

# McDonald–Dunn Forest Plan



June, 2005



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# Executive Summary

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This plan revises and updates a 1993 management plan for McDonald-Dunn College Forest. Covering about 11,250 acres in the hilly country north and west of Corvallis, McDonald-Dunn is the OSU College of Forestry's largest research, teaching, and demonstration forest, and is one of the principal assets of the College. There are usually 40 to 80 active research projects under way on the Forest at any given time. More than 40 university classes receive part of their instruction on the Forest each year. The Forest also receives at least 175,000 visits from hikers, bicyclists, equestrians, public school students, and teachers each year. The College accommodates these uses by devoting a portion of its College Forest budget to maintaining the Forest's recreational and educational features, including an extensive all weather road system. Timber harvested from the Forest produces revenue to maintain and operate the Forest, including recreational use, and to meet special College instructional and research needs. Indeed, meeting this wide variety of needs and uses presents a significant management challenge.

The purpose of the management plan is to allocate the McDonald-Dunn land base to a variety of desired uses, and provide a management framework of policy and direction for forest staff. Specific prescriptions and project plans will be guided by the silvicultural framework and implemented by the forest staff, as they carry out the plan. Overall responsibility for College Forest planning and decision-making lies with the Forestry Executive Committee and Dean of the College of Forestry.

The College Forests planning committee prepared this plan at the direction of the Forestry Executive Committee. In preparation of the plan, the committee sought advice from the College Forests Advisory Committee and through a review process that involved more than 120 faculty, staff, students, alumni, extended education clients, recreational users and neighbors in a variety of meetings, and web based surveys. In addition, the Confederated Tribes of the Grand Ronde reviewed the plan. A wide range of ideas were received on various features of the plan, many times suggesting conflicting management emphases or actions. The input was summarized, considered carefully, and used by the planning team where it coincided with forest goals and objectives. A more thorough discussion of this process is included in Appendix 9, and on the College Forests website <http://www.cof.orst.edu/resfor/plan2004/>.

This revised plan is built around seven goals that relate to the mission of the College Forests:

1. Provide diverse opportunities for learning, discovery and dissemination of new knowledge
2. Optimize net revenue to support education, research, and outreach in the College of Forestry
3. Sustain forest ecosystem services
4. Identify, protect, and perpetuate cultural heritage sites
5. Provide safe, quality recreation opportunities
6. Establish, maintain, and enhance good relationships with neighbors
7. Demonstrate a commitment to continuous improvement

The approach taken for plan revision was to retain the three geographic zones developed in the 1993 plan (North, Central and South) and refine them with four different landscape-scale themes

Theme #1: Short Rotation Wood Production with High Return on Investment

Theme #2: High Quality, Growth Maximizing Timber Production

Theme #3: Visually Sensitive, Even-aged Forest

Theme #4: Structurally Diverse Forest

Each theme area models sustainable forestry for a distinct and different suite of forest values, uses, products, and services. Theme 1 will investigate methods to maximize the yield of Douglas-fir on short rotations to help industrial and other private landowners remain financially competitive in global forest products markets. Theme 2 will focus on optimizing the yield of high-quality wood, on longer rotations than Theme 1, a strategy of interest for many family forest owners. Theme 3 will retain tree cover until regeneration is established in hopes of providing a more visually pleasing harvesting process. Theme 4 will provide complex forest that is desired by many recreational users and important for certain wildlife species. Themes 2, 3 and 4 might help address management issues on public forests.

Layered on top of the themes are many special areas and special issues including:

- Old growth reserve areas have been retained
- Nesting, roosting, and foraging (NRF) habitat for northern spotted owls will be maintained
- Oak savannas, prairies and woodlands will be evaluated and restoration projects implemented
- An invasive species control and containment program will be developed with a major focus on false-brome
- A hardwood analysis and management strategy will be developed
- Snags and down wood will become the focus of an extensive research program
- A research program will investigate options for managing riparian zones

Management of cultural resources on the forest is enhanced in the new plan by a new Memorandum of Agreement between the College of Forestry and the Confederated Tribes of the Grand Ronde.

The plan projects harvest for the next 100 years and indicates approximately 6 million board feet/year will be harvested over the next decade. The actual yearly harvest will vary up and down depending upon a number of factors. Overall revenue produced by the forest is estimated at approximately 50% of maximum cash flow for timber production only.



*Forest engineering student working on timber sale layout*

# Introduction and Description

McDonald-Dunn Forest is the College's main research, teaching, and demonstration forest. There are usually 40 to 80 active research projects under way on the Forest at any given time. More than 40 classes throughout the university receive part of their instruction on the Forest each year. The Forest also receives at least 150,000 visits from hikers, bicyclists, equestrians, public school students, and teachers each year. The College accommodates these uses by devoting a portion of its College Forest budget to maintaining the Forest's recreational and educational features. Timber harvested from the Forest produces revenue to maintain and operate the Forest, including recreational use, and to meet special College instructional and research needs.

## Location

The McDonald-Dunn Forest covers about 11,250 acres of forest and meadow on the western edge of the Willamette Valley and on the eastern foothills of the Coast Range (Figure 1). It lies within a transition area between the Oregon Coast Range and the Willamette Valley in the "Valley Margin Zone," described by Juday in 1976 (Figure 2).

The Forest is west of U.S. Highway 99 W just north of Corvallis and is surrounded on all sides by private residential, agricultural, and industrial forest lands (Figure 3).

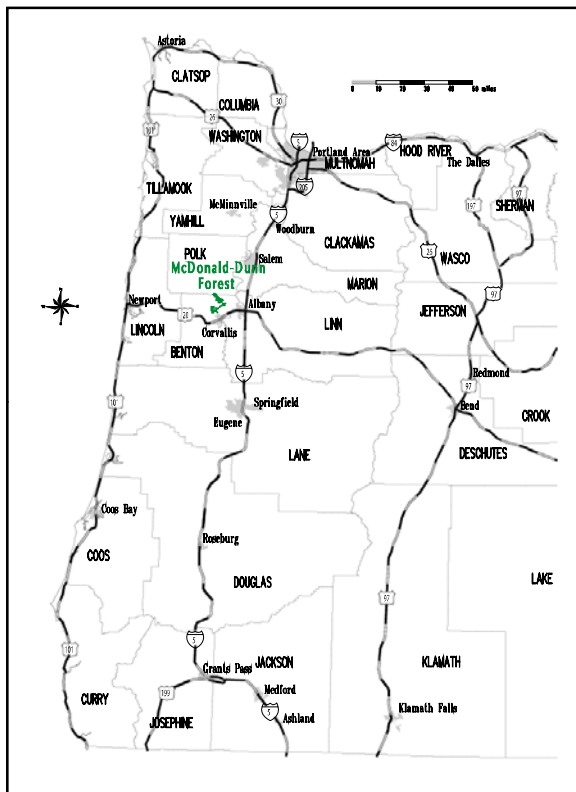


Figure 1. The location of McDonald/Dunn Forest in Western Oregon.

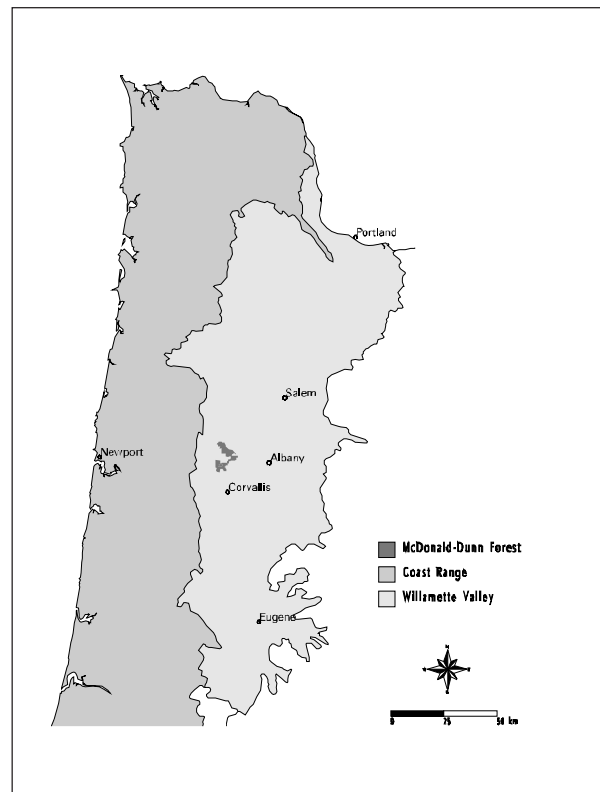


Figure 2. The McDonald/Dunn Forest is in the Willamette Valley Ecoregion.

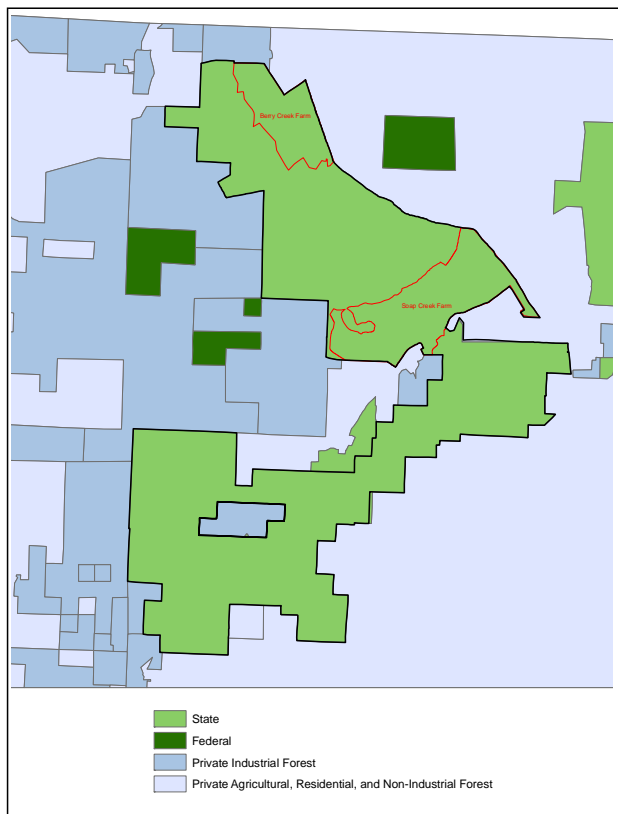


Figure 3. Adjacent land owners

## History

Evidence of Native American use of what is now the McDonald-Dunn Forest dates back over 10,000 years. The area was home to members of the Luckiamute and Marys River band of the Kalapuya Indians. Their purposeful and regular burning produced a landscape that favored important subsistence plant and animal species.

Epidemics in the late 1700's and the 1830's decimated Indian tribes in the Willamette Valley (Mackey, 2004). Kalapuya survivors became part of what is now the Confederated Tribes of Grand Ronde and the Confederated Tribes of Siletz. The McDonald-Dunn Forest is part of the lands that these tribes ceded in 1855.

Early Euro-American explorers arrived in the Willamette Valley in 1812 and found an open landscape dominated by prairie and oak savanna (Figure 4). Wide forested riparian areas up to two miles across were associated with the Willamette River, and smaller riparian areas along its tributaries character-

ized the valley. Valley foothills contained scattered stands of Douglas-fir with open prairies intermixed with oak savanna.

Most of the area that was to become McDonald-Dunn Forest was originally homesteaded. Some who filed donation land claims would later be prominent in Oregon history, such as Levi Scott and Thomas Read. Early settlers emphasized wheat cultivation and animal husbandry, but land uses eventually diversified to include orchards as well as logging.

The McDonald portion of the forest was acquired by the OSU School of Forestry through gifts and purchases from 1925 to 1962 (Figure 6). Mary McDonald was an important benefactress, donating both land and money to the college. Dean George Peavy and Professor T. J. Starker used her gifts to purchase the parcels that became McDonald Forest. Many of these parcels contain the deed language "For the use and benefit of the School of Forestry."

The adjacent Dunn Forest was acquired through the efforts of Dean Paul M. Dunn after World War II. During the war, Camp Adair Military Reservation was built with property acquired through condemnation proceedings. At the end of the war, 6,200 acres of



Mary McDonald



T.J. Starker



Paul Dunn and George Peavy



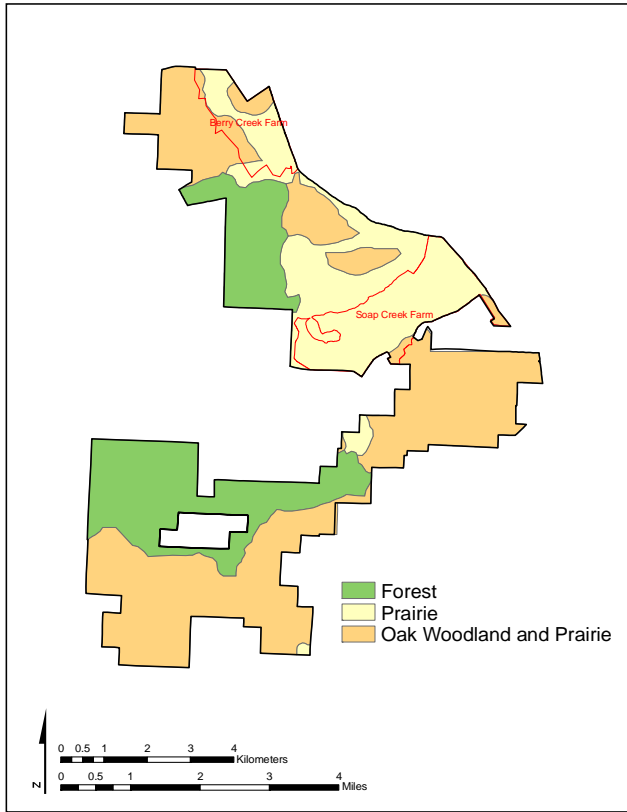


Figure 4. Vegetation in 1800

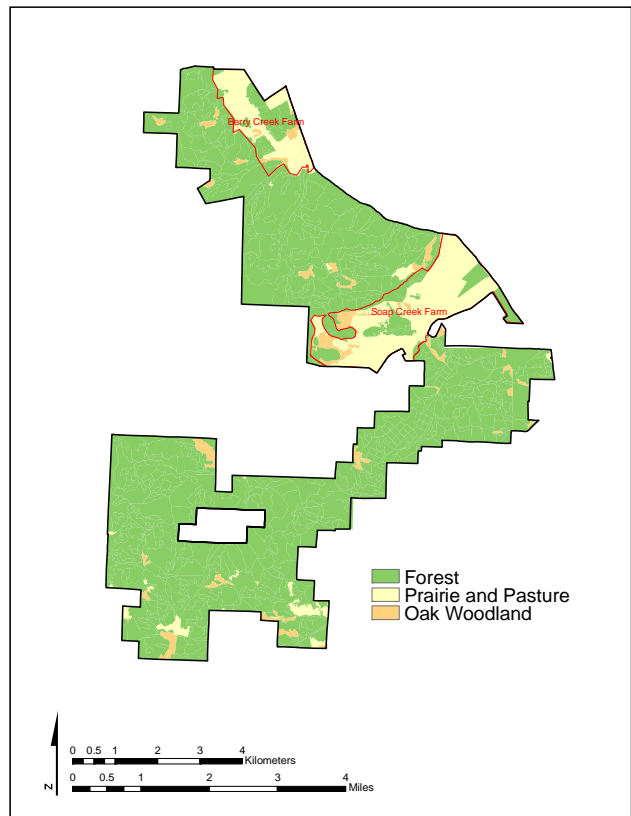


Figure 5. Current vegetation

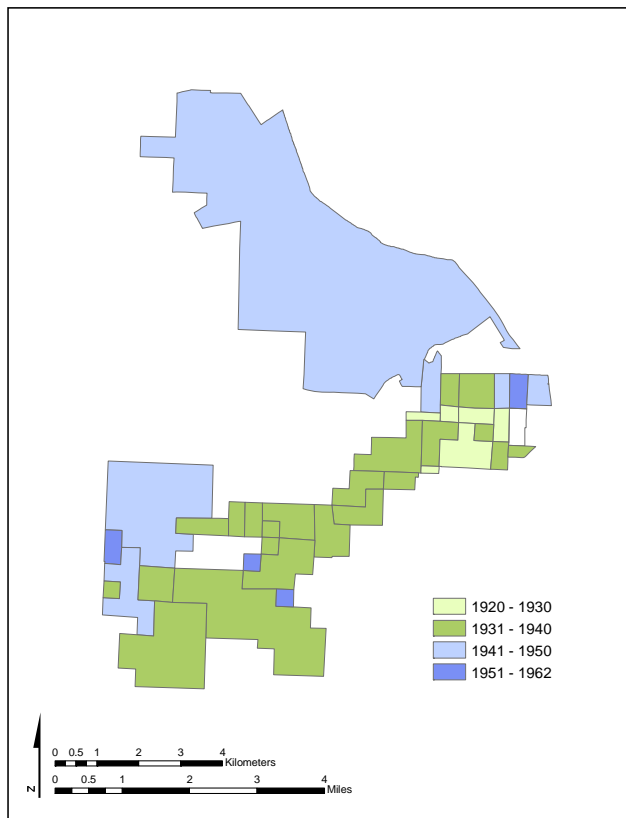


Figure 6. Acquisition history.

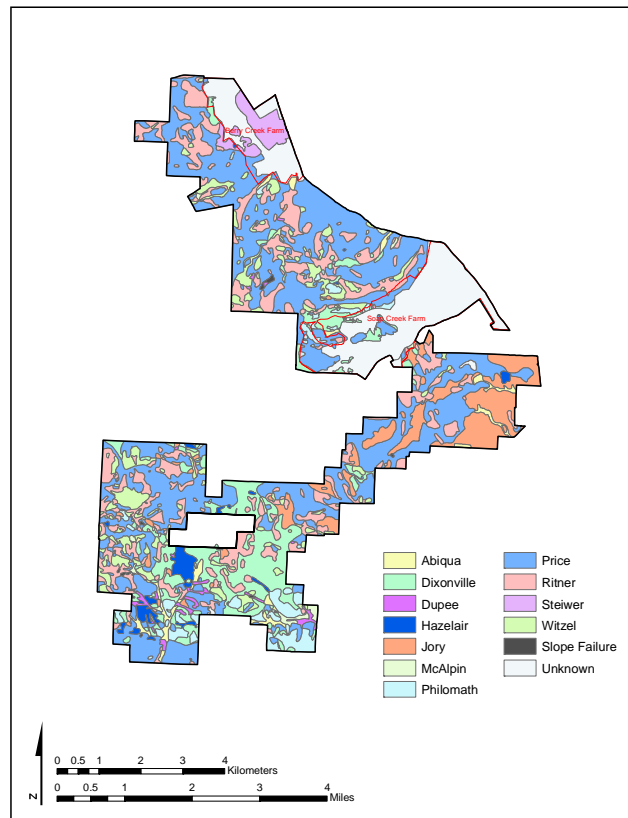


Figure 7. Soil types

the land that did not revert to the original owners were transferred to the university, forming McDonald-Dunn Forest.

In 1993, a group of OSU faculty developed a plan for McDonald-Dunn Forest at the request of Dean George Brown. That plan was in effect from 1994-2004. The plan estimated that the forest could sustain an average harvest of 4.4 million board feet/year, based on the land allocations and management direction in the plan.

Shortly after implementation of the 1994 forest plan, two things happened that influenced the harvest schedule. In spring 1995, a pair of northern spotted owls were detected nesting in the Oak Creek drainage. As a result, many of the stands that had been selected by the scheduling model for uneven-aged harvests in the south zone were no longer available for harvest.

Also, in 1995, a new Memorandum of Understanding was developed between the Colleges of Forestry and Agricultural Sciences, which transferred management responsibilities and revenues for the forested land on the agricultural farms to Agricultural Sciences. The harvest level was recalculated without these lands and reduced to 4.1 MMBF; that harvest level has been maintained over the last 10 years.

## Geology, Soils, and Hydrology

While much of the Coast Range and Willamette Valley is composed of older sedimentary rocks, most of the bedrock on the McDonald-Dunn Forest is predominantly basaltic lavas which formed 50 to 60 million years ago from an undersea chain of volca-

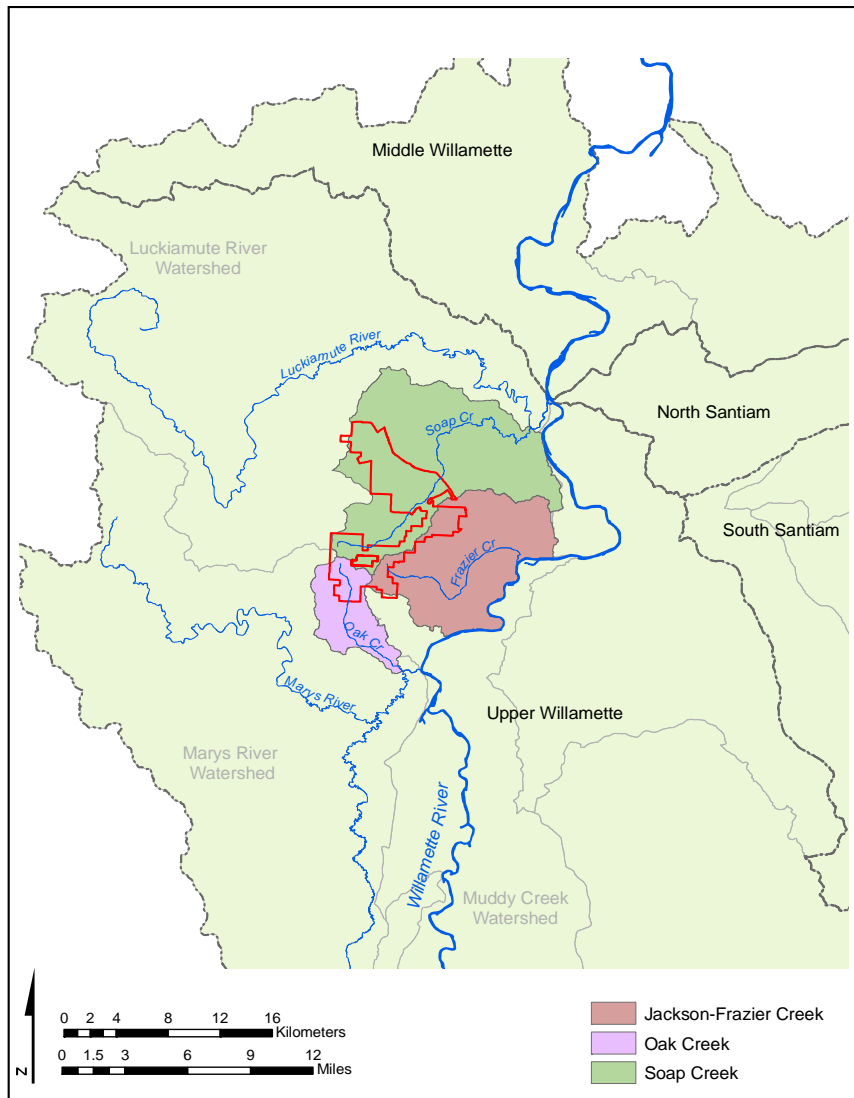


Figure 8. Watershed boundaries.

noes. This seamount terrane collided with the westward moving North American plate where it was accreted to the state. As the seamount terrane was accreted, sediments were carried into the new marine basin blanketing areas with sands and silts.

Siletz River Volcanics provide the foundation for the Forest's ridges and most of the valleys. It underlies the Jory, Price, Ritner, Witzel, Dixonville, and Philomath series soils. The Flourney Formation (Tye sandstone) is the base for the Dupee, Hazelair, Panther, and Steiwer soil series on the Forest. The wide flat drainage bottoms are recent alluvium, which form the basis for the McAlpin, Abiqua, and Waldo series soils (Rowley and Jorgensen, 1983) (Figure 7).

There are three major drainages on the Forest: Oak Creek, Jackson Creek, and Soap Creek. Oak Creek is in the Marys River watershed, Soap Creek is in the Luckiamute River watershed and Frazier Creek is part of the Muddy Creek watershed. These watersheds are contained within the Upper Willamette Sub-basin (Figure 8). Elevation within the three watersheds ranges from 400 to 2180 feet, with forested land in the upper elevations and agriculture, rural residential and urban development in the lower elevations (Figure 9). Two streams in the Soap Creek watershed (Soap Creek and South Fork Berry Creek) are on the Oregon Department of Environmental Quality's 303(d) list of impaired waters in Oregon. Total Maximum Daily Loads (TMDLs) for the Willamette River system have been developed; management of the McDonald/Dunn Forest contributes to the restoration of these streams by following the Oregon Forest Practices Act water protection rules.

## Current Forest Condition

The current coniferous overstory consists predominantly of Douglas-fir (*Pseudotsuga menziesii*) with a small grand fir (*Abies grandis*) component. With the exception of one minor drainage near Soap Creek where western hemlock (*Tsuga heterophylla*) and western redcedar (*Thuja plicata*) occur, the presence of naturally reproducing grand fir throughout the forest puts most of the vegetation of the plan area in the *Abies grandis* series, although Douglas-fir and bigleaf maple (*Acer macrophyllum*) are the dominant trees under the recent disturbance history.

Potential timber productivity of the Forest is medium to good, with most of the area between low site III (where Douglas-fir will grow about 110 feet tall in 50 years) and high site II (125 feet in 50 years) under natural conditions according to King (1966). Actual productivity varies from the King estimates of potential, depending on species composition, stocking,

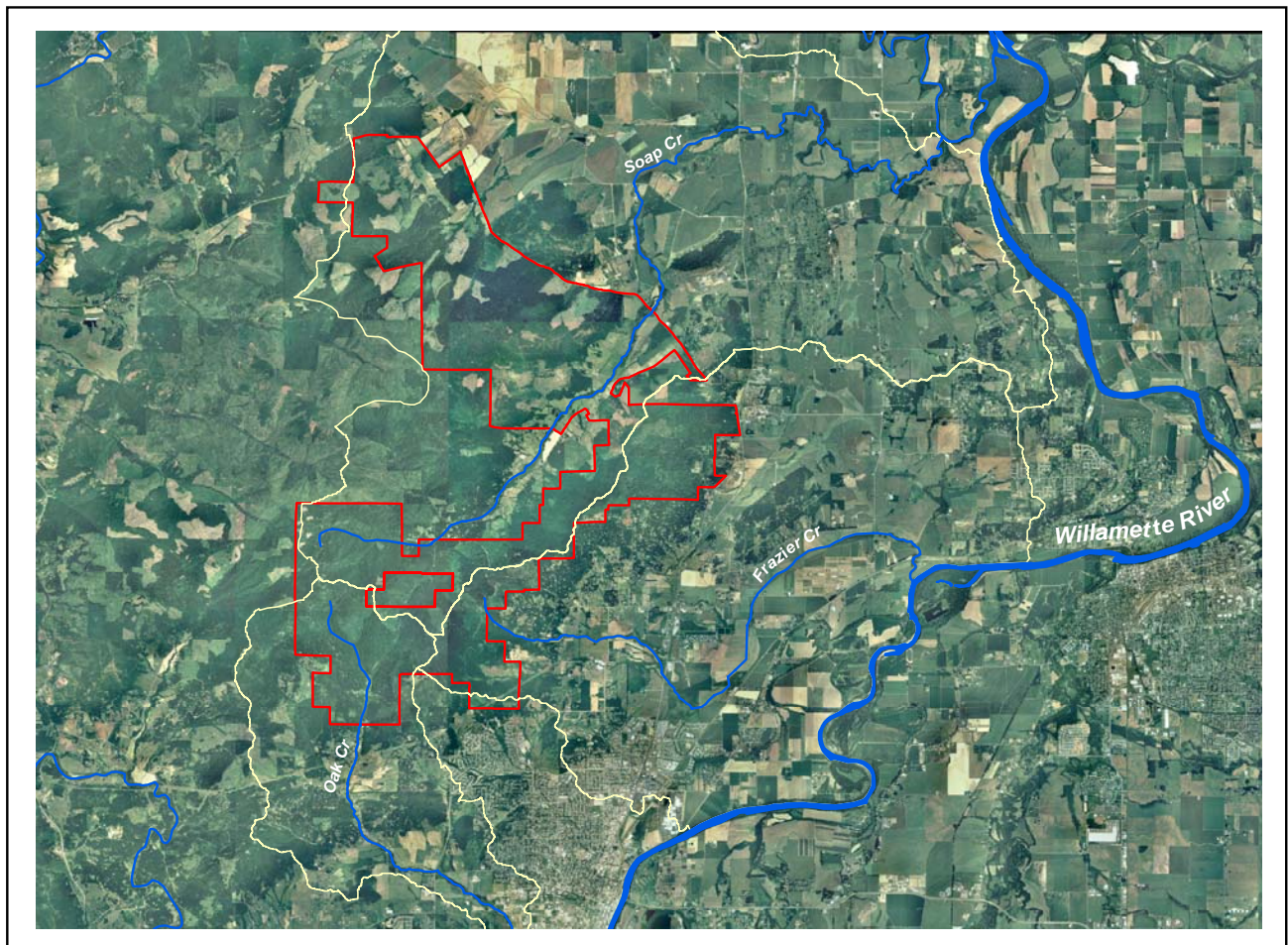


Figure 9. This 2004 National Agriculture Imagery Program orthophoto (USDA, 2004) shows vegetation and land use patterns in the three drainages associated with McDonald-Dunn Forest. Forest boundary is in red and watershed boundaries are in yellow.

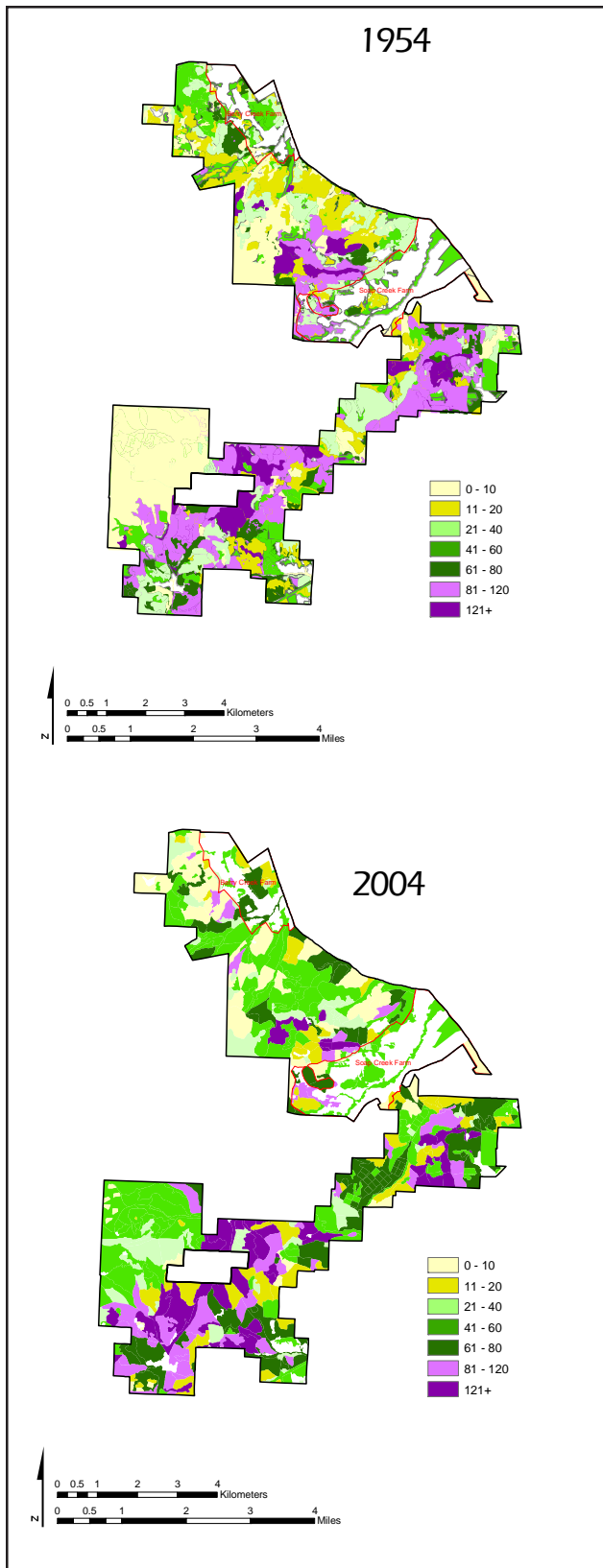


Figure 10. Ageclass distribution in 1954 (top) and 2004 (bottom).

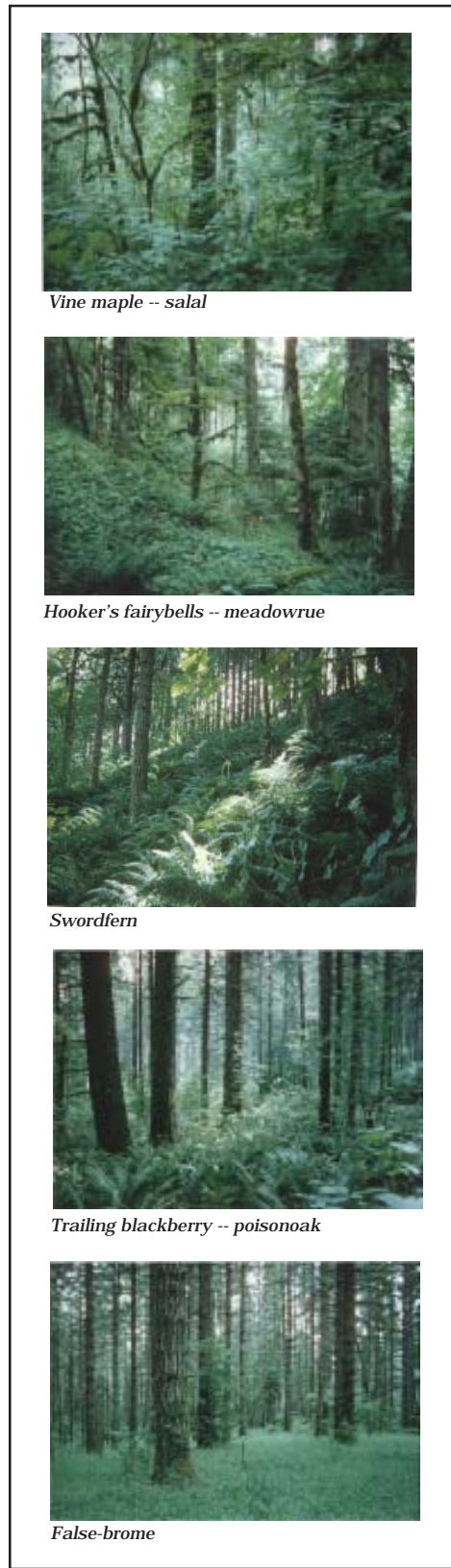


Figure 11. Examples of the understory plant associations that occur along a moisture gradient, from salal at the top to false-brome.

genetics, and cultural practices. The Forest appears to be currently producing below its timber potential, based on stocking and composition as they exist in 2004.

The overstory age-class distribution on the Forest in 1954 and 2004 can be seen in Figure 10. Most of the stands that are currently less than 80 years old are second- or third-growth Douglas-fir forests. Many of the 80- to 120-year-old stands near the southern end of the forest are primary forest, as are all of the stands over 120 years of age.

There are six plant associations (Hubbard 1991) in mature, upland forested areas. These associations are depicted in Figure 11, according to their place in the environmental gradient (Leavell 1991), from moist to dry. The western hemlock/vine maple-salal, grand fir/vine maple-salal and grand fir/trailing blackberry-poisonoak plant associations have understories that are dominated by shrub cover. Grand fir/sword fern and grand fir/Hooker's fairybells-western meadowrue are dominated by forbs, and grand fir/false-brome is dominated by an exotic grass that appears to be spreading and increasing in dominance throughout the forest (Figure 12).

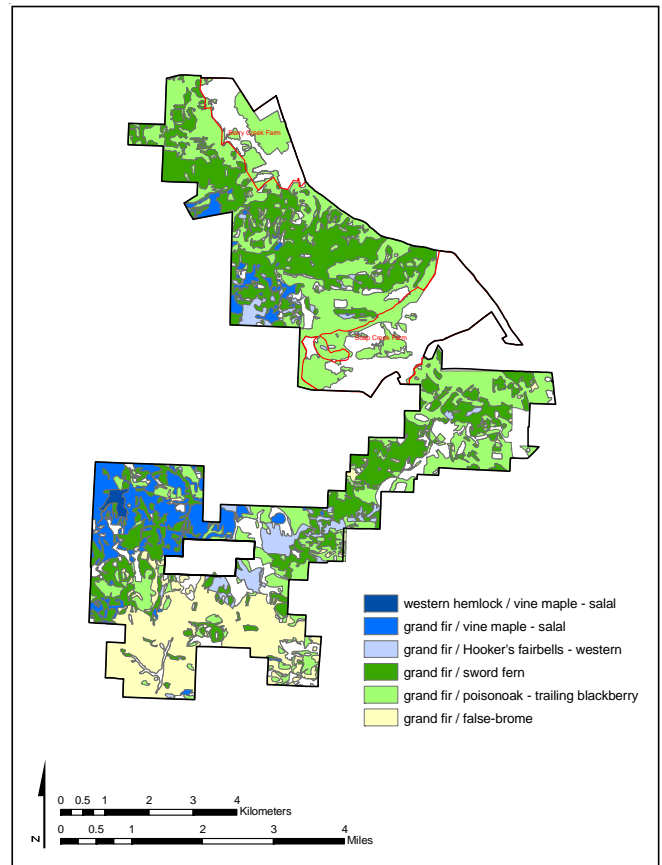


Figure 12. Distribution of plant associations (false-brome as of 1993)



Elk in Soap Creek area near the Dunn Forest

# Forest Goals

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The primary difference between College Forests and all other public or private forests is the goal to enhance teaching, research, and demonstration values and uses of the forests. A subset of this goal is to create dynamic, state-of-the-art management approaches that will be attractive to forestland managers who wish to sustain a variety of values, uses, products, or services and are willing to invest in those purposes and accept different levels of financial, environmental, and social performance in return.

Our second goal is to create a positive flow of revenues to cover the costs of managing the College Forests to produce and sustain desired conditions, and to contribute to the teaching, research, and outreach mission of the College. The ability of forest revenues to contribute to the teaching, research, and outreach missions of the College beyond those created by having College Forests in conditions that offer diverse opportunities, depends on the amount of revenues that exceed costs of forest management, i.e., net revenues.

Goals 3 and 4 represent legal expectations and/or distinctive opportunities for testing forest management options or sustaining distinct forest resources, including conserving listed species habitats and cultural heritage sites. Goal 5 represents a commitment to the community of Corvallis to continue to provide locally available, non-motorized forest recreational opportunities, given compatibility with educational and research goals, and within budgetary constraints. Goal 6 expresses the responsibility inherent in all forest ownerships to be a good neighbor. Goal 7 reflects the commitment to ensure that future managers of McDonald-Dunn Forest are left with abundant options, excellent records, and a legacy of good forest stewardship.

Sustainability for College Forests will be defined by how well the Forest meets goals and objectives as measured by the indicators selected to guide man-

## **Goal 1. Learning, Discovery, Engagement**

Provide diverse opportunities for learning, discovery, and dissemination of new knowledge and technologies related to forest ecosystems, forest management, and forest products/services for forest managers/owners, scientists, teachers, students, and the general public.

## **Goal 2. Net Revenue**

Optimize net revenue from College Forest operations to support education, research, and outreach missions of the College.

## **Goal 3. Natural Heritage and Forest Ecosystem Services**

Sustain forest ecosystem services generally associated with forest environments and ecological diversity commensurate with land capabilities, to meet legal requirements and to capture opportunities to test policy-relevant management options or to feature distinct resource values of the forest.

## **Goal 4. Cultural Heritage Sites**

Identify, protect, and perpetuate the cultural heritage resident on College Forests.

## **Goal 5. Recreation**

Provide safe, quality recreation opportunities, compatible with College Forest characteristics and other goals.

## **Goal 6. Relations with Neighbors and Others**

Proactively establish, maintain and enhance good relationships with neighbors and others connected with College Forest properties.

## **Goal 7. Continuous Improvement**

Demonstrate a commitment to continuous improvement in the management and stewardship of College Forests.

agement and assess performance. The ability to sustain forests and forest benefits depends on several interacting factors:

- the suite of values, uses, products, and services desired from a particular forest by society and the forest's owners--in our case the Oregon State Board of Higher Education as represented by the OSU College of Forestry
- the ecological ability of the forest to sustain those values, uses, products and services
- the financial ability of forestland owners to sustain their lands in forest uses for those values, uses, products, and services--often but not entirely a function of the profitability of the land in forest uses
- the willingness of society (or communities) to provide incentives--monetary as well as non-monetary--for forestland owners to keep forestlands in forest uses for forest values
- the willingness of society (or communities) to grant forestland managers a "social license" to manage forests for the values, uses, products, and services upon which their quality of life and prosperity depend

The first of these factors encompasses the goals for different forest types and ownerships set by the intersection of society's laws, rules, and policies, with landowner needs and expectations. The ecological aspects of forest sustainability comprise the second factor; the economic aspects of sustainability comprise the third. The latter two are the social or community aspects.

Sustainability is not possible if any of the goals exceed the capacity of the forest to sustain desired outcomes or if there are negative outcomes on any one of the three aspects--ecological, economic, or social. If the outcome for any one of these fundamental aspects of forest sustainability is negative, the forest and its values, uses, products, and services are not sustainable.

No single patch of forest, regardless of size, can meet all of society's or landowner needs, wants, or expectations. It can only meet at any point in time a subset of those needs and wants. For example, an

old-growth forest perpetuated as old growth is not going to produce wood for human use. On the other hand, a forest recently harvested to produce that wood is not going to provide old-forest amenities and services. In similar fashion, no single patch or area of a College forest can provide all the learning, discovery, and engagement opportunities that we desire from the entire forest area. To meet all the values, uses, products, and services desired from a forest requires a mosaic of different kinds of forest conditions, ranging from conditions most conducive to producing wood to conditions most conducive to perpetuating nature to the degree that is possible. In between these primary purposes lies the range of multi-resource possibilities for forests.

Guided by our primary goal to enhance learning, discovery, and engagement, the College of Forestry aims to create, enhance, and sustain a wide array of forest conditions on the McDonald-Dunn Forest for a wide array of forest values, uses, products, and services. But in sum, all seven goals guiding the forest plan are vital to sustaining the forests for all the conditions that can serve teaching, research and demonstration. Every management theme, every special area, and every management issue that constitutes this revision of the McDonald-Dunn Forest plan addresses one or more of the seven goals and contributes to the overall sustainability of the forest. But each theme, area, and issue only addresses some of the seven goals and each makes a different kind of contribution to sustainability. Some



*Class discussion in spotted owl habitat area*

address ecological goals and aspects more strongly than economic or social, while others address economic or social goals and aspects more strongly than ecological. No one theme, area, or issue, by itself, simultaneously meets all goals nor does it constitute the “model” for sustainable forestry by which all other themes, areas, or issues can be judged. Only the aggregate of all themes, special areas, and management issues, as they are eventually applied to specific landscapes and places on the College Forests to meet our seven goals demonstrates what forest sustainability means to College Forests and to the mission of the College of Forestry.

Under the adaptive management part of this plan revision, we list sustainability indicators, qualitative and/or quantitative expectations for each goal, and associated objectives for annual, decadal, and longer time frames. These expectations, sometimes called outcomes, or targets, will define what we intend to sustain on College Forests and how we intend to monitor this for McDonald-Dunn Forest.



*Madrones wired for sapflow measurements by Wood Science researcher*



*Forest staff member inspects tree planting*





*Volunteer trail maintenance crew*



*Volunteer guest lecturer*

# Approach

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To achieve the mission and goals for McDonald-Dunn, the Forest was divided into three zones in the 1993 plan. This revision refines the zones and now features four different landscape-scale themes. Within each landscape-scale theme, special areas are identified, and special issues are addressed across the Forest. Most of the special areas and issues continue direction set in the 1993 plan. Faculty interested in the different themes will be available to help successfully implement them.

The revised plan includes an estimated schedule of timber-harvest activities. The schedule is an initial guide that will be adjusted as needed by College Forest staff as they evaluate stands for harvest.

Forest management will be consistent with the Oregon State Forest Practices rules, OSHA, federal Endangered Species Act, Oregon State Endangered Species Act, and other applicable federal and state laws and regulations and the Memorandum of Agreement between OSU and the Confederated Tribes of the Grand Ronde (Appendix 1). We have not attempted to list the requirements in those laws and regulations. Rather, we have listed “guidelines” that go beyond these requirements or provide more detailed guidance for how to achieve Forest management goals.

## Decision Process

Overall responsibility for management of McDonald-Dunn Forest lies with the OSU College of Forestry Executive Committee (FEC). Ultimate approval of the management of McDonald-Dunn Forest, including plans for that management, resides with the dean of the College of Forestry. As the designated managers, the OSU College Forest staff implement this management plan to meet the various goals and objectives listed. The College Forest director reports to the dean and FEC in carrying out the plan and is responsible for day-to-day decisions and operations. The dean and FEC may appoint committees, such as the

current Forest Advisory Committee, Forest Recreation Advisory Council, and Interdisciplinary Planning Team, on an ongoing or ad hoc basis to assist in the analysis of management issues, offer technical advice, and/or collect input from stakeholders.

Alterations of theme and special area designations can be recommended by College Forest staff in consultation with the McDonald-Dunn Forest Advisory Committee, or other committees appointed by the dean or FEC for this purpose. Decision-making responsibility for theme and area designations lies with the FEC and dean of the College of Forestry.

While an initial estimate of the harvest schedule for the decade has been included in the plan, College Forest staff are encouraged to think creatively about how to improve on the schedule to meet forest goals, including short-term and long-term financial needs, within the context of the themes assigned to areas. Operational plans will be guided by the silvicultural framework (Appendix 2). Alterations in timber harvest scheduling consistent with the assigned themes can be made by the College Forest director in consultation with the executive associate dean. Alterations in the schedule that suggest activities outside the assigned themes must be approved by the FEC and dean. A summary of alterations from initial plan

direction made during any given year will be summarized for the FAC and the FEC by the Forest director as part of the annual report on plan implementation and performance. Staff will record the change made, and justification, and document it in a publicly available file.



*Tall bugbane*

## Themes

To achieve the mission and goals for the Forest, land is allocated to one of the four themes. Each theme relates to different management characteristics and different target stand characteristics (Figure 13) and represents a different set of management objectives for Oregon forestland owners and managers. As the theme areas develop over time, they will be important in achieving teaching and outreach goals for these clients, and for providing diverse future research sites. The College Forest staff will manage the area allocated to each of these themes using forest practices appropriate to the vision inherent in the landscape theme descriptions.

**Theme #1: Short Rotation Wood Production with High Return on Investment.** Establishes and manages Douglas-fir plantations to become financially competitive with intensively managed plantations of pine and other species in the southeastern United States and elsewhere, maximizing yields of wood products valuable for domestic mills.

**Theme #2: High-quality, Growth-maximizing Timber Production.** Emphasizes long rotations of even-aged Douglas-fir dominated plantations, established, managed, and harvested on rotation cycles that optimize yield of high-quality wood, generally one to several decades longer than for Theme 1.

**Theme #3: Visually Sensitive, Even-aged Forest.** Seeks to create even-aged forests of primarily Douglas-fir using a two-storied, shelterwood system to maintain continuous tree cover with options for long-term retention of some shelter trees for non-wood forest values.

**Theme #4: Structurally Diverse Complex Forest.** Multi-aged, mixed-species forests of primarily Douglas-fir are established and managed using group-selection harvests, while maintaining structural diversity and associated habitats within stands.

These four themes relate to approaches currently being used by various Oregon forest landowners and managers. Deploying them on the McDonald-Dunn Forest affords OSU College of Forestry expanded research, teaching, and outreach education opportunities. All theme areas will be managed using best current

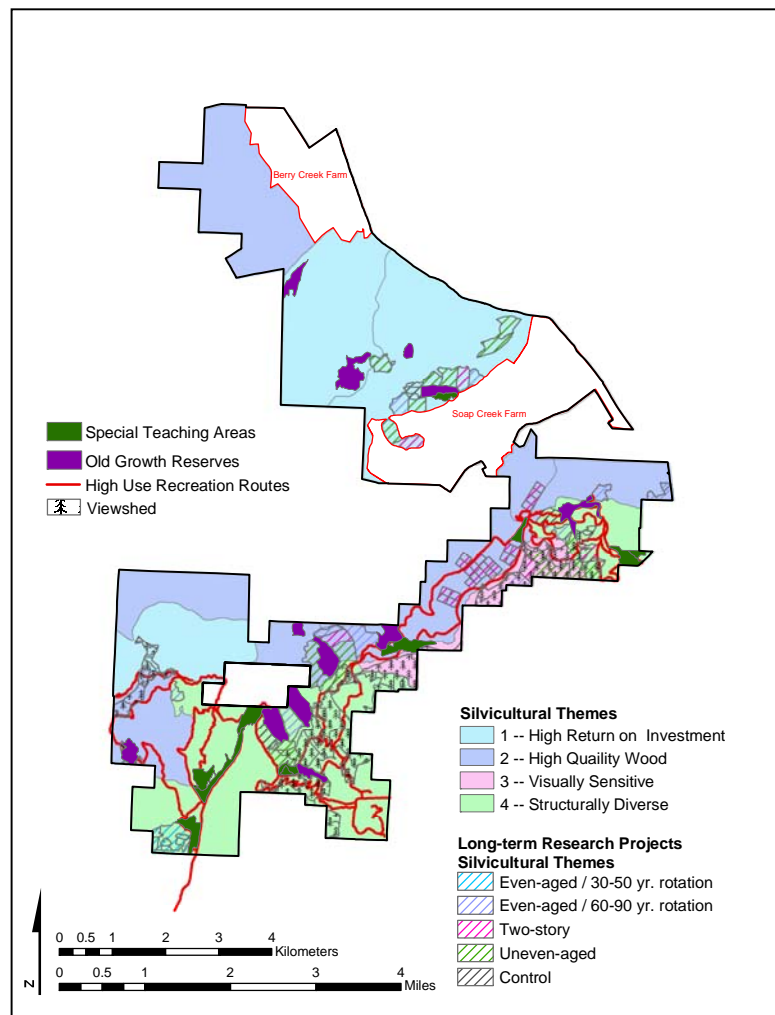


Figure 13. Land allocation

silvicultural practices consistent with meeting desired future stand conditions. These practices, ranging from tree genetics to harvesting systems will be designed as integrated management strategies for each theme area by small teams of faculty and managers. Within the context of theme goals and broad descriptions, flexibility to make site-specific silvicultural decisions is authorized if those decisions further the purpose of the theme or area.

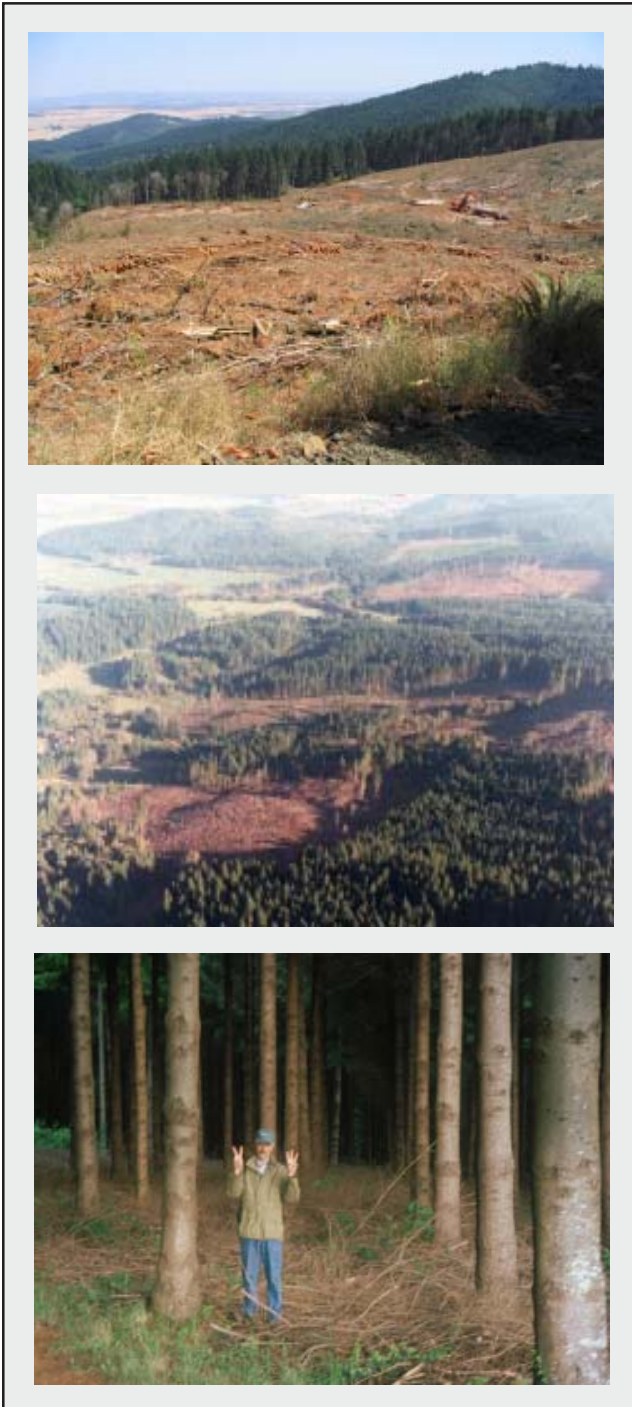
A detailed description of each theme is given below. These descriptions attempt to articulate the vision for each theme, along with a discussion of how they might be implemented. The details in the discussion are intended to increase understanding of the theme, rather than to unduly constrain field implementation. Special guidelines for each theme are given in the next section.

**Theme #1: Short Rotation Wood Production with High Return on Investment**

Theme 1 seeks to show how to establish and manage Douglas-fir plantations to be financially competitive with intensively managed forest plantations worldwide. This theme is meant to be at the leading edge of the forest industry target for western Oregon and will require more investment and management intensity than has been present on McDonald-Dunn Forest in the past.

Theme 1 is expected to produce high cubic volumes of small- to medium-sized logs under short rotations. This is a high-input, high-output, and rapid-return-on-investment strategy. High initial costs associated with intensive management practices will need to be recovered via rotations as short as feasible, likely 35-45 years. Rotation lengths will be regulated primarily by age that maximizes net revenue production. Personnel costs with this theme are expected to be lower than other themes due to larger harvest units and fewer intermediate stand treatments; however, significant personnel resources will need to be deployed during the regeneration phase to ensure that plantations get off to a fast start.

Even-aged plantations of Douglas-fir will be planted, managed, and harvested using high inputs of technology (genetics, vegetation management, fertilization, etc.), and capital. Planted seedlings will be from the best genetically selected material available for timber production. This may require the College to become a member of a local forest genetics cooperative. Regeneration will be conducted with practices and stock types designed to provide early dominance



*Theme 1 after regeneration harvest( top), landscape view (middle), 23 year-old plantation (bottom)*

of the site by planted seedlings. Vegetation management targets will be set to minimize growth loss from competing vegetation. Grasses, herbs, woody shrubs and hardwoods will be targets of removal from plantations during establishment. Damage from rodents, ungulates, or other animals will be monitored and controlled (commonly by modifying habitat or installing physical barriers) where economically justifiable. Fertilization will be done as indicated by soil or foliar tests, and justified by investment analyses. Establishment stocking rates will be at a level that will require no more than one early commercial thinning, except on steep slopes (cable yarding required), where no commercial thinning is planned.

Thinning and other intermediate stand treatments will only be done if they can be justified economically. Logs produced will be targeted for newer-generation industrial milling facilities in the area, which generally require logs that are less than 20 inches in diameter. One early commercial thinning is expected at approximately 20 years of age, followed by a final clearcut regeneration harvest. Harvest unit sizes will be constrained by site conditions, logging systems, and Oregon Forest Practices Act requirements. Logging systems will vary by tree size and terrain, but will focus on industrial style systems, which maximize efficiency. Minor acreages of other species will be maintained where the soil or other conditions favor them over Douglas-fir.

Forest practices, including such issues as “green-up” requirements, snags, downed wood, and riparian zones will follow Oregon Forest Practices Rules except for research projects that test the rules. Recreation will be allowed where it is compatible with wood production or special area designation.

### **Theme 2: High-quality, Growth-maximizing Timber Production**

This theme is meant to capitalize on Douglas-fir’s worldwide reputation for high-quality structural wood products and demonstrate the unique growth cycle attributes of Douglas-fir, which argue for longer rotations than financial markets sometimes advocate. Long rotations (60-90 years) of primarily even-aged Douglas-fir will be established, managed, and harvested to produce high board-foot volumes of wood targeted primarily for high quality structural building products. Rotation lengths will be regulated by the age that optimizes the yield of high-quality wood. Personnel costs for this theme are expected to be lower than Themes 3 & 4, but a bit higher than Theme 1 due to commercial thinning entries and smaller clearcut sizes.



*Theme 2 after regeneration harvest (top), landscape view (middle), mature forest (bottom).*

The establishment phase of Theme 2 will be similar to Theme 1, with plantations requiring high inputs of technology (genetics, vegetation management, fertilization, etc.), and capital. Initial stocking rates are expected to be higher than for Theme 1, with enough trees established to accommodate multiple commercial thins. Vegetation management targets will be similar to Theme 1 for the initial two to three years, but then will allow vegetation to recover around planted trees. Grasses, herbs, woody shrubs, and hardwoods will be initial targets of reduction in plantations. Hardwoods will be controlled where they negatively impact conifer growth during the rotation. It is anticipated that ungulates and other wildlife species will use young stands as primary food sources until crown closure. Where damage from animals justifies it, control measures will be applied.



*Theme 2 will provide logs for high quality building products*

As with Theme 1, the first commercial thinning is expected to occur around 20 years of age. Additional commercial thinning entries are expected until final harvest. The size and shape of harvest units will be varied to fit topography and minimize conflicts with non-timber uses. Logging systems employed are expected to be similar to Theme 1 for early commercial thin and final harvest. The size of harvest units will vary from no more than 20 acres on the south and central zones of the Forest to the maximum allowed by the Oregon Forest Practices Act on the north zone. Logging costs for the final harvest are expected to be lower than thinning due to larger log size and higher volumes per acre harvested. Intermediate-entry thinnings will need to be scheduled carefully to ensure that they contribute positively to financial profitability. Minor acreages of other species will be maintained where the soil or other conditions favor them. Forest practices, such as green-up requirements, snags, downed wood, and riparian zones will follow Oregon Forest Practices Rules in the north zone except for research projects that test the rules. In the central and south zones, Theme 2 includes a research project that explores costs and benefits of incremental additions of structural and species complexity to stands and landscapes.

This theme is expected to result in a heterogeneous landscape of forest stands that will provide a variety of habitats, with some vertical structure within stands. Overall, this system provides about 10%-20% of a landscape with early successional cover, and a third of the landscape in stands that qualify for some later successional features. Recreation will be allowed where it is compatible with wood production or special area designation.

Theme 1 and Theme 2 are very similar during ages up to 20 years. If, during the first two decades of growth, changed conditions indicate either strategy is not yielding desired outcomes, stands can be redirected to the other theme or otherwise modified.

### **Theme 3: Visually Sensitive, Even-aged Forest**

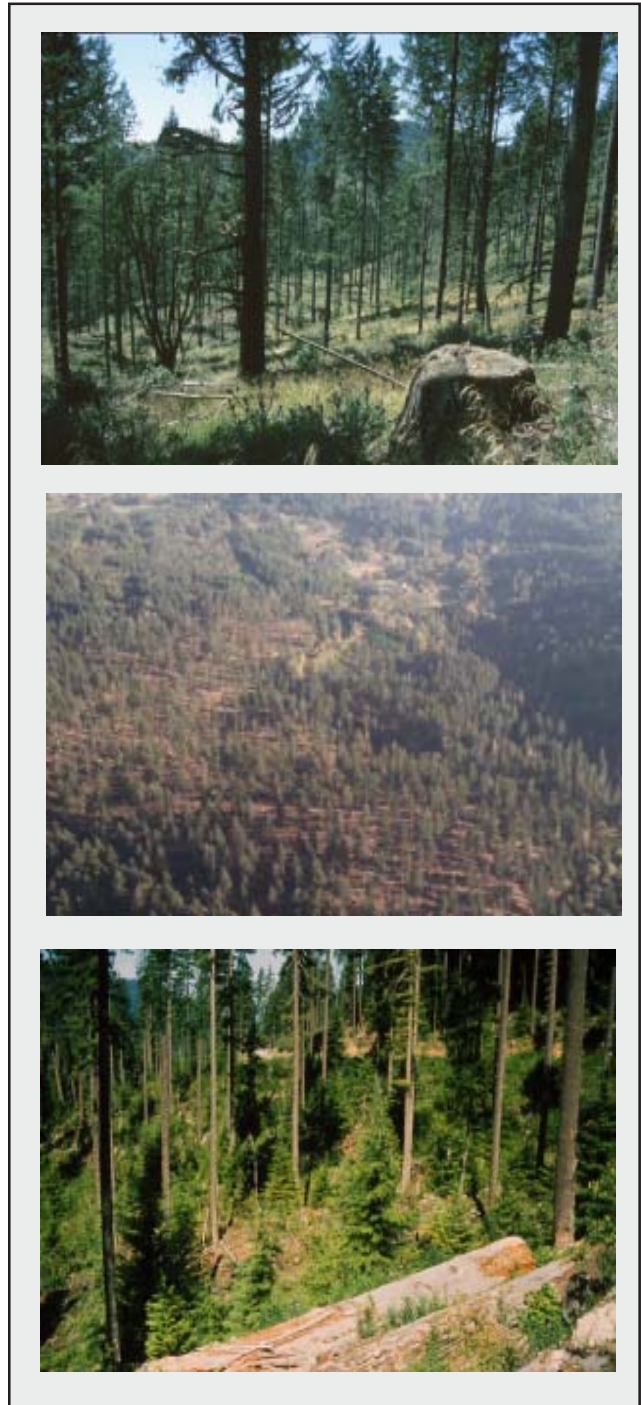
Theme 3 seeks to create even-aged forests of primarily Douglas-fir using a two-storied, shelterwood system to retain a continuous tree cover. Rotation lengths are planned for approximately 70-90 years, and will be regulated primarily by the desire to retain some tree cover until regeneration has been accomplished. The quantity of timber produced from this theme is expected to be less than that of Themes 1 and 2. The timber produced by Theme 3 is likely to be variable, high quality because of longer rotations, but lower quality where

individual trees grow in relatively open conditions for extended periods of time. Personnel costs for this theme are expected to be relatively high because of the complex regeneration phase. Overall financial yields for this theme are relatively unknown because there is little documented experience with it. It is anticipated that the establishment practices necessary for this theme will be similar to Theme 2 in terms of site preparation, planting, vegetation management, and animal damage control. Planted seedlings will grow in partial shade, which may slow their initial growth rate, and lengthen the time necessary to protect them from competing vegetation and animal damage. Another primary difference between this theme and Themes 1 and 2 will be restrictions in the use of aircraft and possibly other equipment because large trees will remain on the site until the regeneration has been successfully established. Some large trees may be retained or treated to accelerate snag development. When shelterwood trees are harvested, some seedlings will be damaged; stocking establishment rates will have to take this impact into consideration. Costs for the reforestation phase of this theme are expected to be highest of the four themes.

Intermediate stand entries are expected to be similar to Theme 2, but will be delayed to later ages because the regeneration phase will take longer. Early commercial thinning may not be possible until as late as 30 years of age, which will reduce the number of other commercial thinnings over the rotation by at least one. Regeneration harvest is anticipated to occur via a shelterwood cut designed to facilitate the establishment of planted trees, and then a removal cut, or conversion of large live trees to snags, to release the planted trees. Logging costs are expected to be higher than for other themes because of the complex regeneration harvest and lower volumes per acre anticipated. Some hardwoods will be retained as a component of conifer stands. Forest practices will follow the Oregon Forest Practice rules except where there are research projects that test the rules. Forest practices will exceed the Forest Practice rules in green tree, snag, and down wood retention. Recreation will be encouraged and a trail system maintained, providing it is compatible with silvicultural operations and special area designations.

#### **Theme 4: Structurally Diverse Complex Forest for Multiple Resource Outcomes**

Theme 4 seeks to manage for multi-aged forests at a landscape scale, composed of small patches of mostly even-aged trees, while maintaining structural diversity and associated habitats within stands. Douglas-fir will be the primary tree species, but other native tree species will be encouraged also. The age



*Theme 3 after regeneration harvest (top), landscape view(middle), before overwood removal (bottom).*

of the oldest trees in these stands will be approximately 80-120 years, and will be regulated primarily by the complexity of habitat desired for a particular stand. Personnel costs are expected to be the highest of the four themes due to multiple entries and small patch layout and management.

Regeneration will occur after small, one to four acre group-selection harvests. Minor amounts of acreage will be designated for individual tree selection with more dispersed regeneration. Growth during the regeneration phase will be significantly less than in Themes 1 and 2 primarily because of shading from large trees adjacent to group selection openings; however, stand growth overall is not expected to be reduced significantly because large trees along stand edges will grow more rapidly than average. Regeneration will be primarily via planted seedlings, but will take advantage of natural regeneration where possible. Over time, too much reliance on natural regeneration may shift these stands away from Douglas-fir and toward more shade tolerant species such as bigleaf maple and grand fir. Regeneration treatments such as site preparation, planting, post-planting vegetation management, and animal damage control will be conducted to ensure successful establishment of planted trees. These practices are expected to be more expensive than for other themes. Stocking rates will be similar to Themes 1 and 2, but may vary to meet future structural diversity objectives.

Intermediate thinning will be conducted periodically within patches to increase vertical structure and provide interim income from wood harvested. Logging is expected to be difficult and expensive due to the complexity created by a landscape of small patches and the cost of working around snags, down logs, and other structural features. Wood quality is expected to be variable, with very high-quality wood produced within older cohorts and lesser quality wood along edges of openings.

Hardwoods and other conifer species will be encouraged, planted if necessary, and retained within stands. Hardwood stands will be managed where soils favor their growth over conifers. Forest practices will exceed the Oregon Forest Practices Act in



*Theme 4 after regeneration harvest (top), landscape view(middle), multi-cohort stand (bottom).*



many areas as listed under additional guidelines, including snag and down wood retention. Habitat features are a bit unknown with this theme, but will likely provide a variety of niches due to structural complexity. Clearcut gaps will have structure much like any other clearcut, only in smaller patches. Recreation will be encouraged, and a trail system maintained, providing it is compatible with silvicultural operations and special area designations.

## Forest Zones

The 1993 McDonald-Dunn Forest Plan recognized three geographic zones (Figure 14):

- North--all forestland in Dunn Forest (4,030 acres)
- Central--south of the Dunn Forest and north of the Sulfur Springs Road (2,509 acres)
- South--all forestland south of the Sulfur Springs Road including the headwaters of Soap Creek (4,720 acres)

This plan still uses these geographic zones to describe some management features.

	Themes/Zones					
Theme	1	1	2	2	3	4
Zone	North	South	North	Central / South	Central	South
<b>Guidelines</b>						
Character trees	+	+	+	+	+	+
Raptor nests	+	+	+	+	+	+
Overstory hardwoods	FPA <sup>1</sup>	FPA	FPA	+	+	+
Viewshed	FPA	FPA	FPA	+	FPA	FPA
Maximum clearcut size	FPA	FPA	FPA	20 acres	FPA	4 acres
Min. regen harvest age	50 <sup>2</sup>	50 <sup>2</sup>	60	70	70	70

<sup>1</sup> FPA = Forest Practices Act standards

<sup>2</sup> In the long-run the minimum harvest age for plantations established under Theme 1 drops to 35-45 years if production and financial outcomes meet expectations

### Guidelines for the Themes

In addition to meeting all applicable laws and the theme visions above, College Forest staff will use the following guidelines to implement the Forest Plan:

#### Character Trees

*Character trees are unusual or unique in structure, or are rare in the context of the current or future stand conditions. They are generally larger, older trees of any species, and were often established in pre-Euro-American times. Character trees will be left as long as no more than 10 square feet of basal area per acre on a stand-by-stand basis will be allocated to living character trees. (Most stands have very few character trees.)*

#### Raptor Nests

*Raptors (birds of prey) often reuse nest sites year after year. Active roost and nest sites of raptors will be protected during harvest.*

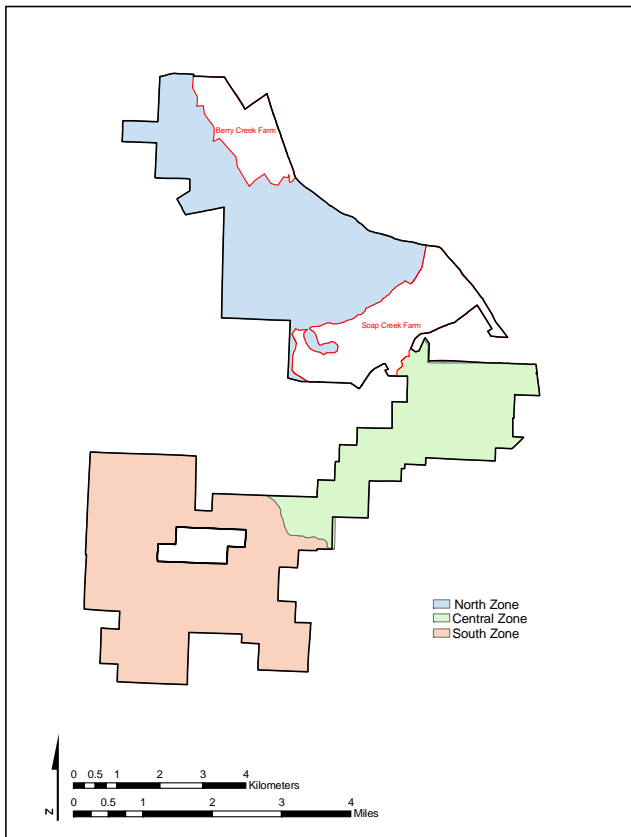


Figure 14. Forest Zones

### Overstory Hardwoods

Large hardwoods are important habitat features for invertebrates, birds, and cavity nesting small mammals like flying squirrels. Overstory hardwoods will be retained as a stand component with an average goal (and limit) of 10 square feet of basal area per acre in mixed and conifer stands.

### Viewshed

Regeneration harvest will leave sufficient overstory trees to recognize the importance of the view from Corvallis. These trees can be removed in later entries after regeneration is well established.



Douglas-fir character tree marked to leave in harvest unit



*Theme 1 looks for ways to establish and manage Douglas-fir plantations to be financially competitive with intensively managed forest plantations worldwide, like this 24-year old radiata pine plantation in New Zealand.*



*Theme 2 uses longer rotations to develop large, high-quality logs*

# Management of Special Areas and Issues

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Management of McDonald-Dunn Forest has a number of unique and special considerations, such as research and teaching areas, sensitive species, oak savannas, cultural resources, and recreation.

## Habitats of Sensitive Species

All known sites with statutorily protected species of threatened or endangered plants or animals, and species that are candidates for such listing, will be managed to protect these species. To help protect these species, we have not identified their location on maps in this report.



Fender's blue butterfly

"Butterfly Meadows" contains Fender's blue butterfly (*Icaricia icarioides fenderi*), which is listed by the federal government as endangered, and Kincaid's lupine (*Lupinus sulphureus ssp. kincaidii*), which is listed by the state and federal government as threatened. Part of the meadow is in the McDonald-Dunn Forest and part is owned by Starker Forests.

A number of locations contain tall bugbane (*Cimicifuga elata*). This species is a candidate for listing by the Oregon Department of Agriculture and is considered a "species of concern" by the USFWS. There are 17 known bugbane sites on McDonald-Dunn Forest, most of which were found during a systematic survey of what we believe is the preferred habitat for this species (moist, old forest). There are

fewer than 10 acres of bugbane sites outside of old-growth reserves (see old-growth reserves below). In 2003, a study was completed on the effects of management on tall bugbane that includes a set of management recommendations.

The McDonald-Dunn Forest area has a long history of occupancy by northern spotted owls (*Strix occidentalis caurina*) going back to at least 1965. Spotted owls in the South Zone were first documented in 1970 (Forsman, 1975). Since implementation of the 1993 plan, spotted owls have nested in four different locations in the Oak Creek basin.

Northern spotted owls are listed as a threatened species under the Endangered Species Act. That Act requires non-federal actors (such as the State) to avoid "take" of the species; federal courts have interpreted "take" as including adverse modification of habitat. Oregon Forest Practice Rules now require retention of a 70-acre core area around owl nests during nesting. The USFWS also issued draft guidelines for avoiding take of northern spotted owls, in preparation for a 4D rule, which called for retention of 40% of the area within 1.5 miles of the owl nest as nesting, roosting and foraging habitat (NRF). College Forest personnel drew a 1.5-mile radius circle around the owl nest near the center of the zone and developed a definition of NRF based on the characteristics of the forest being used by the owls. Currently,



Juvenile northern spotted owls

approximately 38% of the area within this circle qualifies as habitat—slightly less than the 40% recommended by USFWS. To complicate matters, a pair of barred owls have pushed the northern spotted owls out of several nest sites. In April, 2004, a spotted owl activity center was located near Lewisburg Saddle.

### Guidelines

*Butterfly Meadows will be managed, cooperatively with Starker Forests, to restore and maintain the diversity of native plant and animal species that are found there.*

*Management recommendations in Kaye et al. (2003) will be followed for management activities in and around populations of tall bugbane.*

*Management activities will maintain the current level of NRF in the South Zone (1585 acres).*

*Over the next year, Forest staff will develop thinning regimes that maintain NRF and the associated timber yields.*

## Old Growth Forest

In 1850, conifer forests in the Willamette Valley foothills were largely restricted to northerly facing drainages on middle and lower slopes (Juday 1976). These stands comprised a small part of the landscape; they sat in a matrix of oak savanna and prairie. Some, but not all of these conifer stands had a closed canopy. Frequent fire kept the understory open and limited tree regeneration. The fire control that followed Euro-American settlement of the Valley created a flush of successful tree regeneration both in and around these scattered conifer stands. This eventually created the continuous forest cover we see today on McDonald-Dunn Forest. It also changed the structure and developmental pathway of the old stands.

Because the developmental history of old-growth conifer forest on McDonald-Dunn is different from that of most of the Coast Range, it is difficult to develop a clear definition of what constitutes an “old-



growth” stand, other than the presence of large old trees. Approximately 350 acres have been designated as “old growth” (Figure 15) in the Forest Plan.

The purpose of old-growth management areas is to have stands with big, old trees (>160 years), to demonstrate stand and community development in the absence of management, and to conserve elements and processes of biological diversity associated with the stands.

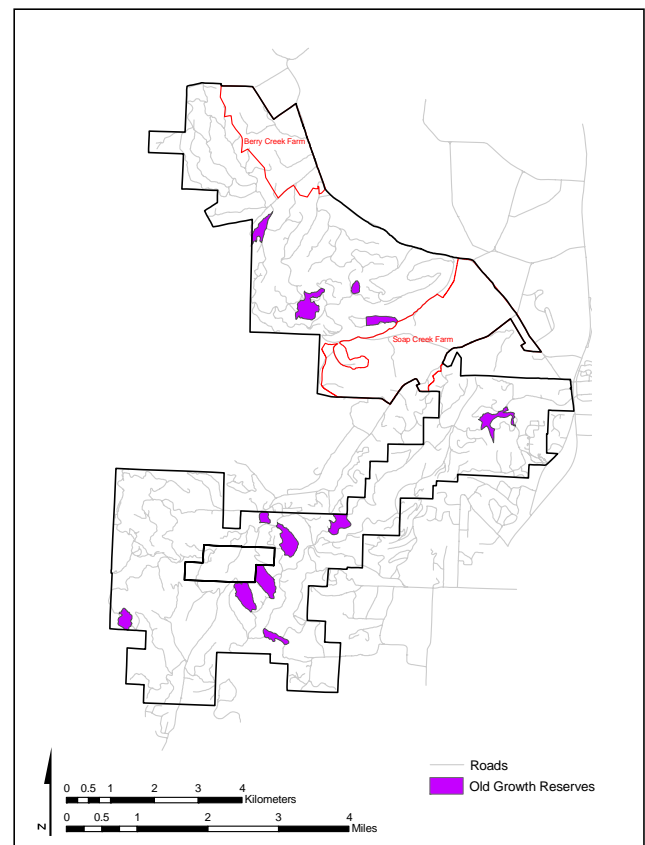


Figure 15. Old growth reserves.

## Guidelines

*Within the areas dedicated to old growth perpetuation, salvage of standing dead or downed trees (due to windthrow or other causes), artificial regeneration, and operational activities that harm old trees or change the character or function of the old growth stand are not permitted unless safety requires removal of specific trees.*

## Native Grasslands, Oak Savanna and Oak Woodland

In 1850, approximately 72% of McDonald-Dunn Forest was covered by oak savanna and prairie because of the long history of Indian burning. Today, less than 3% of these communities remain, having been replaced by closed canopy conifer forest and exotic plants. A similar trend exists for these types in the Willamette Valley, where agriculture has replaced upland prairie and logging and natural succession have eliminated much of the oak savanna. Estimates suggest that only 1% to 2% of the acres that were present in these types at the time of Euro-American settlement remain. There is currently scientific interest and public concern about oak and prairie ecosystems and there are a number of organized efforts within the Willamette Valley to identify and restore them.

McDonald-Dunn Forest has a number of remnant grasslands, as well as forested areas where Oregon white oak is still a dominant species. Prime examples exist at Carson Prairie, Forest Peak, Jackson Place,

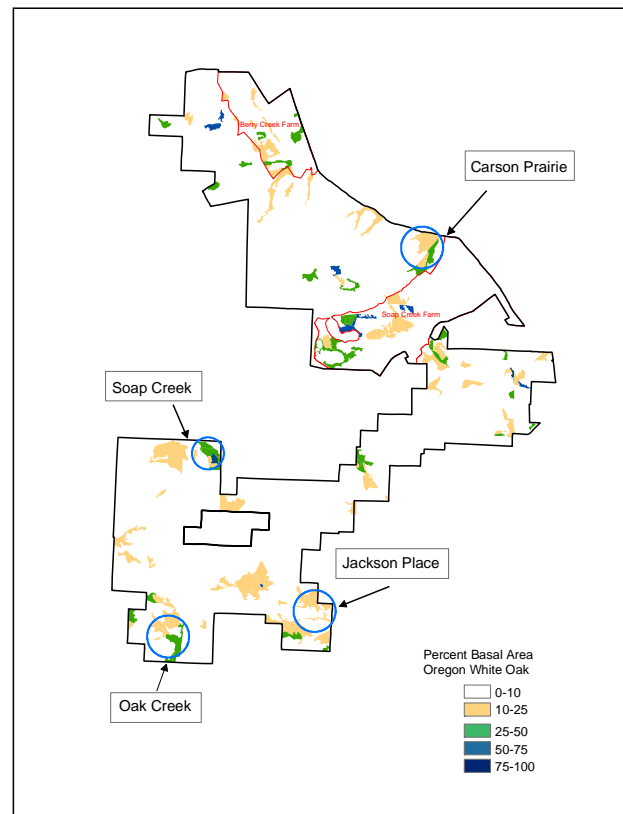


Figure 16. Restoration areas with remnant oak savanna and oak woodland

Oak Creek, and north of Sulfur Springs (Figure 16). Some of these sites are not very suitable for Douglas-fir because of soil conditions. Without the indigenous burning that created and maintained these conditions or other management actions, these sites will continue to be invaded by noxious weeds (false-brome, exotic blackberries), and the areas suitable to Douglas-fir will naturally convert to conifer forests. Historically, most of these sites were not managed for their grassland, savanna, or oak woodland values.

## Guidelines

*Establish a native grassland, oak savanna, and oak woodland working group that will work with College Forest staff and other groups with similar interests to develop a prairie, savanna and oak restoration and conservation strategy (Appendix 3) by January 1, 2006.*

*Implement at least one restoration project every two years for the highest priority restoration/management area and feature its teaching, research, and demonstration opportunities.*



*Deltoid balsamroot*

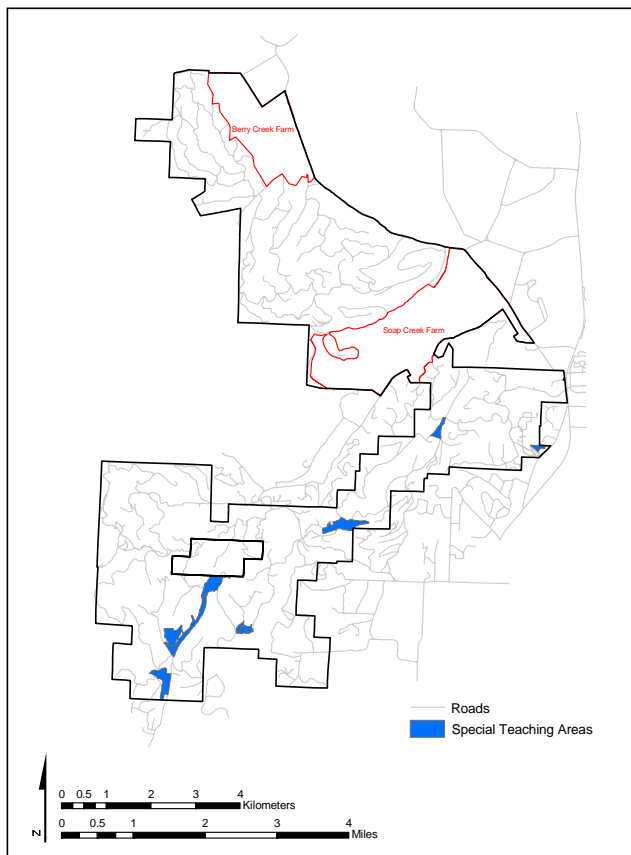


*Butterfly Meadows hosts Fender's blue butterfly and Kincaid's lupine*

*Identify sources of funding to cover costs and ongoing maintenance of restoration project areas. Sources may include College Forest revenues and grants.*

## Dedicated Teaching Areas

Some teaching areas require special management attention to retain their educational value. These areas are heavily used by OSU and community



*Figure 17. Areas dedicated to teaching.*

college classes for teaching forest, prairie, and aquatic ecology. They contain a variety of special features in proximity that illustrate historical or ecological processes (Figure 17).

Other dedicated teaching areas may not require special effort for development or maintenance, but they may require restricted management operations, depending on the particular features of the area.

### Guidelines

*Dedicated teaching areas must have the approval of the Forest Executive Committee. Teaching area plans must be filed with the Forest Director and be clear about the intent, land areas used, methods, restrictions on other land uses on the teaching site, and duration of the use. Area dedication may be rescinded when the Director has had no information on current use for five years.*

*These areas will be managed or conserved in accordance with their teaching purposes.*

## Long-term Research Projects

Long-term research projects generally last more than a decade. Six such projects currently exist on the College Forest (Figure 18): College of Forestry Integrated Research Project (CFIRP) (847 acres); Stand Density Regulation and Understory Regeneration Study (139 acres); Stand Density Management Cooperative (60 acres); Urban Fringe (55 acres); Forest Peak Uneven-aged (25 acres); and Douglas-fir Genetics (37 acres). In addition, there are a number of small long-term projects, such as the "post farm," mostly near the Forest Office.

### Guidelines

*Formal research plans for existing long-term research projects must be approved by the College of Forestry Executive Committee and be on file with the Forest Director by January 1, 2006.*

*Proposed long-term research projects will be consistent with the theme of the area in which the research will occur and be clear about the intent, land areas used,*

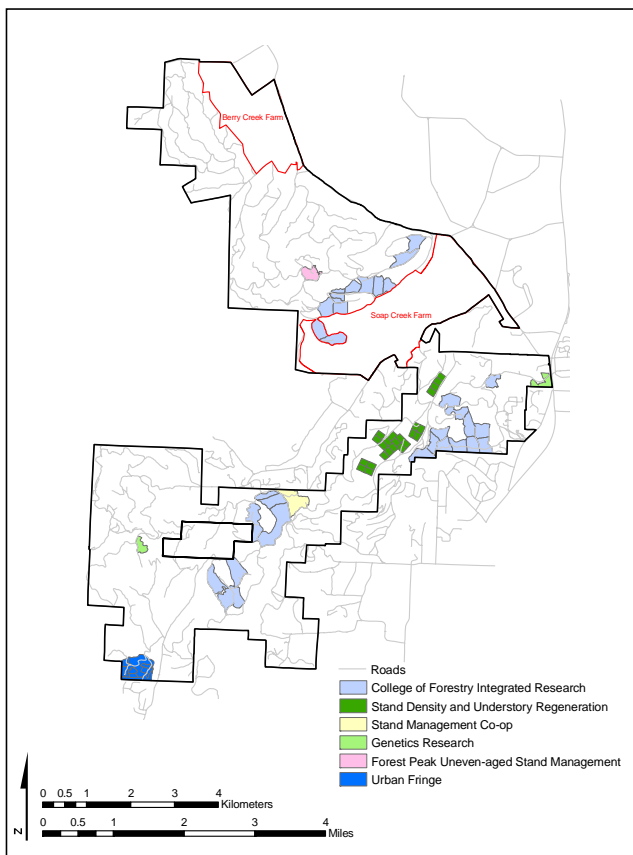


Figure 18. Long-term research project areas.

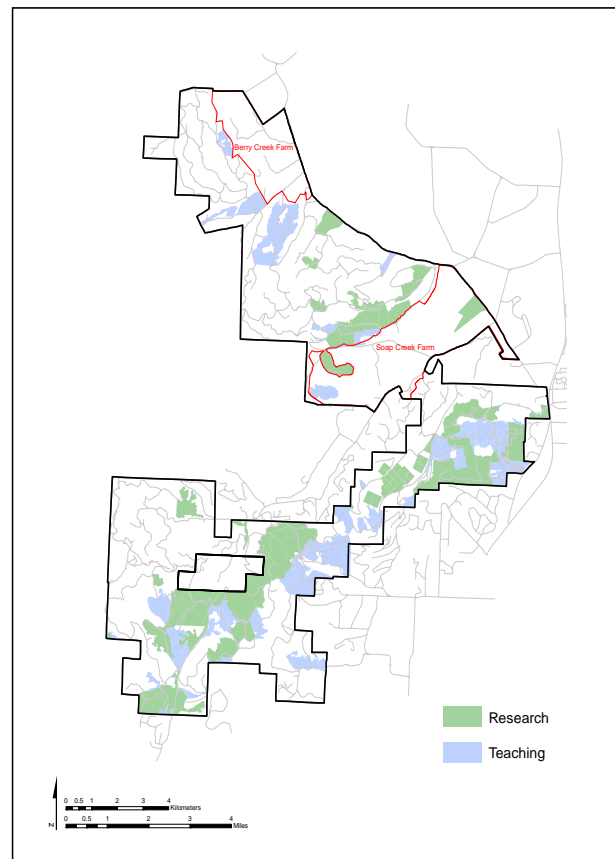


Figure 19. All current teaching, research and demonstration areas

*methods, restrictions on other land uses on the research site, budget, and duration of the project.*

*Activities are directed toward the objectives of the research projects and are generally initiated at the request of the researchers. The Principal Investigator named in the research plan guides management treatments and data collection.*

## Research, Teaching, and Demonstration Projects across the Forest

Many stands, meadows, and streamside areas are used for teaching, research, and demonstration (Figure 19) in addition to the teaching and research areas named above under “Special Areas.” A database covering all of those areas that have been reported to the College Forest is on file at the College Forests Field Office. While teachers and researchers are welcome to use other areas of the Forest for teaching, research or demonstration, forest management will proceed consistent with the zone theme

without special restrictions.

### Guidelines

*Before treating stands identified as having research, teaching or demonstration interest, researchers or educators interested in these stands (as named in the research, teaching, demonstration database) will be contacted.*



Meadow restoration research fire



## Snags and Down Wood

*A research program on snags and down wood will be developed to document and demonstrate the ecological, economic and operational implications of varying levels and distributions of snag and down wood retention in harvest units, ranging from Oregon Forest Practices Act standards, to higher levels of abundance and distribution. The research proposal for the research program will be ready for implementation by July 1, 2006 (Appendix 4).*

## Riparian Areas

*A research program on riparian forests in the Central and South Zones will be developed to document and demonstrate the ecological, economic, and operational implications of different riparian management practices in harvest units. The research proposal for the research program will be ready for implementation by July 1, 2006 (Appendix 5).*

## Oak Creek Watershed

The Oak Creek watershed in the south zone of the forest will be featured for watershed teaching and research uses, as part of a larger Oak Creek watershed management area that may include downstream landowners and the Corvallis community.

## Identification and Management of Sensitive Species

The forest staff have developed an overall list of “sensitive species” that are known to occur on the McDonald-Dunn Forest and listed their status, based on the Oregon Natural Heritage Information Center (Appendix 6).

### **Guidelines**

*Forest staff will maintain a list of sensitive species and their status. Faculty and/or other knowledgeable biologists will assist the forest staff to propose management guidance for sensitive species by July 1, 2006.*



*False-brome in the forest understory*

*The Forestry Executive Committee will approve the species list and provide direction on management practices for sensitive species that will be used during plan implementation in areas known to be occupied by sensitive species.*

## Landscape Level Diversity

Goal 1 will benefit from having representative examples of major vegetation types, conditions, and seral stages that occur in valley foothill forests.

### **Guidelines**

*Unique forest cover types, conditions, and seral stages will be maintained on the forest during the plan period.*

- *Unique conifer cover types include the area in upper Soap Creek where western hemlock is naturally regenerating under a stand of mature mixed hemlock and Douglas-fir.*
- *Unique hardwood cover types include oak savanna and woodlands, oak/ash swales, and madrone dominated stands.*

Abundance and distribution of forest types, conditions, and seral stages will be identified from stand and landscape scale inventories and locations summarized through periodic updates to forest maps and databases.

## Invasive Plants

Non-native plants are now common on many sites on McDonald-Dunn Forest. False-brome, Himalaya blackberry, Scotch broom, English holly, thistles and other species abound where native plants once grew. Given current distributions and continuing sources of new exotic plant entries, it will be impossible to grow only native species on College forests.



### Guidelines

*College Forest staff will develop strategies and annual action plans for reducing the spread of non-native invasive species into, within, and out of the forest, and favor the growth of native species where possible in management activities. As an example, the staff has developed a false-brome management plan that is in Appendix 7.*

*A roadside weed control program will be an important component of invasive plant management.*

*Where possible, invasive species management actions will link to scheduling of forest management activities to minimize costs.*

## Recreational Use

Recreational use of the 7,000-acre McDonald Forest has been increasing annually--to an estimated 150,000 visits in 2004. The pressures upon McDonald Forest to serve the recreational needs of a growing Corvallis community are expected to continue increasing. Recreational activities at times conflict with research, education, and timber management on the Forest. A 1996 survey found that 48% of the 46 researchers and teachers who re-

sponded had experienced vandalism from recreationists (Torres et al., 1996). It should also be noted, however, that recreation visitors represent a great opportunity to educate people about forest management, which links directly with our highest priority management goal.

The Forest Recreation Advisory Council (FRAC) will advise Forest Staff and FEC to help realize our goal of providing safe, quality recreation opportunities, compatible with Forest characteristics and other goals.

During the plan period the forest recreation program will proceed toward cost recovery through an aggressive donation program for five years (until 2010). If enough revenue cannot be raised through donations, a user fee system will be considered. Funds will be directed at keeping the existing recreational facilities and trail system safe and adequately maintained according to users needs before other trails or facilities are added to the system.

### Guidelines

*Our investment in recreation trails and other facilities is an investment leading to opportunities for public education. This idea carries with it a commitment to make each trailhead and trail an educational opportunity, such that information is available along trails and entry points leading to a better understanding of what goes on in managed forests.*

*Trail management will focus on providing safe recreation that protects natural and cultural resources and is consistent with the College Forests' mission, goals, and themes. If a trail cannot be maintained with these considerations explore changing the use designation, rerouting or closing the trail.*

*Trail displacement will be considered in harvest planning to avoid costly trail repairs and to protect the integrity of the trail system.*

*Large group recreational events (20+ participants) will be allowed to occur on the Forests if*

- *the event does not conflict with the forest mission, goals, themes, and recreational guidelines*

- *the safety of recreationists and liability are adequately addressed*
- *the event won't monopolize use or preclude other recreational or forest management uses*
- *the event will monetarily compensate the Forest for use of facilities at a level determined by the recreation manager, forest director, and the College Forests business manager*

*Requests for large group events must be submitted to the Recreation manager six months in advance for proper evaluation and approval.*

## Visual Resource Management

Visual resource management on the Forest is intended to maintain a visual backdrop for the City of Corvallis and to take into consideration the concerns of neighbors. The Forest Plan is sensitive to visual concerns in locating the zones for the major landscape themes, designing silvicultural systems for each zone, and developing procedures for communi-

cating with neighbors. Harvest activities adjacent to residential areas will be designed consistent with the zone theme.

A full range of harvest types will be visible to College Forest visitors.

## Cultural Resources

Management of cultural resources on the College Forest is guided by five state laws, a county ordinance, and a federal law that applies when federal funds are used in an activity. Management of American Indian sites and artifacts is coordinated with the Confederated Tribes of Grand Ronde and the Confederated Tribes of Siletz. Management efforts will continue as long as the forest plan is in effect. In 2003, a Memorandum of Agreement (MOA) between the Confederated Tribes of the Grand Ronde and the College of Forestry was signed (Appendix 1). This MOA will help direct cultural resource management activities on the forest. An MOA between the Confederated Tribes of the Siletz and the College of Forestry is in process.

A protocol for cultural resource protection can be found in Appendix 8.

### Guidelines

*The academic support manager will work with the Tribes annually, to facilitate learning, training, and interpretation activities for Native American history and cultural resource sites on the forest. These activities will be organized for Tribal members, students, and other learner groups.*

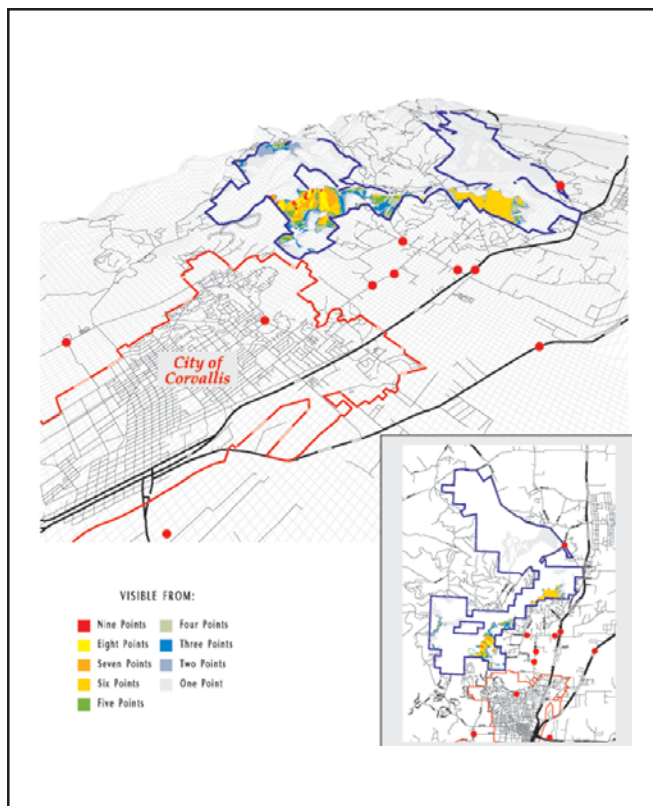


Figure 20. An analysis of areas on the McDonald-Dunn Forest that can be seen by the city of Corvallis.



*Kalapuyan hunter (Wilkes, 1845)*

# Management Emphases, Inventory, Harvest and Growth

The management emphases shown in Figure 13 reflect the management themes, special areas and special issues for management on the Forest. The distribution of forested acres among themes, reserves, and research areas is shown in Figure 21. The division of current long-term research areas among the reserved category and the four themes is approximately as follows: Reserved (controls): 85 acres, Theme 1: 0 acres, Theme 2: 346 acres, Theme 3: 271 acres, Theme 4: 491 acres.

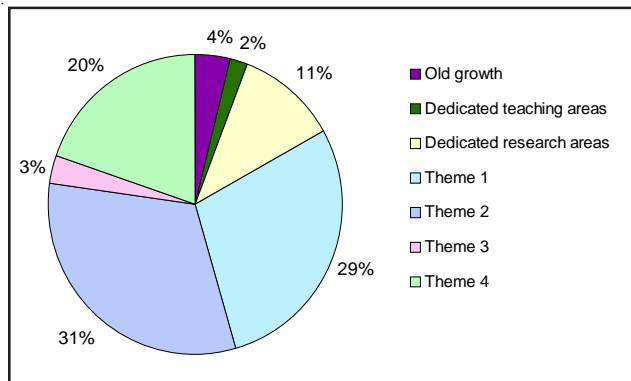


Figure 21. Forested acres by silvicultural strategy under the plan.

board feet/year for the first decade rising to approximately 8 million board feet/year as growth and inventory improve over time.

The increase in projected harvest from 4.1 to 6.0 million board feet is due to five factors in the revised plan: 1. We count the periodic harvest from long-term research projects in the harvest calculation; in the previous analysis, it was not counted. 2. We assume medium or high management intensity investment for future stands consistent with current and proposed management; in the last analysis, we assumed low management intensity for future stands consistent with the previous management on the forest. 3. We have corrected a problem in the last analysis that resulted in an underestimate of standing volume. 4. We reduced the minimum future rotation age throughout the forest consistent with changes in private land management. 5. We allocated the Soap Creek portion of the South Zone to wood production with a high return on investment; previously, it had been allocated to a long-rotation strategy.

## Timber Harvest Schedule

A harvest scheduling analysis (Figure 22) was undertaken for the College Forest that considered the management themes, special areas, and special issues for management. The harvest schedule in the last plan called for an annual harvest of 4.4 MMBF/year in the first decade rising to between 6 and 7 MMBF/year in the long term. This level was then reduced to 4.1 MMBF/year after removal of the College of Agricultural Science's lands. The average volume harvested over the last decade approximated that level, although the harvest varied considerably from year to year (Figure 23).

Analysis done for the current plan suggests a sustainable harvest level of approximately 6 million

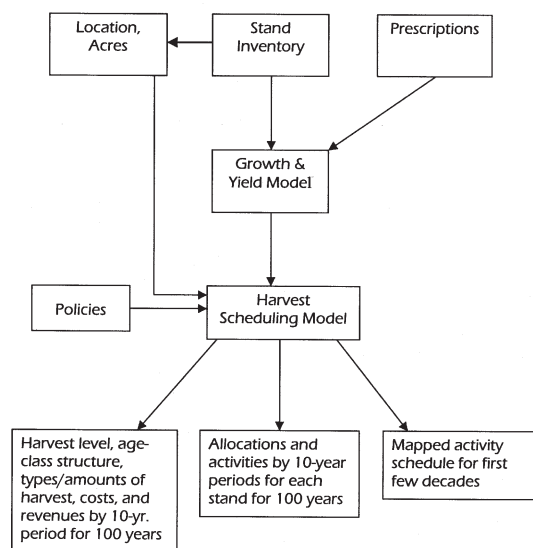


Figure 22. Harvest scheduling analysis process.

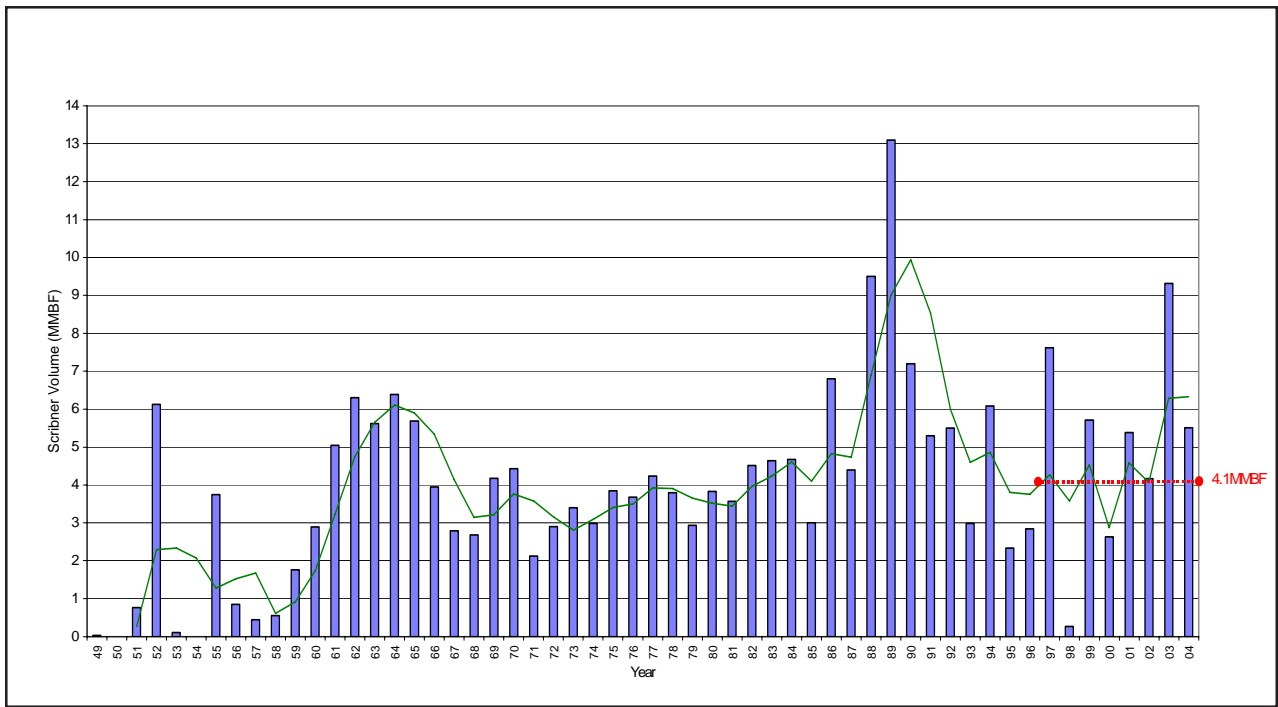


Figure 23. Volume harvested from McDonald Dunn Research Forests from 1949-2004 in Scribner volume (MMBF) with a 3-year moving trend line shown in green and the desired harvest level from the 1993 Forest Plan (after removal of the College of Agricultural Science lands) shown in red.

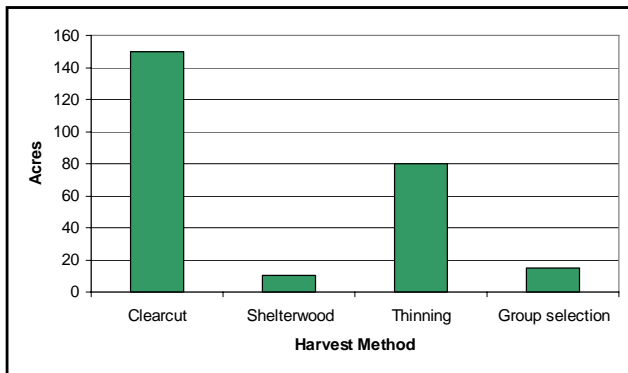


Figure 24. Acres harvested annually in the first decade for the new plan.

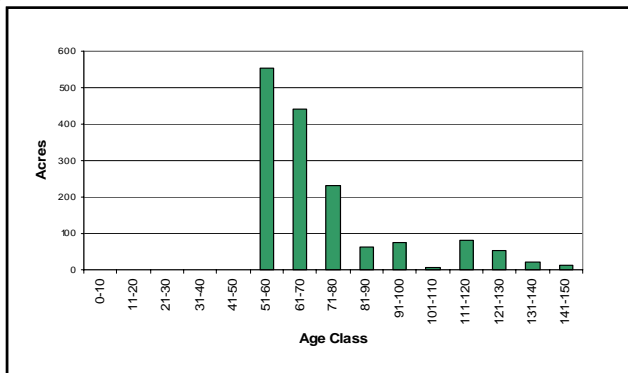


Figure 25. Acres of regeneration harvest by age class during the first decade.

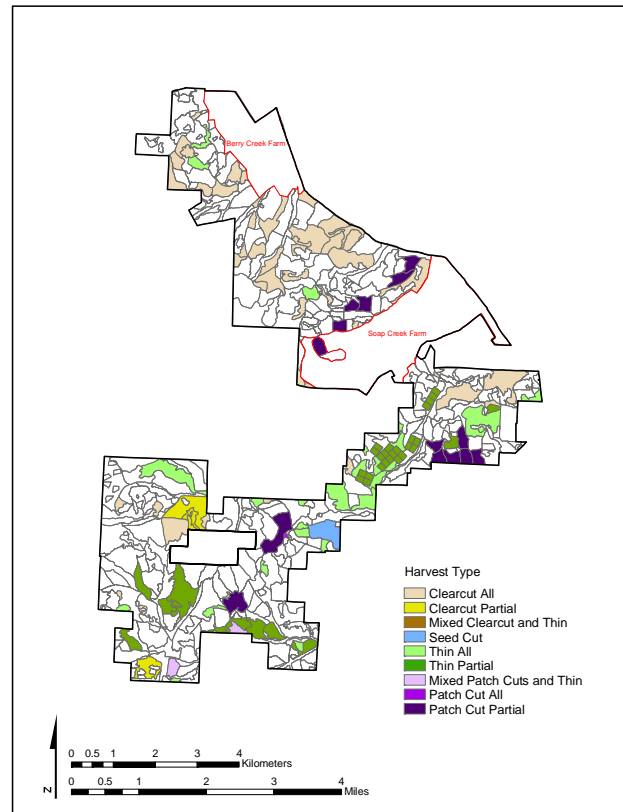


Figure 26. Tentative harvest schedule for the first decade.

## Guidelines

*The timber harvest level for the College Forest for the first decade will average 6.0 million board feet/year. Given this average annual harvest, timber harvest in any year within the decade may be above or below that level to respond to markets and other factors.*

The harvest methods in the first decade under the revised Forest Plan and approximate acres to harvest are shown in Figure 24. Most regeneration harvest will come from stands 50--70 years old (Figure 25). The harvest acres are derived from the tentative harvest schedule that is shown in Figure 26. This schedule will be used together with on-the-ground experience and reconnaissance work to identify sale areas.

## Future Forest Condition: Growth and Yield

Sustainability of Forest conditions and harvest levels was assessed through examining the projected age-class distribution of forested acres (Figure 27) and the projected inventory-harvest-growth relationship (Figure 28).

The age-class distribution remains fairly stable over time with most acres less than 70 years of age but with a scattering of acres out to 200 years. Average age of the Forest under the revised plan increases slightly from 55 years now to 56 years in a decade. If

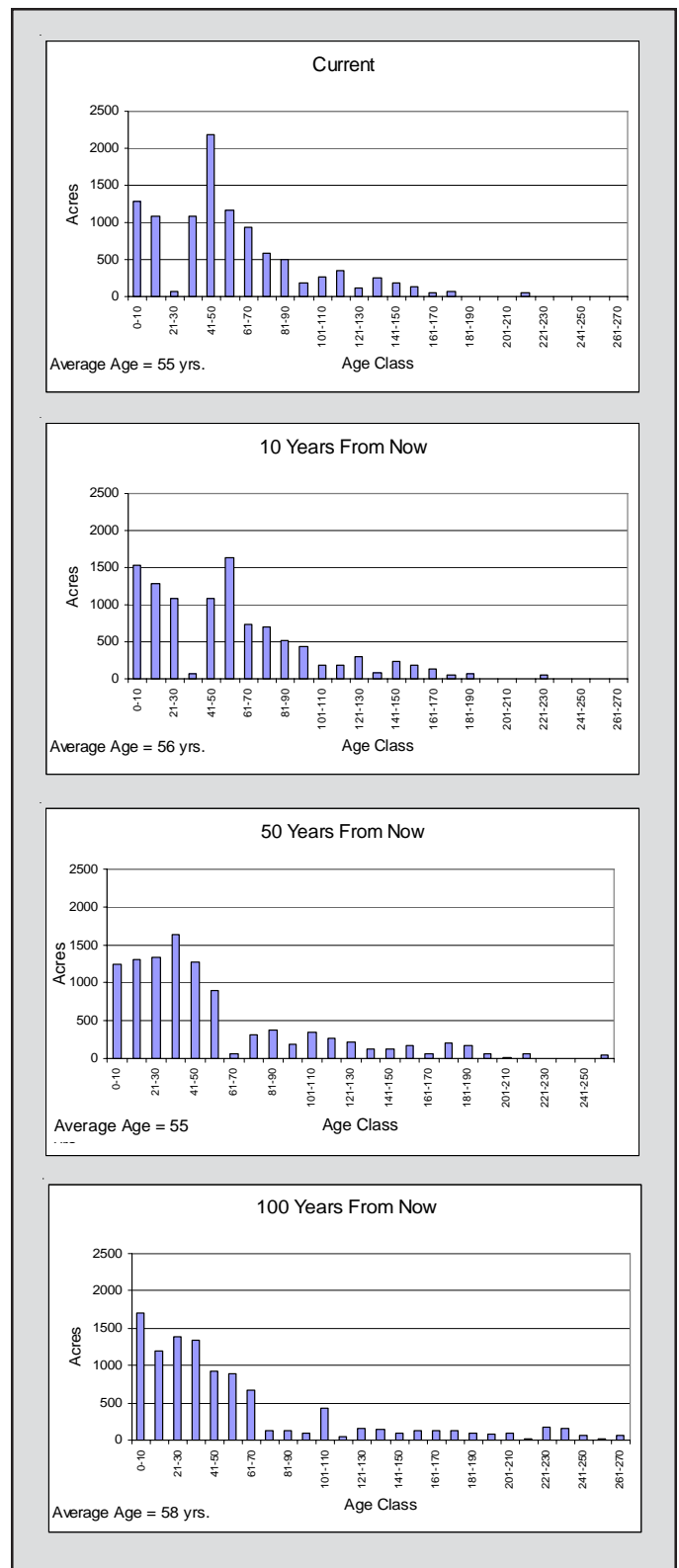


Figure 27. Projected age class distribution over time.

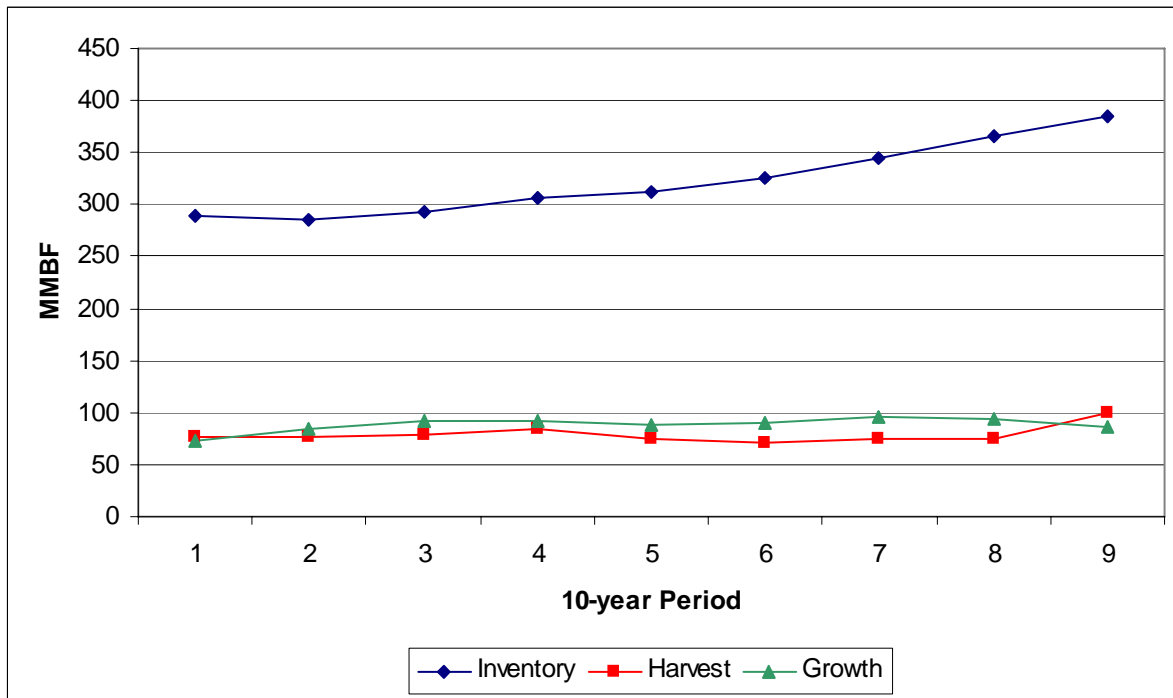


Figure 28. Projected inventory, harvest, and growth.



Fallers on clearcut harvest unit in the North Zone



this plan were to be carried out for 100 years, the average age at that time would be approximately 58 years, barring any major catastrophes (wind, wild-fire).

Harvest and growth are approximately equal for a few decades and then growth begins to exceed harvest and inventory begins to increase. Approximately 8% of the growth comes from reserved stands over the first few decades, decreasing to 5% of growth in the long run.



*Student logging crew yarding patch cuts in South Zone*

# Plan Implementation

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## Communication

Communication with the public is an important part of being a good neighbor, as well as fostering and coordinating teaching and research among university faculty. Communication has four major purposes: sharing information, interpreting and revising the forest plan, explaining and improving the annual operations plan, and gaining feedback from people affected by the forest plan and its implementation. Techniques to accomplish this will include tours, use of the press and radio, newsletters, mailings to neighbors, trailhead signboards, interpretive displays, handouts, College Forest phone information recordings, establishment of neighborhood email listserves, the College Forest web page ([www.cof.orst.edu/resfor](http://www.cof.orst.edu/resfor)), and meetings.

### Guidelines

*The public will be informed on a continuing basis about allowable recreation and safety concerns on the Forest.*

*The public will be informed annually about planned operational activities on the Forest.*

*Neighbors in the vicinity of proposed harvest activities will be informed before actions take place adjacent to their property.*

## Plan Review and Revision

We expect the Forest Plan to change over time in response to monitoring and changes in internal and external forces. The continuous improvement goal and desire to implement adaptive management will ensure this occurs.

Periodic review of operational performance is an essential part of any plan implementation. It is anticipated that performance under this plan will be

summarized annually by the Forest Director and staff for the FEC, FAC, and other stakeholders, using indicators appropriate to the goals and objectives in the forest plan. The report will include performance during the evaluation period, problems encountered, exceptions to the guidelines, and a plan for the upcoming year that identifies adaptive management actions (to meet management goal #7). This summary may take multiple forms, such as a meeting, tour and/or website posting.

Outside review is a concept well accepted within academia, and is becoming common for forestry organizations via forest certification. Performance under the Forest Plan will be assessed by an independent review team of the FEC's choosing once every five years, using indicators appropriate to the goals and objectives in the forest plan.



*Coastal woodfern*

## Adaptive Management/Continuous Improvement

The following goals, objectives, and sustainability indicators will be used to develop, implement, and evaluate the revised McDonald-Dunn Forest Plan and to drive the adaptive management process. Qualitative and/or quantitative sustainability indicators are listed by objective for annual, decadal, and sometimes longer time frames. These indicators are stated as outcomes or targets, and define what we intend to sustain on the McDonald-Dunn College Forest. It is anticipated that individual indicators may change during the plan period. The FEC will decide by July 1, 2006 which indicators to use for a given evaluation period and the specific level of indicator desired as a target.

Two or more objectives are listed under each goal to provide more definition and understanding of what the goal means and how to tell whether it is being achieved. A number of potential indicators are listed under each objective. They describe what would be measured if the indicator is selected to assess whether the plan is meeting the objective under which they are listed. Four desirable characteristics of indicators are as follows: they relate to the objective; their performance can be measured; measurement can occur at reasonable cost; and information gathered about the indicator will help direct change when change is needed.

Our adaptive management plan outlines how each of these indicators would be measured if selected for use, how often measurement would occur, and the metric that would be used to gauge performance. We have included here a brief statement about the measurement technique and frequency of measurement after each indicator. Metrics for gauging performance are not covered here but will generally be one of three types: (1) trend such as whether class use is increasing or decreasing (requires baseline measurement), (2) comparison to demand for feature such as demand for particular types of forest structures, and (3) absolute standard such as a water quality standard.

Evaluation of performance using the plan indicators will only be possible if monitoring, recordkeeping, and inventory are funded and accomplished in a timely manner. The College Forest director and staff will be a critical part of providing this information and implementing the results of the learning process.

## Performance and Sustainability Indicators (Preliminary List)

### **Goal 1. Learning, Discovery, Engagement**

*Provide diverse opportunities for learning, discovery, and dissemination of new knowledge and technologies related to forest ecosystems, forest management, and forest products/services for forest managers/owners, scientists, teachers, students and the general public.*

### **Objectives**

Provide a diverse array of high quality outdoor learning opportunities for students from the CoF, OSU, and other institutions of higher education.

1. College Forest sites used by college and university students and classes. *(Survey of usage trends compiled each year)*
2. Type and number of requests for access to teaching sites and tours of forest operations along with how they were accommodated, as well as reasons for those that could not be accommodated. *(Teaching Requests Database summarized annually)*
3. Educational needs identified by College Forest Advisory Committee, College Forest staff, faculty, and from other sources, along with how they were accommodated. *(Needs surveys conducted every year/*

*record of accommodation along with reasons for any that could not be accommodated)*

4. Important teaching sites that are identified and managed according to written plans. *(Existence of and progress on plans audited every 5 years)*

Contribute to the creation of new knowledge and technologies.

1. Active research sites on College Forests that are clearly identified and protected. *(Vandalism report compiled from the annual research survey/summary of protection measures)*
2. Researchers' requests for establishment of new research and demonstration projects and how they are accommodated. *(Annual report on progress)*
3. Whether research and demonstration projects on College Forest properties have written plans on file. *(Research Database)*
4. Research projects on College Forests cited in academic and trade publications. *(Number of citations compiled on an annual basis from the annual research survey; archived in the Research Database)*
5. College Forests operations, research and demonstration plots featured in outreach events and tours being conducted by OSU and others. *(Annual report of operations includes list of tours and events)*
6. Visits of forestry professionals and others to operations and research sites on College Forests. *(Annual report of operations includes number of participants of different categories)*
7. Research needs identified by College Forest Advisory Committee, College Forest staff, faculty, and from other sources and how they are accommodated. *(Needs surveys conducted every year/written response with requests along with reasons for any that could not be accommodated)*
8. Demonstration needs identified by College Forest Advisory Committee, College Forest staff, faculty, and from other sources and how they are accommodated. *(Needs surveys conducted every year/written response with requests along with reasons for any denials)*

Provide neighboring communities with a source of high-quality forest learning opportunities for a variety of audiences including neighbors, youth, recreational users, civic groups, and other visitors.

1. Requests for public tours, including K-12 school groups and how they are accommodated. *(Annual report)*
2. Gain in knowledge by participants in programs on the College Forests regarding forests, forest management and the impact of College Forests on OSU and surrounding communities. *(Survey of selected individual events annually)*
3. Knowledge gained by College Forest visitors from informational kiosks *(Survey of visitors)*

Include potentially attractive examples of different strategies and practices for managed forests in the region.

1. Representative examples of strategies and practices implemented for each of the four major themes. *(Annual report of operations summarizes performance in implementing the plan.)*
2. Whether regional forest managers perceive College Forests as leaders in the development and application of innovative forest management practices. *(Survey completed once every two years)*



*Student forest inventory employee*

3. Whether policy mechanisms appropriate for enhancing sustainable forest management are explored, evaluated, and demonstrated on College Forests. (*Annual report; five-year audit evaluation of strategies implemented and shared*)

## **Goal 2. Net Revenue**

*Optimize net revenue from College Forests operations to support education, research, and outreach missions of the College.*

### **Objectives**

Manage and harvest forest growth sustainably through time in conformance with themes and goals for particular forest management areas.

1. Relation of actual harvest to decadal harvest scheduling targets met for each theme. (*Annual report on harvest type (acres and volume) by theme*)
2. Relation of growth and yield measured through inventory to decadal and long-term expectations. (*Annual cutout report compared with inventory estimates/actual growth compared to simulated growth on a decadal basis*)
3. Progress in rehabilitation of poorly stocked or greatly underperforming stands. (*Acres of poorly stocked and/or greatly underperforming stands evaluated as part of ongoing inventory/ Investments in rehabilitating stands*)

Manage the College Forest efficiently.

1. Net annual revenue to the College of Forestry from College Forests operations meets expectations. (*Annual report*)
2. Cost effectiveness of College Forest operations. (*Annual revenue/cost report, and comparison to costs of other similar organizations*)
3. Options explored to reduce operations costs. (*Actions taken by staff to ensure costs for road building, harvesting, monitoring and other activities meet goals and minimize costs*)
4. Options explored for enhancing revenues from marketing forest products, communications site leases, recreation user fees, carbon credit markets, conservation easements, etc.
5. Discounted cash flow value of College Forests (*Annual analysis*)

## **Goal 3. Natural Heritage and Forest Ecosystem Services**

*Sustain forest ecosystem services generally associated with forest environments and ecological diversity commensurate with land capabilities, to meet legal requirements and to capture opportunities to test policy-relevant management options or to feature distinct resource values of the forest.*

### **Objectives**

Meet or exceed state, federal, or other laws, except where research requires deviation from laws and rules, and exemption is obtained from the appropriate regulatory agencies.

1. Success in operational practices meeting or exceeding OR FPA regulations except where research projects dictate testing an alternative approach. (*# of citations/warnings from ODF Forest Practices Foresters*)
2. College Forest participation in the Oregon Plan for Salmon and Watersheds. (*Annual report*)
3. Success in plans and practices complying with regulations for at-risk and federally listed species.

Sustain, and restore if necessary, known examples of natural heritage resources.

1. Natural heritage sites registered by the Oregon Natural Heritage Program that are identified and maintained. (*Database*)

Learn how to track carbon balance and demonstrate to others

1. Estimates of carbon balance completed for each land allocation and management unit. (*Five year report*)

Sustain or restore native plant and animal species, fish and wildlife habitats, and ecosystem diversity commensurate with overall themes or purposes for each area of the forest.

1. Protection of candidate plant and animal species (*Protection level compared to plan guidelines*)
2. Distribution of species, size, and structural forest characteristics. (*Inventory measurement--sufficient to maintain stand level; map compared to plan guidelines*)
3. Distribution, quality, and characteristics of standing and fallen deadwood. (*Forest-wide inventory of snags and down wood every 10 years related to plan guidelines*)
4. Distribution, quantity, and characteristics of legacy structures and character trees. (*Leave tree database by harvest unit compared to plan guidelines*)
5. Distribution, quantity and characteristics of wetlands, meadows, oak savannas, and/or other sites of exceptional conservation value identified, restored and sustained. (*Biannual report of restoration successes and failures*)
6. Control of the disrupter species (e.g., false-brome, Himalaya blackberry, elk). (*Survey of key disrupter species every decade*)
7. Damage to the water resource or riparian habitat by management activities. (*Stream surveys every 10 years*)



Botany researcher measuring plots in Carson Prairie

#### Goal 4. Cultural Heritage Sites

*Identify, protect, and perpetuate the cultural heritage resident on College Forests.*

#### Objectives

Protect cultural heritage sites during forest operations

1. Success in identifying cultural resources prior to ground-disturbing activities sufficient to identify cultural resources. (*Annual report on surveys and success in finding cultural resources before disturbance; predictive modeling success*)
2. Success in avoiding damage to identified cultural heritage sites. (*Annual report on success in avoiding damage of known sites*)
3. Success in avoiding damage to cultural heritage sites (overall--known and unknown). (*Annual report on any site damage along with steps taken to avoid damage in future*)

Maintain relations between the College, and the recognized indigenous Tribes of Oregon that are based on trust and mutual respect.

1. Engagement of the appropriate tribes' cultural resources staff in early stages of revisions to College Forest management plans to obtain tribal input to the formulation of goals and objectives for cultural resources.

2. Development of Memoranda of Understanding (MOU) with appropriate tribes. MOUs that cover collaborative activities between the tribes and College in protecting and enhancing tribal cultural sites on College forests.
3. Implementation of the Memorandum of Understanding with the Confederated Tribes of the Grand Ronde and modification as necessary.
4. Discussion of annual operations plans, and ideas to improve cultural resources stewardship with the College Forest staff and the appropriate tribes' cultural resources staff. *(Annual meeting between College and appropriate tribes)*

**Goal 5. Recreation**

*Provide safe, quality recreation opportunities, compatible with College Forest characteristics and other goals.*

**Objectives**

Provide non-motorized recreation desired by local users within the social and ecological carrying capacity of each management area.

1. Estimated number of recreation use visits per year by major category of use. *(Survey every five years)*
2. Satisfaction of local users and potential users with recreation opportunities. *(Survey every five years)*
3. Ecological damage from recreation use.

Minimize conflicts among recreation users, between recreation users and adjacent landowners, and between recreation users and forest management, teaching, research, and demonstration operations.

1. Number, type, and magnitude of conflicts. *(Database)*
2. Conflicts between recreation users and teaching and research uses of the forest decrease. *(Report database/survey)*

Engage recreation users through the Forest Recreation Advisory Council to address ways of best meeting the above goals and to explore opportunities to finance recreational services of the Forests.

1. Actions taken to engage recreation users in strategies to improve performance on recreational goals. *(Annual report)*
2. Percentage of recreation program that is financed/supported through non-forest-derived revenues or via volunteer activities increases. *(Annual report)*

**Goal 6. Relations with Neighbors and Others**

*Proactively establish, maintain, and enhance good relationships with neighbors and others connected with College Forest properties.*

**Objectives**

1. College Forest communication of Forest Plan and annual operations plan to neighbors and community. *(Written records of communication effort/database)*
2. Experiences of neighbors with nearby forest operations and in working with forest staff. *(Annual survey)*
3. Understanding by neighbors of College Forest's management policies. *(Five-year survey)*
4. Relationship of College Forest with forest contractors. *(Evaluation form sent to each contractor at the close of the contract)*

## Goal 7. Continuous Improvement

*Demonstrate a commitment to continuous improvement in the management and stewardship of College Forests.*

### Objective

Develop and implement an adaptive management strategy that uses monitoring of indicators that represent each goal and objective, evaluates outcomes for each indicator against goals and objectives for each management area, and adapts goals, strategies, and practices accordingly.

1. Implementation of a strategy for monitoring performance on sustainability indicators to determine impacts and identify possible improvements. Process will specify monitoring targets, times, and metrics, as well as threshold levels that can be used to determine needed changes. *(Annual report)*
2. Use of monitoring plan to adapt management direction.



*Paul Dunn and George Peavy looking towards the Dunn Forest*



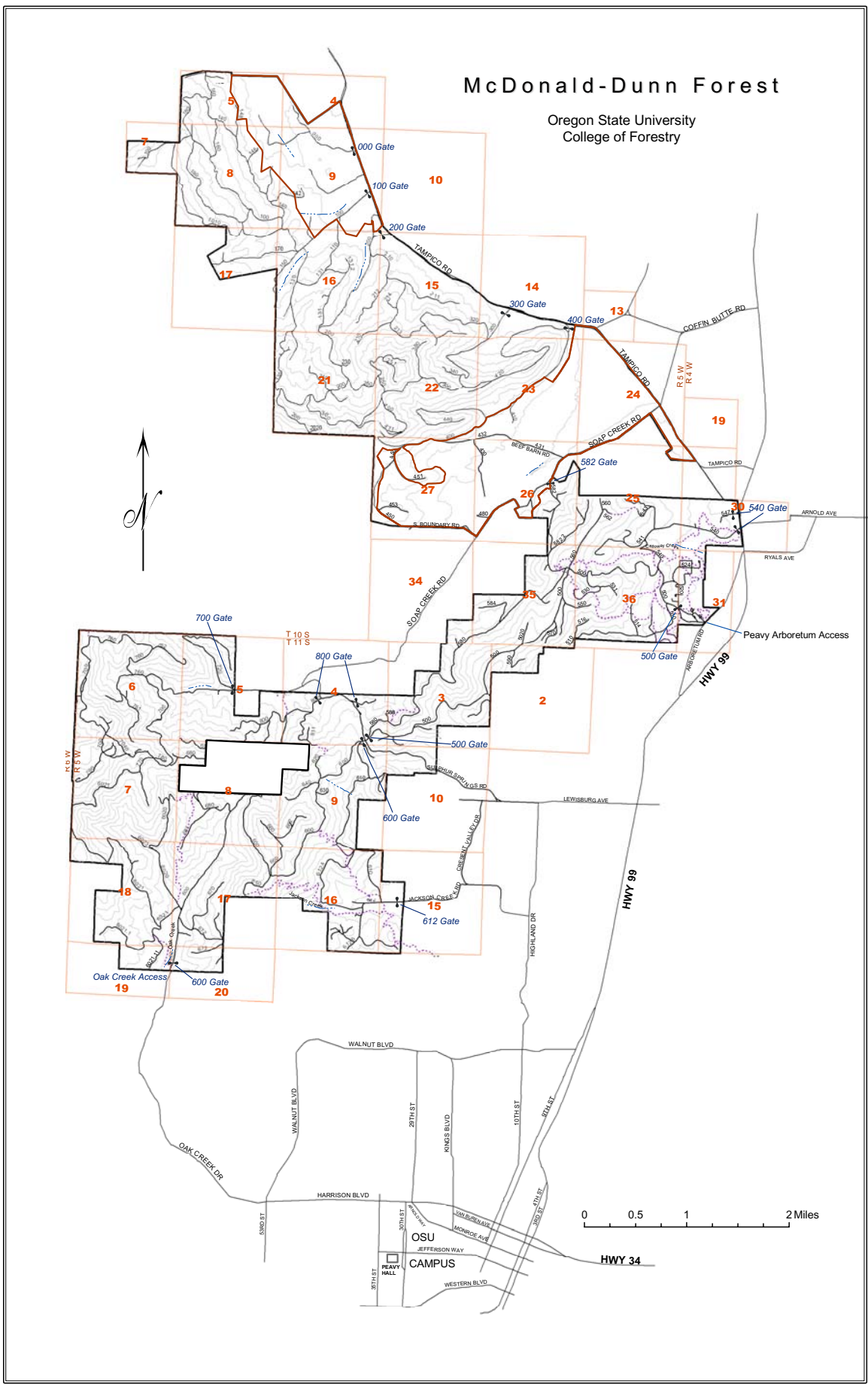
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# McDonald-Dunn Forest

Oregon State University  
College of Forestry



# Appendix 1

## MOA Between Confederated Tribes of Grand Ronde and College of Forestry

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Memorandum of Agreement  
Between  
The Confederated Tribes of the Grand Ronde Community of Oregon  
and  
Oregon State University, College of Forestry  
for  
Coordination of Cultural and Heritage Resources Management Issues

This Memorandum of Agreement (“Agreement”) is entered into by and between the State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University, College of Forestry (“College”), and the Confederated Tribes of the Grand Ronde Community of Oregon; herein after referred to as “the Tribe”.

WHEREAS, several federal and state laws require protection of cultural resources on the College Forests. In Oregon, “Archaeological sites are acknowledged to be a finite, irreplaceable and nonrenewable cultural resource, and are an intrinsic part of the cultural heritage of the people of Oregon. As such, archaeological sites and their contents located on public land are under the stewardship of the people of Oregon to be protected and managed in perpetuity by the state as a public trust.” ORS 358.910(1); and

WHEREAS, the cultural resources and customary use locations on the College Forests are invaluable resources critical to the preservation of the Tribe’s cultural heritage and pursuit of traditional lifeways for the present and future generations; and

WHEREAS, it is consistent with the College’s mission, goals and values that the College contribute to society’s social, cultural, political, aesthetic, ethical, and economic well-being; and

WHEREAS, cultural resources have been disturbed inadvertently on the College Forests managed by the College of Forestry at Oregon State University. The College of Forestry regrets these instances.

THEREFORE, in an effort to remedy the disturbances mentioned above, and as a way to avoid further such incidents, this Agreement is entered into to establish protocols for protection of cultural resources located on the College Forests.

Agreement;

The College of Forestry and the Tribe agree as follows:

1. The College and the Tribe will cooperatively develop an action plan to protect and restore integrity to site 35BE34. OSU point of contact for this will be the Director of College Forests. The Tribe’s point of contact for this will be the Cultural Resources Department Manager.
2. The College and the Tribe will cooperatively develop an action plan to protect and restore integrity to Cootes Mill site 35BE80. OSU point of contact for this will be the Director of College Forests. The Tribe’s point of contact for this will be the Cultural Resources Department Manager.
3. The College will engage the Tribe’s cultural resources staff in early stages of revisions to College Forest management plans to obtain Tribal input to the formulation of goals and objectives for cultural resources. College of Forestry Associate Dean and Benton/Lincoln Forestry Extension Agent, Co-Leads on forest plan revisions, will be the OSU points of contact. The Tribe’s Cultural Resources Department Manager will be the Tribe’s point of contact.

4. The College and the Tribe will consult with the State Historic Preservation Office when preparing damage assessments and mitigation plans, to ensure standards are being met.
5. The College, in consultation with the Tribe, will develop a strategy within revised forest plans for working with the Tribe's cultural resources staff to use cultural resources activities on College Forests as learning, training and interpretation opportunities for tribal members. College of Forestry Associate Dean and Benton/Lincoln Forestry Extension Agent, co-leads on plan revisions, will be the OSU points of contact. The Tribe's Cultural Resources Department Manager will be the Tribe's point of contact.
6. The College and the Tribe will cooperatively develop protocols and procedures for cultural resources protection and interpretation to incorporate into revised forest plans, including the following:
  - a. Communication procedure for cultural resources briefings by College Forest staff to field crews on all activities with potential to impact cultural resources.
  - b. Before and after cultural resources survey procedure for ground disturbing activities.
  - c. Strategy within revised forest plans for inventory and mapping of sites and training of College Forest staff in how to conduct activities in areas known or suspected to have cultural resources.
  - d. Strategy within revised forest plans for sharing data and maps with the Tribe's cultural resources staff.

OSU point of contact for this will be the Director of College Forests. The Tribe's point of contact for this will be the Tribe's Cultural Resources Department Manager. Specific names of the people in these positions, as well as other Tribal contacts, will be attached to this agreement as exhibit A, and updated annually.

7. The College and the Tribe will participate in an annual meeting to discuss proposed activities and ideas for improving cultural resources stewardship between College Forest staff and the Tribe's cultural resources staff and Tribal Council. OSU point of contact for this will be the Dean of the College of Forestry. The Tribe's point of contact for this will be the Cultural Resources Department Manager
8. The term of this Agreement shall be four years from date of last signature. This Agreement may be modified at any time with the mutual consent of the parties, and may be terminated by either party on 30 days' notice to the other party.
9. To the extent permitted by the Oregon Public Records Law, the College will keep any documents, materials, and information collected or generated in connection with this Agreement (collectively "Work Product") confidential. The College will provide reasonable notice to the Tribe of any disclosure required by law prior to making such disclosure and will take no action to prevent the Tribe from instituting proceedings to prevent or challenge any such disclosure. The College will disclose the Work Product to its students, employees or agents only to the extent necessary to perform this Agreement and will require its students, employees or agents to maintain the confidentiality of the Work Product. The terms and conditions of this paragraph will survive termination of the Agreement.

Signatures;

Oregon State University College Forests

The Confederated Tribes of the  
Grand Ronde Community of Oregon

  
OSU Contracting Officer      Date 12/4/03

  
Tribal Council Chairperson      Date 1-29-04

  
Dean, College of Forestry      Date 12/5/03

# Appendix 2

## Silvicultural Framework

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This will be completed by July 1, 2006.

# Appendix 3

## Restoration and Conservation Strategy for Native Prairie and Oak Habitats

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This will be completed by July 1, 2006.

# Appendix 4

## Snag and Down Wood Research Plan

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This will be completed by July 1, 2006.

# Appendix 5

## Riparian Management Practices Research Plan

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This will be completed by July 1, 2006.



# Appendix 6

## Sensitive Species Management Plan

### Sensitive Species Known to Occur on McDonald-Dunn Forest

A plan for the management of sensitive species will be completed by July 1, 2006.

Scientific Name	Common Name	Heritage Global Rank	Heritage State Rank	Federal Status	State Status	Heritage List
<b>Vascular plants</b>						
<i>Cimicifuga elata</i> Nutt.	Tall bugbane	G3	S3		C	1
<i>Lupinus sulphureus</i> Dougl. ex Hook. ssp. <i>Kincaidii</i>	Kincaid's lupine	G5T2	S2	LT	LT	1
<i>Montia howellii</i> S. Wats.	Howell's montia	G3G4	S3		C	4
<b>Mosses</b>						
<i>Fissidens pauperculus</i> Howe		G3?	S1			3
<b>Lichens</b>						
<i>Cetrelia cetrarioides</i> (Del. Ex Duby) Culb. & C.Culb		G4G5	S2S3			3
<i>Leptogium saturninum</i> (Dickson) Nyl.		G4	S3			3
<i>Usnea longissima</i> Ach.		G3G4	S2			3
<b>Fungi</b>						
<i>Clavariadelphus subfastigiatus</i> Wells & Kempton		G3?	S2?			3
<i>Endogone oregonensis</i> Gerdemann & Trappe		G2G3	S2			3
<i>Hellava maculata</i> N.S. Weber		G4	S2			3
<i>Gymnomyces monosporus</i> Stewart & Trappe		G1	S1			3
<i>Phaeocollybia attenuata</i> (A.H. Smith) Singer		G3	S3?			4
<i>Phaeocollybia radicata</i> (Murrill) Singer		G2	S1			3
<i>Phaeocollybia olivacea</i> A. H. Smith		G2	S2			1
<i>Plectania milleri</i> Paden & Tylutki		G3?	S2			3
<i>Sowerbyella rhenana</i> (Fuckel) J. Moravec		G3G4	S3			3
<b>Birds</b>						
<i>Accipiter gentilis</i>	Northern goshawk	G5	S3B	SOC	SC	4
<i>Chordeilus minor</i>	Common nighthawk	G5	S5B		SC	4
<i>Contopus cooperi</i>	Olive-sided flycatcher	G4	S3B	SOC	SV	4
<i>Empidonax traillii adastus</i>	Willow flycatcher	G5T5	S3S4B	SOC	SU	4
<i>Haliaeetus leucocephalus</i>	Bald eagle	G4	S4B, S4N	LT	LT	4
<i>Icteria virens</i>	Yellow-breasted chat	G5	S4B	SOC	SC	4
<i>Melanerpes formicivorus</i>	Acorn woodpecker	G5T2	S2B, S2?N		SV	4
<i>Poocetes gramineus affinis</i>	Oregon vesper sparrow	G5T3	S2B, S2N	SOC	SC	2
<i>Progne subis</i>	Purple martin	G5	S2B	SOC	SC	2
<i>Sialia mexicana</i>	Western bluebird	G5	S4B, S4N		SV	4
<i>Strix occidentalis caurina</i>	Northern spotted owl	G3T3	S3	LT	LT	1
<b>Mammals</b>						
<i>Lasionycteris noctivagans</i>	Silver-haired bat	G5	S3S4	SOC	SU	4
<i>Myotis evotis</i>	Long-eared myotis	G5	S4	SOC	SU	4
<i>Myotis yumanensis</i>	Yuma myotis	G5	S3	SOC		4
<i>Sciurus griseus</i>	Western gray squirrel	G5	S4		SU	4
<i>Thomomys bulbivorus</i>	Camas pocket gopher	G3G4	S3S4	SOC		4
<b>Fish</b>						
<i>Lampetra tridentata</i>	Pacific lamprey	G5	S3	SOC	SV	4
<i>Oncorhynchus clarki</i>	Coastal cutthroat trout	G4T?Q	S3?	SOC		4
<b>Amphibians</b>						
<i>Ascaphus truei</i>	Coastal tailed frog	G4	S3	SOC	SV	4
<i>Aneides ferreus</i>	Clouded salamander	G3	S3		SU	4
<i>Rana aurora aurora</i>	Northern red-legged frog	G4T4	S3S4	SOC	SV	4
<i>Rhyacotriton variegatus</i>	Southern torrent salamander	G3G4	S3	SOC	SV	4
<b>Reptiles</b>						
<i>Emys marmorata marmorata</i>	Northwestern pond turtle	G3G4T3T4	S2	SOC	SC	2
<b>Invertebrates</b>						
<i>Euphydryas editha taylori</i>	Taylor's checkerspot butterfly	G5T1	S1	C		1
<i>Icaricia icarioides fenderi</i>	Fender's blue butterfly	G5T1	S1	LE		1
<i>Pinalitus solvagus</i>	True fir plant bug	G5	S2			3
<i>Platylygus pseudotsugae</i>	Douglas-fir plant bug	G5	S2			3

## Codes and Abbreviations

### Federal Status

- LE Listed as an endangered species
- LT Listed as a threatened species
- C Candidate for listing as threatened or endangered
- SOC Species of concern -- Taxa for which additional information is needed to support a proposal to list under the ESA

### State Status -- Animals

- LE Listed as an endangered species
- LT Listed as a threatened species
- SC Sensitive -- critical
- SV Sensitive--vulnerable

### State Status -- Plants

- LE Listed as an endangered species
- LT Listed as a threatened species
- C Candidate for listing as threatened or endangered

### Natural Heritage Ranks

- G1 Critically imperiled throughout its range
- G2 Imperiled throughout its range
- G3 Rare, threatened or uncommon throughout its range
- G4 Not rare, apparently secure throughout its range
- G5 Widespread, abundant and secure throughout its range
- S1 Critically imperiled in Oregon
- S2 Imperiled in Oregon
- S3 Rare, threatened or uncommon in Oregon
- S4 Not rare, apparently secure in Oregon
- S5 Widespread, abundant and secure in Oregon
- T Rank for a subspecies, variety, or race
- Q Taxonomic questions
- ? Not yet ranked
- B Rank of the breeding population (migratory birds)
- N Rank of the wintering population (migratory birds)

### Natural Heritage Lists

- 1 Threatened or endangered throughout range
- 2 Threatened, endangered or extirpated from Oregon, but secure or abundant elsewhere
- 3 Review
- 4 Watch

Source: Oregon Natural Heritage Information Center. 2004. Rare, Threatened and Endangered Species of Oregon. Institute for Natural Resources, Oregon State University.

# Appendix 7

## Invasive Species Management Plan

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### False-brome Management Plan

#### **1. Reduce the amount of seed leaving the forest**

- Require that logging and construction equipment is washed using water from fire trucks or other sources (sale by sale determination) to remove false-brome seeds. Keep water from this washing process that is contaminated by petroleum away from streams and do not concentrate petroleum contaminants in one place.
- Kill seeds deposited in these areas after sale is completed.

Excluded equipment: rock trucks, log trucks, incidental vehicles, crew vehicles that do not leave roads or treated roadsides.

#### **2. Reduce the amount of false-brome in seed when logging occurs.**

- Spray concentrations of false-brome with herbicides.
- Spray roadsides in sale to both reduce contamination in rock and the amount of seed in contact with crew. Seed ditches with something that is not invasive, being careful not to impede drainage.
- Pre-treat false brome areas in sale.

#### **3. Reduce the amount of false-brome seeds that recreationists are spreading.**

- Develop a map of where there are heavy concentrations of false-brome along roads and trails.
- Establish a set of priorities for road and trail herbicide treatments.
- Set up some trials to see what types of treatments and seeding work best and are most cost effective. Develop a list of species we can use along roadsides for replacement.
- Develop an interpretive display at Oak Creek and brochures to educate public. Include boot brushes and encourage people to remove seeds from their shoes.

#### **4. Reduce the amount of false-brome seeds that the staff are spreading.**

- Wash seeds from vehicles before going to another tract.
- Install a boot washer; boot brushes.
- Educate staff, students, and contractors.

Plans for controlling the spread of other invasive species will be developed by July 1, 2006.

# Appendix 8

## Cultural Resource Protection Protocol

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*Archaeological sites are acknowledged to be a finite, irreplaceable and nonrenewable cultural resource, and are an intrinsic part of the cultural heritage of the people of Oregon. As such, archeological sites and their contents located on public land are under the stewardship of the people of Oregon to be protected and managed in perpetuity by the state as a public trust.*

*The State of Oregon shall preserve and protect the cultural heritage of this state embodied in objects and sites that are of archaeological significance. ORS 358.910 Policy*

### Purpose

The Oregon State University College Forests contain valuable archeological sites which are critical to the cultural heritage of Oregon and its citizens. The College Forests recognize the historic and cultural significance of these resources and are committed to their protection and preservation.

The archaeological history in Oregon goes back over 13,000 years, to the Pleistocene Epoch. While the archaeological history in Oregon is extensive, the written history spans only the last two centuries. Prior to that time, the only historic records are archaeological. If this early history is to be understood and appreciated, sites must be identified and protected.

The archaeological record also contains more recent records, those within the written history of Oregon. Historical records by their nature seldom contain the full breadth of information needed to recover specifics of a time or place. Details are often only available from the archaeological record for specifics. The history of Oregon is contained in both the unwritten as well as the written archaeological records.

The importance of these resources is reflected in the protection afforded them in state and federal laws:

- The National Historic Preservation Act of 1966, as amended
- The National Environmental Protection Act of 1969
- The Archeological and Historic Protection Act of 1974
- The Archeological Resources Protection Act of 1979
- The Native American Graves Protection and Repatriation Act
- ORS 97.740 et seq. Indian Graves and Protected Objects
- ORS 358.905 et seq. Archaeological Objects and Sites
- ORS 390.235 et.seq. Archaeological Sites and Historical Materials

These laws provide the foundation for our commitment for management of archeological resources on the College Forests.

## Definitions

An **archaeological object** is 1) at least 75 years old, 2) is part of the physical record of an indigenous or other culture found in the state or waters of the state, and 3) is material remains of past human life or activity that are of archaeological significance. ORS 358.905 (a).

An **Archaeological site** means a geographic locality that contains archaeological objects and the contextual associations of the archaeological objects with each other or biotic or geological remains or deposits. ORS 358.905 (c) (A)

**Burial** means any natural or prepared physical location whether originally below, on or above the surface of the earth, into which, as a part of a death rite or death ceremony of a culture, human remains were deposited. ORS 358.905 (e)

**Funerary objects** means any artifacts or objects that, as part of a death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later. ORS 358.905 (f)

**Ground Disturbing Activity** is a disturbance to the soil such that an archaeological object could be damaged or the contextual integrity of an archaeological site compromised.

**Human Remains** means the physical remains of a human body, including, but not limited to, bones, teeth, hair, ashes or mummified or otherwise preserved soft tissues of an individual. ORS 358.905 (g)

**Object of Cultural Patrimony** means an object having ongoing historical, traditional or cultural importance central to the native Indian group or culture itself but does not mean unassociated arrowheads, baskets or stone tools or portions of arrowheads, baskets or stone tools. *Paraphrased from* ORS 358.905 (h)

**Qualified Archaeologist** means a person who has a post-graduate degree in archaeology, anthropology, history, classics or other germane discipline with a specialization in archaeology, or documented equivalence of such a degree, twelve weeks of supervised experience in basic archaeological field research and has designed and executed an archaeological study. ORS 390.235 (b)

**Sacred Object** means an archaeological object or other object that is demonstrably revered by any ethnic group, religious group or Indian tribe as holy, is used in connection with the religious or spiritual service or worship of a deity or spirit power or was or is needed by traditional native Indian religious leaders for the practice of traditional native Indian religion. ORS 359.905 (k)

A **Site of Archaeological significance** is an archaeological site on or eligible for inclusion on the National Register of Historic Places as determined in writing by the State Historic Preservation Officer or determined significant in writing by an Indian tribe. ORS 358.905 (b)

## Background

From 1994 until August 2004 the College Forests employed a qualified archaeologist. This person conducted surveys of identified areas where ground-disturbing activities were to occur. Potential archaeological sites were identified on the ground and on maps and forestry activity in the areas identified was avoided. Sites were not surveyed to determine significance. However, inadvertently, some sites were disturbed. This

protocol is established to ensure, within the limits of practical sampling designs, that sites of potential archaeological significance are identified and protected until surveyed to determine archaeological significance.

The Oberteuffer, Ram's Dell, Cameron, and Marchel Forests were surveyed in the late 1990's. No potential sites were discovered on the Ram's Dell, Cameron, or Marchel Forests; however, a potential site in an open field (meaning, not subject to ground-disturbing forest activities at this time) was discovered on the Oberteuffer Forest. This potential site will require further investigation prior to any ground-disturbing activity. The Spaulding Forest has not been surveyed.

## Implementation

The College will collaborate with the Oregon tribes and the State Historic Preservation Office (SHPO) to develop survey protocols for surveys prior to ground-disturbing activities, assist in development of training procedures for College Forest staff in cultural protection and interpretation and in sharing data. The tribes will participate in annual meetings to discuss proposed activities and ideas for improving cultural resources stewardship between College Forest staff and the tribes' cultural resources staff. The tribes also have oral testimony from tribal elders that SHPO does not have that can significantly augment SHPO information when making significance determinations.

The SHPO maintains a comprehensive statewide inventory of known cultural resource sites. SHPO is also a source of information and education on cultural resources management and can provide technical advice for conducting surveys and recording site information.

The College Forest staff will coordinate and cooperate with the tribes and SHPO to develop predictive maps of potential cultural site locations, conduct pre-ground disturbing activity surveys in areas identified as having a high probability of having cultural resources and a sample of lower probability areas and also conduct post-disturbance surveys of a representative sample of both high and low probability areas to validate and/or improve the predictive map. The College Forest Director and Forest Information Manager will provide cultural resource protection leadership and management of the cultural resources program on College Forests.

The College Forests will work with the tribes in a spirit consistent with Executive Order -96-30.

Faculty will be directed to contact the College Forest Director or Forest Information Manager prior to engaging in ground-disturbing activities.

## Policy

The intent of cultural resource management on the OSU College Forests is to become a model of cultural resource management that others will emulate.

The College Forests Director, in consultation with the College Forests Forest Information Manager, is responsible for the management of cultural resources on the College Forests.

The College Forests will contract with a qualified archaeologist to conduct field surveys prior to ground disturbing activities but that does not relieve all field crews of their responsibility to be mindful and watchful for archaeological sites. To help field crews appreciate and recognize archaeological objects and potential sites, appropriate field personnel will participate in training sufficient to become proficient at the technician

level of expertise. Additional training will also be provided for summer crews prior to the summer field season.

In consultation with the tribes and SHPO, a predictive map showing areas of high and low probability of containing an archaeological object or site, including locations of known sites, will be developed for McDonald, Dunn and Blodgett Forests. This map will be used as a guide to prevent inadvertent disturbance of potential archaeological sites but will not substitute for on-site surveys prior to ground disturbing activities.

The predictive map will be consulted prior to any ground disturbing activities. For ground disturbing activities within areas identified as having a high probability of containing archaeological objects or sites, a ground survey conducted by a qualified archaeologist is required. A sample of sites identified as having a low probability will be surveyed by a qualified archaeologist.

The predictive map is recognized as a “work in progress” and will be revised periodically in consultation with the tribes and SHPO based on new information obtained both on the College Forests and elsewhere in Oregon as appropriate. Because archaeological objects are difficult to detect in forested environments, post-disturbance surveys will be conducted on a representative sample, perhaps 20%, of both high probability and low probability areas to validate the predictive map and serve as the basis for revision if needed.

Areas of forests that have been extensively disturbed in the past such that the probability of finding an archaeological object with contextual associations is low may not be surveyed prior to future ground disturbing activities on a case-by-case basis. However, an area previously surveyed for a past ground disturbing activity may warrant a second survey, especially in high probability areas.

While collection of an archaeological object from the surface of the ground is permitted if not a sacred object, human remains, funerary object or object of cultural patrimony (ORS 358.915), the College Forest policy is to leave the object in place until the possibility of a contextual association can be determined. This policy pertains to pre-disturbance activities, objects found during ground disturbing activities or after the conclusion of ground disturbing activities.

Findings of any archaeological object should be reported to the Director or Forest Information Manager. No excavation or alteration of the site is permitted (ORS 358.920) unless by a qualified archaeologist after obtaining a permit (ORS 390.235). Following an assessment of possibility of the object being part of an archaeological site, the object may be removed.

Appropriate language will be included in contracts to require contractors engaged in ground disturbing activities to stop ground disturbing activities in the area and report their findings to the contracting officer representative immediately.

It is the responsibility of College Forest staff, temporary employees and contractors to be mindful of discovering archaeological objects or sites, to respect and protect the possible integrity of the site and to immediately report findings.

# Appendix 9

## Process Used to Develop the Revised Forest Plan

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During the late spring of 2003, the College of Forestry Executive Committee (FEC) appointed a new committee, the Interdisciplinary Planning Team (IDT) to update management plans for its two major forest holdings, McDonald-Dunn Forest near Corvallis, and the Blodgett Forest west of Portland in the Oregon Coast Range. Committee members included:

- Rick Fletcher, Forestry Extension, Chair
- Becky Johnson, Associate Dean of Forestry, Co-chair
- Gary Blanchard, Starker Forests
- Bill Emmingham, Forest Science
- John Hayes, Forest Science
- Norm Johnson, Forest Resources
- Dave Lysne, College Forests
- Glen Murphy, Forest Engineering
- Mike Newton, Forest Science
- John Sessions, Forest Engineering

As the committee continued to meet, Becky Johnson's job changed and she resigned from the committee. Debbie Johnson, information officer for College Forests, was added as a formal team member in winter 2004.

The IDT plan revision work was at the direction of the FEC. The IDT was charged to create management plans, different in several ways from the existing plans. First, the plans were to focus on desired outcomes and leave operational implementation up to the professional judgment of the College Forests staff. Plans for many public forests are very prescriptive and detailed, but this was not the desire of the FEC for the new plans. Second, success of the plans was to be measured in terms of predetermined indicators, each tied to a planning goal. Third, FEC was most interested in testing strategies on the McDonald-Dunn forest that would be of primary interest to private forest owners. Finally, the plans were to engage the teaching and research faculty in a much more active role than had been the case with previous plans.

In revision of the existing plan, the committee sought advice from the College Forests Advisory Committee (FAC) and through a review process that involved several hundred faculty, staff, students, alumni, extended education clients, recreational users and neighbors in a variety of meetings, and web based surveys. In addition, the Confederated Tribes of the Grand Ronde was consulted.

The IDT began meeting in June 2003. An initial task of the committee was to collect current information about management of the forests and to clarify the planning task. It was decided to begin with the McDonald-Dunn plan revision and then do Blodgett so that the two plans fit well together. Eventually the committee decided there was no compelling reason to link the plan revision and decided to complete McDonald-Dunn and then begin work on Blodgett.

Several different stages of plan revision were eventually identified including:

1. Collecting existing information
2. Setting overall forest plan goals, objectives and indicators
3. Testing several possible management scenarios



4. Identifying needs, issues and concerns of faculty, students and other interest groups.
5. Draft plan preparation and review
6. Final plan adoption and implementation

Table 1 provides a chronological timeline for the various steps in the process. There were many more meetings and items than are listed in the Table, but the major ones are listed.

Table 1. McDonald-Dunn plan revision process

TASK	DATE
Visit McDonald Dunn and Blodgett Forests to examine current management.	July 28 and Sept. 12, 2003
Develop general goals for research forests	Fall 2003
Data Collection on existing management, update inventory	Aug-Sept 2003
Alternative Forest Scenario Creation, including allocation of land base to different management strategies.	September 2003
Stand Level Scenario Creation—quantification of different management regimes for each stand reflective of the management emphases chosen for the stand in the three Forest Scenarios	October 1, 2003
Simulations of Alternative Forest Scenarios	October-mid Nov. 2003
Presentation of Alternative Scenario Results to FEC and discussion of next steps	Dec.16, 2003
Survey of Faculty and Students regarding uses of research forests, issues and needs.	December 2003
Finalize Forest Plan Goals/Objectives/Indicators	By January 31, 2004
Design and install a website to solicit input on planning process.	By February 15, 2004
Solicit stakeholder input on alternative scenarios, special management areas and other forest issues from COF faculty and other primary university users of the college forests.	Meeting on Feb. 23, 3:30-5:00pm; website input through March 1.
Stakeholder meetings with community and neighbors.	Mar.11 &-16, 2004
Summarize results of stakeholder dialog for FEC	April 6, 2004
Formulate specifications for draft plan, including land allocation.	April-May 2004
Review draft plan specifications with faculty	June 10 2004
Prepare draft plan, complete with simulations, and adaptive management/monitoring plan	June-July 2004
Present Draft Plan to FEC	July 2004
Draft plan input and recommendations from FEC	July 19, 2004
Revise Draft Plan, prepare public review draft	July-August 2004
Draft plan available for comments	Fall 2005
Meeting with faculty, staff & students on draft plan	Oct. 25, 2004
Meetings with other plan stakeholders on draft plan	Nov. 3 & 29, 2004
Synthesis of input received via meetings, surveys and mail	December 2004
Review of draft plan input and recommendations to FEC	Jan. 25, 2005
Revise draft plan	February-April 2005
FEC Adopts revised planning framework	May 3, 2005
Work begins on Theme teams, research plans, restoration plans and monitoring plan.	July 1, 2005
Plan adoption completed, implementation of projects begins	July 2006

An initial task of the committee was to become familiar with the overall management of the forest today. College forest staff hosted two separate tours for the committee during the summer of 2003. One tour covered McDonald-Dunn Forest and another Blodgett. In addition, the College forest staff spent considerable time updating the forest inventory to ensure that any projections done would be completed with the most current information.

Another important initial task was to have the FEC articulate clearly a set of goals for all college forests, and to indicate a hierarchy in these goals. This discussion resulted in 7 overall goals for College Forests. A primary goal of using the forest for learning, discovery and outreach was confirmed as the primary use of the forest, and reason for the College owning it.

To ensure that the plan prepared would be related to these goals and be outcome oriented, the next task was to determine objectives for each of these goals and associated performance indicators for each objective. This task was completed through several meetings during the fall of 2003. The suite of goals, objectives and indicators created is applicable to all tracts owned by the College. To fully implement the McDonald-Dunn plan a suite of performance indicators specific to McDonald-Dunn will need to be chosen and used.

The FEC was interested in modeling various management scenarios on McDonald-Dunn to see how they might impact various uses of the forest. The IDT formed 4 separate teams and created scenarios to model:

1. Intensive plantations
2. Quality wood production
3. Visual management
4. Complex forest structure.

During fall of 2004 the scenarios were modeled and the results discussed with FEC. Also during fall 2003, Dr. Norm Johnson, OSU professor and committee member had one of his classes conduct a survey of OSU faculty to determine current users of the Forest, and some characteristics of their uses of College Forest properties (Figure 1).

Information gathered from the scenario modeling, surveys and meetings was compiled and put onto a website during January 2004 in preparation for moving towards a draft forest plan. Meetings were held during

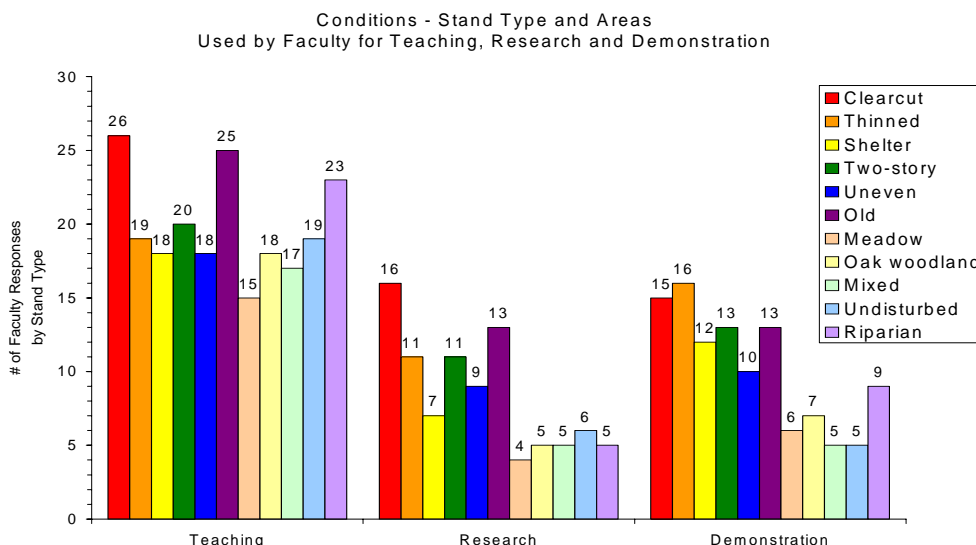


Figure 1. Results of faculty survey conducted by Fielder et al. 2003.

February and March 2004 with faculty and other stakeholders to get their input on the scenario modeling and other issues regarding the forest. The meetings were conducted with the help of the College Forests Advisory Committee. Input was received at the meetings and also via two separate web surveys (one for faculty/staff/students and the other for other stakeholders). Information collected during this process was assembled in late March and presented to the FEC on April 6, 2004.

FEC considered the various options and requested more simulations before finally adopting a basic land allocation for a new draft plan in June 2004. From this allocation a draft plan was constructed and presented for review during late July. With some revisions, the draft plan was completed and prepared for public review during fall 2004.

The initial draft plan was distributed during first to the Confederated Tribes of the Grand Ronde during September 2004 (at their request), and then to faculty, staff, students and other stakeholders. Three review meetings were held during October and November 2004. In addition input was received via an internet survey and via other written correspondence. Input received was summarized during December 2004 and reviewed by the IDT during early January 2005. At the January 25, FEC meeting a summary of input received and recommendations from the IDT were presented to the FEC. The FEC made some modifications in land allocation as suggested by the IDT recommendations, and asked for some further edits of the planning framework before final adoption.

Subsequently, May 3<sup>rd</sup> 2005 was set for adoption of the final planning framework, and January 1, 2006 as the date for full implementation to begin.

# Appendix 10 – 2006

## Annual Performance Report and Forest Plan Updates

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This appendix will be completed at the end of each year to document performance for the year as measured by the performance and sustainability indicators (see page 40), as well as any new updates that are made to the plan.

