been intentionally cultivated by the local Luckiamute Indians, who routinely burned the valley grasses to maintain important food and fiber "crops,"

¹ compiled in part from Brauner and Stricker, 1994.

including oak, camas, hazel, and berries, to encourage lush grass growth for game, and to make travel easier.

Riparian forests covered the floodplains of most rivers and major streams, where moist soils resisted Indian burns. These contained an often dense mix of ash, cottonwood, bigleaf maple, Douglas-fir, and various shrubs. Upland forests of large Douglas-fir, hemlock, redcedar, and maple were found on the slopes of the Coast and Cascade Ranges, and on moist north aspects at lower elevations. In mountainous areas forests were extensive, dense and often contained large trees. Forests nearer the valley were more open and diverse, influenced by frequent fire.

A transition forest was often located between the prairie and the upland forest. Early surveyors of the 1840's recorded open forests of white oak and Douglas-fir, with either a grass or shrub understory. Groves varied from a few trees to several square miles in extent, with Douglas-fir more common near hilltops and floodplain margins, and oak on both drier or wetter sites. They called this transition forest "open woodland." Early survey records show this vegetation type was common in the hills surrounding Kings Valley.

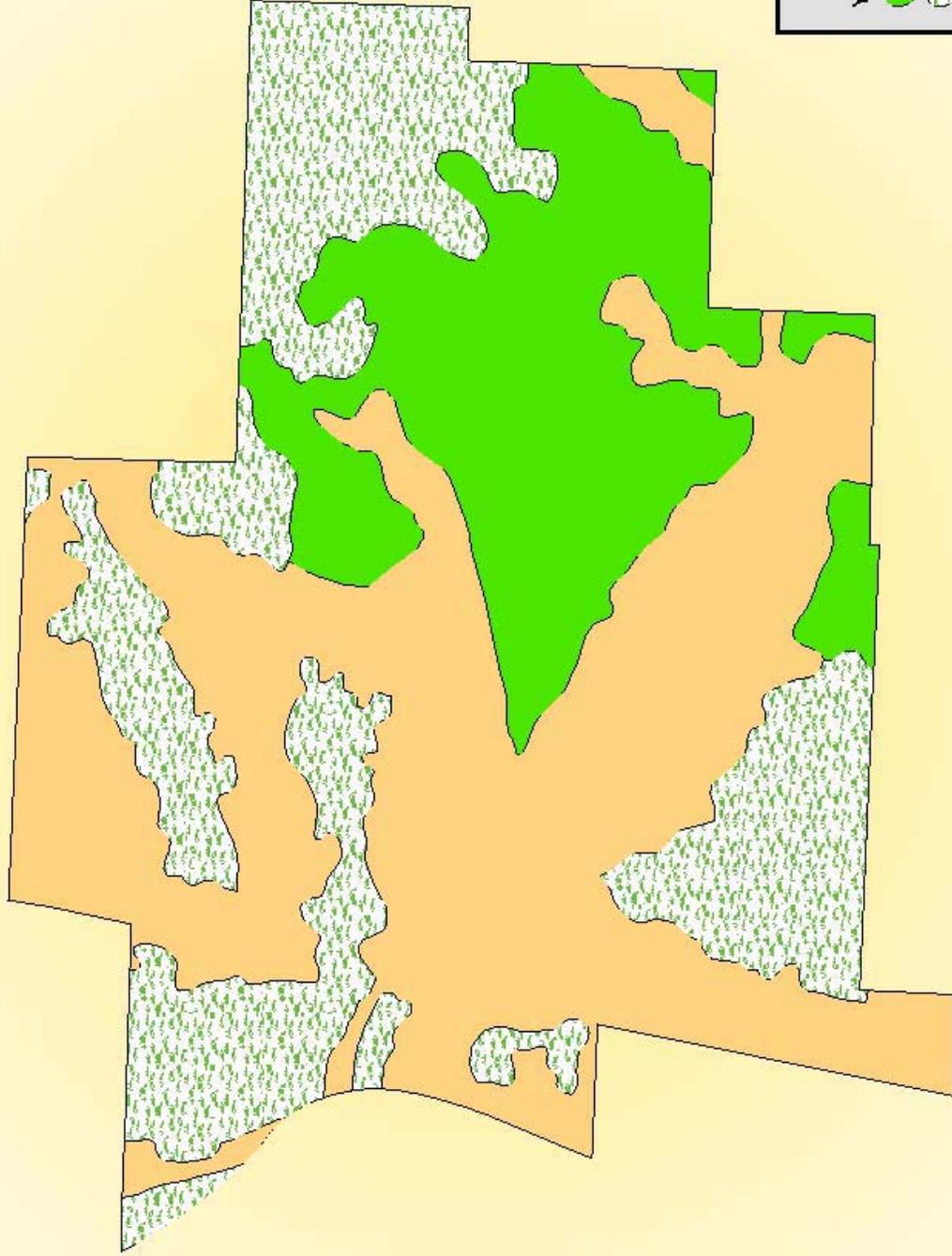
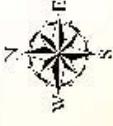
Changing Vegetation Patterns

When the first settlers began arriving in Kings Valley in the 1840's, there were few barriers to pioneer settlement. Diseases brought into the area by early trappers and explorers had already decimated native Indian populations (reducing their numbers by nearly 75 percent). As a result of the cessation of native burning, and the farming and grazing practices of early settlers, vegetation patterns changed quickly.

Open prairie was the site of most early agricultural activity, and was so thoroughly exploited that no areas of pure native valley prairie exist today. By the mid-1850's, much of the prairie and riparian forest around Kings Valley was already cleared for farming. The invasion of trees into savanna and idle agricultural land was noted as early as 1870. Timber harvesting intensified during the 1940's and 50's, removing most the older fir forest, as well as younger forests which reseeded in the late 1800's. By the 1970's the open woodland forest type had virtually disappeared from the entire region, having been cleared for field or pasture, or having changed through natural succession into closed fir forest.

The landscape today looks vastly different from that of a hundred years ago. The Beazell Forest has shifted from a landscape dominated by mixed oak/fir stands and savanna, to one comprised almost entirely of dense Douglas-fir (see map following). Many of the few remaining open meadows and mixed forests continue this trend of change, as prolific and fast-growing fir seeds into the shelter of field edges and oak groves, which in a few decades it quickly dominates.

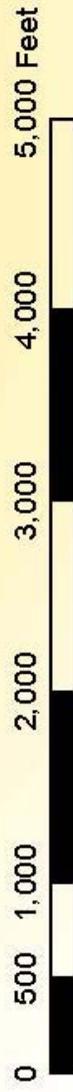
Dolores Beazell Forest Year 1900 Cover Types



Legend

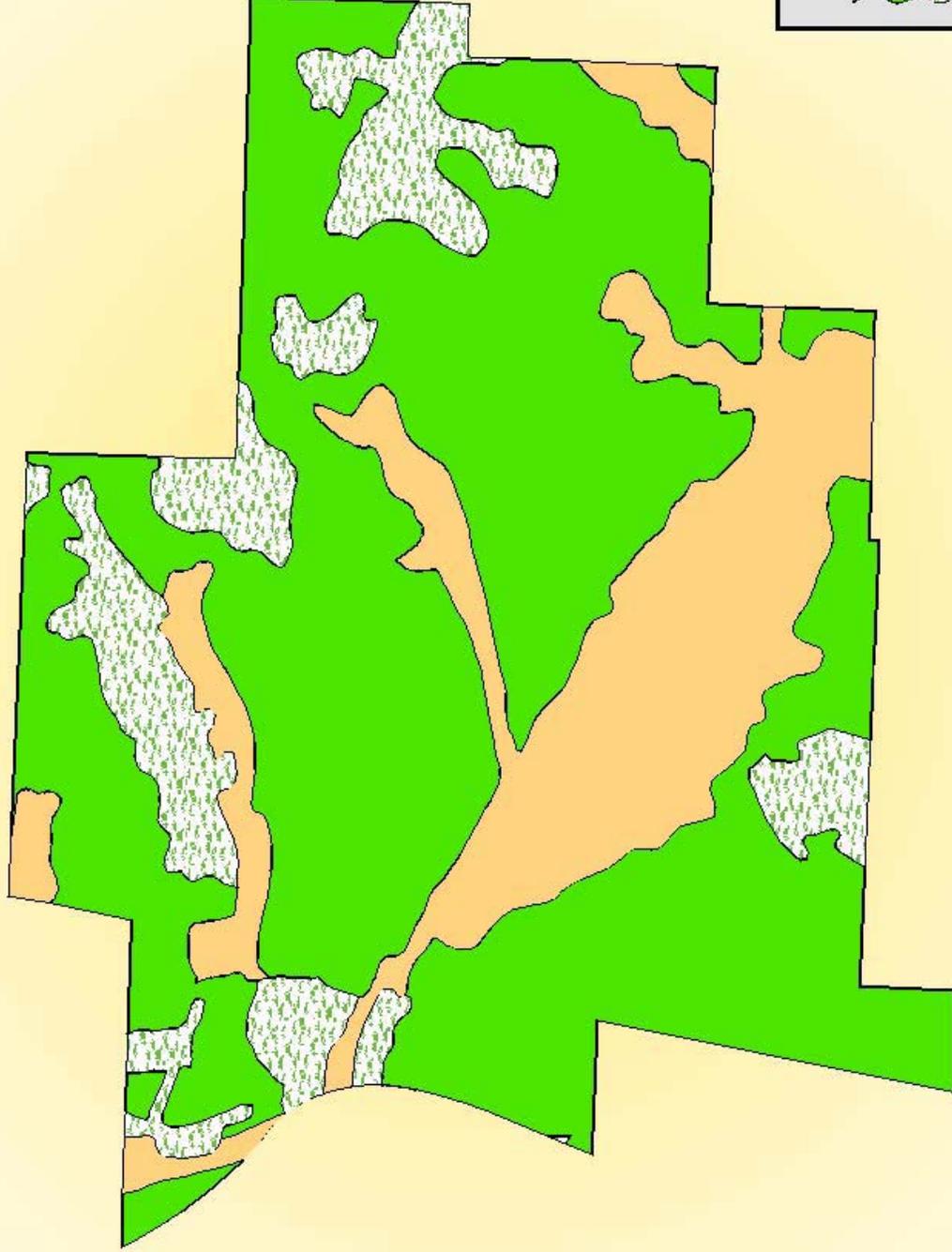
Year 1900 Cover Types

- Fir (Green)
- Grass (Light Green with Stippling)
- Mixed/Savanna (Orange)



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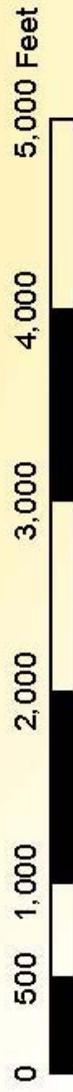
Dolores Beazell Forest Year 2000 Cover Types



Legend

Year 2000 Cover Types

- Fir
- Grass
- Mixed



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Natural Resources Consultants

PROJECT NO. 00-001
DATE: 03/01/00

Current Management 1950-2000

In the early 1950's extensive timber harvesting across the Beazell property removed most of the marketable Douglas-fir. A network of skid trails and haul roads were constructed for this work. Using logging practices typical of the day, trees were ground skidded with crawler tractors, often downhill on steep grades. These roads and log landings often caused in serious impacts to soil and streams, practices which would be illegal under today's regulations.

Fred Beazell's passion for the forest is evident in the considerable time and effort he spent planting and tending his trees. From the time he purchased the property in 1966 until 1995 he planted nearly 100 acres of seedlings. He planted openings left after logging, idle farm land, and open hilltop meadows. Early plantings were primarily Douglas-fir, though by the 1990's he began to plant cedar and ponderosa pine as well. In the 1990's Fred pre-commercially thinned some of his earliest plantings, which by then were dense young stands. He conducted a small commercial thinning operation in the late 1980's. He was proud in his efforts, and enrolled his forest in the Tree Farm Program.

Socio-economic Context

The communities of Kings Valley, Wren, the greater Corvallis-Philomath area, and much of Benton County comprise the primary sphere of social influence for the Beazell Memorial Forest. The Forest is one of two new public properties in the Kings Valley area, and the largest parcel in the Benton County Parks system. Few Forest visitors are expected from outside Benton County.

Economic

Economic impacts to the local economy are likely to be modest. Facility development and maintenance will provide primarily indirect economic benefits, as no full-time staff will be dedicated to park operations. Park development will use County Parks staff, contractors, and volunteers. Most materials and labor will be acquired locally. Use of corrections work crews and volunteer youth programs will conserve operating expenses and offer constructive outdoor work experiences. Timber harvesting and natural resource improvements on the Forest will provide a direct, although modest contribution to the local economy.

Recreation

The Beazell Memorial Forest will provide recreation opportunities for Benton County residents as a primary focus. The Forest will contribute to the "quality of life" for residents, supplying open space, solitude, recreation opportunities, scenic vistas, rugged terrain, clean air and water, and natural forest qualities. Opportunities will be available for individuals, families, and school groups. Special accommodation will be made for persons of various physical abilities.

A program of active and self-guided interpretation will educate visitors about the forest and its natural qualities and functions, and inspire users to take up a personal commitment to stewardship of our natural resources.

Current Resource Conditions

Recreation and visual

There are currently no developed trails on the Forest, and negligible public use of the property. An old road parallels Plunkett Creek the length of the property, and affords the best current opportunity for walking. Several old haul roads and skid trails provide hiking options, but are frequently steep, in poor locations, or have filled in with brush. There are excellent vistas — of Marys Peak and Luckiamute Valley to the south, southeast, and southwest — afforded from several ridgetop meadows. However, there is currently no access to these sites, other than difficult cross-country walking. The Forest will be closed to public use until sensitive resources are inventoried and safe parking can be provided.

Recreational use of City, County, and other nearby public lands has grown steadily in the past decade, due in part to the rising population of the Corvallis area, as well as popular trends in outdoor recreation. There is a high demand for local hiking, horseback riding, and mountain biking opportunities. The closest sites for hikes of comparable length and scenic quality are at Marys Peak (Suislaw National Forest), Fitton Green (north of Philomath), and MacDonald-Dunn Forest (on the edge of Corvallis).

Wildlife

The contiguous stands of a mixed conifer and hardwood, Oregon white oak, grass/savanna meadows, smaller grass/oak openings, and Plunkett Creek and its associated tributaries provide a diversity of habitats, and create the potential for a large array of associated wildlife. It is possible that over 100 species of birds, 50 mammalian species and 20 salamander/reptiles may utilize the site for nesting, foraging or migration². A detailed wildlife habitat assessment, species lists, and management plans are found in Appendix D.

Dead trees (snags) and dead parts of live trees provide essential nesting, roosting and foraging habitat to a wide array of species. Over 30% of bird species richness and abundance may be related to the level of cavity-nesting habitat available. Levels of suitable cavity nesting habitat vary widely across the parcel, but are very low overall. In many of the young conifer stands cavity nesting habitat is virtually absent. Very few large diameter (4'+) snags are present. Hardwood trees and snags provide much of the current and potential cavity habitat. This includes numerous dead or dying large diameter oak trees (19"+ DBH³, many 3' DBH), and many hundreds of small diameter oak snags, the result of suppression by competing Douglas-fir. In the near future, a natural increase in snag levels can be expected, mostly due to the continuing mortality of white oaks.

Logs and other woody debris provide cover, food and unique environmental conditions (moisture, temperature) required by numerous wildlife species. Levels of woody debris vary widely across the parcel, but are very low overall (especially of large logs). In many of the young conifer stands logs are virtually absent, or are small diameter (under 6" DBH) and consequently of low wildlife value. Large logs (2-3'+ diameter) include a very few recent blowdowns, but are

² During the survey 60 species of birds and 5 mammals were encountered on the site.

³ diameter breast height

more commonly well decayed residual logs from past logging activity. Death of oak trees provides additional down wood, which will increase as current declining trees and snags ultimately fall.

Hardwoods offer unique food (mast and lichen), cover, and other environmental conditions not found in conifer forests. Even a small percentage of hardwoods in a stand will greatly increase biodiversity. Oregon white oak is especially important to wildlife, with over 100 species utilizing the trees for nesting, foraging, hiding and resting. Oak communities are among the most threatened habitat types in Oregon, but are well represented on the Beazell property. Tree size, form, density and condition vary widely. Ancient (300+ years), large diameter (3'+), widely spaced trees with spreading canopies are scattered throughout the property. The survival of a large segment of the existing oak habitat is threatened by competition and suppression by young, faster growing Douglas-fir. In a number of areas the situation is critical, with oak demise imminent. Much of the property's original oak forest has been lost over the past 10 years, a trend certain to continue without intervention.

Other forest types provide a variety of wildlife habitats. Red alder is abundant in riparian zones. Conifer trees are well represented, and provide forage and important thermal and hiding cover, especially important during the winter. Minor species like grand fir, western redcedar, and Pacific yew help create structurally diverse, multi-layer canopy habitat conditions in some locations.

Grassland habitat is required by a number of wildlife species that are not likely to inhabit dense forests, including many songbirds, a number of reptiles, certain shrews and voles, and raptors. Grasslands also provide foraging opportunities for elk and deer. Abundant grassland habitat is present on the Beazell parcel. Although currently in relatively good condition, Douglas-fir encroachment is a major concern for the future status of these habitats.

Maintaining a diverse shrub habitat is essential to a number of wildlife species, including several songbirds. Although shrub habitat is vibrant in a few areas, overall shrub abundance on the parcel is low. Most shrub habitat is located in the west of the parcel in association with the site perimeter, homestead, and pasture hedgerows. Serviceberry, snowberry, ocean spray, Indian-plum, poisonoak, trailing blackberry, hawthorn, rose, hazel and cascara are all represented. Upslope shrub cover is most developed along meadow perimeters and in the smaller forest openings.

Riparian zones represent the interface of the aquatic and upland habitats, providing habitat for both aquatic and terrestrial wildlife. These areas are associated with a rich and unique herbaceous and shrub community and with tree species diversity. Invertebrate diversity and abundance can be especially high in these areas, with even small seasonal creeks harboring hundreds of species not likely to be found elsewhere.

The residential and homestead areas integrate a diversity of habitats, including grassland, shrubs, open forests, streams, and agriculture (pasture, orchards, berries), all resulting in abundant wildlife potential. A high level of shrub diversity and abundance is located in patches and roadside hedgerows, but includes exotic Himalayan blackberry and Scotch broom. An old apple orchard provides foraging opportunities for a number of species, ranging from bear to sapsucker.

Two large barns are present which may provide nesting/roosting opportunities for owls, bats and swallows, as well as less desirable exotic species like starling, rat and house mouse.

Wetland habitat (ponds, marshes) and their abundant associated wildlife is absent from the Beazell property. Pond construction in the west of the site should be considered to increase wetland habitat.

No threatened or endangered species were found on the Beazell property. Ongoing surveys for the northern spotted owl (listed Federally and by the State of Oregon as threatened) have not recorded spotted owl responses to date. Spotted owl pairs are present on an adjacent ownership, as well as in King's Valley and the Mary's Peak Watershed. The Beazell parcel is likely providing occasional foraging habitat for the nearby owls, as well as migration habitat for dispersing owls. Pileated woodpeckers and Western gray squirrel (both listed by the State of Oregon as sensitive) have also been observed on the site. A number of other species of state or local concern are likely to occupy the site, but were not encountered, including western bluebird, common nighthawk, western meadowlark, willow flycatcher, olive-sided flycatcher, sharp-tailed snake, and long-legged myotis.

Fisheries

The primary stream flowing through this property is Plunkett Creek, a tributary of the Luckiamute River. The property includes approximately 1.3 miles of the upper main stem of Plunkett Creek and an additional 1.5 miles of several unnamed tributaries. Plunkett Creek flows approximately 1.8 miles downstream from the property before its confluence with the Luckiamute River. A detailed fish inventory of Plunkett Creek is found in Appendix E, and aquatic habitat assessment of property streams in Appendix F.

Although the list of fish present in the Luckiamute River is lengthy, few species are likely to be found in Plunkett Creek itself. Of the anadromous fish, only Pacific lamprey and juvenile steelhead would use the stream. Lamprey could easily migrate the length of Plunkett Creek, and though there is suitable habitat no lamprey were observed. Juvenile winter steelhead have been found seasonally in the Luckiamute and in streams like Plunkett Creek, but these too were absent during the survey (none were expected due to survey timing and low stream flows).

The survey of Plunkett Creek found a fish community typical of a smaller, higher gradient stream of the eastern Coast Range. The sample was dominated by native cutthroat trout, with most under three years old. Two species of sculpin were found, of multiple size classes but relatively low numbers.

No threatened or endangered fish species were found. Winter steelhead and spring chinook salmon in the upper Willamette are both currently listed as "Threatened" under the Federal Endangered Species Act (ESA). Coho salmon are not native to the upper Willamette, and there is no record of them ever having been stocked in Plunkett Creek. There is concern for the health of lamprey populations in the northwest, and some discussion as whether they too should be protected under the ESA.

There are no known barriers to prevent fish from migrating from the Luckiamute and into Plunkett Creek. At Highway 223 a culvert presents a seasonal upstream migration barrier to fish during high flows, but is passable at moderate or low flow conditions. Two instream downed wood debris complexes may also present seasonal barriers to upstream movement of fish, but during low flows rather than high. Of greater concern to cutthroat movement is access to the smaller tributary that joins with Plunkett Creek in the mid-section of the property, where it passes under the road via a culvert which prevents all fish passage.

Two historical dam break flood events shaped the current condition of Plunkett Creek. The first, around 1960, originated near the southeast corner of the property in the right fork of Plunkett Creek. This event removed nearly all of the woody debris associated with the aquatic corridor, and straightened and “simplified” the stream and its pool structure. This event created the broad alluvial terrace located just above the entrance to the property. The second event, in the winter of 1996, washed out a pair of culverts at a stream crossing 600 yards above Hwy 223, after they became plugged with debris during the 1996 flood. This flood deposited more soil on the terrace above the highway, which led to additional colonization by blackberry.

Although Plunkett Creek has been impacted by human activity, the fish resource is healthy. It supports an expected diversity of fish species, each represented by multiple age classes. All appeared in excellent condition and well fed. The stream health is also reflected in the relative abundance and diversity of other aquatic invertebrates that were found, including stoneflies, crayfish, and amphibians such as the Pacific giant salamander and tailed frog.

Vegetation and botanical

The Beazell Memorial Forest contains a wide diversity of forest and grassland plant species. A total of 246 plant species were encountered, approximately 75% (185 species) native (see Appendix G). The remaining species were introduced plants, many of them weedy. In addition to the extensive forest, plantation, and riparian habitats on the property, a mosaic of grasslands covers a large portion of the area. These grasslands (also referred to as meadows and prairies) and associated oak savanna represent important habitat for native plants and animals, and much of the plant species richness we observed at the site is present in these remnant prairies.

Two rare species were encountered during the surveys, tall bugbane (*Cimicifuga elata*) and thin-leaved peavine (*Lathyrus holochlorus*). Tall bugbane is a candidate for listing as endangered by the State of Oregon, and thin-leaved peavine is a Species of Concern with the U.S. Fish and Wildlife Service. Two additional endangered plant species, Kincaid’s lupine (*Lupinus sulphureus* ssp. *kincaidii*) and Willamette daisy (*Erigeron decumbens*), are documented to occur in King’s Valley but were not encountered during our surveys at Beazell⁴.

Other significant (but not protected) plants occur at the site. Oregon geranium (*Geranium oregonum*) and Hooker’s catchfly (*Silene hookeri*) are both prairie plants of the Willamette Valley and surrounding areas that are decreasing in abundance due to habitat alteration and loss.

⁴ Willamette daisy generally flowers later than the end of May (our survey date), and may occur at the site even though it was not noted during our survey visits.

They are also very showy and attractive to park visitors, and represent an important resource at the site that is compatible with visitor viewing (if trails are located appropriately).

Several species of native grasses were encountered in the prairies⁵. The presence of these species is important because they represent the dominant plants of native upland prairies prior to Euro-American settlement. Some of these grasses are now difficult to find in the greater Willamette Valley area. Proper management of the prairies and oak savanna would likely result in an increase in the abundance of these species. If they became abundant here, they could serve as a seed source for restoration efforts at Beazell and surrounding areas.

The most significant invasive plants at the site include blackberry (*Rubus discolor* and *R. laciniatus*), false-brome (*Brachypodium sylvaticum*), thistles (*Cirsium arvense* and *C. vulgare*), Scotch broom (*Cytisus scoparius*), and tall oatgrass (*Arrhenatherum elatius*). All should be controlled to reduce their rate of spread and impacts on native plant communities. Control strategies are detailed in Appendix G.

Timber

Of the 586 acre land base, approximately 500 acres are forested. Much of the forest could benefit from active management, including tree harvesting. Other areas should be reserved from harvesting to protect important recreation, visual, or environmental resources.

A timber cruise was conducted by Duck Creek Associates in June of 1998, and updated in 2000. It found a total merchantable timber inventory of 12,460,000 board feet (see Appendix H)⁶. This volume is comprised mostly of Douglas-fir (78%), followed by hardwoods⁷ (13%), and other conifers (9%). Average annual growth for the entire tract is estimated to be 450,000 board feet. Soil productivity is good, ranging from site class III to IV⁸. The cruise estimates an average of five tons of woody debris per acre.

Fifteen separate forest cover types are described (see Appendix I). Most of the forest stands are between 45 and 55 years old, and have had no past thinning. There are 65 acres of Douglas-fir plantations, which range from 11 to 35 years of age. The oldest forest stand is 62 years old, though older individual trees are scattered across the property. Older trees are typically poor quality, and were bypassed in earlier harvests. Oak is a minor component of many cover types. Most of the oak, some trees centuries-old, have died or are rapidly being overtopped by the faster growing fir.

⁵ including Roemer's fescue (*Festuca roemeri*), California oatgrass (*Danthonia californica*), Lemmon's needle grass (*Stipa lemmonii*), prairie Junegrass (*Koeleria cristata*), California fescue (*Festuca californica*), and meadow barley (*Hordeum brachyantherum*)

⁶ net total volume, as of June 2000.

⁷ individual hardwood and other conifer species are not differentiated

⁸ on a scale of 1 to 5, with one being most productive

Cultural resources

The most significant cultural resource on the property is the old farmhouse⁹. Known as the Henry Plunkett House, this gothic vernacular farmhouse built was in the 1870's, and is one of the oldest surviving structures in Kings Valley. It was the second farmhouse built on the property, located just downstream from the site of the earlier structure. Most of the associated barns and outbuildings were built in the 1930's. Nearby walnut trees and a large lilac probably date from the mid to late 1800's.

The Plunkett House is in fair to poor condition. The large barn is in good condition. The small barn and other outbuildings are in fair to poor condition. Assessments of the structural integrity and restoration potential of these buildings are recommended.

Fire management

Though fire was a part of the historic disturbance regime throughout the Willamette Valley, current risk of fire at the Beazell Forest is moderate to low most times of the year. Fire risk is highest from July through September. Increased visitor use and dense unmanaged fir plantations can lead to heightened fire hazard, though increases are small¹⁰. Practices to reduce fire risk include controlling vehicle access, prohibiting open fires and overnight use, closing portions of the park during extreme fire danger, and treating slash or other accumulations of forest “fuels.”

Although fire was an integral part of the oak savanna and local coniferous forest ecology, due to the proximity to homes and adjacent properties, wildfires will not be allowed to burn. Unplanned ignitions will be suppressed. However, prescribed fire — carefully planned ignitions and controlled burns — may be used to a limited extent for reducing slash concentrations in development and restoration areas, and as a management tool to maintain savanna and meadows.

The Beazell Memorial Forest is within the West Oregon Fire Protection District, managed from the Oregon Department of Forestry office in Philomath. The lead agency for fire suppression for forested areas is the Oregon Department of Forestry. The lead agency for structural fires is the Kings Valley Volunteer Fire Department.

Access

Although the Beazell tract has over a half mile of frontage on Kings Valley Highway (Oregon Route 223), current access is limited to two driveways immediately on either side of Plunkett Creek. Historic access for all property use, including timber harvesting, has been via these two roads. In addition, timber harvesting on properties to the southeast (Willamette Industries, Coast

⁹ identified on the 1985 Benton County Cultural Resources Survey as resource #202

¹⁰ During the period from 1990 to 2000, only 3 fires were reported on park lands in Benton County, all in heavily used parks (Chip Ross: 2 fires - 1 cigarette, 1 arson; Fitton Green: 1 cigarette; Steve Elephant, personal communication). Prohibiting overnight use and having an on-site caretaker should reduce fire risks at Beazell Memorial Forest

Range Conifers) has historically used the road on the north side of Plunkett Creek¹¹. Currently, the only access to the ridgetop meadows is via old skid trails which cross to Swanson-Superior roads to the north.

Most existing roads and skid trails date around 1950, when widespread timber harvesting occurred on much of the property. The central road along Plunkett Creek was upgraded more recently, probably for harvesting on adjacent parcels. This road is well situated, partially rocked, and for the most part quite stable. Many interior roads, skid trails, and landings are insufficient for modern harvesting equipment, or are poorly situated. A road crossing Plunkett Creek upstream of the Plunkett House washed out during high runoff in 1996. To use the existing road network all timber harvesting would access from the central road, resulting in heavy visual and environmental impacts to the Plunkett Creek riparian zone, one of the most scenic portions of the property. Alternative access should be developed.

Facilities

The Bezell house (circa 1982) currently serves as the residence for the park caretaker. The Plunkett house (circa 1870) is unoccupied, and should be evaluated for structural integrity and restoration potential. It and the large barn could provide for storage, and potentially as meeting/staging areas. A second barn provides only unsecured storage. Power is available at both houses. Water is available from a well at the Bezell house, and from an unprotected spring and cistern south of the Plunkett house. Septic systems are present at both houses, though the Plunkett house system is in poor condition..

The property currently lacks most other facilities necessary for park operation. On-site parking is extremely limited. There are no public picnicking, water, or restroom facilities. Water and septic improvements will be needed. The existing electrical systems is likely sufficient for park development needs. Complete engineering evaluation and design specifications will follow as a separate project.

The following basic facilities must be developed before opening the site to the public:

- parking (12–24 cars, plus school bus and overflow area)
- trailhead (with information kiosk)
- hiking trails
- portable toilets

Additional facilities will be developed as funds become available:

- picnic facilities (4-6 tables)
- permanent flush toilets (2 unisex)
- drinking water
- footbridges (2-3 at various locations on Plunkett Creek)
- covered education and interpretive facilities¹²

¹¹ Willamette Industries and Coast Range Conifers apparently have legal rights-of-way to use this road. Currently both intend to use other routes to access their lands (Leroy Volz and Sarah Leiman, personal communications).

¹² these could possibly be housed in the Plunkett house and/or barn

Chapter 4: Management Policies

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CHAPTER 4: Management Policies

This chapter documents how the Forest will be managed. A management statement and specific management goals are stated. Criteria for determining how specific areas are managed are given. For each of four general resource areas, policies and objectives are defined, and performance standards are detailed.

Management Statement

The Beazell Memorial Forest will be managed for environmental education and research opportunities.

As a demonstration forest and open space area, progressive ecosystem management practices will be used to protect, conserve, and restore the natural, scenic, outdoor recreation, and wildlife values of the site.

Emphasis will be placed on restoring the Douglas-fir/oak forest and oak savanna ecosystems through conservation-based forest management, as well as accommodating passive day-use recreation such as hiking, wildlife viewing, and scenic enjoyment.

The desired future forest will feature mixed species stands of older, larger trees, with sufficient harvesting and regeneration to assure adequate younger stands to balance the age of the forest.

Built facilities will be minimal, primarily designed to support public access, parking, and visitor information, including environmental and cultural education. Development and operation of the park will be at little or no cost to taxpayers.

Beazell Memorial Forest Management Goals

The Goals for the Management of the Beazell Memorial Forest are:

- 1. Strive for a balanced approach, giving equal consideration to ecosystem protection, community and social benefits, and forest management*
- 2. Provide appropriate opportunities for public enjoyment, appreciation, and understanding of the forest*
- 3. Utilize and demonstrate current best practices in conservation forestry and biological resource protection*
- 4. Use environmentally sensitive management and harvest techniques to restore degraded habitats, maintain forest health, improve tree quality, and support park management*
- 5. Actively promote diverse wildlife habitats, and support a wide range of native biodiversity*

Management area classification criteria

To offer the greatest protection to sensitive resources, and to direct visitor use and management efforts to the most appropriate sites, Beazell Memorial Forest lands are classified into three general area designations: Reserve, Open Space, and Forest Management. Practices used in each management area will take into account the special conditions and intended uses of each site. A management area map follows.

Reserve Areas

Areas with one or more of the following characteristics will be considered candidates for Reserve Area designation. Management of reserve areas will emphasize natural forest development processes, with active restoration of ecologically significant sites¹. In most cases there will be no commercial extraction of timber products. Recreation access will be provided where compatible with the resource.

- Riparian areas — lands within 100 feet of perennial streams
- Steep slopes — slopes greater than 40% (over distances of 200 feet or more)
- Inaccessible — areas lacking convenient access for logging, including areas where excessive road building or harvest systems other than ground-based would be required
- Representative ecosystems — a substantial portion of each forest community type present will be reserved from harvesting (ie. oak woodland, Douglas-fir/hazel (dry site), Douglas-fir/vine maple (moist site), mixed woodland)
- Old forest — stands or groves of trees older than 100 years²
- Sensitive sites — areas of moist soils, sites prone to landslide or windthrow, unique vegetative communities, critical wildlife habitats, visually sensitive areas, or other sensitive resources

Open Space

Areas currently (or in the recent past) predominately open and unforested, where expansive views and feelings of solitude dominate. These areas will be intended for light or moderate visitor use (where suitable), or for natural habitat maintenance.³

- Meadows and grassy balds — open ridgetops, natural meadows and old pasture, including such areas threatened by conifer encroachment which can be readily reclaimed
- Buffers — wooded edges of meadows and openings, where tree removal could have negative visual or environmental impacts

Forest Management Areas

Areas where harvesting will use an array of silvicultural techniques to achieve improved biodiversity and increased forest health objectives. Management techniques and principles will be demonstrated and/or interpreted for park visitors. Forest management blocks will occur within a matrix of reserve and open space areas.

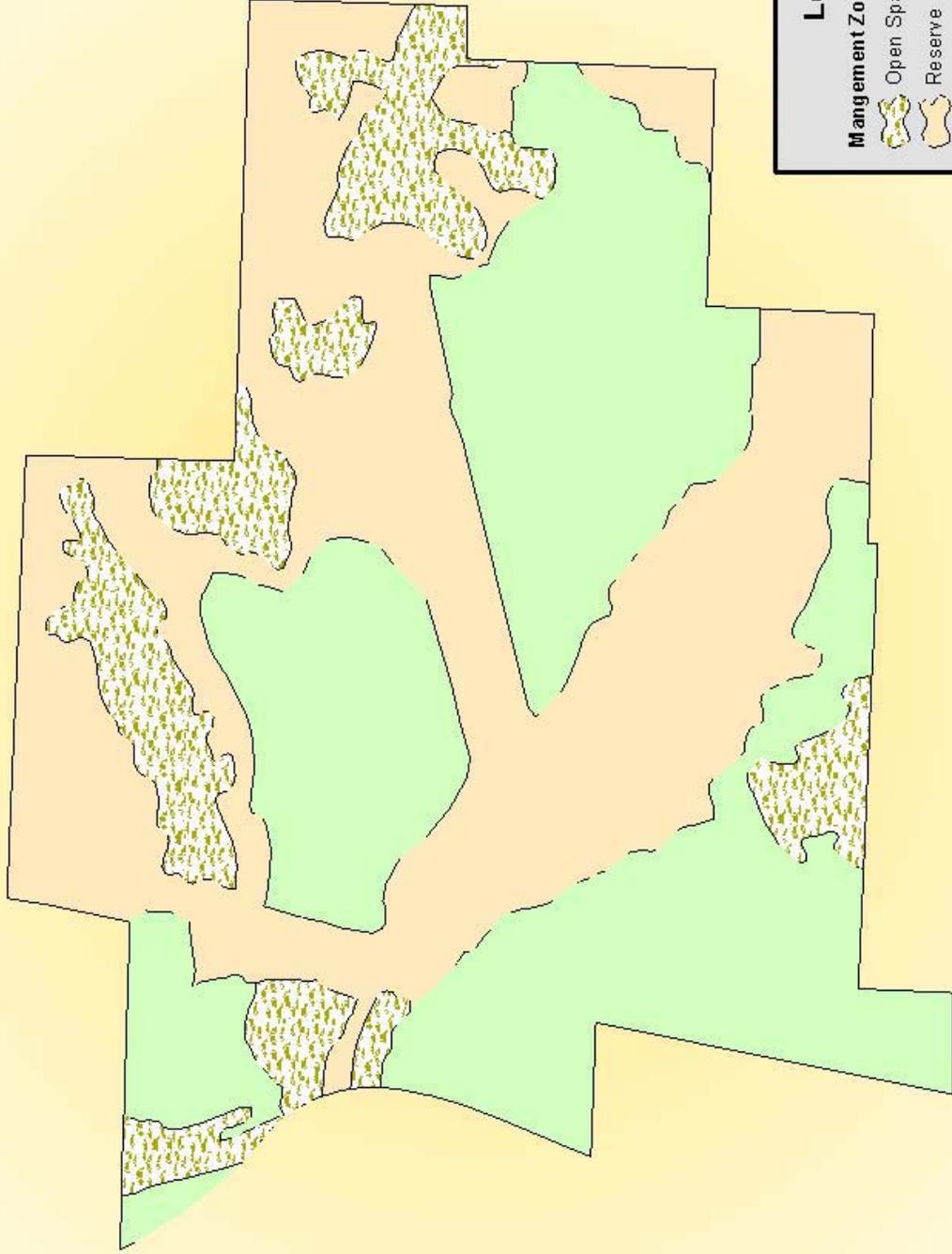
- Upland sites — areas located at least 100 feet from intermittent and perennial streams,

¹ especially oak woodland and stream habitat

² Within younger stands individual trees older than 100 years will be protected during any harvest activities

³ It may be appropriate to classify some or all of the lands used for park facilities as Open Space (ie. grounds used for picnicking, parking, visitor service and park maintenance)

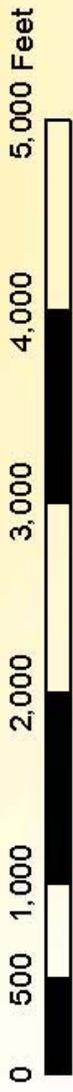
Management Zones of the Dolores Beazell Forest



Legend

Management Zones

- Open Space
- Reserve
- Sustainable Forest Management



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where risk of erosion or stream sedimentation is minor

- Gentle slopes — areas with continuous slopes under 40% grade, suitable for ground-based harvest systems, where risk of landslide is minimal
- Easily accessible — areas where logging access can be developed economically and with low risk of negative environmental or visual impacts
- Planted forests — plantations greater than one acre, including areas of associated natural regeneration
- Douglas-fir communities — areas dominated by Douglas-fir or mixed woodland forest types

Resource Policies, Objectives, and Performance Standards

A comprehensive set of Policies, Objectives, and Performance Standards provide the means for implementing the Management Statement and achieving management goals. Policies provide guidance to current managers during initial site development, and clearly articulate the Beazell Memorial Forest vision to future managers. Policies are organized into four general resource areas: recreation and visual, wildlife and fisheries, vegetation and botanical, and timber.

Recreation and Visual Resource Management

Policies

The Beazell Memorial Forest will emphasize dispersed, day-use opportunities, with a focus on hiking and nature appreciation. The property's scenic qualities will be promoted. Recreational use will not impact sensitive areas, wildlife and fish habitats, cultural sites, or other resources. Education and interpretation opportunities will be actively promoted.

Objectives

- Highlight for visitors areas with special value for scenic enjoyment, recreation use, open space, or cultural resources
- Protect sensitive areas from visitor impacts, diverting use to less sensitive areas
- Provide access to accommodate visitors at a variety of physical ability levels
- Attempt to resolve user conflicts through segregating or restricting incompatible uses
- Ensure that recreation use is compatible with maintaining other resource values
- Develop effective public education opportunities
- Promote connectivity with other trails and public open space areas, as opportunities arise

Standards and Guidelines

Trails and roads

1. Public vehicle access is restricted to a staging and parking area near the Kings Valley Highway.
2. Motorized vehicles are prohibited in the forest, except for approved forest management or maintenance purposes and fire suppression.
3. Access to the interior of the forest is developed only as necessary for maintenance and management activities.

4. Trails and roads are appropriately sized and constructed to be visually unobtrusive, and to achieve a harmonious relationship with the natural environment.
5. Visitors are encouraged to keep to designated trails.
6. Roads and trails are improved, relocated, or closed when recreation or management results in water quality or other resource degradation.
7. Trails are located away from property boundaries to reduce trespass on neighboring properties.
8. Select trails are built to Americans with Disabilities Act (ADA) standards.
9. Horses and mountain bikes are allowed only on specified trails, and during appropriate use periods.
10. Recreation trails are temporarily closed when logging activity poses a risk to recreational users. Signs are posted warning visitors of potential hazards.

Visual resources

1. The overall management effort strives to maintain a visually pleasing forest setting.
2. Trails access a variety of ecosystem types and scenic vistas across the property. Undesirable views are avoided.
3. The visual impacts of harvesting are mitigated through appropriate conservation-based practices, rather than hidden from view behind visual buffers.

Cultural resources

1. Cultural resources are identified and protected during harvest activities.
2. The Plunkett house, barn, and farmstead are evaluated for structural and historical integrity, with suggestions for management response.
3. Interpretive signage or materials educate users about cultural resources.

Facilities

1. Developed recreation is limited to recreational trails, parking, picnic areas, restrooms, and interpretive facilities.
2. Camping or overnight parking is not allowed.
3. Facilities are designed to reduce annual maintenance costs and to discourage vandalism.
4. Trails, signs, interpretive displays, restrooms, and other facilities are designed and constructed of materials to achieve a harmonious relationship with the natural environment.
5. Facilities will provide reasonable accommodation to Americans with Disabilities Act (ADA) standards.

Educational/interpretive

1. An interpretive program educates users on native forest ecosystems, their processes and functions, forest practices which enhance biodiversity and forest health, a Land Ethic⁴, and cultural resources.
2. The interpretative program seeks partnerships with schools, 4-H clubs, local environmental organizations, and other appropriate groups.
3. Signage encourages trail users to adopt appropriate trail etiquette, protect sensitive resources, and to discourage littering.
4. Forest management and resource enhancement projects are used as opportunities for educating the public, through signage, self-guiding trails, workshops, tours, or press releases, as appropriate.

⁴ refers to concepts expressed by Aldo Leopold in “A Sand County Almanac”, stressing the need for citizens to have personal responsibility for protecting the land upon which we live.

5. Signs indicating park boundary and no hunting are placed at all access points.

Wildlife and Fisheries Resource Management

Policies

Protection of the biological resources of the Beazell Memorial Forest will be accomplished by using active management to improve habitat conditions, as well as reserving sensitive sites from timber management. Wildlife habitat improvements shall promote species diversity, and ensure that populations of indigenous species are maintained or enhanced. Fisheries habitat management shall include protecting water quality through maintaining soil stability and productivity, as well as improving the health of riparian and aquatic ecosystems.

Objectives

- Identify and protect the full array of wildlife species present and their habitats. Enhance habitats where desirable
- Give special consideration to protecting or recovering designated sensitive species
- Manage riparian zones to give priority to wildlife habitat and water quality
- Retain select trees as biological “legacies”, as seed sources for natural regeneration, and for stand structure
- Protect areas with special value for wildlife habitat or watershed protection
- Monitor and evaluate the effects of recreation use and forest management on wildlife resources

Standards and Guidelines

General

1. Firearms and hunting are not allowed in the forest. Exceptions may be considered for controlled hunting of “problem” species.
2. Fishing is managed to protect sensitive species and riparian vegetation.
3. Forest management efforts are designed to maintain viable populations of all native vertebrate species present on the site, and select invertebrates.
4. Wildlife or fisheries professionals are involved in planning for resource improvements.
5. Habitats of rare, endangered, and sensitive species are given high levels of protection.
6. Recreation use is directed away from uncommon or sensitive habitats.

Oak woodlands

1. Existing oaks are given highest levels of protection. Mechanisms for assuring oak regeneration are investigated.
2. Management of mixed stands protects veteran oaks and encourages vigorous younger oak (as replacements).

Savanna and meadows

1. Savanna and meadows are protected from conifer and shrub encroachment.
2. Active maintenance reduces presence of invasive exotics. Prescribed fire, mowing, and hand cutting are the preferred maintenance techniques.
3. Active restoration perpetuates and encourages the reestablishment of native species on appropriate sites.

Legacy and wildlife trees

1. Trees that are unique for their size, age, species, wildlife value or location are protected. Criteria for legacy and wildlife tree selection and management are followed (see Table 1).
2. Trees currently older than 100 years are identified and retained as legacy trees.
3. Wildlife trees are cultivated to provide critical habitat (den cavities, nests, perch sites) or mast (acorns, seeds, or fruit).
4. Wildlife trees are retained during harvest and allowed to die naturally, providing future snags and large woody debris.
5. Legacy trees are reserved from harvest until target numbers are exceeded (see Table 1). Any future harvest of legacy trees will ensure target numbers are maintained.

Snags and woody debris

1. Snags and down logs are actively cultivated for wildlife habitat. Criteria for snag selection and management are followed (see Table 1).
2. All snags are permanently retained and allowed to deteriorate naturally, except where posing a safety hazard near roads, trails or structures.
3. Trees are cut, limbed and bucked in place; slash and cull log sections are left in the woods.
4. Pulp and firewood removals are restricted (to encourage woody debris recruitment).
5. Woody debris levels are managed to promote soil productivity. A minimum of 20 tons per acre of woody debris is maintained (property wide average); additional recruitment is encouraged.
6. Salvage of wind, insect, disease, or fire damaged trees is allowed only in cases of significant risk or loss (at least 1 load of logs in a landing area). Salvage is avoided in reserve areas.

Riparian areas

1. Timber removal is prohibited within 100 feet of streams, except for restoration activities. Practices promote older forest structure and diversity.
2. Skid trails or roads in riparian areas are retired or relocated wherever possible.
3. Equipment operation in riparian areas is prohibited, except at designated crossings or for restoration activities.
4. Restoration activities within riparian areas use methods with the lightest possible impacts.

Fish habitat and stream structure

1. Key (anchor) habitats are given the highest levels of protection.
2. Degraded or at-risk habitats are targeted for improvement or restoration.
3. Man-made barriers to fish passage are removed, when possible.
4. Stream structure improvements are designed to protect against possible off-site impacts.

Reserve areas

1. At least one third of the total forest area is reserved from harvesting, except for restoration activities.
2. Sensitive sites are protected as reserves, including old forest remnants, riparian areas, slopes greater than 40%, areas prone to windthrow or landslide, critical wildlife habitats, and other unique resources.
3. Reserve areas include representative areas of all forest types present.
4. Active restoration is considered when reserve area resources are degraded or at risk. Restoration is recommended only when risks to sensitive resources are low, and using methods with the lightest possible impacts. No timber products are removed.

Vegetation and Botanical Resource Management

Policies

A key management priority is maintaining the biological richness and native diversity of the Beazell Memorial Forest, which will involve active and diligent management. Oak savanna and woodlands will be restored or rehabilitated by controlling conifer encroachment. Invasive exotics will be controlled to improve degraded habitats and create a species mix indigenous to native prairie and Oregon oak, Douglas-fir and mixed woodland communities.

Objectives

- Maintain the biological richness of the native vegetative communities present, including oak woodland, oak savanna, upland prairie, mixed forest, and Douglas-fir ecosystems
- Identify species present, and protect habitats of designated sensitive species
- Maintain control of invasive non-native species
- Rehabilitate degraded ecosystems, including areas impacted by recreation overuse
- Restore selected forests and grasslands to native conditions
- Educate forest users of the importance of forest botanical resources

Standards and Guidelines

Plant communities

1. Areas of rare or sensitive plant communities are protected from adverse impacts. Road building through such areas is not allowed.
2. Degraded plant communities are actively managed to promote biological diversity and ecosystem health.

Rare flora

1. Rare and endangered species are given the highest levels of protection.
2. Collection of native plant material or mushrooms for commercial or personal purposes is not allowed.
3. Plant surveys are conducted to identify and evaluate known and suspected populations of sensitive plant species. Surveys are targeted to be reconducted at no less than 10 year intervals, or as needed.
4. Populations of designated sensitive species are identified and managed in accordance with State and Federal policy.
5. Plant population enhancement and reintroduction is conducted to benefit sensitive species, where appropriate.
6. Recreation use is directed away from sensitive vegetative communities.

Exotics

1. Surveys to identify potential invasive exotics are conducted prior to harvest activities.
2. Scotch broom, Himalayan blackberry, false brome, and other invasive exotics are aggressively controlled, preferably by non-chemical means, including mowing, hand cutting, and prescribed fire. Neighboring landowners are encouraged to institute their own controls near common boundaries.
3. Chemical control is used on a spot application basis where non-chemical means are ineffective or impractical.
4. An undisturbed soil buffer is left around populations of exotics to slow their rate of spread.

Restoration

1. Active restoration encourages the reestablishment of native species on appropriate sites.

2. Restoration activities minimize ground disturbance, unless disturbance is deemed an appropriate management technique.
3. Restoration activities are initiated first on a small scale and on low risk sites. Large scale efforts may be applied once practices are proven to be effective on each site.
4. A variety of methods are investigated for reestablishing native ground cover and controlling competing vegetation.
5. Local and on-site seed sources are used for restoration and revegetation, as practical.

Timber Management

Policies

The management emphasis of the Beazell Memorial Forest is to maintain and improve the long-term productivity and biological integrity of the entire forest ecosystem. The desired future forest will feature large trees of mixed species and age. Oak woodlands and mixed forests will be actively rehabilitated or restored. Harvest levels shall be based on forest health and other ecological goals, and not be driven by revenue needs. Lands on which other resource values exceed timber values will be removed from the timber management base, or will receive substantially modified practices.

Objectives

- Actively manage forest stands to create stated desired future conditions; reserve sensitive areas from harvesting
- Protect biological resources as a key priority in management
- Select management practices based on the best forest science available.
- Prescribe flexible silvicultural methods that enhance the health and vigor of the forest, while maintaining aesthetic and recreation values.
- Maintain long term site productivity by protecting soils from adverse harvest impacts and promoting natural soil fertility.
- Allow portions of the forest to become more mature.
- Emphasize thinning to promote stand growth and longevity, forest health, and economic returns
- Regenerate selected stands to maintain a balance of ages and species, or when stands are at risk
- Reforest stands by natural reseeding if practical, using planting as necessary to ensure regeneration success
- Adapt management plans over time to address changing goals, forest conditions, and the understanding of forest ecosystems
- Meet Forest Stewardship Council standards for forest management

Standards and Guidelines

Planning

1. Written forest management and operational plans are used to document the decision-making process, and to justify and schedule management operations.
2. Plans are written by a professional forester, and based on statistically relevant resource inventories and assessments of forest values and functions.
3. Plans perpetuate or enhance the full range of forest values and functions, as possible.

4. Input from wildlife, fishery, and botany professionals is solicited and incorporated into management plans.
5. Forest resources are inventoried and the management plan is updated every 10 years.
6. Operational plans are prepared every 3 to 5 years to plan and detail periodic harvests and other management activities.
7. Operational plans include detailed maps and a brief operational notes. Maps include: stand delineations, reserve areas, and locations of any landings and skid trails. Operational notes include: prescriptions for each unit, project specifications, intended outcomes, timber harvest volume and value estimates, and implementation details.

Harvests level

1. Harvest level calculations consider only the forest management base acreage (other areas reserved from harvesting).
2. Harvests do not exceed growth during any five-year period.
3. Preferred harvest levels are 50–70% of growth for young stands (to allow stands to become more mature), 80% for older stands (to maintain tree vigor and allow gaps for regeneration).

Rotation

1. For even-aged stands the target age at maturity ranges from 75 to 100 years⁵.
2. For uneven-aged stands regulation is based on maintaining a balance of small, intermediate, and mature size trees.
3. Seedlings and saplings ultimately comprise at least 10% of the managed forest. Every ten years enough regeneration is secured to maintain this balance.

Silviculture

1. The forest contains a diversity of tree species and age classes, and provides high quality wildlife habitat. Alder, grand fir, bigleaf maple and other species are present where appropriate sites exist, and eventually account for at least 25% of total stocking.
2. Restoring and rehabilitating oak and mixed stands is a priority of management.
3. Within the Forest Management area, uneven-aged stand structures will ultimately be present on the majority of the area, with a minority in even-aged structures.
4. Selection thinning is the preferred harvest method, especially in areas of high visual and/or environmental sensitivity.
5. No more than 30 percent of stand volume is removed in any thinning entry.
6. Harvest cycle is determined from thinning response. Stands are reentered when crown competition slows growth.
7. Clearcutting is prohibited on the forest.
8. Group selection is the preferred method of regenerating stands, with the maximum group size being 3 acres. Small openings (less than 1 tree height) are used to regenerate shade tolerant species, and large openings (1–2 tree heights) to regenerate moderate- or shade-intolerant species.
9. Harvest openings blend in with the natural terrain. A minimum of 10 percent of the initial stand is retained. Retained trees are selected to promote windfirmness.
10. The distance between harvest openings is sufficient to promote stand windfirmness and wildlife cover, and is generally a minimum of 1.5 tree heights.

Timber harvesting

⁵ This is nearly twice the industry average. Rotation longer than 100 years would produce most log volume in larger sizes, that are increasingly unusable by most mills.

1. A professional forester supervises all aspects of timber harvest operations, including marking trees to be cut, marking wildlife, legacy trees, and other protected resources, and supervising operations as necessary. The forester also provides ongoing stumpage accounting, and notifies Benton County Parks in case of contract or environmental infractions.
2. All remnants of the older forest (e.g. residual trees, snags, large cull logs) receive the highest levels of protection.
3. Boundary lines are marked prior to any nearby harvest activity. Adjoining property owners are notified before harvest start-up.
4. Logging is conducted in ways that insure public safety and minimize user conflicts. Logging is suspended on weekends.
5. Logging is limited to ground-based methods (to facilitate small harvests, low harvest levels, and minimize road building costs).
6. Hand falling by chainsaw, with ground skidding by crawler tractor or horse are the preferred harvest methods. The smallest equipment that will do the job satisfactorily is utilized.
7. Logging is restricted to dry-season conditions (to minimize soil impacts and road building costs), and avoided during early spring (to limit bark damage).
8. During logging every effort is made to leave snags, hardwoods, and down logs intact.
9. Loggers fall trees and process logs to minimize waste and maximize timber yields.
10. Logging equipment is restricted to designated skid trails.
11. Logging equipment is cleaned prior to activities, to limit spread of weeds and disease.
12. After logging, clean-up of landing areas removes all unmerchantable material and trash.

Reforestation

1. Natural regeneration is favored where it exists or can be initiated. Scarification is used to encourage natural regeneration on appropriate sites. Advance (pre-existing) regeneration is protected from damage during logging.
2. Unless early sufficient advance regeneration is present, any harvest operation that reduces stand basal area below 80 sq.ft. per acre is replanted (per Oregon law).
3. When planting, a variety of native, site-adapted commercial tree species are used. No single species comprises more than 70% of the future stand. Seedlings from appropriate seed zones are used.
4. Planted seedlings and natural regeneration are kept vigorous and free to grow by judicious and economical vegetation control. Manual brush cutting is the preferred control method.
5. Logging slash is lopped and scattered across harvest areas. Piling is restricted to regeneration areas with excessive slash volumes. In such situations piles are kept under 4 feet tall (to decompose rapidly).
6. Herbicide use is limited to exotic weed control, or where manual methods are ineffective. Targeted application by single stem injection or backpack sprayer are the preferred methods.
7. No aerial application of forest chemicals is allowed.

Roads and culverts

1. Road beds and cleared rights-of-way are kept to the smallest size necessary for log truck access.
2. Roads and skid trails are designed to follow slope contours, and use dips, water bars and seeding as needed to control erosion. Out-sloped roads are preferred.

3. Haul road grades are kept to under 20%. Skid trails grades are kept to under 35%.
4. Stream crossings are kept to the absolute minimum number necessary.
5. Culverts on fish bearing streams are designed to allow fish passage.
6. Landings are kept to the absolute minimum size and number necessary for logging safety and efficiency.
7. Any temporary roads built are closed and revegetated upon completion of logging operations.
8. Skid trails, landings and haul roads cover less than 10% of the land area.
9. Roads may double as walking trails. Surfaces are either dirt or fine crushed rock (1.5” minus) to allow easy walking. ADA trails are surfaced with 3/8” minus rock.
10. Roads and recreation trails are temporarily closed when logging activity poses a risk to recreational users. Signs are posted warning visitors of potential hazards.

Fire management

1. All wildfires occurring on the forest are controlled as soon as possible during initial attack. There are no “let-burn” areas on the forest.
2. Prescribed fire is used as appropriate for maintaining meadows, controlling exotic and invasive vegetation, or to reduce fuel loading.
3. A fire management plan is prepared by Oregon Department of Forestry to minimize fire hazards in park operations, and specify wildfire response procedures.
4. Fire plans are developed prior to any prescribed burn, and approved by Oregon Department of Forestry.
5. Controlled burns are managed by or made with the assistance of Oregon Department of Forestry.
6. Slash burning is avoided, except to reduce fuel loading or fire hazard in key areas, and in savanna areas.
7. No accumulations of slash remain within 25 feet of roads, landings, or hiking trails.
8. Signage shall educate visitors of fire danger during dry seasons.
9. Smoking is prohibited outside of developed facility areas.
10. Facilities are closed to the public during periods of extreme fire danger.

Table 1: Selection and management of special trees

SELECTION CRITERIA

	Wildlife Trees	Snags	Legacy Trees
Number	2-4 per acre	4 or more per acre	eventually 4 or more per acre; mark at least 1/ac at each entry until target is met
Species	representative of stand; at least 50% conifer	any conifer or oak preferred for longest persistence; avoid alder (short persistence)	representative of stand; for diversity include minor species, except alder (short lived)
Size	large diameter from any crown class	larger snags have greatest habitat value	larger dominants; smaller trees may be selected if likely future dominants
Vigor	any vigor	n/a	high vigor: good growth, leaf color/density, crown depth
Form	trees with current or potential cavities, heavy limbs, dead tops; live trees to be topped	n/a	good form: low taper, small branching, few defects
Location	well distributed wherever present; especially valuable if near riparian areas	well dispersed or clumped; least safety hazard when located near stand margins	well distributed or clumped (4 per group)

MANAGEMENT

	Wildlife Trees	Snags	Legacy Trees
Marking	during harvest layout mark with paint (W) or tags	not required	during harvest layout mark with paint (L) or tags
Recording	during harvest layout tally by stand, species, diameter; GPS locate after harvest	during harvest layout tally by stand, species, diameter; GPS locate after harvest	during harvest layout tally by stand, species, diameter; GPS locate after harvest
Protection	reserve from harvest; top and upper stem damage acceptable (serves to hasten creation of snags and CWD); fell only where a safety hazard	fell only where a safety risk; retain as woody debris	highest level of protection during harvest
Replacement	mark replacements when felled as safety hazards or lost through natural mortality	secure replacements by marking additional wildlife trees	mark replacements if trees damaged or lost from logging, natural disturbance, or disease
Longevity	retain as future snags and woody debris	retain as future woody debris	reserve from harvest until suitable replacements are available (regen at least pole size); retain at least 25% as future snags

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Chapter 5: Management Recommendations

This chapter summarizes management needs and opportunities by resource area, and prioritizes recommendations. A recreation facilities plan and a listing of educational themes are presented. A timeline suggests a schedule for development and operations.

Recreation and Visual Resources

Opportunities

- A variety of ecosystem types and forest management demonstrations can be accessed and interpreted for visitors.
- Plunkett House and adjacent barn could be used as an interpretive center and outdoor education “classroom”.
- Excellent views are available at ridgetops. Several miles of hiking trails in 3 loops can provide a variety of recreation and scenic experiences.
- Sites are available for parking and a trailhead station. Water and power are available nearby.

Recreation Facilities Plan

The Recreation Facilities Plan (Appendix C) is composed of two major parts: the trails scheme, and base facilities. The trails scheme is composed of a series of loop trails to access the various regions of the site and to provide interpretive opportunities. Base facilities include parking, information signage and assembly area, picnic facilities, historic buildings, and trailheads.

Trails

The trail scheme includes an easy grade, handicapped accessible, primary trail along the main Plunkett Creek drainage. This trail is accessible from the assembly area near the historic house and barn, crosses the creek on a footbridge, and follows the existing logging road. Handicapped access extends approximately one half mile up the creek. It requires minimal regrading and cross drainage to allow year-round use.

Beyond the primary trail, the scheme includes four loop trails (see trail map, Appendix C). Each loop can be a satisfying experience in itself, or the outer connecting portions of each loop create a more arduous trip. The entire trail system exceeds five and one half miles in length. Each of the loops has contact with timber management activities. This provides opportunities for interpretation of the activities and their objectives. The loop system allows for closing certain areas during tree cutting, while still allowing access to the majority of the site.

The primary access trail is located along the south side of the creek, starting at the rear of the barn and near the trail bridge. It is part of the south loop trail, and the beginning of the outer connecting loop trail. The second loop follows the old logging road to the east, and then climbs

steeply to the highest point on the property¹. This loop returns to the primary trail via a valley running toward the south. The third loop descends the most northern ridge and passes between the caretaker's house and the small barn, across the old orchard and to the primary trail near the trail bridge. A fourth loop trail extends from pond/wildlife area and logging road at the east side of the small barn. This trail is designed to access excellent bird and other wild life habitat². Trails are purposely located away from boundaries with neighboring timberlands to minimize conflicts or trespass issues.

Trail phasing

The main trail up Plunkett Creek will require only the construction of a footbridge at the trailhead. The ADA-access portion of the primary trail should also be completed with the first parking area development and initial public facilities.

The second trail section to be developed should be Loop One, accessing the area to the south of the creek. A third trail section would be the outer loop, which will access the view opportunities of the upper portions of the site. Loop Four, the "Birder's Trail," could be built at any time after the handicapped access portion of the Primary Trail (possibly undertaken by a special interest group).

Base facilities

A base facilities plan map is found in Chapter 7 and Appendix C. Public access will be through the existing southern driveway to the Plunkett House site. The second entry drive will be gated and closed to public access. The primary sign is located to the south of the main entry, at a location with best visibility from the County Road. Parking for a dozen cars will be east of the Plunkett House. Over-flow parking (dry season only) will be available in a mowed portion of the meadow in front of the house. Busses or long vehicles can be parked along the entry drive. Additional parking (if needed) can be constructed off the caretaker's drive (east of the small barn).

To accommodate parking and other facilities, the several sheds and small buildings between the Plunkett House and the large barn must be removed. Only the original house (without later additions) and the large barn should be saved. The house should be assessed for structural integrity and restoration potential. The large barn is in fairly good condition, though minor repairs and security modifications are needed. A portion of the first floor can be opened to provide a covered area for small group assemble and covered bike storage. Ultimately, the barn should be made available for gatherings, workshops, and demonstrations.

The front meadow shall be maintained for wildflowers and the entry view. The large oak in the parking and arrival area will shelter a simple kiosk, as the assembly point and trailhead. The site for a small restroom is directly southeast of the house. The area to the east of the barn will be mowed, and contain a few picnic tables. A memorial area below the orchard will be rough mowed, the memorial trees protected, and may have a marker placed in it at some future date.

¹ The best location for this trail uses the old road that crosses neighboring land owned by Willamette Industries for a short distance. An easement or outright ownership would be required.

² The name "Birder's Trail" is proposed, and may be of interest to special interest groups.

Education and interpretation opportunities

A rich array of education and demonstration opportunities can be developed. The variety of natural habitats, diversity of site resources, and range of planned management activities can readily be interpreted to a variety of ages and user groups. Preliminary interpretive themes are outlined below.

To effectively realize these opportunities an education and demonstration should be developed. A combination of county staff, environmental education professionals, and interested teachers and community members may be utilized in this planning process.

Table 2: Preliminary Interpretive Themes for Bezell Memorial Forest

Cultural and Historic

- pre-European history and practices
- native American plant uses
- early farming practices
- Kings Valley history
- historic medicinal plants
- ties to Fort Hoskins
- the Plunkett House

Vegetation and Rare Plants

- native plant communities
- native species identification
- prairie restoration practices
- use of fire: historic, current
- controlling invasive exotic weeds
- recovering endangered species

Wildlife

- habitats and native species
- role of woody debris
- oak release
- oak thinning (including a control)
- large overtopped dead oaks
- snag creation techniques
- multi-stem maple girdle for snag creation
- riparian enhancement
- meadow improvements
- hedgerow enhancement

Fisheries

- riparian/creek ecosystem
- habitats and native species
- anchor habitats
- restoration options for private owners
- barriers to fish passage
- stream structure improvements
- riparian conifer plantings
- monitoring macroinvertebrates

Forest Management

- the “Land Ethic” (as from Aldo Leopold)
- low-impact logging techniques
- uneven-aged management
- managing stands to enhance biodiversity
- alternative silvicultural techniques
- BMPs – best management practices
- forest - wildlife interactions
- landscape-level management

Other Educational Products

- interpretive displays at the Plunkett House
- tours during logging and stream restoration operations
- videos
- education guides for school use
- self guiding nature trails

Recommended Actions

- 1.1 Develop base facilities, parking, and trail system
- 1.2 Upgrade forest management road system
- 1.3 Mark and sign property boundaries
- 1.4 Develop a program of active demonstrations, with self-guided and group interpretive materials. Seek partnerships with 4-H, schools, local environmental groups, etc.

- 1.5 Develop outreach to Oregon State University and local schools to use the site as a laboratory for education and research, and to promote field trips, student projects and studies
- 1.6 Create a database archive of resource management events and activities
- 1.7 Work cooperatively with neighboring landowners to reduce trespass concerns
- 1.8 Assess Plunkett House for structural integrity and restoration potential

Wildlife and Fisheries Resources

Opportunities

- Oak habitat can be preserved and expanded.
- Snag and mast production can be increased.
- Woody debris levels can be increased.
- Understory openings and maturing alder in riparian areas can easily be supplemented by planting conifers.
- Maturing forests can provide good habitat for many old-forest dependent species.
- Dense, uniform stands can be thinned for biodiversity. Mixed species stands can be encouraged.
- Meadow habitats can be preserved and expanded by preventing encroachment by trees and shrubs.
- The current condition of the Plunkett Creek aquatic habitat is poor. Fish passage and in-channel improvements can increase resident fish populations, and help recover sensitive species.
- A potential pond site could be developed to expand wildlife habitat.
- A wide diversity of habitats offer opportunities for education and interpretation.
- Planned habitat improvements offer opportunities for demonstration and education.

Oak release and restoration

Releasing white oaks from competing Douglas-fir represents the most important suggested management activity. The widespread and increasing level of oak mortality and decline suggests that management options will be reduced or unavailable in the near future. Therefore, the majority of oak release should be conducted within the next 3 years. Threat assessment of oaks should be a priority, with release begun as soon as possible. All large diameter oaks should be released, including those in evident decline (to extend their snag standing time).

Encouraging oak seedlings and saplings in meadow areas (removing grass, protecting from animal browse) will promote tree growth and development. In addition, selective thinning of densely growing oak trees is recommended to encourage spreading canopies and increased growth in the remaining dominant trees. Without intervention, crowded conditions will persist for many decades, resulting in relatively slow growth and limited canopy development.

Cavity habitat improvements

Intentionally topping conifer trees below their canopies will create a viable conifer snag (and a down log from the tree top). Created snags may be utilized by wildlife species within five years, and may stand for decades. This activity can be conducted in conjunction with oak release or

conifer harvest activities. Topped trees should be at least 15" DBH (larger is desirable) to increase potential use and standing time.

Girdling selected maple stems of multi-bole big-leaf maple provides an excellent opportunity for cavity production, while encouraging diameter and canopy growth in the remaining live boles. When the dead boles break they will add woody debris to the system. This can create a continuous supply of potential cavity-habitat at very low cost.

Nest boxes may be placed in the meadows to provide immediate nest-sites for violet-green and tree swallows, chickadees, nuthatches, wrens and western bluebird. Nest boxes may also be considered near development areas.

Meadow habitat improvements

Removing both internal and perimeter fir trees will be necessary to ensure the long-term survival of meadow openings. Cut trees can be removed to the adjacent forest, piled and burned, or placed in hedgerows. Feeding perches can be created by limbing meadow interior fir trees. These perches may be used by owls, hawks, bluebird and flycatchers. Bat roost and nest structures and kestrel nest boxes can be established on larger perch trees.

Shrub and hedgerow enhancements

The existing hedgerows along the highway, northwestern site perimeter, southern pasture, some upland meadow perimeters and homestead area all vary in shrub composition and overall integrity. Enhancement activities are indicated at all locales. Himalayan blackberry and Scotch Broom should be controlled. Oak trees and saplings can be released from other trees or shrubs, and densely growing sapling oaks can be thinned. Douglas-fir should be controlled both in the hedgerows and at the edge of adjacent fir plantations. Although some conifers in the hedgerow is acceptable, they can compete with the oak and shrub community.

A grass strip (rough mown) should be maintained adjacent to the hedgerows (as possible) to define hedgerow boundaries and provide additional foraging opportunities. Planting red-flowering currant (for hummingbirds), white or blue-flowering ceanothus (for butterflies), and other species beneficial to wildlife (chokecherry, blue elderberry) may be considered.

Riparian habitat improvements

The current scarcity of conifer trees in riparian areas may reduce vertebrate and invertebrate species diversity, and the future potential for formation of very large logs. Underplanting shade-tolerant red cedar, hemlock, or grand fir can establish future conifers without disturbing the existing habitat. In the western reach (start of pasture), riparian tree cover is sparse and the planting of both conifer and hardwood species is warranted.

Although a native shrub community is well established along most of the riparian zone, the western reach is in a highly degraded condition, with Himalayan blackberry the dominant species. As this area has high public viewing shrub enhancement may be appropriate. Removal of the blackberry is the primary activity followed by planting of desirable species. Willows, creek dogwood, and Pacific ninebark are present upstream and cuttings from these plants may be utilized for transplanting, thereby reducing seedling cost and providing optimal genetics. Other species including spirea and red-flowering dogwood can also be planted. All the above species

are valued by wildlife, and once established, may compete with the returning blackberry. Trash (old dump site near barn) in the riparian area should be removed.

Stream restoration

Past flood events have removed wood from the Plunkett Creek channel, and straightened and entrenched the stream within its floodplain. The result is a straight, narrow stream with fish habitat well below its potential. An instream restoration strategy is recommended, consisting of adding logs to the stream channel at several locations, and excavating off channel backwaters.

Adding both large and small logs in carefully designed complexes would encourage stream deflection, scour and pool development. Approximately 60-80 logs of mixed diameter and length could be utilized to create 15-20 structure complexes. Potential sites have been selected based on the presence and configuration of riparian anchor trees.

Excavation of off channel backwater habitats, located in historic meander channels, would encourage flood plain interaction, and create off channel winter habitat. Five sites have been identified and flagged. There are two additional sites where side channel pools could be excavated in existing side channels.

Sensitive site protection

There are four sensitive sites which require special consideration to protect water quality and fish habitat. First, the left fork of the main stem of Plunkett Creek (unit 117 to the property boundary) has not been impacted by recent floods. It is considered a significant anchor habitat for the endemic population of cutthroat, and is likely the source population for resident cutthroat within the extent of the Bezell property. A high level of scrutiny be used for upslope prescriptions and activities that may influence this reach.

Second, the central road that parallels the stream encounters the active channel of Plunkett Creek at one site, where the channel is actively migrating into the road prism. Heavy truck traffic would exacerbate the active bank erosion and may facilitate a road failure. If the road were to be used as recreational access only the lack of additional compaction and equipment vibration would distinctly decrease the likelihood of road failure. Improvements are needed in either case.

Third, where the central road crosses the first tributary a culvert crossing is perched 4.5 feet above its active channel. This culvert is a definitive barrier to the upstream migration of juvenile salmonids. The current crossing is not in the original stream location, a result of historic logging activities. Though crossing improvements would only minimally improve overall fish habitat, this is an excellent location for demonstration and education.

Finally, the twin concrete culverts that plugged and formed the 1996 debris torrent event created a new channel. The remaining sand and gravel deposits filter subsurface flow into the abandoned channel below and create extremely high quality winter habitat. The current location and function of these culverts is a tremendous benefit to the endemic over wintering populations of cutthroat. The culverts should be maintained in their current location and utilized as a public educational opportunity. Removing the culverts would negatively impact endemic cutthroat populations, and require invasive restoration.

Pond site development

The low terrace on the left bank of Plunkett Creek just above Highway 223 culvert provides an opportunity to develop off channel pond habitat. This would benefit the diversity and abundance of wildlife, and provide potential high flow refuge to cutthroat. The pond could be as large as 15,000 sq.ft., and would be connected to the active channel only during high winter stream flows. Excavation and flooding of this site would displace the current community of Himalaya blackberry and be part of a solution for curbing this invasive species at the Beazell site.

As a first phase, a pilot hole should be dug and monitored throughout the summer to evaluate the water retention ability of this terrace. If summer retention is adequate a site plan would be developed for excavation. Planning should involve both fisheries and wildlife specialists.

Recommended Actions

- 2.1 Release oak from overtopping fir (commercially log fir in forest management zones; use felling, topping, girdling, or injection, with cut trees remaining on site in reserve areas)
- 2.2 Create snags in conjunction with timber harvest operations
- 2.3 Mark and retain wildlife and legacy trees in conjunction with timber harvest operations
- 2.4 Install nest boxes at meadow and field edges
- 2.5 Thin dense young oak clumps
- 2.6 Develop hedgerow demonstration area along highway and near houses
- 2.7 Plant conifers in riparian zones
- 2.8 Develop and implement an aquatic restoration plan for stream structure and off channel improvements
- 2.9 Upgrade access road at two sensitive sites
- 2.10 Locate and excavate a pilot hole to monitor the summer water table at the potential pond site. Evaluate for possible pond development
- 2.11 Clean up and restore aquatic and riparian corridor (from Hwy 223 to forest edge)

Vegetation and Botanical Resources

Opportunities

- Several healthy and stable native plant communities are present.
- Fir encroaching on meadows are young and can be easily controlled.
- Exotic species are not yet widely established across the property. Many can be effectively controlled at this early stage.
- Meadow areas contain populations of native prairie species which can be recovered with management.
- Native grasses may be suitable for on-site collection of seed for restoration projects.
- Potential habitat exists for reestablishing native species once present on the property.
- A wide diversity of habitats offer opportunities for education and interpretation.
- Planned habitat improvements offer opportunities for demonstration and education.

Savanna and prairie restoration

Protecting oak woodland, savanna, and prairie habitats should be a top priority of management. Douglas-fir trees that are invading savanna habitats should be cut to release oak trees from competition and open-up prairies. Several very large and old oaks are in peril, but could be saved if the fir trees immediately surrounding them are removed soon. The margins of some of the prairies are being invaded by Douglas-fir, and their removal should be a priority for prairie management. Scot's broom should be removed from the north prairie as soon as possible.

A burning and mowing plan should be developed for the site. All of the main prairies require management of this type as soon as possible to control invasive grasses and stimulate growth of native plants. Areas dominated by bracken-fern may be better treated by mowing than burning, because this aggressive species may respond positively to burning to the exclusion of other native plants. Also, the area in the east prairie dominated by thistle but also containing Oregon geranium may be better treated by mowing or burning than herbicide.

A 1 acre± test burn should be applied to the eastern most meadow to evaluate the use of fire at this site, and stimulate seed production of Roemer's fescue and other native grasses. Seeds from native grasses are in short supply and could be used in restoration efforts here and at other sites.

Rare and endangered species recovery

A reintroduction plan for endangered prairie plants should be developed. Kincaid's lupine and Willamette daisy could both occupy the habitats in the Beazell prairies, and reintroduction methods are currently under development for them. Both species occur near to Beazell and likely occurred there in the past. In addition, Kincaid's lupine is the primary food plant for larvae of the endangered Fender's blue butterfly. If the lupine were present at Beazell, the butterfly could be reintroduced there as well. This activity would not only contribute directly to the recovery of these endangered species, but it would represent an excellent public education opportunity.

Willamette daisy may be present on site, as survey dates were too early to allow for definite identification (mid-June is usually best). Additional surveys for thin-leaved peavine would fully document the extent of the population at Beazell.

Recommended Actions

- 3.1 Remove Douglas-fir trees that are invading savanna habitats
- 3.2 Remove Scotch broom from the north prairie as soon as possible
- 3.3 Apply a 1 acre± test burn to the eastern most meadow to evaluate the use of fire
- 3.4 Develop a burning and mowing plan for the site
- 3.5 Survey for Willamette daisy and thin-leaved peavine
- 3.6 Develop a reintroduction plan for endangered prairie species

Timber Resources

Opportunities

- Gentle terrain allows ground-based logging across much of the property, enabling small scale, environmentally sensitive logging techniques.
- Tree vigor and timber quality can be improved by a program of regular thinnings. The range of tree ages can be maintained and expanded.
- The diversity of tree species can be increased by cutting fir where it threatens centuries-old oak, and using a variety of species in new plantings.
- Road use agreements with abutters may enable access to areas currently lacking access.
- A large land base allows regular harvesting and predictable cash flow.
- The wide variety of forest types and planned operations offer opportunities for demonstration and education.

Roads and access

Several interior roads and skid trails dating from the 1950 harvest are well situated, and may be used again with minor modifications. Others are too steep, located in stream bottoms, or unstable, and should be decommissioned (“B” and “H” on road map, Chapter 7). New road construction (at “A” and “I”) would allow the northern and southern management blocks to have separate access, minimizing visitor and environmental impacts along Plunkett Creek.

Access to the eastern management unit and upper meadows is complicated by the need to minimize heavy hauling along Plunkett Creek (“C”), and the lack of alternative legal access. The best access would be off existing haul roads on the Swanson-Superior property immediately to the north (“F” and “L”). Extending an old road (“E”) can allow much of the eastern forest management unit to be accessed from the north, eliminating the need to use the road along Plunkett Creek³. Besides decreasing visitor impacts, these roads would improve fire safety on this and adjoining properties. A right-of-way agreement would be required from Swanson-Superior and at least one other owner (Lowther) between the Forest and Highway 223.

Sustainable timber harvesting

The forestland within the Forest Management zone totals approximately 259 acres. Sensitive sites and areas where other resource values exceed timber values have been removed from this timber management base. Current timber volume on this 259 acres is estimated at 6,386,000 board feet, or 24,700 board feet per acre. The cruise estimated annual timber volume growth (on

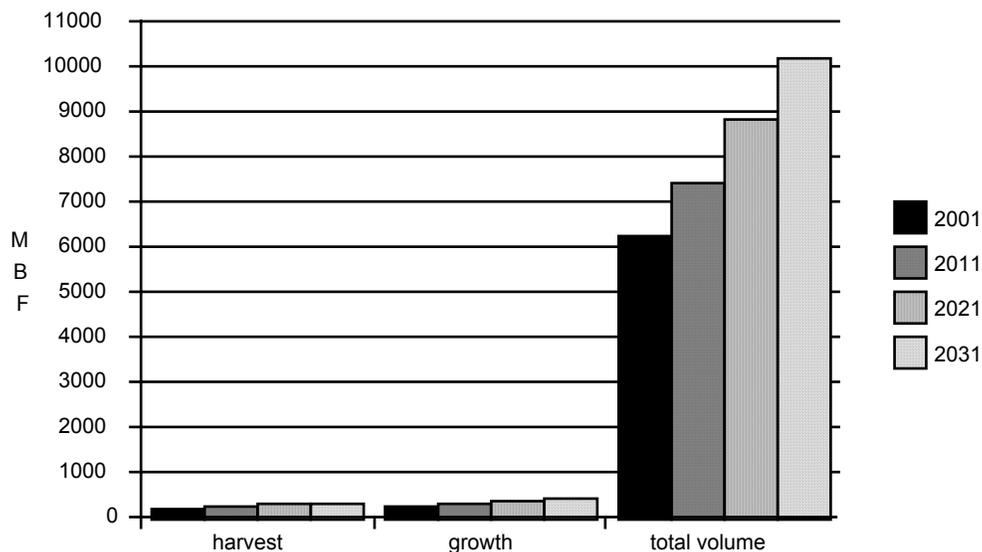
³ except to access the eastern quarter of the block at road “G”

existing merchantable stands) of 1,275 board feet per acre (5.2 percent), acknowledged in the cruise report as “a very high growth rate”. To maintain a conservative and “balanced approach,” the annual growth rate for planning purposes is assumed to be 4.0 percent, or 1,000 board feet per acre. Growth is assumed to drop to 3.0 percent after 2010, reflecting the slower growth of a mature forest. Future timber cruise updates will monitor actual forest growth, and harvest levels will be adjusted accordingly.

The preferred harvest level for the 2001–2010 period is 60 percent of growth, or 150 thousand board feet per year. This conservative harvest level will allow young stands to become more mature. Increased harvesting will be needed over time to maintain the vigor of larger trees and provide light for new seedlings. Growth, harvest, and total volumes are shown in Figure 2. General harvest prescriptions are described in Figure 3.

The total volume at 2011 is projected to be 7,700 MBF. From 2011 to 2020 harvesting should cut 70 percent of growth (160 MBF per year). For the 2021–2030 period harvesting should cut 80 percent of growth (210 MBF per year). By 2030 sustainable harvest levels should be near 290 MBF of a total forest volume of over 9.5 million board feet.

Figure 2: Growth, harvest, and total tract volume 2001–2031



Harvest control (Rotation)

Harvest scheduling shall be based on the biological needs of each stand. For long range planning general assumptions concerning annual harvest volumes and operating acreage are useful. Foresters often term these volume control and area control. The above recommended harvest level of 150 MBF (for 2001–2010) represents an annual volume control limit.

An average harvest return interval of 10-year is recommended (after 10 years most thinned stands will be ready for a next thinning). If cutting on an annual basis, approximately 25 acres

each year should be harvested, of which 22.5 acres would be individual tree selection thinning, and 2.5 acres would be group selection for regeneration. This represents an area control approach.

For efficiency annual harvests should be combined, for example into 50 acre units of 300 MBF, cut every two years. Harvest timing can be adjusted to take advantage of favorable markets, or to meet park development needs. Five-year harvest levels should not exceed 125 acres or 750 MBF (for period 2001–2010). In the first 5-years deviations from these acreage guidelines may be necessary to adequately recover threatened oak.

Figure 3: Forestry Prescriptions

Recommended stand treatments can be grouped into five general categories:

Thinning — Overcrowding is resulting in decreasing crown size and declining tree vigor. Individual tree selection thinning may be from above (removing larger trees), below (removing smaller trees), or balanced (removing trees of all sizes). Thinning should encourage transition to uneven-aged structure (often thinning from above). Each entry should remove no more than 30 percent of stand volume. *Thinning is needed on 150 acres over the next 10 years.*

Regeneration — To harvest groups of mature or at-risk trees, or to initiate new seedlings. Group selection cutting would create small patches (one tree height) or large openings (two tree heights up to 3 acres) based on light requirements and stand condition. At least 10 percent of the original stand would be retained in large openings. *Regeneration is needed on 10 acres over the next 10 years.*

Oak release — Oak are being overtopped by faster growing fir. Maintenance and restoration oak savanna and woodlands is needed. Depending on location and stand condition, fir may be either slashed (for seedlings and saplings), girdled, topped (to create wildlife habitat), or commercially logged. *Oak release is needed on 150 acres over the next 3-5 years.*

Habitat improvement — Site specific treatments target specific habitat conditions for improvement (ie. stream restoration, riparian plantings, snag creation). *Several habitat improvements have been recommended.*

Wait — Stand has no current needs. *At least 40 acres have no current needs.*

Cash flow

At current market prices (spring 2001), the recommended level of harvesting should generate income of \$45,000–50,000 per year (net proceeds after logging, trucking, and supervision fees). Initial harvests will require road maintenance and construction costs in the range of \$25,000 to \$30,000⁴. These road improvements should be scheduled over the first two or more years.

Meadow maintenance, oak savanna and woodland restoration, and stream and wildlife habitat improvements are non-revenue generating, and should be done in conjunction with, or paid from the proceeds of timber sale operations. One method of budgeting for these activities is to assign a proportion of harvest revenues to be dedicated to habitat improvements, initially recommended as 25 percent.

⁴ does not include right-of-way acquisition costs.

Recommended Actions

- 4.1 Obtain rights-of-way or access agreements to access ridgetop meadows and northern management unit, if possible
- 4.2 Construct and upgrade forest management road system
- 4.3 Cut fir that are crowding out centuries-old Oregon white oak
- 4.4 Begin a program of sustainable harvests within the forest management demonstration area. Priorities include saving oak and other hardwood species, thinning overstocked stands, and providing additional structure for wildlife habitat, including snags, down woody debris, canopy gaps, etc.
- 4.5 Work with Oregon Department of Forestry to develop fire management plans for risk abatement, wildfire control and prescribed burning

**Table 3: Recommendation Timetable
Bezell Memorial Forest
2001–2010**

Note: the following is a generalized planning scheme. Actual extents and timing will dependent on log markets, available labor, availability of additional funding sources, and other factors. Project specifications and budgets should be prepared prior to scheduling operations.

year	action	activity	notes
ASAP	4.1	Obtain rights-of-way or access agreements, if possible	
	4.3, 2.1	Begin to release oak from overtopping fir	determine priority areas
	3.2	Remove Scotch broom from the north meadow	
	4.5	Develop fire management plans	ODF
	1.8	Assess restoration potential of Plunkett House	
2001– 2003	1.1	Develop park facilities and phase 1 trail system	early start spring 2002?
	1.3	Mark and sign property boundaries	
	1.4	Begin education/demonstration plan development	
	4.3, 2.1	Continue to release oak from overtopping fir	2nd priority areas
	2.2, 2.3	Create snags, mark and retain legacy trees	combine with other harvests
	1.2, 2.9, 4.2	Begin forest management road system upgrades, protect two sensitive riparian sites	combine with harvests, co-ordinate with 2.8 implementation TBA
	2.8	Develop stream structure restoration plan	
	2.11	Begin aquatic and riparian clean-up and restoration	
	2.10	Excavate pilot hole at potential pond site	
	3.1	Remove Douglas-fir trees invading savanna habitats	phased operation?
	3.5	Survey for Willamette daisy and thin-leaved peavine	mid-June 2002?
	3.3	Trial burn eastern-most meadow	August-September 2002?
	3.4	Develop a burning and mowing plan for the site	implementation TBA
	3.6	Develop reintroduction plan for endangered prairie species	implementation TBA
2003– 2005	1.1	Develop phase 2 trail system	
	1.5	Outreach to OSU & local schools to use the site for education, research, field trips, projects, etc.	
	1.2, 4.2	Continue forest management road system upgrades	combine with harvests
	4.3, 2.1	Continue to release oak from overtopping fir	remaining areas
	2.2, 2.3	Create snags, mark and retain legacy trees	combine with other harvests
	2.4	Install nest boxes at meadow & field edges	
	2.5	Thin dense young oak clumps	
	2.6	Develop hedgerow demonstrations	
	2.7	Plant conifers in riparian zones	
2005– 2010	1.1	Develop Phase 3 trail system.	
	4.4	Continue program of sustainable harvests	focus on Douglas-fir stands
		Monitor visitor impacts and the effects of management	
		Review and update Management Plan	as needed
Ongoing	1.6	Create a management database archive	
	1.7	Work cooperatively w/ neighbors to reduce trespass	

Chapter 6: Monitoring and Adaptive Management

Plans	6-1
Monitoring	6-1
Methods	6-2

Chapter 6: Monitoring and Adaptive Management

The following discussion covers the types of plans and reports needed to guide effective management and ensure adequate recordkeeping. A system for monitoring plan implementation and management practices is described.

Plans

The **Master Plan** for the Beazell Memorial Forest shall be reviewed every 10 years, and revised as needed. **Operational Plans** shall be prepared every 3-to-5 years, depending on the level of activity. Operational plans include the harvest prescription or project specifications, including maps, stand delineations, reserve areas, intended outcomes and implementation details. Brief **Project Reports** are prepared following completion of the project, detailing immediate results.

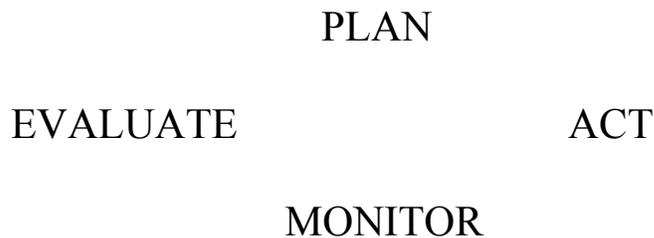
Monitoring

Monitoring provides information to help determine if the Beazell Memorial Forest management activities are meeting the Plan's objectives and are adhering to the Plan's Policies and Guidelines. Through the monitoring process determinations may be made as to whether the Plan needs to be amended or management activities need to be redesigned.

The objectives of monitoring are to:

- Assess the implementation of the plan and strategies
- Evaluate the effectiveness of the strategies in achieving the expected results
- Assess the assumptions built into the plan
- Evaluate the extent to which goals are being met
- Practice adaptive management

Monitoring is an essential part of an adaptive management loop — a framework for continually improving the state of our knowledge about the forest, and acting on new information. This simplified adaptive management process is shown below:



Once the Plan's goals and strategies have been articulated and implemented, monitoring can proceed. **Monitoring questions** are a useful way to frame the process. By formulating questions, useful measurement indicators can be identified, protocols developed, and data collected. Evaluating this new information may confirm the effectiveness of the management strategy and practice, or indicate that a revision to a plan, policy or practice is needed. This monitoring plan identifies an initial set of questions, and data to be collected for the Beazell Forest.

This monitoring plan is intended to be a beginning. It is intended that it be revised over time, as the plan adapts to change.

Methods

To make monitoring cost-efficient and useful, this plan focuses on integrating monitoring into on-going forest management, not creating a separate process. This philosophy emphasizes an integrated approach where, as possible, information is collected during operational work, as part of the project. This may take the form a resource project report (e.g. cutting invasive weeds out of meadows) or a timber harvest report that collects on site data during the activity.

There are several methods that can be used to monitor forest management activities:

- Peer review groups
- Resource project reports
- Inventory
- Special projects

Peer Review: A peer review group, comprised of the Benton County Parks director, staff and members of the county Parks Advisory Board, shall periodically meet to evaluate the progress in plan implementation and discuss what is working well, what problems there are, and possible adjustments to be made.

Resource Project Reports: These are project reports, including pre-operational plans and post-operational reports. For example, a timber harvest plan will describe existing conditions, the harvest prescription and how it meets goals for stand development and structure such as tree density, snags, wildlife and legacy trees, down wood, etc..

Inventory: Measurement of resource conditions on a periodic basis helps to measure change in the forest and impacts of management activities. For the Beazell Forest these include fish habitat surveys, vegetation and wildlife surveys and timber resource inventories.

Special Monitoring Projects: There may be cases where special monitoring projects are developed to answer specific questions. These can provide educational opportunities for students or interested citizens who want to be involved in data collection, with coordination and evaluation support from a resource professional.

The following table shows some of the possible monitoring activities on the Beazell Memorial Forest:

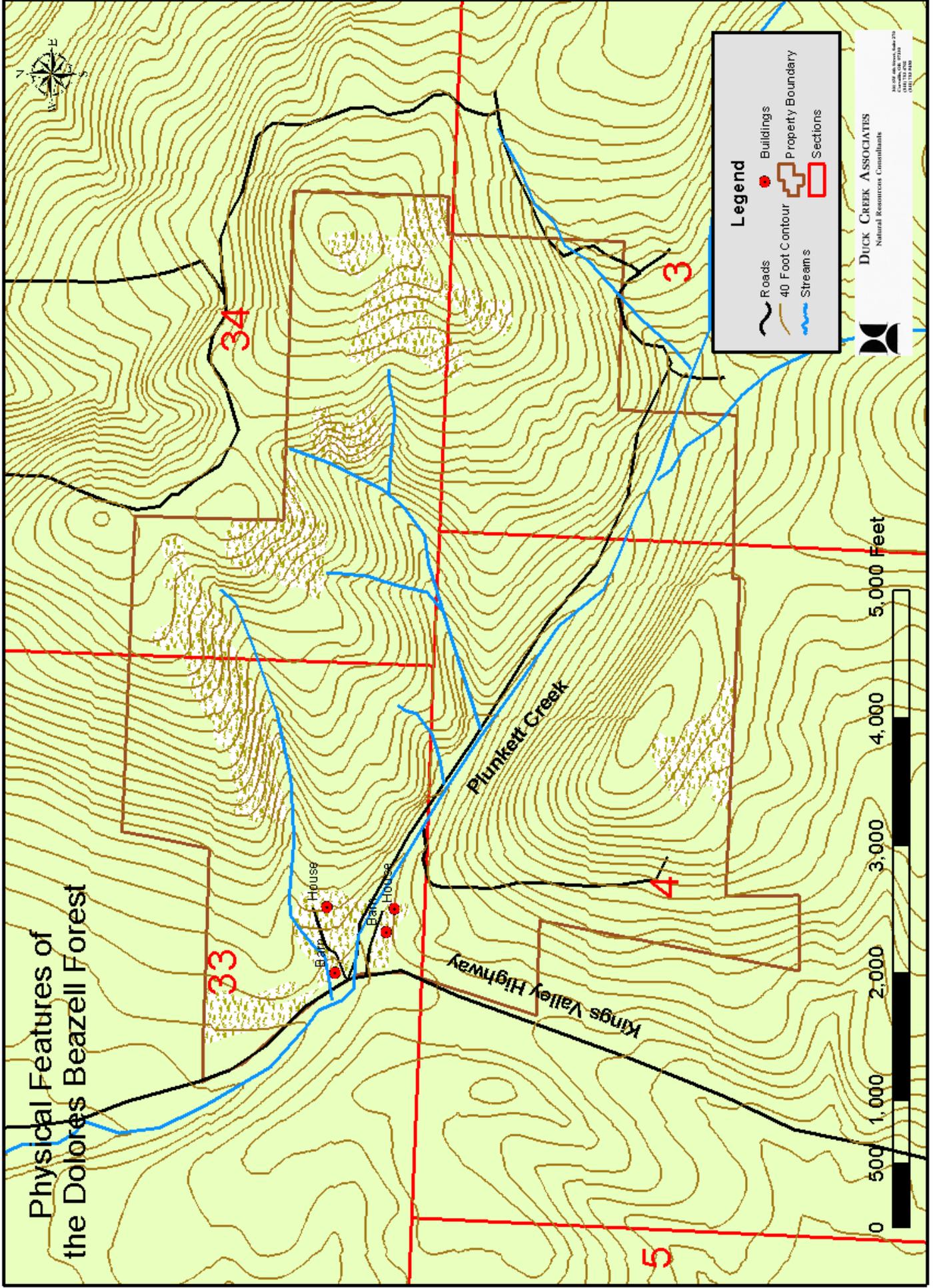
Table 4: Monitoring Questions

Component to be Monitored	Monitoring Question	Methods	Frequency	Conditions Requiring Action
Dispersed Recreation	Is visitor use resulting in adverse effects on natural resources?	Photograph and informal field surveys	Annually	Visible damage to trails in sensitive zones, off-trail visitor travel
Vegetation and Botanical Resources	Are rare or sensitive plants present? Is plant diversity or abundance changing?	Field surveys in accordance with established protocols	Every 10 years, or as necessary	Any negative change in native plant abundance or diversity
Reforestation	Are adequate numbers of seedlings present following harvesting?	Stocking surveys	Two and four growing seasons after planting	Survival rates below 75%, competing vegetation, suppressed height growth
Tree Growth and Mortality	What is the forest's growth response to harvesting?	Timber inventory	Every 10 years	Growth reduction or significant mortality
Snag and Woody Debris Habitat	Are desired snag and woody debris levels being maintained?	Operational reports and periodic timber inventory	During operational field work, and every 10 years	Decline in snag or wood debris levels
Fisheries and Riparian Habitats	Are stream ecosystems healthy?	Aquatic insect sampling	Every 5 years, or on a project basis	Any detectable decline
Wildlife Habitat	Is sufficient woodpecker habitat present?	Timber inventory (snag inventory)	Every 10 years, or during operational field work	Any detectable decline

Chapter 7: Maps

Topographic and site features	7-1
Base facilities plan	7-2
Forest type map	7-3
Roads and access	7-4

Physical Features of the Dolores Beazell Forest

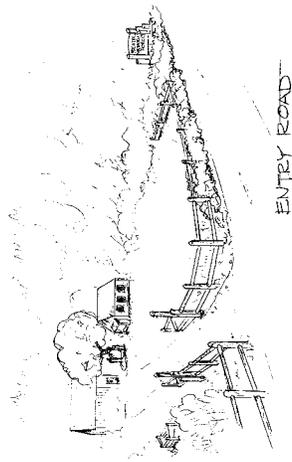


Legend

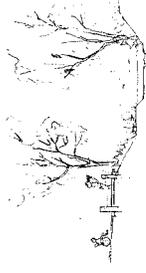
- Roads
- Buildings
- 40 Foot Contour
- Property Boundary
- Streams
- Sections

DUCK CREEK ASSOCIATES
Natural Resource Consultants

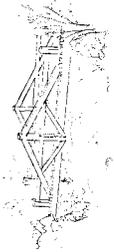
1000 10th Street, Suite 200
Durango, CO 81301
303.733.1330



ENTRY ROAD



POND/WILDLIFE VIEWING PLATFORMS

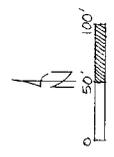


PEDESTRIAN & MAINT. BRIDGE

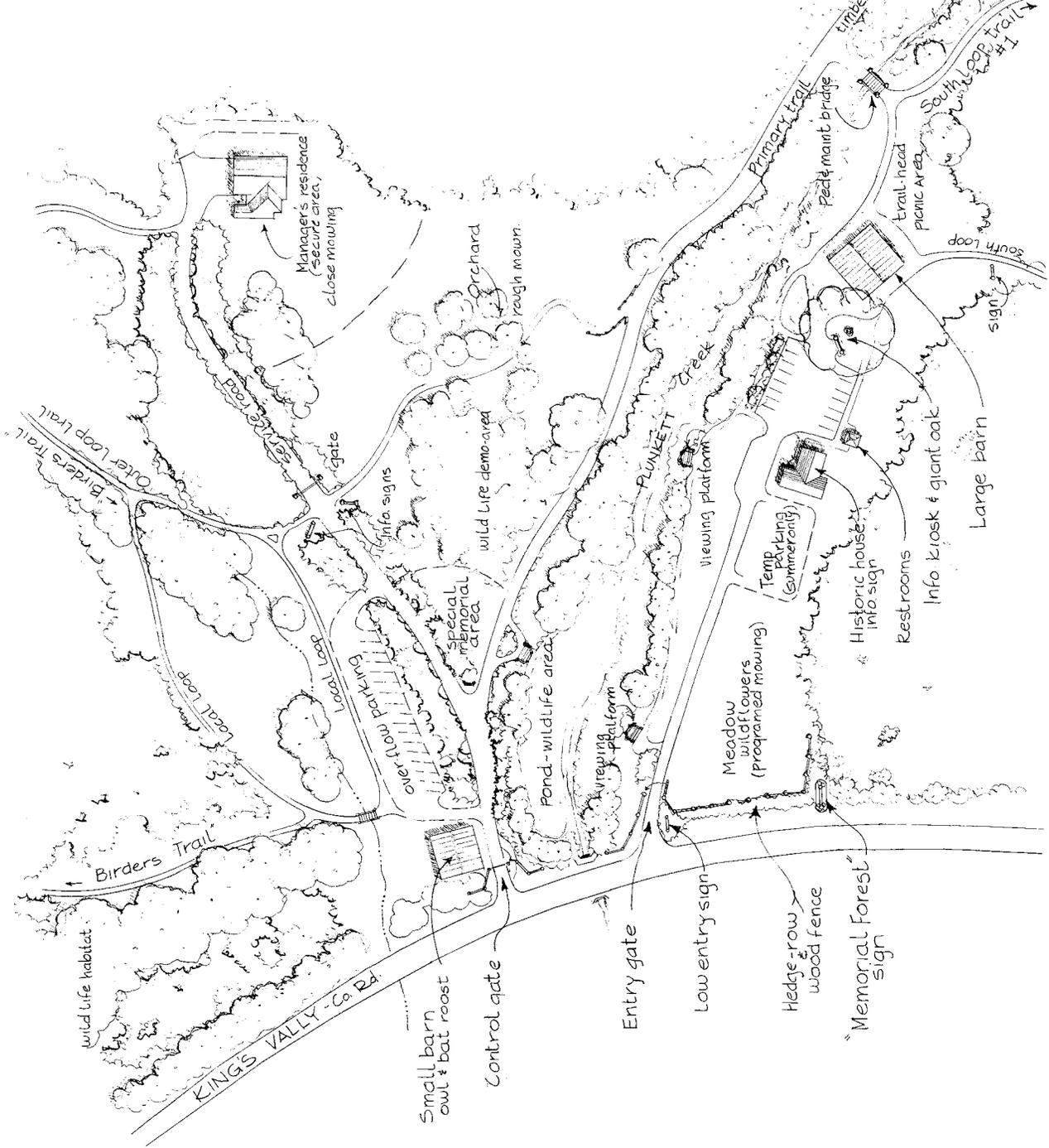
BASE FACILITIES PLAN

DOLORES MAY (ANTHONY)

BEAZELL MEMORIAL FOREST



John R Stewart
Landscape Architect 6-12-01



Forest Cover Type Descriptions

(from Duck Creek Associates, 1998)

Cover Type codes:

Dominant Species		Density of Overstory		Size Class of Dominant Cover	
D	Douglas-fir	1	10% to 33% crown cover	X	Seedlings and Saplings (<6" dbh)
M	Maple and Alder	2	33% to 67% crown cover	P	Poles (merchantable, 6" to 10" dbh)
Q	Oak	3	67% to 100% crown cover	Y	Small Sawtimber (10" to 16" dbh)
G	Grass			M	Mature Sawtimber (16"+ dbh)

D1X

This type is Douglas-fir plantation having below-average stocking levels or clumpy spacing.

D1X/G

This type is similar to D1X, but shows considerably more clumpiness of the regeneration in open grass hillsides.

D2Y/D1P

This type is a well-stocked stand of primarily young sawtimber trees, with a noticeable element of pole-sized fir.

D2M/D2Y

This type represents one of the most mature stands of conifer on the property, containing a considerable volume of larger mature fir, with a healthy component of younger sawtimber.

D1Y/D1P

This stand exhibits average stocking of younger merchantable and pole-sized fir.

D2X

This type represents well-stocked Douglas-fir plantations, with fairly uniform spacing.

D2Y/D2P

This type contains moderate amounts of young sawtimber mixed in with moderate amounts of pole-sized sawtimber.

D2Y/D1M

This type represents well-stocked stands of vigorous young sawtimber with occasional open-grown or remnant conifer mixed throughout.

D2P/D1Y

This type primarily contains pole-sized material which is starting to enter into the young sawtimber diameter class.

D3P

This type is a very homogeneous Douglas-fir plantation exhibiting a very uniform diameter distribution.

D3P/D1Y

This type is similar to the D3P type, having an additional component of young-sawtimber material scattered throughout.

D2Y

This type has average stocking of Douglas-fir young sawtimber.

M1Y/D1Y

This large type is primarily a hardwood (maple) type with scattered Douglas-fir and grand fir sawtimber trees. Low density of conifer stocking throughout.

M2Y

This represents the riparian type. Mostly composed of younger maple, oak, and alder. Residual fir trees can be found scattered throughout the draws.

Q1M/D1X

This small type consists of scattered open-grown oak trees over grass and scattered Douglas-fir reproduction. Low stocking overall.

G

This type represents the open grassy hillsides. Occasional patches of natural regeneration can be found, along with scattered oak trees and remnant older conifers.

R

This represents the residential areas near the Kings Valley highway.

Beazell Memorial Forest Roads & Access

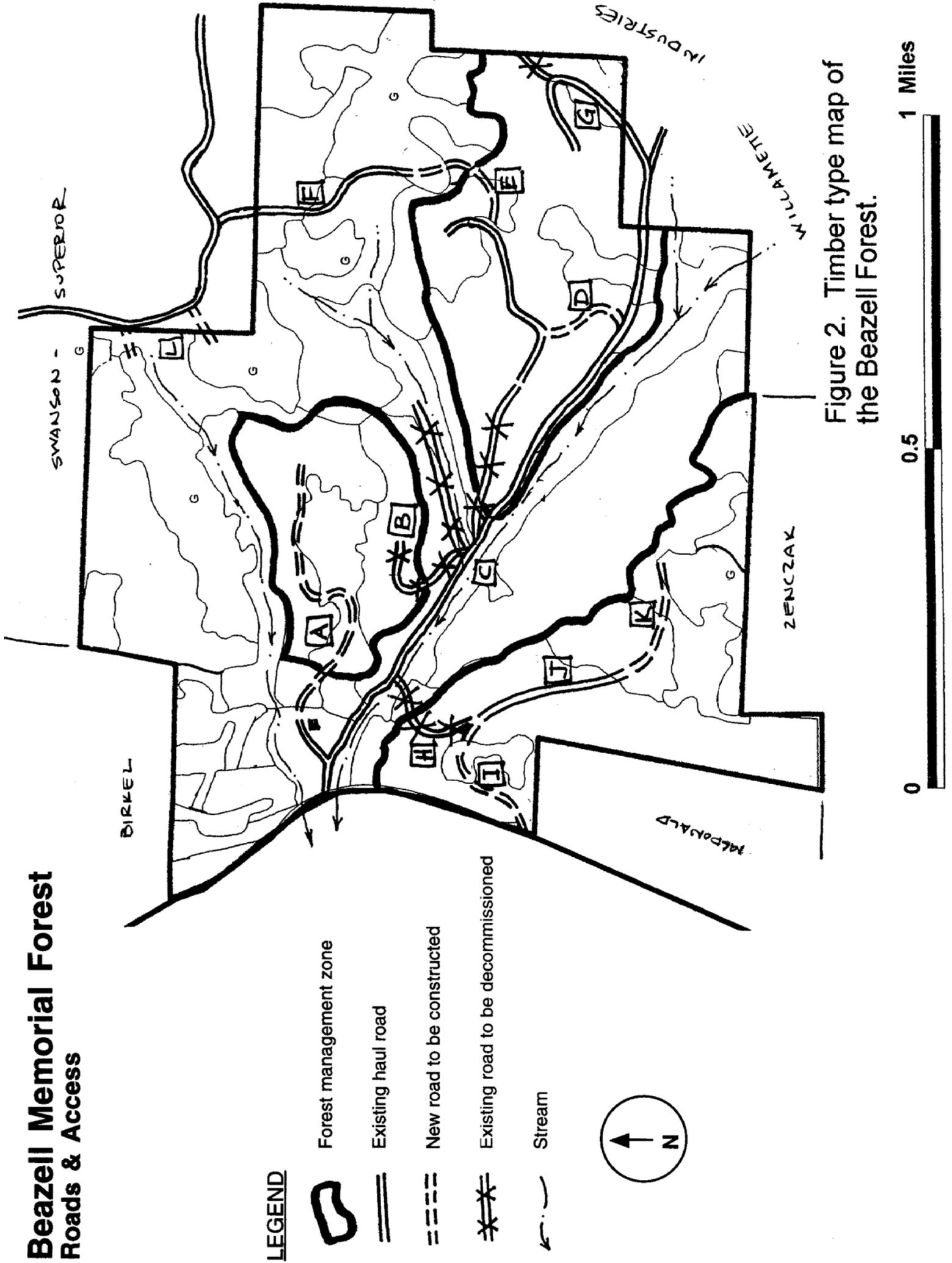


Figure 2. Timber type map of the Beazell Forest.