

City of Forest Grove Watershed Stewardship Management Plan Update



by

Trout Mountain Forestry

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Chapter 1 - Executive Summary

This summary includes the Management Statement for the Forest Grove Watershed, outlines the basic forest management goals and related issues, summarizes the most important management policies for resolving issues and achieving goals, and finishes with a brief list of recommended actions.

The Forest Grove Watershed Stewardship Management Plan is a policy oriented, conceptual framework for managing the City's 4,225 acres of streams, riparian woods and upland forest. It also serves as a vehicle for the assessment of the Watershed's ecosystem condition and health, including information from new surveys of biological resources, including fisheries, wildlife, vegetation and rare plants. The Plan articulates a future vision for the Watershed, with specific management goals that will help realize this overarching vision. Critical management issues are identified, supported by findings of fact, and followed by specific strategies and plans for active management. This Plan is based on the original 10-year Watershed Stewardship Plan that was completed and adopted by the City Council in 2001. It describes current forest conditions, management accomplishments of the past ten years and updates forest policy and management recommendations for the 2013-2022 planning period.

Management Statement

The City of Forest Grove Watershed is managed to protect and improve forest ecosystem health, for the purpose of providing the City with high quality water.

Emphasis is placed on protecting the health of the watershed streams, and restoring riparian habitat degraded by past management activities. Management activities (including tree harvest) will strive to increase the natural diversity of the forest and enhance its wildlife habitat values.

As a demonstration of progressive management practices, the watershed provides a model of sustainable forest stewardship that balances ecological, social and economic goals.

Vision for the Watershed

Since 1917, when the City began to have a controllable source of water, the watershed has provided clear, plentiful water for the Citizens of Forest Grove. The publicly owned 4,225 acre forested watershed constitutes a significant ecological, economic and social resource for the community of Forest Grove and the region.

As articulated in the original 2001 Plan, the City of Forest Grove is looking beyond the timber-based approach of the past. The vision for the watershed as expressed in the 2001 Plan continues, which emphasizes protection and enhancement of water quality

and other ecosystem functions as well as sustainable resource management. This vision creates a model of sustainable resource management that is an inspiration and legacy of stewardship for future citizens. The City's demonstration of stewardship practices encourages others who strive to become better caretakers of our important natural resources.

Management Goals

1. To provide the highest possible quality water to the City of Forest Grove.
2. To actively promote diverse wildlife habitats, and to support a wide range of native biodiversity.
3. To use environmentally sensitive management and tree harvest techniques to restore habitat, maintain forest health, improve tree quality, and help support the water delivery infrastructure.
4. To utilize and demonstrate current best practices in sustainable forestry and biological resource protection.
5. To strive for a balanced approach, giving ecosystem protection, sustainable harvest levels, and community and social benefits equal consideration.
6. To establish a model forest to demonstrate resource stewardship and provide educational and research opportunities.
7. To enhance stream health and riparian habitat quality.

Current Resource Conditions

The Forest Grove Watershed is covered by vigorous stands of Douglas-fir. Active logging in the past century has produced a mosaic of forest stands that range in age from 1 to 110 years. In this region of the Coast Range Mountains -- where there are few forest stands over 70 years old -- the watershed is notable for having almost 1,000 acres of 90-to-110 year old forest. Much of this older forest is located in a designated reserve zone in the Watershed, and has the potential to be good quality habitat for the Northern Spotted Owl. The forest type with the highest volume in the managed forest area is 50 to 70 year old naturally regenerated fir.

Watershed roads are generally well located (away from streams and steep slopes) and have few stream crossings. Major stream crossings are low on the watershed, via well placed concrete slab bridges. Beginning in 2002, a routine program of road monitoring and road improvements has been implemented.

A stream snorkel survey completed in May, 2001 found important populations of Pacific Lamprey, Cutthroat Trout and Steelhead in Clear Creek. Roaring Creek also supports

populations of Cutthroat Trout. A stepped-pool fish ladder and a new fish screen were installed on the Clear Creek water diversion structure in 2005.

An accompanying aquatic habitat inventory found favorable spawning and rearing conditions for Steelhead on the lower reaches of Clear creek, including 0.7 miles of potential Steelhead habitat above the Clear Creek diversion structure. The Steelhead habitat potential of Roaring Creek was found to be naturally limited by high stream gradients, lack of spawning gravels and several massive debris torrent jams that block fish passage.

The watershed contains a diversity of fair to good quality wildlife habitats. A detailed wildlife habitat assessment was conducted by Beak Consultants in September 2001. Three general wildlife habitat types are present in the watershed: lowland conifer-hardwood forest, riparian/wetlands, and open water (pond & streams). Lowland conifer-hardwood forest is the predominant wildlife habitat type, occupying about 84% of the watershed.

As the implementation of this 2013 Stewardship Plan gets underway, the conditions of the Watershed will be surveyed and documented.

Management Policy Overview

The Forest Grove Watershed is managed by the City's Water Division within the Public Works Department. The primary purpose of managing the watershed is to ensure the highest possible water quality to the citizens of Forest Grove. The City relies on the various creeks in the Watershed to supply its winter water. Because these creeks tend to have low flow in the summer, summer water is generally supplied by the reservoir behind Scoggins Dam – Henry Hagg Lake.

The Water Division is responsible for ensuring the Watershed is managed according to the goals and policies outlined in this plan. Resources for managing the Watershed are prioritized into the Water Division's annual budget, funded by both timber harvest net revenues and water rates paid by the citizens of Forest Grove.

1. Water Quality and Aquatic Resources

Water quality, riparian and aquatic biological productivity shall be maintained and enhanced through the use of good stewardship management practices and the implementation of watershed improvement projects.

2. Wildlife Resource Management

Management should reflect the importance of wildlife habitat to forest health by protecting existing habitats, and restoring threatened or degraded habitats. Wildlife habitat improvements shall promote species diversity, and ensure that populations of indigenous species are maintained, especially those that are threatened or endangered. All forest management practices will not only meet, but strive to exceed the legal minimum requirements for habitat protection and retention.

3. Vegetation and Botanical Resources

Maintaining the biological richness and native diversity of the Forest Grove Watershed is a key priority, and involves active management. This richness and diversity also promote resistance to wildfires and diseases. Mixed conifer/hardwood stands are encouraged where appropriate. Invasive exotics are controlled, degraded habitats improved, and a species mix indigenous to Douglas-fir and mixed woodland communities will be restored.

4. Timber Management

The emphasis of tree harvest on the watershed is to maintain and improve the long-term productivity and biological integrity of the entire forest ecosystem. The desired future forest will feature mixed species stands of older, larger trees, with sufficient harvesting and regeneration to assure adequate younger stands to balance the age of the forest. Timber harvests will be both even-aged and uneven-aged to help create structures that benefit wildlife, such as gaps in the canopy, increased light for understory shrub and forb growth, snags and down woody debris. All timber harvests are subject to the overriding stewardship goals and policies governing protection of water quality, aquatic habitat and wildlife habitat in the watershed. Harvest levels shall be based on forest health and other ecological goals, and shall not be revenue driven. A system of selection thinning, patch cutting and variable retention harvest shall be used to maintain forest health and structure. No clearcutting is allowed.

5. Reserves

Lands with significant biological, wildlife, or other resource values, or lands with high management risk are removed from the timber management base.

6. Herbicides

Herbicide use is minimized and strictly controlled. Aerial or broadcast backpack application is prohibited. Exotic plants may be treated with targeted backpack spraying. Manual cutting is the preferred method of brush control.

7. Roads

Roads are managed and maintained to minimize adverse impacts on the watershed. New access roads shall be earth surface, out-sloped to drain naturally where possible, and re-seeded after use. Existing roads that do not serve management purposes shall be de-commissioned.

8. Monitoring and Assessment

Regular monitoring of key forest health indicators is a critical part of the sustainable management program. Monitoring serves as the basis for regular evaluation of the management plan, assessing the progress toward specific goals, and modifying practices if goals are not met. Regular surveys and field reporting will be done to measure changes in water quality and riparian habitat, road infrastructure, forest understory vegetation and the presence of rare, threatened, or endangered species.

Recommended Actions

1. Stream Restoration: Reduce the impact of the Clear Creek headwaters sediment source by designing and implementing a slope stabilization project. Monitor the recently installed large wood structures on Clear Creek and their impact on fish populations. Maintain the Clear Creek fish ladder in good functioning condition, particularly during critical fish runs. Inventory Clear, Roaring, Thomas and Deep Creeks.

2. Tree Harvest: Continue the program of sustainable harvests within the active forest management area. Priorities include thinning overstocked stands to promote tree health, diversity, resistance to disease and wildfires, and providing additional structure for wildlife habitat (including snags, down woody debris, canopy gaps, and creating forest openings for the establishment of young forest stands). Develop a 10-year forest operations plan and annual operations plans.

3. Wildlife: Conduct surveys to confirm whether any Northern Spotted Owls are living within the watershed. When lacking, create snags and down logs in reserve areas and in conjunction with timber harvest operations. Provide additional small mammal, amphibian and reptile habitat by creating brush piles. Promote a healthy shrub layer in forest stands.

4. Monitoring: Create a more complete and robust monitoring plan that includes sufficient surveys and field reports to give a meaningful picture of changes in the watershed due to timber harvests and ongoing natural processes.

5. Roads: Continue routine maintenance and monitoring of watershed roads. De-commission the final 5,000 feet of Deep Creek Road. Restore and improve the segment of road that connects Potts Road and Clear Creek Road. Disconnect ditch lines from streams and direct water into filtering vegetation to prevent sediment from entering streams.

6. Vegetation: Protect forest understory vegetation during harvest operations. Control invading Scotch broom, thistle and Himalayan blackberry by hand cutting, or use of targeted herbicide application if necessary.

7. Forest Zones: Reduce the watershed zones from three to two by eliminating the Special Management Area. SMA acres will be assigned to the Reserve or Active Management Area.

8. Public Education and Involvement: Continue a program of regular tours of the watershed. Encourage efforts to connect with local schools and make the watershed available for educational site visits and research projects.

9. Land Acquisition: Acquire adjacent forestland outside the current boundaries of the City-owned watershed if that forestland is deemed to have hydrologic, ecologic or economic benefit to the City.

10. Fire Management: Continue to work with Oregon Department of Forestry on fire management and wildfire control.

Chapter 2 – Introduction

This chapter describes the vision for the City of Forest Grove Watershed, states the purpose of this second 10-year plan, outlines the planning process used in updating the original 2001 plan, and details plan implementation and administration.

Vision for the Watershed

Since 1917, when the City began buying land to have a controllable source of water, the watershed has provided clear, plentiful water for the Citizens of Forest Grove. The publicly owned 4,225 acre forested watershed constitutes a significant ecological, economic and social resource for the community of Forest Grove and the region.

The vision for the Watershed has been enhanced in this Update by adding a statement of Desired Future Conditions. The Desired Future Conditions, or DFCs, outline what the watershed forest stands and vegetation may look like in forty years, the year 2053, in both the Reserve Area and the Active Management Areas.

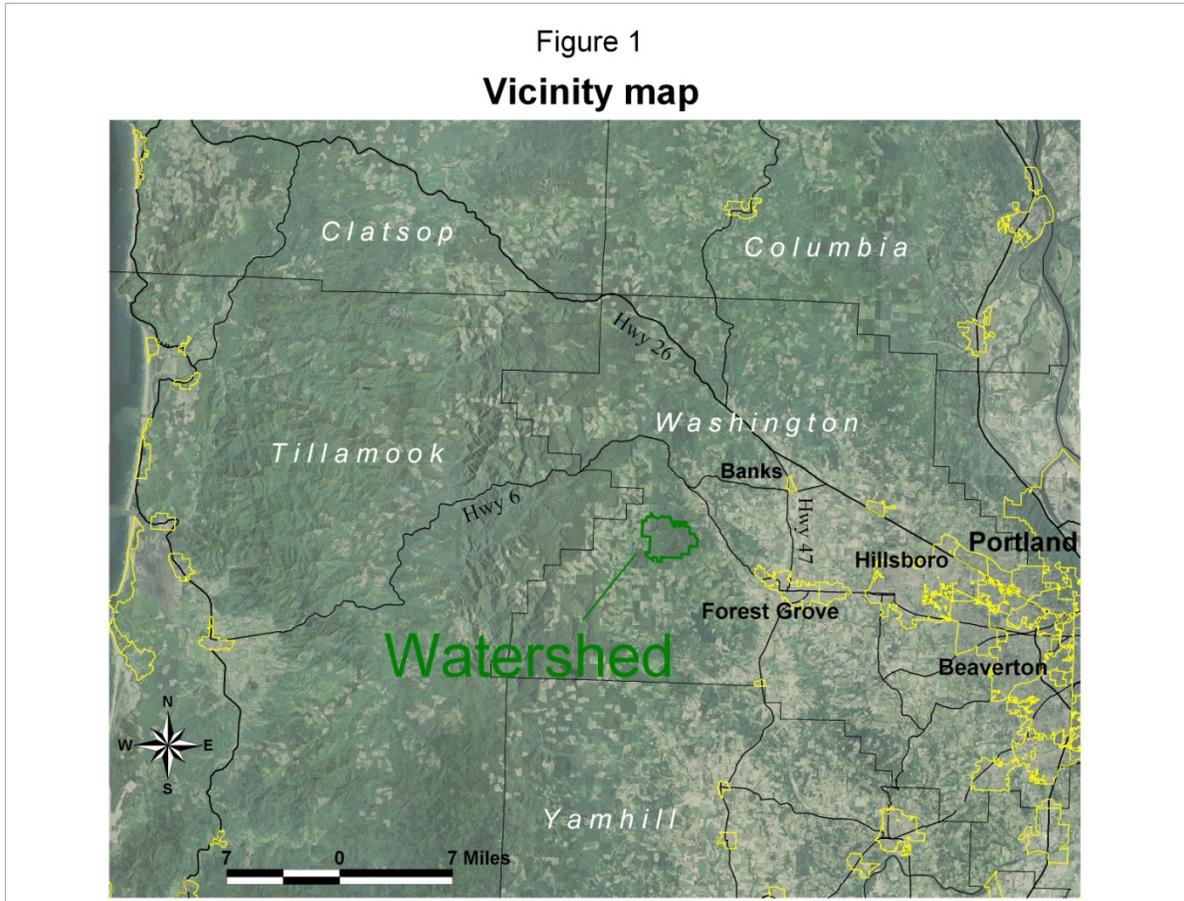
As articulated in the original 2001 Plan, the City of Forest Grove is looking beyond the timber-based approach of the past. The vision for the watershed as expressed in the 2001 Plan continues, which emphasizes protection and enhancement of water quality and other ecosystem functions. The City envisions a watershed that is a model for sustainable resource management that will be an inspiration and legacy of stewardship for future citizens. The City's demonstration of stewardship practices will encourage others who strive to become better caretakers of our important natural resources.

Conservation based management practices demonstrate that water quality, stream health, wildlife habitat enhancement, and tree harvest can go hand in hand. Protecting the quality of water, the health of the forest and its ecosystems and maintaining the site's aesthetic appeal are top priorities.

This continuing vision sees the watershed as an important part of the greater landscape, connected to the region by its streams (that provide cool water and important fish habitat for the Tualatin River Basin) and its forests (that provide potentially important wildlife habitat for sensitive species, including the Northern Spotted Owl).

To demonstrate the City of Forest Grove's commitment to stewardship, the City's practices are consistent with the Forest Stewardship Council's (FSC) certified forest management practices. The FSC forestry principles and guidelines--as well as independent third-party assessment--ensure that management meets stringent standards for environmental sensitivity, sustainability, and community and social concerns.

Figure 1 Watershed Location



Purpose of the Plan

The purpose of this second 10-year plan is to articulate and implement the stewardship vision of the Forest Grove community, and to provide City officials and Staff with guidance for the continued management of site resources. Some of these resources include species such as the Northern Spotted Owl and Winter Steelhead, which are listed under the Endangered Species Act. Conservation strategies, habitat improvements, and additional surveys and monitoring are proposed that will help the City fulfill its legal obligations and stewardship responsibilities under the Endangered Species Act (ESA) and the Oregon Forest Practices Act, administered by the Oregon Department of Forestry (ODF). Accurate resource information and comprehensive

management policies are critical to ensure the responsible and long-term stewardship of this extraordinary property.

Specifically, the Plan serves to:

- inventory and assess watershed resources;
- describe resource management practices to be used to reach goals and desired future conditions;
- provide a comprehensive policy framework to guide future management decisions;
- establish monitoring and evaluation protocols.

This plan is intended to be a “working document,” that can be revised from time to time, and is scheduled to be updated in 10 years (2023). As the City monitors the results of management activities, there will be a continuing need to refine the plan and adopt changes that will help meet stewardship goals.

Planning Process

The plan update process involved review of the 2001 plan and management actions and accomplishments of the past 10 years. New resource assessment information was reviewed. Management policies, standards and recommended actions were considered within three general resource areas: wildlife and fisheries resources, vegetation and botanical resources, and timber resources.



Public Involvement

To assure an open and public planning process, the City Council formed the Watershed Ad Hoc Committee in 2012. The committee was specifically designed to be comprised of community members from a variety of interests including local business (Forest Grove Chamber of Commerce), residential and industrial water users, educators (Pacific University), rural landowners, and advocates for water quality, wildlife and fishery resources. The purpose of the committee, as directed by the City Council, was to serve in an advisory capacity to City Staff, the Watershed Management Consultant, and the City Council.

The committee was an active participant in the planning process, meeting twice monthly for six months, from January through June, 2012, and periodically thereafter, with City Staff and the Consultant. Members were actively and enthusiastically engaged in reviewing and updating all areas of the 2001 plan. Work on each issue continued until a consensus was reached.¹

Members of the planning team included:

- The Ad Hoc Committee: Bud Bliss, Dallas Boge, Steve Edward, Carla Ingrando, Dave Johnson, Lou Karabinus Teri Koerner, Bob VanDyk and Roy Woo. Three committee members (Edward, Karabinus and VanDyk) were members of the 2001 planning team.
- Trout Mountain Forestry: Scott Ferguson and Barry Sims (consultants)
- City Staff: Robert Foster (Director of Public Works) and Susan Cole (Assistant Director of Administrative Services.)

See Appendix D for more information about the Watershed Ad-Hoc Committee.

Additionally, the City Council held work sessions and presentations to consider the draft update to the 2001 Plan. The draft document was available for public review via the City's website prior to the Council adopting the Plan Update.

Implementation

The adopted 2013 Plan Update will be implemented by City's Water Division staff, who are also be responsible for ongoing monitoring and evaluation. Annual written operational plans will guide watershed activities. These operational plans will be presented to the City Council each spring, prior to watershed management activities. After the management activities are complete each season, a report will be presented to the City Council summarizing the results. These results will be archived so that the City can monitor and reference over time various actions and outcomes in the watershed.

Planning and Administration

The ultimate decision on resource policy and management direction rests with the Forest Grove City Council. Once adopted, any policy changes to the Forest Grove Watershed Plan would be accomplished via a Resolution adopted by the City Council.

The City Manager and City's Water Division staff are responsible for implementing the provisions and recommendations of the plan, and for ongoing management. The public is invited to attend City Council meetings, which are typically held bi-monthly. Agendas and reports can be found on the City's website or by contacting City Hall.

The City engages other resource professionals as necessary, to supplement their expertise and/or work force. Guidance from or oversight by appropriate resource professionals should be sought for any resource improvements or modifications.

Chapter 3 - History and Current Resource Conditions

This chapter provides a historical background for the Forest Grove Watershed, summarizes the socio-economic context, and reviews the current resource situation.

Physical Landscape and Setting

The 4,225 acre watershed owned by the City of Forest Grove encompasses nearly the entire upper Clear Creek Watershed. Clear Creek is one of nine sub-watersheds of the 78 square mile Gales Creek Watershed, which is in turn one of the many large rural watersheds in the Tualatin River Basin (see figure 1) Located on the forested mid-to-lower slopes of the Oregon Coast Range Mountains, the City watershed is about 4 miles northwest of Forest Grove, a city of approximately 21,000 people in 2013. Clear Creek is a moderate gradient stream in the lower, main stem of the Watershed (elevation of 400 feet). The three other primary drainages are Roaring Creek, Deep Creek and Thomas Creek. The upper reaches of these streams become high gradient as the topography changes to steep slopes rising to the watershed ridge tops at elevations of 1,600 to 2,400 feet.

The greater Gales Creek Watershed is almost two-thirds privately owned, either as industrial forestland (26%) or private agricultural or rural residential lands (38%). The Oregon Department of Forestry (ODF) owns and manages 28% of the watershed as part of the Tillamook State Forest. Private industrial forestland owners (mainly Stimson Lumber) own nearly one third of the watershed. ⁱⁱ Only four percent of the Gales Creek Watershed land base is urban or developed (see figure 2).

The topography of the Forest Grove Watershed is dominated by moderate to steep slopes (approximately 62% of the land base is >35% grade). The landform is comprised of volcanic and sedimentary rocks formed during the Eocene and Oligocene ages, primarily basalt overlain by sedimentary rocks made up of shale, claystone, sandstone and siltstone.

The maritime climate features an extended winter rainy season with hot, dry summers. Snow can accumulate in the upper watershed during brief cold storm events. This is usually followed by melting warm rains a few days later, often creating a surge of elevated water levels that drop soon afterward. Average annual precipitation is above 60 inches.

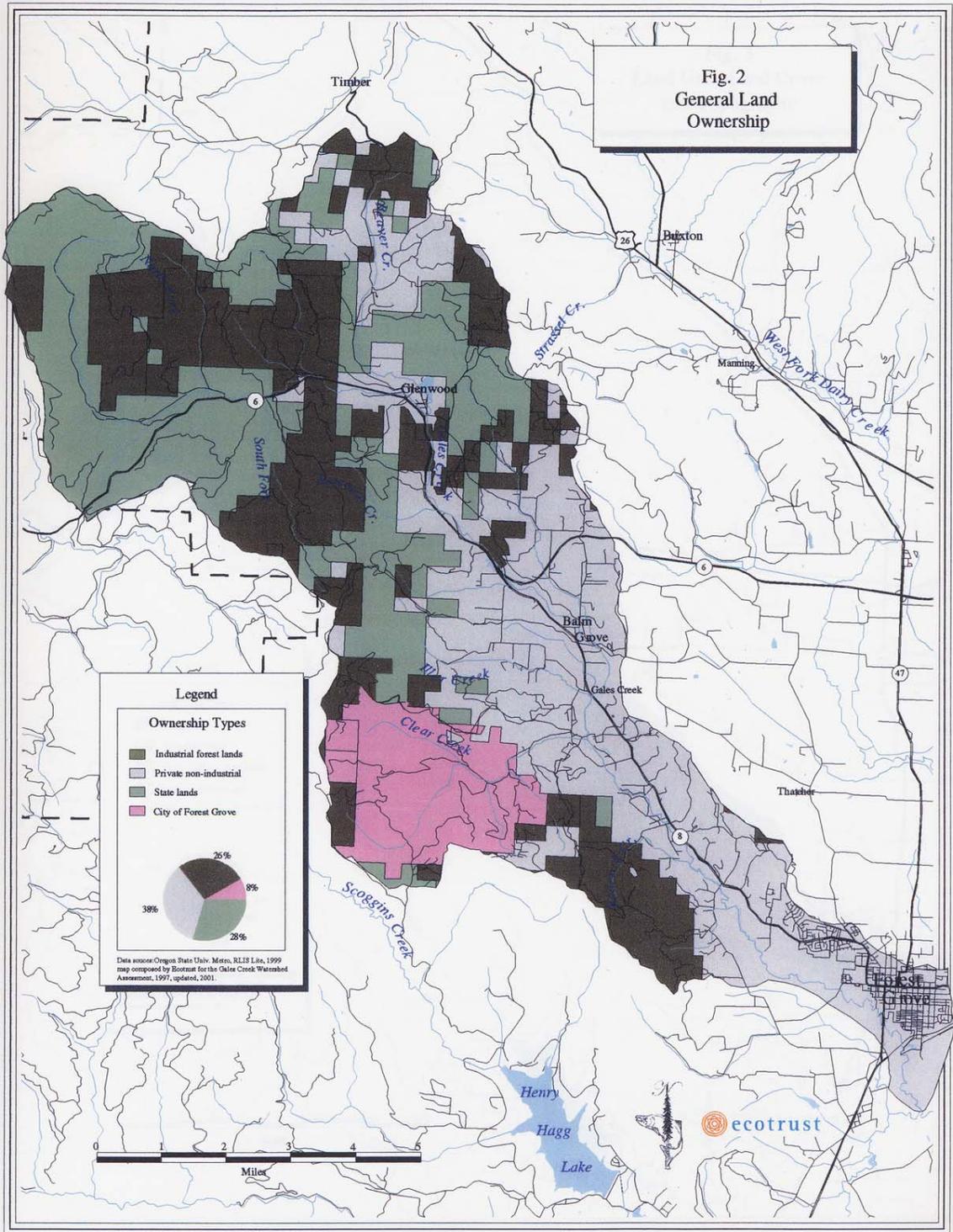
Historical Conditions 1800-1950

Historic Vegetation Patterns

In the early 1800s the landscape surrounding Forest Grove was strikingly different than that which is seen today. Conditions mirrored those found throughout the Willamette Valley and western Oregon. At that time, four major vegetation types occurred in the area: prairie, riparian forest and wetlands, open woodland and upland forest. Open grasslands dominated the vegetation from the floodplain margins to the hillsides of most valleys of the area. Isolated groves of trees were primarily white oak and Douglas-fir. This prairie condition had been intentionally cultivated by the local Tualatin (or Twality) Indians, who routinely burned the valley grasses to maintain important food and fiber “crops”, including oak, camas, hazel, and berries, to encourage lush grass growth for game, and to make travel easier. They likely used the Gales Creek Watershed as hunting grounds and as a route to coastal areas (Breuner, 1998ⁱⁱ). When the first settlers began arriving in the Tualatin Valley in the 1840s, there was little standing in the way of pioneer settlement. Diseases brought into the area by early trappers and explorers had already decimated native Indian populations (reducing their numbers by nearly 75 percent). Vegetation patterns changed quickly as a result of the cessation of native vegetation burning, and the beginning of farming and grazing practices by early settlers.

The Forest Grove Watershed is located in the upland forest zone, an area that was less affected by Indian burning and later agricultural clearing by settlers. The forest shows evidence of long-standing forest cover that burned less frequently than open woodland areas on the valley margins. Timber harvest began in the City watershed at the end of the 19th century to supply local sawmills, and probably included log drives down Gales Creek. Industrial logging at that time was muscle-powered, with men, horses, oxen and donkeys. Logs were transported down creeks by floating them during peak flows.

The most significant large fires of the twentieth century in the region were the result of unsafe logging practices during low humidity conditions. Major fires (collectively called the Tillamook Burns) occurred in 1933, 1939, 1945, and 1951, charring more than 500,000 acres. Although the first of these fires started nearby in the Gales Creek Watershed, the City watershed was essentially untouched by the Tillamook Burn.



Water Use History 1908-2001

The first public water system on Clear Creek was built in 1908. A mill was set up on site to cut and bore logs, which were wrapped with wire, coated with tar and dipped in sawdust before they were installed as pipes. To secure a reliable water source, the City began buying land, with the first purchase of 200 acres in 1917. In 1927 the log line was replaced with a wood stave line. The City purchased the bulk of the watershed (3,900 acres) in the years just prior to and after World War II.

The system was modernized in 1948 when a water treatment plant was built, and in 1964 when the old wood stave line was replaced by a concrete cylinder transmission line. The City continued to purchase land within the watershed when the opportunity arose, most recently in 1988 (140 acres) and in a 1995 land exchange with the Oregon Department of Forestry (220 acres).

Forest Grove obtains about 50% of its water from five diversion structures on the watershed (on Clear Creek, Roaring Creek, Deep Creek, Smith Creek and Thomas Creek). Combined, these five structures provide a supply of about 2-to-4 million gallons per day. This water supplies the City's water need in the winter and spring months. The balance of the City's needs, in the summer and fall, is supplied from the Barney and Scoggins reservoirs through the Joint Water Commission water treatment plant on the Tualatin River.

Timber Harvest History 1950-2001

Forest Grove began an active timber cutting program in the watershed in 1950. Under a cooperative arrangement, the Oregon Department of Forestry (ODF) managed all timber sale work and regeneration efforts, for a percentage of sale proceeds. State supervision continued until 1980 when the City took over management. From 1981 until 1989 the Director of Public Works supervised sales. In 1989 citizen concern over the negative impacts of clear-cutting in the watershed culminated in a decision by the City Council to stop the harvest program. In 1994 an attempt was made to resume the harvest program, when the City hired a forestry consulting firm to inventory the timber and craft the watershed's first detailed timber harvest plan. The plan was met with skepticism by some councilors and citizens when it was proposed to the City Council in an open meeting later that year. Lacking significant public support (amid continuing concerns over the management approach), the plan was adopted by a 4-to-3 vote, but not implemented by the City Manager. The de-facto timber harvest moratorium continued until 2001, when the original Watershed Stewardship Management Plan was adopted.

Records for the first ten years (the 1950's) of State supervision are incomplete. A comprehensive report covering the 1960 through 1977 period details their management philosophy and harvest results. During those years, 440 acres were clear-cut, targeting the oldest timber stands on the watershed (+100 years old) in an attempt to establish a regulated forest with a 100 year rotation age. By 1977, fewer than 50 acres of this oldest

forest type remained. ⁱⁱⁱ Of the 12,260,000 board feet of conifer harvested, 95% of the harvest volume came from clear-cuts; the largest was 160 contiguous acres at the headwaters of Deep Creek.

After a brief hiatus in the early 1980's, the City began an ambitious cutting program under the supervision of the City's Director of Public Works. Over the next seven years 477 acres were clear-cut. Harvest block sizes ranged from 7 to 135 acres. The program was carried out without the benefit of a forest inventory or management plan, until it lost public support in 1989.

Recent Management History 2002-2012

In 2001, the City commissioned its first Watershed Stewardship Management Plan, followed in 2002 by hiring Trout Mountain Forestry, consulting foresters, to implement the plan. The consultant provided operational planning and oversight of watershed improvement projects such as bridge replacement, road system upgrades, stream habitat enhancement projects and annual sustainable timber harvests. A stepped-pool fish ladder and a new fish screen were installed on the Clear Creek water diversion structure in 2005. Over these 11 years, on average, 90 acres of forest were thinned and 10 acres were patch cut each year under the guidance of the plan's forest policies and recommendations. Harvest prescriptions were developed to encourage tree growth and vigor by thinning; where forest stands had two crown layers, trees were thinned to promote uneven-aged forest structure. Hardwoods were allowed to grow to promote wildlife habitat and stand diversity. Annual harvest volume ranged between 600,000 board feet to over 1,500,000 board feet.

Socio-Economic Situation

The community of Forest Grove takes pride in the high quality of its water and enjoys some of the lowest water rates in the region. The watershed, while supplying approximately 50% of the City's needs, combines with early planning and water resource acquisition as the reasons for the high quality water and low rates. An important, though intangible social benefit is the "sense of place" and connection to the surrounding resource lands that a watershed can foster in a small community. This was evidenced by the concern over past management practices and the current public interest in forest health and fisheries management issues in the watershed.

The economic impacts of the watershed are two fold - the water supply provided to Forest Grove rate payers, and the sale of products from the annual timber harvest. The City of Forest Grove has restricted public access and prohibits recreation to protect the resource. The watershed contributes to the livability and economic climate of the area by providing open space, clean air and clean water (into Gales Creek) and helps protect the viewshed (forested hills) from town.

The recent annual harvests have contributed revenue to the City, produced expenditures in the private sector, and generated jobs for local contractors and mill workers by providing a periodic source of sawlogs to mills in the region.

Current Resource Situation

This section reviews the current conditions on the watershed, informed by an inventory completed in 2011, and organized by resource area. See chapter 5 for management recommendations.

Water Quality and Aquatic Resources

The watershed contains extensive fish and riparian habitat of good-to-excellent quality. A detailed aquatic habitat inventory of Clear and Roaring Creeks was conducted by Bio-Surveys in May 2001. Additional surveys and inventories will be conducted as this plan is implemented over the next decade.

The watershed contains approximately 13 miles of medium-to-small fish bearing streams, including Clear Creek (5.5 miles), Roaring Creek (4.8 miles), Deep Creek (1.8 miles), Thomas Creek (0.6 miles) and Smith Creek (0.2 miles). Clear Creek is a fourth order stream classified as medium-sized fish bearing, with its third order tributaries classed as small fish bearing streams.

The Clear Creek sub-basin currently contains important populations of Pacific Lamprey, Cutthroat and Steelhead. Numerous Steelhead spawning beds (redds) have been observed. Steelhead (a species listed under the ESA) and fluvial Cutthroat distributions in the sub-basin have been reduced by two significant factors: the water diversion dams on both Roaring and (until recently) upper Clear Creeks^{iv}, and massive debris torrent log jams in the Clear Creeks headwaters. In addition to past man-made impacts from road building on steep slopes and tree cutting on creek headwall areas, there is evidence that fire and natural slope failure are part of the basin's torrent history. The combination of rainfall, steep slopes and shallow soils throughout the watershed presents potentially high risks to water quality and fish habitat.

Stream habitat conditions are good to excellent. Large woody debris in the stream stabilizes stream channels, provides fish habitat, and traps sediments. Large wood densities are exceptional for 6 out of 7 surveyed reaches. Overall, the abundance of riparian conifers and hardwoods for potential future woody debris recruitment is also excellent. However, in some locations past harvesting has removed many conifers and large wood from riparian zones, creating concern for long-term wood recruitment at these sites. Road failures associated with the 1996 storm (a 100-year event) caused several debris flows into Clear and Deep Creeks, adding massive amounts of large woody debris to the stream channels.^v

The 1996 road failure in the Clear Creek created a steep dirt slope above the stream that continues to erode, adding considerable sediment to the water system year round. This impacts not only water quality, but also reduces fish egg survival and macro-invertebrate populations. In 2003, an attempt was made to stabilize the lower slope by planting willows. This effort was only partially successful.

Wildlife

The watershed contains a diversity of fair-to-good quality wildlife habitats. A detailed wildlife habitat assessment was conducted by Beak Consultants in September 2001. Three general wildlife habitat types are present in the watershed: lowland conifer-hardwood forest, riparian/wetlands, and open water (lakes, rivers, and streams). Lowland conifer-hardwood forest is the predominant wildlife habitat type, occupying about 84% of the watershed. Open water is provided by the network of streams within the watershed, with riparian/wetlands habitats associated with these streams, seeps and areas with poor drainage. Together open water and riparian/wetlands occupy about 16% of the watershed. It is possible that over 200 species of birds, 65 mammalian species and 23 salamander/reptiles may utilize the site for nesting, foraging or migration.

The conifer-hardwood habitat type is further differentiated into five classes, representing the continuum of successional stages for forested habitats [sapling/pole (1-9" diameter), small tree (10-14"), medium tree (15-19"), large tree (20-29"), and giant tree (>30")]. Although this habitat type has been subjected to various intensities of forest management over the last 100 years, almost 40% of this habitat is in the large tree phase, and less than 10% is in the early sapling/pole phase. A small number of stands within the conifer-hardwood forest type are deciduous dominated, or of mixed composition, and provide important habitat variety.

Dead trees (snags) and dead parts of live trees provide essential nesting, roosting and foraging habitat to a wide array of species. Over 30% of bird species richness and abundance may be related to the level of cavity-nesting habitat available. Levels of suitable cavity nesting habitat vary widely across the forest, but are medium-to- low overall. Snags sufficient to support most cavity dependent species are important, especially large snags (over 21 inches base diameter). In the past 11 years significant amounts of large snags have been produced by tree mortality from a number of causes, the most important being: Natural mortality from *Phellinus weirii* (root fungal infection), girdling from a healthy black bear population and small pockets of trees killed by Douglas-fir bark beetles. Many snags present on the property are either small diameter, or well decayed.

Logs on the forest floor and other woody debris provide cover, food and unique environmental conditions (moisture, temperature) required by numerous wildlife species. Levels of woody debris vary widely across the watershed, but are low to moderate overall (especially of large logs). In many of the conifer plantations logs are

virtually absent, or are small diameter (under 6" DBH) and consequently of low wildlife value. Large logs (2-3'+ diameter) are found in a few small areas where large trees have blown down in recent storms, but most large, down logs are old remnants from past logging activity.

The 920 acres of older conifer plantations are very uniform in composition and structure (primarily Douglas-fir monocultures with some alder and bigleaf maple), with few gaps or older trees. This uniformity and lack of older residual legacy trees is a typical result of industrial practices of 1960's through 1980's, where clear-cutting removed nearly all trees, including cull and pulp logs. Current understanding identifies older trees and rotting logs as critical habitat for numerous species, important water reservoirs, and sources of organic material for soil fertility.

The giant tree forest stands (90-to-110 years old) are important wildlife habitat, particularly since in the Northern Coast Range Mountains forests of this size are uncommon.^{vi} The maturing, closed canopy, conifer and mixed growth forests are potentially good habitat for the Northern Spotted Owl (listed under the ESA). An earlier wildlife survey found 792 acres with high quality owl habitat (potential).^{vii} Although there are currently no known active owl nests, a single female spotted owl was sighted on the property in 2002, and a pair of spotted owls were detected in 2009. i.

A significant beaver dam complex is located just upstream of the Thomas Creek water diversion structure. Beavers actively maintain a large dam on a broad, low-gradient stretch of the stream and have developed several additional dams upstream (where the Thomas Creek channel narrows). In this area beaver cutting and girdling of trees has produced numerous down trees and snags.

Vegetation and Botanical

The property contains a rich variety of botanical resources. Notable plant communities include extensive stands of 80-to-110 year old Douglas-fir, several hundred acres of riparian vegetation, the wetland and beaver dam complex on Thomas Creek, and the remnant, centuries-old forest structure found in a few forest stands. There are few open, non-forested areas. One small rock outcrop above upper Clear Creek also adds to plant species diversity. Approximately 100 acres of new, 1-to-5 acre patch cuts provide areas with significant shrub and early-successional habitat.

A detailed inventory of special habitat areas and potential rare plant populations was completed in July 2001 by the Institute for Applied Ecology. A total of 176 plant species were encountered, approximately 77% (136 species) were native. The remaining species were introduced plants, many of them weedy. Additional species may be present, as some were not identifiable at the time of the survey. Additional surveys, preferably in spring would be required to gain a complete plant list.

No listed rare, threatened, or endangered plant species were encountered. Habitat for tall bugbane (*Cimicifuga elata*) is present, but the species was not encountered. The

species may not occur on the watershed, but more extensive surveys would be required to confirm this. Closer inspection of the rock outcrop on the watershed may result in identification of additional rare plant species.

The most significant invasive plants in the watershed include Scotch broom, Himalayan blackberry, thistles, and reed canary grass. Scotch broom and Himalayan blackberry are well established in the surrounding industrial forest landscape, but exist only in isolated locations within the watershed. Care has been taken prior to recent harvests to limit the spread of these invasive shrubs. Annual monitoring and invasive plant removal in harvest areas have been successful in preventing the spread of blackberry and broom in disturbed sites.

Reed canary grass is a noxious weed of wetlands and ditches. It occurs in the watershed near Clear Creek Road and at the Thomas Creek pond, in ditches, and disturbed riparian areas. It has completely replaced native vegetation over much of the margins and wetland surrounding Thomas Creek pond and is therefore a serious threat to native vegetation. However, control of this species can be particularly difficult once it is established, especially without the use of herbicides.

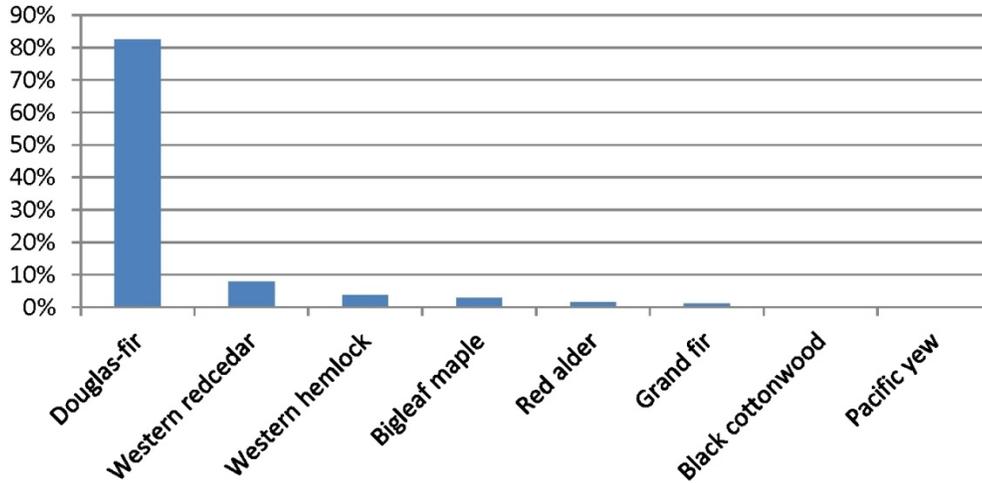
Thistles, foxglove, oxeye daisy, and Klamath weed are other exotics abundant on roadsides in the watershed and can be expected in clear-cuts. Their control is less urgent, but they will likely continue to spread in disturbed areas.

Timber

Of the 4,225 acre land base, almost all acres are forested with a mosaic of even-aged stands. A detailed timber cruise was conducted in 2011. Data were taken on forest stand composition (tree species, age, height, radial growth, and volume) Other information was gathered, including wildlife habitat features such as snags and down logs, as well as presence or absence of invasive vegetation. The cruise estimated a merchantable timber inventory on the entire tract of over 142 million board feet (up from the 92 million board feet estimated in the 2001 plan). This volume is comprised mostly of Douglas-fir (82 %), followed by western red cedar (8 %), red alder (2 %) western hemlock (4 %), bigleaf maple (3 %) and grand fir (1%). Average annual conifer growth for the entire tract is estimated to be over 3 million board feet.

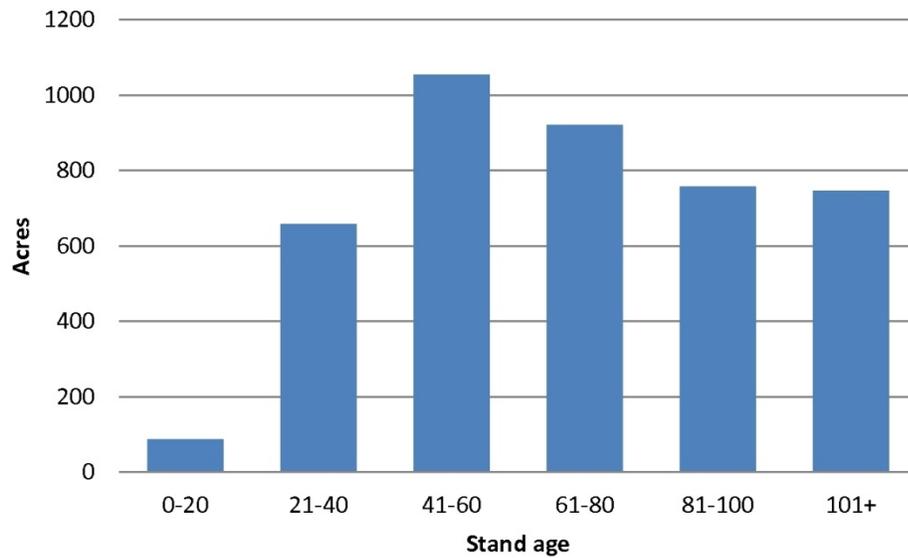
Chart 1

Tree species composition

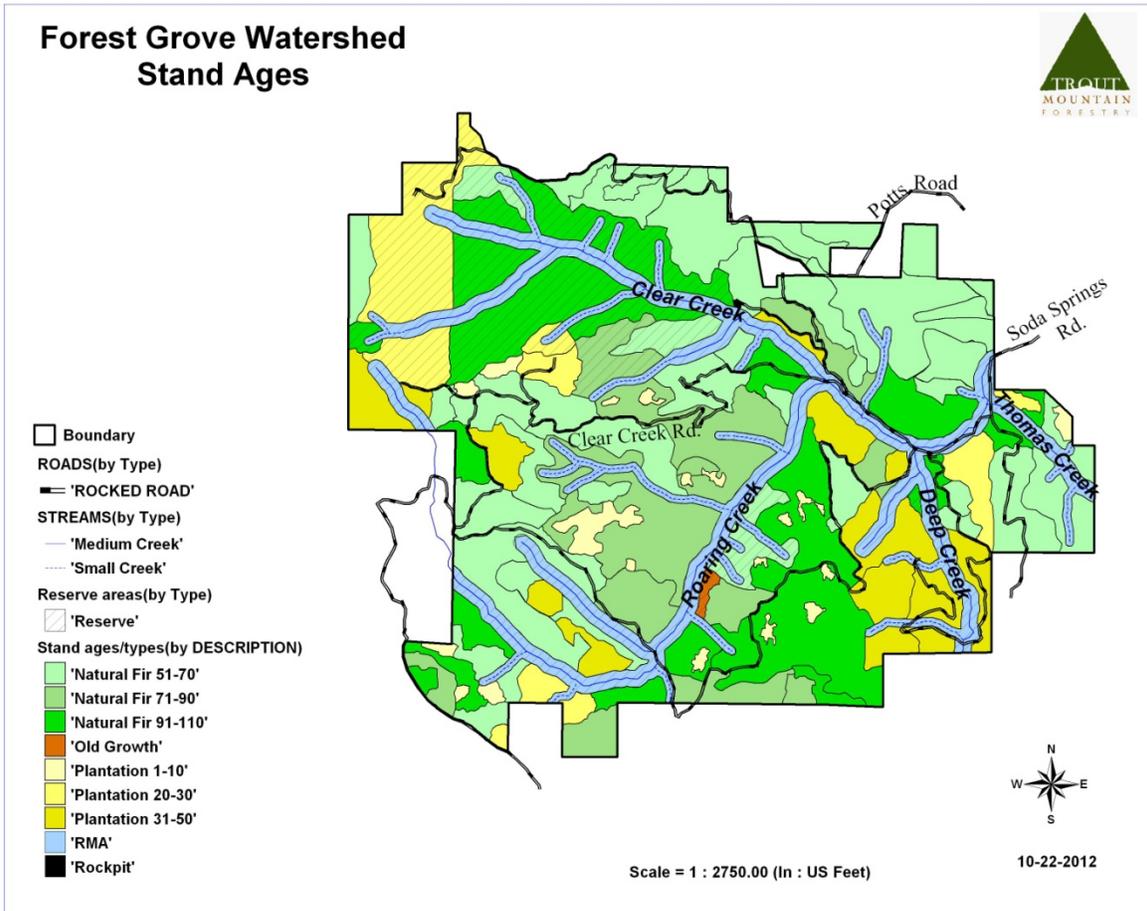


Most of the forest is comprised of even-aged Douglas-fir stands that are between 50 and 110 years old. Almost one thousand acres of these stands have been thinned in the past 11 years. There are approximately 920 acres of Douglas-fir plantations, which range from 22 to 50 years of age. The oldest forest stands are 90-to-110 years old, although older individual trees are scattered across the property. There is one seven acre old growth stand in the Roaring Creek reserve area.

Chart 2
Forest Age Distribution



With over 1,400 acres of over-80-year-old stands, the watershed forest is unusual in this part of the Coast Range, where most upland forest was logged 40 to 110 years ago or burned in large stand replacing fires known as the “Tillamook Burn” (1933 and 1945). There are few openings in the continuous forest canopy of the watershed, with the exception of a number of one-to-five acre regeneration “patch cuts” that have occurred during the past 11 years.



The forest structure is fairly homogeneous within the younger plantation forest stands (22-50 years of age). Older stands (harvested prior to 1960) feature much more structure and legacies from the pre-settlement forest. These older stands were harvested and not replanted -- they were simply left to naturally regenerate over time. These areas reproduced naturally, producing stands of greater diversity in tree age, species and density patterns. Often the loggers of that era let scattered trees stand for “seed trees” or left them because they were slightly defective and had no merchantable value. These “residual” trees now constitute the oldest trees on the watershed, reaching heights of over 200 feet and diameters greater than five feet. They also left large cull logs and other woody debris on site. Logging practices after 1960 emphasized “clean logging” that removed all trees.

Since 2001, logging practices in the watershed have focused on sustainable thinning, and small patch cut areas up to five acres. Methods used to harvest have been chosen to minimize the disturbance on soils, vegetation and neighboring trees. These recent patch cuts have created approximately 100 acres of new forest regeneration with a high diversity of species. Several of these areas were replanted to alder, some to fir and others to both fir and cedar.

Forest Protection

Management activities within the forest can either increase or decrease the risk of forest loss or decline from fire, wind, soil disturbance, insects and disease. Forest protection is accomplished through thoughtful actions that reduce this risk.

At present there is little evidence of tree loss from insects or disease on the Forest Grove Watershed. *Phellinus weirii* (laminated root rot), red ring rot (*Phellinus pini*) and brown cubicle rot (*P. schweinitzii*), are all present at low levels in the forest, and cause minor annual volume losses. Older, less vigorous trees that have prior stem injuries can lose most of their merchantable value as the rot progresses. Healthy trees are much more resistant to decay.

Swiss needle cast disease (*P. gaeumannii*), a native fungal pathogen, has affected Douglas-fir throughout the Oregon Coast Range, with damage identified in the Cascade Range as well. Serious disease symptoms include needle loss and growth decline, which has been found over an expanding area of northwest Oregon.^{viii} Insect defoliators such as Douglas-fir tussock moth and the western oak looper are also capable of doing damage if populations reach high levels. A windstorm in 2006 blew down small pockets of timber in the watershed, causing minor damage but providing habitat for a short-lived outbreak of Douglas-fir Bark Beetles, which reached populations sufficient to kill several small patches of trees. This beetle infestation quickly dropped off as the population returned to normal levels.

The best protection against disease and insects is to promote a healthy, diverse forest with abundant wildlife habitat. Healthy trees are much better at resisting disease and insect attacks. Diversity in tree species reduces the chance of insect and disease infestations, while lessening the impact if one tree species is lost. While Douglas-fir is dominant, establishing and maintaining a more diverse mix of species will help maintain long-term forest health. Planting should feature multiple species of trees when regenerating the forest. Good management practices such as soil protection and thinning to increase stand vigor will help protect the forest. By increasing wildlife habitat, the natural control of feeding birds, mammals and other insects will be enhanced.

Blowdown and snow breakage is a threat to trees of poor health and vigor. After a harvest, trees that have not acclimated to the new conditions are susceptible to wind damage. There is little damage of this type in the watershed. Trees are generally stable and vigorous, with little indication of post-harvest trauma following past cuts.

Soils, Roads & Slope Stability

Olyic, Hembre, Tolke and Pervian silt loams predominate. These are well drained silt loams and silty clay loams that formed from sedimentary and igneous rock. Runoff from bare soil is rapid and erosion hazard can be severe. On steep slopes (>60%) there is a hazard of landslides or ground slumping of soil from the base of sedimentary or

basalt rock. This can be seen in the several landslides that occurred during the 1996 storm. Of the six major landslides that originated during this storm event, all were on slopes >60% grade, and all the slides originated from poorly-drained roads that concentrated storm runoff on slopes that had been recently clearcut.

A watershed *Slope Stability and Landslide Hazard Evaluation* was done by Timothy W. Blackwood (in association with Portland State University), as part of the 1994 management plan. The report provides a delineation of hazard zones related to the risk of landslides within the watershed. The “extreme” and “high” hazard zones comprised about 17 percent of the forest, and consisted of headwalls, steep slopes over riparian zones, and other areas of potential soil instability. The “moderate” landslide hazard areas comprised 73% of the forest. A Light Detection and Ranging (LiDAR) image was completed in 2012 and confirms the 1994 data. These hazard zones correspond closely to the slope steepness, which is displayed in the LiDAR image on page 27.

Soil productivity is good, ranging from site class III to II.^{ix} These soils are well suited for growing Douglas-fir and mixed conifer/hardwood forests. Roots penetrate to a depth of 40 inches to more than 60 inches.

Watershed roads are generally well located (away from streams and steep slopes), are stable and have few stream crossings (see figure 4). Major stream crossings are low on the watershed, via well placed concrete slab bridges. Recent road work has repaired problem areas where ditching, cross drainage culverts and road surface improvements were needed (Roaring Creek Road and the Roaring Creek-Clear Creek connector road).

Figure 4

Watershed Roads

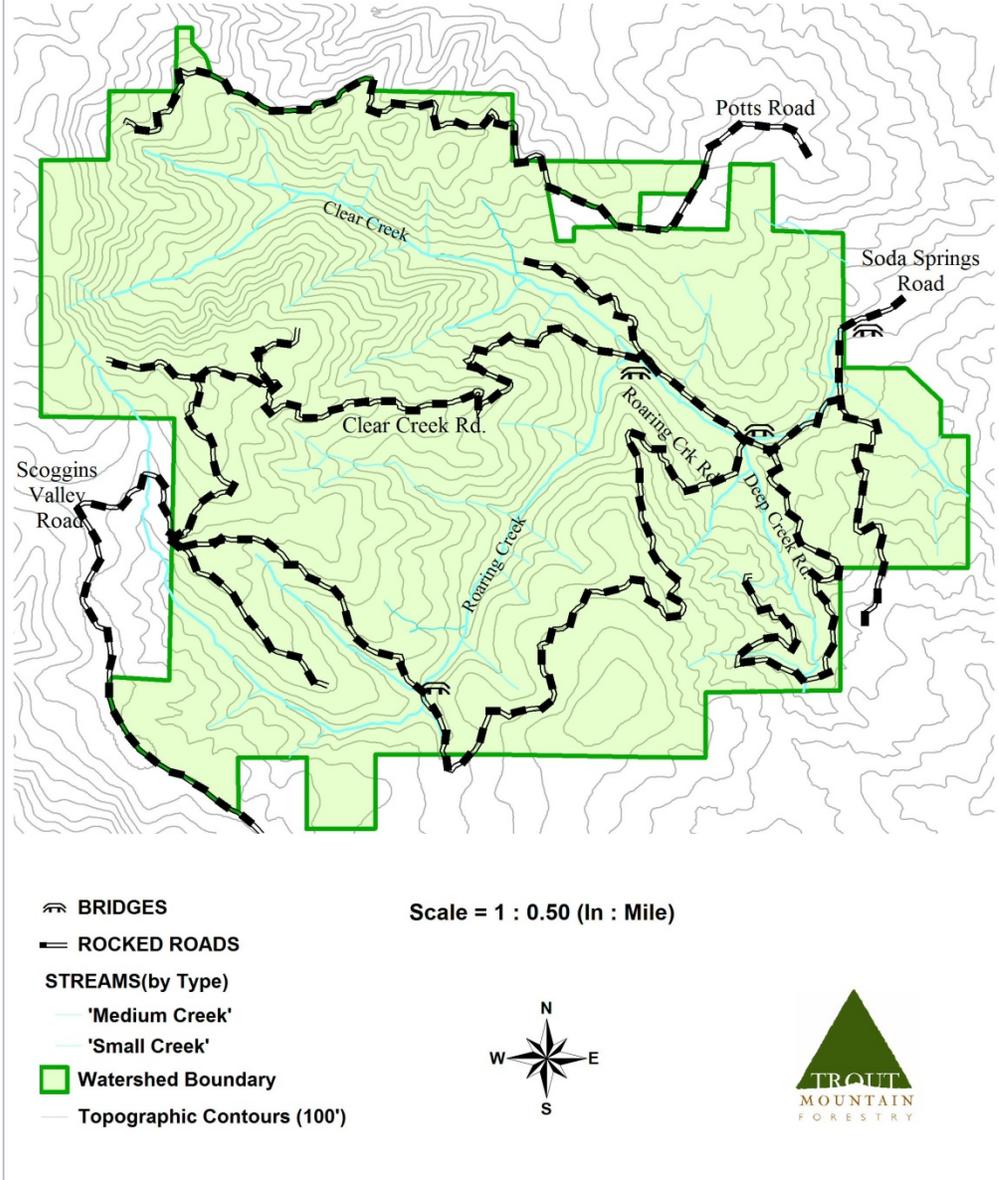
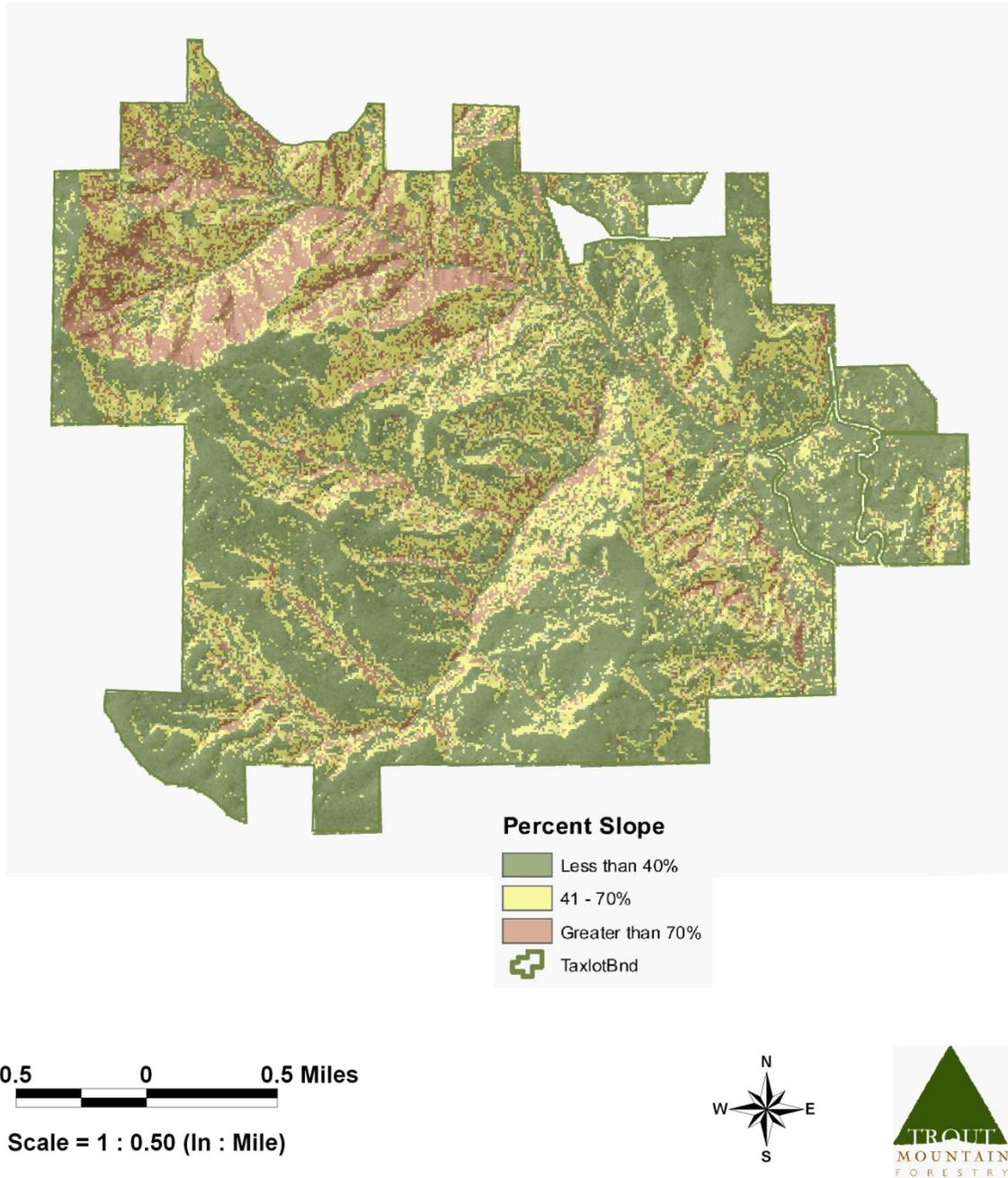


Figure 5

Slope steepness and erosion potential



The several landslides on the watershed in the past 20 years are associated with road building and timber cutting on steep, unstable slopes. In some cases, landslides occurred during extreme storm events, when drainage systems failed to prevent the concentration of water and the saturation of road fills. In all cases the roads have been repaired and the slides stabilized, with the exception of the previously described slide at the headwaters of Clear Creek. The 16 mile, rocky road system provides access to all major watershed landforms with the exception of a large contiguous block at the headwaters of Clear Creek. This block of forest consists of several hundred acres on the steep slopes to the south of Clear Creek (part of the forest reserve). Past harvest activity has been limited to dry season months (due to soil impact and water quality concerns) when rock-surface roads are less impacted by log hauling.

New road construction has been identified in recent studies as being the major factor in landslides and erosional deposition of sediment into forest streams. Stream impact increases with the density of the network and width of the roads. Although the methods of road construction and maintenance have improved greatly over the past 30 years, it is still the area of greatest potential impact on the forest ecosystem.

Fire Management

Although fire was a part of the historic natural disturbance regime on the Forest Grove Watershed and throughout the Oregon Coast Range, current risk of fire is moderate to low. Fire risk is highest from July through October, with low-to-minimal risks the rest of the year. Increased visitor use and dense, unmanaged fir plantations can lead to heightened fire hazard, though increases are small. Practices to reduce fire risk include encouraging hardwoods as fire breaks, controlling vehicle access, prohibiting open fires and overnight use.

While it is understood that fire in the forest can be beneficial, the risk of catastrophic loss from wildfire is always a concern. The two primary causes of wildfire are "Man" and "Lightning". This plan stresses (1) reducing the risk of a fire starting and (2) reducing the size and hazard of any fire by preparations which include upgrading and maintaining logging roads and trails, minimizing concentrations of slash, avoiding slash burning and preventing trespass. It's also important to follow the basic Department of Forestry rules on fire safety, especially when harvests coincide with late summer fire season.

Although fire was an integral part of the Oregon Coast Range coniferous forest ecology, wildfires cannot be allowed to burn due to the proximity to homes and adjacent properties. ^x

The City of Forest Grove Watershed is in the Northwest Oregon Fire Protection District, managed from the nearby Gales Creek office. The lead agency for fire suppression for forested areas is the Oregon Department of Forestry. The lead agency for structural fires is the Forest Grove Fire Department. More information on fire management is provided in Chapter 4.

Chapter 4 – Resource Policies

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

Management Statement

The City of Forest Grove Watershed is managed to protect and improve forest ecosystem health, for the purpose of providing the City with high quality water.

Emphasis is placed on protecting the health of the watershed streams, and restoring riparian habitat degraded by past management activities. Management activities (including tree harvest) will strive to increase the natural diversity of the forest and enhance its wildlife habitat values.

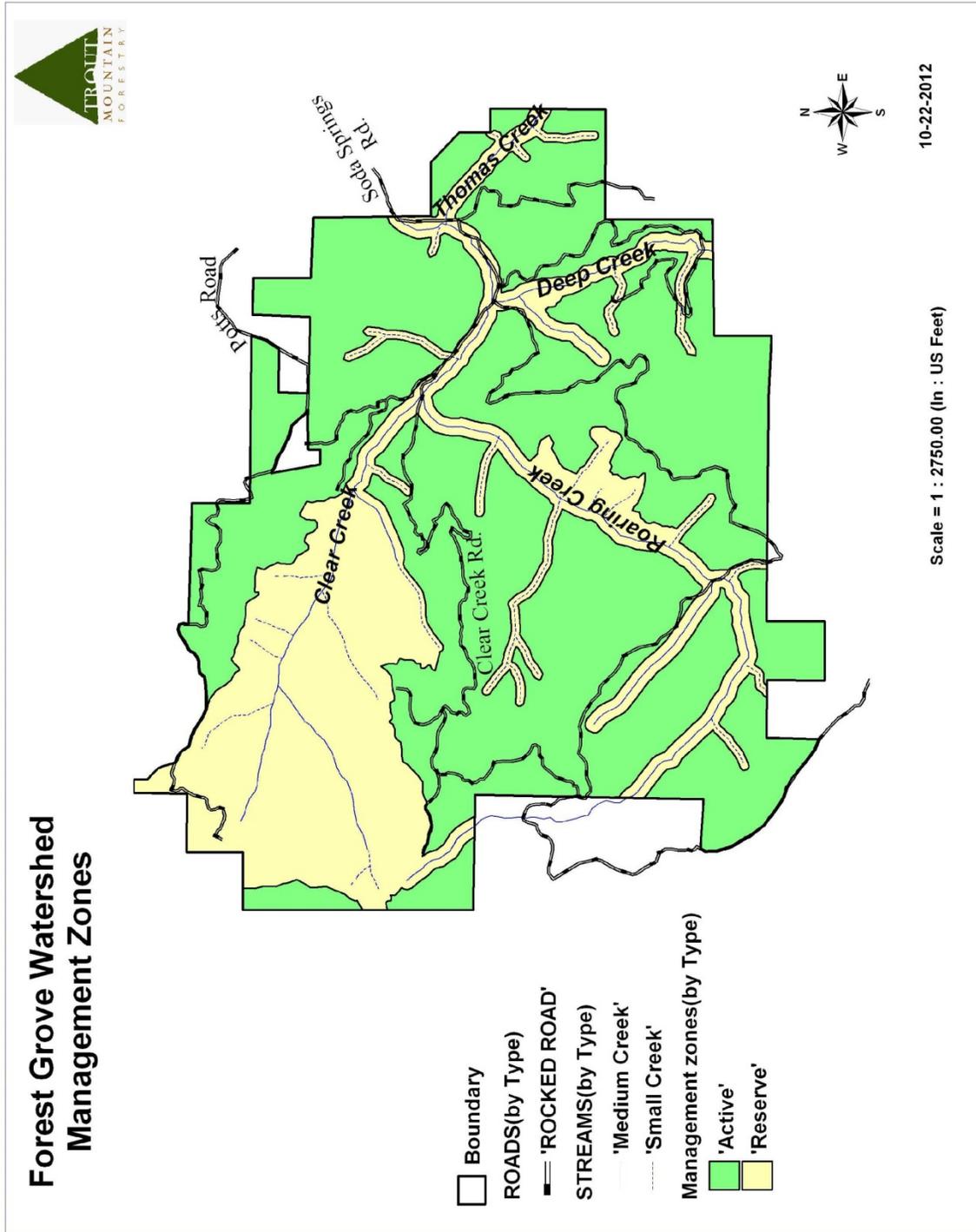
As a demonstration of progressive management practices, the watershed provides a model of sustainable forest stewardship that balances ecological, social and economic goals.

City of Forest Grove Watershed Management Goals

The Goals for the Watershed Management are:

1. To provide high quality water to the City of Forest Grove.
2. To actively promote diverse wildlife habitats, and to support a wide range of native biodiversity.
3. To use environmentally sensitive management and harvest techniques to restore degraded habitats, maintain forest health, improve tree quality, and help support watershed infrastructure.
4. To utilize and demonstrate current best practices in stewardship forestry and biological resource protection.
5. To strive for a balanced approach, giving ecosystem protection, community and social benefits, and sustainable forest management equal consideration.
6. To establish a model forest to demonstrate resource stewardship and provide educational and research opportunities.
7. To enhance stream health and riparian habitat quality.

Figure 6



Management Area Classification Criteria

To support the management goals and the Desired Future Conditions (DFCs), as well as to offer the greatest protection to sensitive resources and to direct management efforts to the most appropriate sites, watershed lands are classified into two general area designations: Reserves and Active Management Areas (AMA). Practices used in each management area take into account the special conditions and intended uses of each site (see table 1, page 33).

1,395 acres of the forest are reserved from harvesting (33%) to protect important biological and physical resources. 2,830 acres of the forest (67%) can benefit from more active management, including tree harvesting.

Reserve Areas

Areas with one or more of the following characteristics listed below are candidates for Reserve Area designation. Management of reserve areas is limited to that necessary for ecological restoration or enhancement.

- Riparian areas — lands within 200 feet (as measured from the annual high water mark outward) of the main stems of the five major streams, including the main tributary to Roaring Creek, and within 100 feet of minor perennial streams.^{xi}
- Steep slopes — areas of steep slope that are prone to landslide.
- Inaccessible — where excessively expensive or higher risk road building would be required to access.
- Representative ecosystems — Forest community types that are not common will be reserved from management (e.g., older mixed hardwood/conifer stands or two aged, Douglas-fir/western hemlock/cedar mixed forest).
- Old forest — stands or groves of trees older than 200 years.^{xii}
- Sensitive sites — areas of moist soils, sites prone to soil movement or windthrow, unique vegetative communities, critical wildlife habitats, and visually sensitive areas



Thinned Stand

Active Management Areas (AMA)

These areas of low risk, listed below, are where forest cover will be manipulated (active tree harvesting and replanting) using an array of techniques intended to achieve a variety of improved biodiversity and increased forest health objectives. Management techniques and principles will be demonstrated and interpreted for the citizens of Forest Grove and other visitors. These areas include upland sites — areas located at least 200 feet from main stem streams and 100 feet from perennial streams -- where risk of erosion or stream sedimentation is minor.

- Low risk of landslide— areas suitable for ground-based harvest or small scale cable systems, where risk of landslide is minimal.
- Easily accessible — areas where access for management can be developed economically and with low risk of negative environmental or visual impacts.
- Planted forests — plantations greater than one acre, including areas of associated natural regeneration.
- Douglas-fir communities — areas strongly dominated by Douglas-fir.

Table 1. Management Area Characteristics

	Reserves	Active Management Area
Acres	1,395 (33%)	2,830 (67%)
Features	Riparian zones, steep slopes above streams, inaccessible areas, unique habitats, old forest	Upland sites of moderate to low slope, natural and plantation forests, easily accessible
Target Forest Age	Old Forest (+200 years)	Balanced Ages 0 – 140 Years
Site Sensitivity (risk)	Moderate to High Risk	Low Risk
Tree Harvest	No commercial harvest	Conservative harvest levels, even and un-even aged stands, harvest cycles of 10-to-15 years
Habitat Enhancement	Highest priority	Enhancement accompanies tree harvest

Conservation Strategies

The basic elements of the conservation strategy in this forest management plan are included in the policies, objectives, standards and guidelines under each resource area in the sections that follow. A brief list of these basic strategies would include:

- *Management Zoning with large Reserves* - large reserves add a level of safety by removing sensitive parts of the forest from active management. Reserves Areas serve as “insurance” against the risk of unintended consequences from the more intensive management practiced in the AMA. This strategy is likely to provide a wider variety of conditions on the watershed, preserving options for future managers during a time of rapid change in societal values and natural resource sciences.
- *Go slow approach* - a key element in this management plan is the conservative, gradual approach to implementing management activities. This provides time to monitor and assess the success of management in an adaptive context, as strategies are applied from site to site.

- *Integrated management of resources* - the planning process has used a multidisciplinary, integrated approach to management of water quality, wildlife, fisheries, timber and botanical resources. These are linked on the landscape and all are important aspects of forest ecosystem health.
- *Forest Structure* - under this plan, the forest will grow older and more structurally diverse. Harvest prescriptions will create more structural variety within planted and natural stands that will benefit wildlife.^{xiii} Carbon storage within the watershed will increase over time as the forest ages and accumulates physical volume.
- *Tree harvest based on forest health needs* - harvest levels are set below current growth rates and are not revenue driven.
- *Landscape approach* - the watershed management plan focuses on landscape-level effects, both within the watershed sub-basin and in the greater Coast Range region. Examples include policies to work cooperatively with neighbors, to purchase additional land within the Clear Creek drainage basin, and to provide additional old forest structure within reserves (currently lacking in the region).



Doug Fir Bark Beetle

Water Quality and Aquatic Resources

Policies

Water quality, riparian habitat and aquatic biological productivity shall be maintained and enhanced through the application of good stewardship practices and the implementation of watershed improvement projects. Fisheries habitat management shall include protecting water quality through maintaining soil stability and productivity, as well as improving the health of riparian and aquatic ecosystems.

Objectives

- Provide the highest quality of water to the citizens of Forest Grove.
- Give special consideration to protecting or recovering designated sensitive species.
- Manage riparian zones for restoration and enhancement of wildlife habitat and water quality.
- Protect areas with special value for water quality or aquatic productivity.
- Monitor and evaluate the effects of forest management on water quality and aquatic productivity.

Standards and Guidelines

General

1. The watershed is protected from trespass or other unauthorized use. Authorized use guidelines can be found in the Public Access section of this plan.
2. Management efforts are designed to maintain viable populations of all native fish species present, and select invertebrates.
3. Fisheries professionals are involved in planning for resource improvements.
4. Habitats of rare, endangered, and sensitive species are given high levels of protection.
5. Active fish habitat restoration perpetuates and encourages the habitat productivity and reestablishment of native fish species.
6. Logging is restricted to dry season conditions to reduce impacts on roads and the resulting sediment that is generated by log trucks. Logging policies are covered under the Timber Management section.

Riparian areas

1. Timber removal is prohibited within stream riparian reserves, except for restoration activities (no commercial harvest is allowed). Practices promote older forest structure and diversity.
2. Skid trails or roads in riparian areas are retired or relocated wherever possible.
3. Equipment operation in riparian areas is prohibited, except for restoration activities.

4. Restoration activities within riparian areas use methods with the lightest possible impacts.

Fish habitat and stream structure

1. Key (anchor) habitats are given the highest levels of protection.
2. Degraded or at-risk habitats are targeted for improvement or restoration.
3. Fish passage is provided around barriers when practical and beneficial.



Stream Restoration

Wildlife Resource Management

Policies

Protecting the wildlife resources of the Forest Grove Watershed is accomplished by using active management to improve habitat conditions, as well as reserving sensitive sites from timber management. Wildlife habitat improvements shall promote species diversity, and ensure that populations of indigenous species are maintained or enhanced. A range of habitat conditions (from open and edge habitat, to large areas of undisturbed, older forest for deep-forest species) is provided within the watershed.

Objectives

- Identify and protect the full array of wildlife species present and their habitats. Enhance habitats where desirable.
- Give special consideration to protecting or recovering designated sensitive species.
- Retain select trees as biological “legacies”, as seed sources for natural regeneration, and for stand structure.
- Protect areas with special value for wildlife habitat.
- Monitor and evaluate the effects of forest management on wildlife resources.
- Promote connectivity between habitats as opportunities arise.

Standards and Guidelines

General

1. Forest management efforts are designed to maintain viable populations of all native vertebrate species present on the site, and select invertebrates.
2. Wildlife professionals are involved in planning for resource improvements.
3. Habitats of rare, endangered, and sensitive species are given high levels of protection.
4. Management of mixed stands protects veteran broadleaf trees (especially oak and madrone).
5. Active restoration perpetuates and encourages the re-establishment of native species on appropriate sites.
6. Wildlife management considers the overall goals of the watershed and the functionality of the forest ecosystem.

Legacy and wildlife trees

1. Trees that are unique for their size, age, species, wildlife value or location are protected. Criteria for legacy and wildlife tree selection and management are followed (see table 2, in the Timber Management section).
2. Trees more than 200 years old are identified and retained as legacy trees.
3. Wildlife trees are cultivated to provide critical habitat (den cavities, nests, perch sites) or mast (acorns, seeds, or fruit).^{xiv}
4. Wildlife trees are retained during harvest and allowed to naturally die, providing future snags and large woody debris.

Snags and coarse woody debris (CWD)

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



Top Notch Snag Creation

Vegetation and Botanical Resource Management

Policies

Maintaining the biological richness and native diversity of the Forest Grove Watershed is a key priority. Active and diligent management enhances forest health, and promotes disease and wildfire resistance. Invasive exotics are controlled to improve degraded habitats and create a species mix indigenous to Douglas-fir and mixed woodland communities.

Objectives

- Maintain the biological richness of the native vegetative communities present, including mixed hardwood/conifer woodland, riparian forest, and upland Douglas-fir ecosystems.
- Identify species present, and protect habitats of designated sensitive species.
- Maintain control of invasive non-native species.
- Rehabilitate degraded ecosystems, including areas impacted by past management.

- Educate the forest visitors of the importance of forest botanical resources.

Standards and Guidelines

Plant communities

1. Areas of rare or sensitive plant communities are protected from adverse impacts. Road building through such areas is not allowed.
2. Degraded plant communities are actively managed to promote biological diversity and ecosystem health.
3. Forest understory vegetation is protected during timber harvest operations (see Timber Management section for timber harvest standards and guidelines).

Rare flora

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

Exotics

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

Restoration

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

Timber Management

Policies

The emphasis of timber management of the Forest Grove Watershed is to maintain and improve the long-term ecological productivity and biological integrity of the entire forest ecosystem. The desired future forest will feature large trees of mixed species and age. Harvest levels shall be based on forest health and other ecological goals, and not be driven by revenue needs. Lands on which other resource values exceed timber values are removed from the timber management base. Reserves are dominated by maturing Douglas-fir and mixed conifer/hardwood forest. The Active Management Areas support more harvest activity, but retain significant elements of older forest character scattered throughout.

Objectives

- Actively manage forest stands in accordance with the Plan's Management Goals, to create the stated Desired Future Conditions (see chapter 5). "DFCs" are subordinate to the plans goals and resource policies. Reserve sensitive areas from management.
- Protect biological resources as a key priority in management.
- Select management practices based on the best forest science available.
- Prescribe flexible silvicultural methods that enhance the health and vigor of the forest, while maintaining aesthetic values.
- Maintain long term site productivity by protecting soils from adverse harvest impacts and promoting natural soil fertility.
- Allow portions of the forest to become more mature.
- Emphasize thinning to promote stand growth and longevity, forest health, and economic returns.
- Regenerate selected stands to maintain a balance of ages and species, or when stands are at risk.
- Reforest stands by natural reseeding if practical, using planting as necessary to ensure regeneration success.
- Adapt timber management plans, with City Council approval, over time to preserve water quality and quantity, and to address other resource policies, changing goals, forest conditions, and the understanding of forest ecosystems.
- Align with externally recognized sustainable management practices, such as the Forest Stewardship Council standards for sustainable forest management^{xv}.

Standards and Guidelines

Planning & Reports

1. Annual timber harvest reports and operational plans are used to implement the management goals and make progress toward the DFCs, document the decision-making process, and to justify and schedule management operations.
2. Operational Plans are written by a professional forester, and based on statistically relevant resource inventories and assessments of forest values and functions.
3. Plans perpetuate or enhance the full range of forest values and functions, as possible.
4. Input from wildlife, fishery, and botany professionals is solicited and incorporated into harvest plans.
5. Forest resources are inventoried and the management plan is updated every 10 years (see Monitoring section).
6. Annual Operational plans are prepared to detail management activities, periodic harvests, and planned surveys.
7. Operational plans include detailed maps and brief operational notes. Maps include: stand delineations, reserve areas, and locations of any landings and skid trails. Operational notes include: prescriptions for each unit, project specifications, intended outcomes, timber harvest volume and value estimates, and implementation details.
8. Prior to harvest notification and commencement of activities, the operational plans are submitted to City staff and presented to the City Council for review feedback and comments.
9. At the beginning of each 10-year planning cycle, a 10-year Forest Operations Plan will be developed to describe forest restoration activities, any surveys that need to be done, and harvest prescriptions. The 10-year operation plan will describe the extent, location, and estimated year that the operations will occur.

Sustainable harvest level

1. Growth rates used in harvest level calculations are estimates and consider only the AMA forestry base acreage.
2. Harvests do not exceed estimated growth during any five-year period.
3. Preferred harvest levels are 50–70% of estimated growth for young stands (30 to 60 years old) and may exceed the estimated growth increment for older stands to maintain tree vigor and allow gaps for regeneration.¹
4. Harvests may vary from these levels -- if necessary -- to protect forest health following a significant disturbance such as fire, wind or insect damage. Salvage removal in these cases must conform to the over-arching plan policies and guidelines regarding resource protection, with particular emphasis on stream health and water quality.

¹ See Chapter 5 for discussion of harvest levels

Rotation

1. For even-aged stands the target age at maturity ranges from 90 to 140 years.^{xvi}
2. For uneven-aged stands, regulation of stand structure is based on maintaining a balance of small, intermediate, and mature size trees.²
3. Seedlings and saplings (1 to 20 year old trees) should comprise at least 10% of the actively managed forest (AMA). Every ten years enough regeneration is secured to maintain this balance.

Silviculture

1. Clearcutting is prohibited on the forest.
2. Openings for tree regeneration are produced by “Patch cuts” or Variable Retention Harvests (see appendix for definitions). Harvest openings are generally less than five acres and are non-contiguous. The area of variable retention harvests may exceed five acres only if needed for forest health and wildlife goals. Such “VR” units may be up to 20 acres in size and must be reviewed and approved by the City Council prior to the start of harvest operations. Tree retention requirements in VAR units are proportional to the size of the opening, and increases to 30 percent as the opening size approaches 20 acres. No variable retention harvests larger than 20 acres are allowed. Small openings (less than 1 tree height) are used to regenerate shade tolerant species.
3. Harvest openings blend in with the natural terrain. Retained trees are selected to promote wind firmness.
4. In harvest openings of 3 acres or greater in size, at least 15 percent of the original stand is retained.
5. Forest tree species diversity is encouraged by retaining alder, bigleaf maple and minor coniferous species in thinned stands.
6. Retaining and developing mixed species stands is desired on appropriate sites
7. Thinning is the preferred harvest method, especially in areas of high visual and/or environmental sensitivity.
8. No more than 50 percent of stand volume is removed in any thinning entry.
9. The harvest cycle (return interval) is determined from thinning response. Stands are re-entered when stand health is increased by harvest and/or for the promotion of desired forest structure and biodiversity goals.

² See Chapter 5 for discussion of desired future conditions



Shovel Thinning

Timber harvesting

1. A professional forester supervises all aspects of timber harvest operations, including marking trees to be cut, marking wildlife, legacy trees, and other protected resources, and supervising operations as necessary. The professional forester may be certified by the Forest Stewardship Council (see appendix). The forester also provides ongoing stumpage accounting, and notifies the City of Forest Grove in case of contract or environmental infractions.
2. The Forester works with City staff to delineate the qualifications of the logger the City hires to perform the timber harvest. The Forester coordinates the method of sale of the timber with City approval, and documents all transactions.
3. All remnants of the older forest (e.g. residual trees, snags, large cull logs) receive the highest levels of protection.
4. Boundary lines are surveyed (where needed) and marked prior to any nearby harvest activity. Adjoining property owners are notified before harvest start-up.

5. Logging is conducted in ways that insure public safety and minimize user conflicts.
6. Logging is suspended on weekends.
7. Logging systems are used that are appropriate for the site and adequate to protect watershed resources from undue disturbance and impacts, including bark damage and soil compaction. Cable yarding systems are used on steep terrain to protect against ground disturbance and soil erosion.
8. All logging equipment is cleaned (power-washed) prior to entering the watershed, in order to prevent the introduction of exotic species.
9. Logging is restricted to dry-season conditions to minimize soil disturbance and impacts on the watershed road system. Hauling is restricted during periods of heavy rain (e.g. rain in excess of 1 inch in 24 hours) at the discretion of the forester.
10. During logging every effort is made to leave snags, hardwoods, and down logs intact.
11. Loggers fall trees and process logs to minimize waste and maximize timber yields.
12. Ground logging equipment is restricted to designated skid trails, to limit damage to residual trees and minimize soil compaction.
13. Forest understory vegetation and soil structure is protected during logging operations by minimizing soil disturbance, using appropriate equipment to yard logs, and careful design and layout of the logging plan.
14. After logging, clean-up of landing areas removes all un-merchantable material and trash.

Reforestation

1. Natural regeneration is favored where it exists or can be initiated. Scarification is used to encourage natural regeneration on appropriate sites. Advance (pre-existing) regeneration is protected from damage during logging.
2. Unless an alternative plan for natural regeneration is in place, any harvest operation that reduces stand basal area below 80 square feet per acre is replanted (per Oregon law).
3. When planting, a variety of native, site-adapted commercial tree species are used. Seedlings from appropriate seed zones are used.
4. Planted seedlings and natural regeneration are kept vigorous and free to grow by judicious and economical vegetation control. Manual brush cutting is the preferred control method.
5. Consider the establishment of natural fire breaks when regenerating a stand.
6. Logging slash is lopped and scattered across harvest areas. Piling is restricted to regeneration areas with excessive slash volumes. In such situations piles are kept under 4 feet tall (unless piles are created for wildlife habitat).
7. Herbicide use is limited to exotic weed control, or where manual methods are ineffective. Targeted application by single stem injection or backpack sprayer is the preferred method.
8. No aerial application of forest chemicals is allowed.

Roads and culverts

1. Road beds and cleared right-of-ways are kept to the smallest size necessary for log truck access.
2. New roads shall be kept to the minimum necessary for management access. Skid trails are designed to follow slope contours; dips and water bars are installed.
3. Haul road grades are kept to less than 20%. Skid trails grades are kept to under 35%.
4. Stream crossings are kept to the absolute minimum number necessary.
5. Culverts on fish bearing streams are designed to allow fish passage.
6. Landings are kept to the absolute minimum size and number necessary for logging safety and efficiency.
7. Any temporary roads built are closed and re-vegetated upon completion of logging operations.
8. Road construction and re-construction shall be restricted to the dry season.
9. Skid trails, landings and haul roads cover less than 10% of the operational area.
10. At stream crossings, all road ditch lines shall be dis-connected above the stream area and directed into filtering vegetation to prevent sediment from entering streams.

Fire management

1. All wildfires occurring on the forest shall be controlled as soon as possible. There are no “let-burn” areas on the forest.
2. Slash burning is avoided, unless necessary for wildlife habitat or forest health reasons.
3. No accumulations of slash remain within 25 feet of roads or landings, except in the case of piles created for wildlife habitat.
4. Management activities are restricted according to State industrial fire precaution levels, unless local conditions warrant a waiver (applications for waivers are at the discretion of the forester and the Director of Public Works).

The watershed has certain trees that should be managed with special care due to their attributes and characteristics. These trees may provide critical wildlife habitat, or may be of a certain species or age that adds to the diversification of the forest. Table 2 below delineates the selection criteria and management of special trees.

Table 2. Selection and management of special trees

Selection Criteria

	Wildlife Trees	Snags	Legacy Trees
Number	2 – 4 per acre	4 or more per acre	Eventually 4 or more per acre; mark at least 1/acre at each entry until target is met
Species	Representative of stand; at least 50% conifer	Any conifer or maple preferred for longest persistence; avoid alder	Representative of stand; for diversity include minor species
Size	Large diameter from any crown class	Larger snags have greatest habitat value	Larger dominants; smaller trees may be selected if likely future dominants
Vigor	Any vigor	n.a.	High vigor; good growth, leaf color and density, crown depth
Form	Cavities, heavy limbs, dead tops; live tree to be topped	n.a.	Good form: Low taper, small branching, few defects
Location	Well distributed wherever present; especially valuable if near riparian areas	Well dispersed or clumped; least safety hazard when located near stand margins	Well-distributed or clumped

Management

	Wildlife Trees	Legacy Trees
Marking	During harvest layout mark with paint (W) or tags	During harvest layout mark with (L) or tags
Recording	During harvest layout tally by stand, species, diameter; GPS locate unusual trees	During harvest layout tally by stand, species, diameter; GPS locate unusual trees
Protection	Reserve from harvest; top and stem damage acceptable; fell only where a safety hazard	Highest level of protection during harvest
Replace	Mark replacements when felled as safety hazards or lost through natural mortality	Mark replacements if trees are damaged or lost from logging, natural disturbance, or disease
Longevity	Retain as future snags and woody debris	Reserve from harvest until suitable replacements are available (regeneration at least pole size)/ retain at least 25% as future snags

Access and Public Education/Demonstration

Policies

Protecting the water quality and biological resources of the Forest Grove Watershed are accomplished by restricting public access in a manner that is consistent with the desire to accommodate citizens interested in the watershed and groups pursuing educational or research activities.

Objectives

- Protect water quality and sensitive resources.
- Accommodate public interest in the watershed.
- Provide access for educational or research activities.³
- Encourage tours and visits as a “model forest”.
- Ensure a safe experience for visitors.

Standards and Guidelines

1. Use a written permit process.
2. City staff will evaluate requests on a visit-by-visit basis.
3. Visitors must be accompanied by staff (City may require reimbursement for time).
4. Special arrangements may be made for organizational groups and individuals pursuing educational or research activities.
5. Visitors will be informed about restricted areas and location of roads.

³ Within the capacity of City staff to manage

6. No vehicles are allowed on the watershed other than vehicles authorized by the City of Forest Grove or an agent of the City.
7. The City will arrange for sanitary facilities when tours are conducted.

Monitoring

Policies

Monitoring of water quality and biological resources of the Forest Grove Watershed enables managers to assess the health and the ecological functions of the forest.

Objectives

- Provide ongoing information on changes in watershed resource conditions.
- Develop a base of resource data that informs management decisions.
- Where practical, measure “before and after” conditions to assess impacts of active management.
- Provide a scientific basis for adaptive management in the watershed.

Standards and Guidelines

1. Where possible, use sampling methods and techniques that are replicable and statistically meaningful.
2. Focus monitoring efforts on the measurement of changes in water quality and health of aquatic organisms (e.g. fish and aquatic macro-invertebrates).
3. Monitor the effects of site disturbance on surface water flow and stream sedimentation.
4. Monitor changes in invasive vegetation along roads and disturbed sites.

Chapter 5 – Management Recommendations

This chapter discusses the desired future conditions (DFC's) of the watershed and summarizes management needs and opportunities by resource area, and prioritizes recommendations. A timeline for suggested activities and operations follows at the end of the chapter.

Desired Future Conditions (in 2053)

Reserve Areas

- Clear Creek and its tributaries provide high-quality water to the City and healthy habitat conditions for native fish populations.
- Older, diverse forest stands that have large trees, multiple canopy layers with cedar and hemlock.
- Large snags and down wood.
- Large hardwoods that promote diversity and habitat richness.
- Healthy, undisturbed understory vegetation.
- No established populations of invasive plants.
- No new permanent roads.
- Streams with healthy riparian areas and good wood recruitment.

Active Management Areas

- The number of hardwood stands has increased (>10% of the AMA).
- Up to 20% of forest stands have two-or-three canopy layers (uneven-aged).
- The uneven-aged and hardwood stands are open enough to support a vigorous understory of native vegetation.
- The majority of the area is comprised of even-aged Douglas-fir in all stages of forest development, ranging in age from 1 to 140 years old⁴.
- Up to 10% of the currently oldest even-aged forest stands remain (where special habitats exist or access is difficult).
- Forest stand openings (harvest units) do not exceed 20 acres and are irregular in shape and contain abundant forest legacies.
- The AMA contains up to 850 acres of even-aged fir stands under 40 years old, and the age class distribution of all stands is more balanced.
- All stands have good soil structure and healthy understory vegetation.
- Roads are stable with good surfacing and drainage.
- There are no established populations of invasive plants.

Discussion

No active management will occur in the Reserve Areas over the next 40 years, with the exception of invasive weed control and non-commercial tree cutting to improve wildlife

⁴ See Age Class Distribution Chart 2, page 22

habitat. This lack of disturbance will lead to natural aging of the forest stands, with a resulting increase in snags and down wood. General wildlife habitat richness will increase. In the Active Management Areas the harvest planning for the next 10-year period will be guided by the goal of having even-aged Douglas-fir stands in all stages of natural development, from young seedling-and shrub openings to older stands with large trees and advanced natural regeneration. Forest stand ages will be balanced in broad age classes to provide an array of successively developing stands and a diverse mix of forest conditions and habitats. The future forest will have a mosaic of forest stands of different size, age and density that are vigorous and where insects and disease are present in low levels appropriate to a stable, natural condition. The most common forest stand will continue to be older, mature Douglas-fir that has been thinned several times to promote tree vigor, forest health and habitat diversity. Soil function and fertility will rise with increasing levels of down wood and the increasing diversity of understory vegetation.

This concludes the discussion of long-term Desired Future Conditions. The following sections discuss specific management opportunities and management recommendations by resource area. These are near-term recommendations for the next 10-year planning period.

Water Quality and Aquatic Resources

Opportunities

- Water quality and aquatic systems can be safeguarded by protecting wide riparian management areas and sensitively managing upland sites adjacent to riparian zones.
- A landslide area in the upper reaches of Clear Creek can be re-vegetated and stabilized to reduce sediment input.
- Additional suitable habitat in upper Clear Creek can be made accessible to Steelhead, Coho, Cutthroat, and Pacific Lamprey by maintaining the fish ladder in good operating condition, particularly during times of anadromous fish migration.

Careful management can mitigate the site's inherent risks of landslides and erosion due to high rainfall, steep slopes, and shallow soils, as well as risks associated with the existing road infrastructure and past slope failures associated with roads.

Sensitive Sites and Key Habitats

There are several conditions within the basin that warrant special consideration in the development of management alternatives for the watershed. Each of these sites has the potential for precipitating events that would be detrimental to water quality and/or endemic salmonid populations.

An old road failure and slide area on Deep Creek Road continues to impact the stream system with sediment during high stream flow periods. This slide area should be

studied for possible treatments to reduce the input of sediment. The last mile of Deep Creek Road was constructed in a zone of high landslide risk, and needs to be decommissioned to protect the stream.

The large beaver dam complex above the Thomas Creek diversion structure functions as a filter and trap for sediment, and provides important fish habitat. The beaver population in this area should be encouraged and protected.

Stream Temperature

Clear Creek has been listed in the past as water quality limited by the Oregon Department of Environmental Quality (DEQ) for not meeting minimum water temperature criteria. Past clear-cutting of headwaters areas, debris torrents and the resulting homogeneous stream channels, diversion impoundments, and late summer water system withdrawals all can contribute to elevated stream temperature.

As plantations in the headwaters of Clear Creek and Thomas Creek areas age, increased shade has gradually lead to lowered stream temperatures. Wider buffers on headwater streams and sensitive management of adjacent stands have reduced impacts of tree harvesting on water temperature and sediment loading. Wider buffers, restrictions on clear-cutting, and restrictions on road building have minimized the risk of future debris torrent events.

Recent additions of large logs to the stream channel of Clear Creek should be monitored for beneficial impacts of stream habitat and fish populations.

Summer withdrawals from the five streams should continue to be closely monitored and managed to provide enough cool water for healthy fish populations.

Stream Sediments

Stream sediments impact domestic water quality, increase water treatment costs, clog fish spawning beds, and impair the survival of eggs and young fry. Wide riparian buffers, sensitive upslope management and ongoing road maintenance have reduced the risk of debris flows, erosion and resulting stream sedimentation.

The slope failure in the headwaters of the upper left fork of Clear Creek continues to effect water quality with persistent sediment recruitment into the active stream channel. A slope-stabilization project at the source of the sediment would consist of a natural fiber mat with closely spaced willow stakes. This should be undertaken in the spring when the willow is most likely to take root and survive.

Fish Passage Improvements

While it would be uneconomical (and inadvisable) to remove all barriers to fish passage, key fish passage improvements were made with the construction of the Clear Creek fish ladder in fiscal year 2006-07 and the removal of the upper Roaring Creek bridge and Clear Creek weir gauging station in fiscal year 2012-13. It is important to monitor fish populations to document the effectiveness of these changes.

Additional surveys

Low fish densities observed in Clear Creek (in the 2001 survey) are typical of an aquatic corridor not functioning to its full potential. However, fish numbers were surveyed in conjunction with the removal of the concrete weir and addition of large wood placements during the summer of 2012. To monitor the effectiveness of these changes, summer rearing densities of steelhead, Coho and Cutthroat trout in Clear Creek should be re-inventoried in the summer of 2013. Fish populations and habitats of the Thomas and Deep Creek sub-basins could be sampled at that time.

Recommended Actions	Water Quality and Aquatic Resources
1.1	Bio-Engineer slope stabilization of the Clear Creek headwaters sediment source.
1.2	Maintain the Clear Creek fish ladder in good functioning condition, particularly during the critical spring run of Steelhead and fall run of Coho.
1.3	Establish a macro-invertebrate baseline sample for Clear Creek.
1.4	Inventory Clear, Roaring, Thomas and Deep Creeks.
1.5	Research minimum flow criteria for Clear Creek.

Wildlife Resources

Opportunities

- The rich array of native biodiversity can be maintained and expanded.
- Snag and woody debris levels can be increased.
- Hardwood habitat and mast production can be increased.
- Riparian habitats can be protected and enhanced.
- Maturing forests can provide good habitat for many old-forest dependent species.
- Dense, uniform stands can be thinned for biodiversity. Mixed species stands can be encouraged.
- The large, contiguous acreage of maturing and riparian forests can benefit wildlife on a landscape-wide basis (beyond the property boundary).

Species diversity

Timber management prescriptions should include provisions to maintain or increase the abundance and diversity of trees and shrubs. Hardwoods and minor conifer species should be retained in thinning and regeneration harvests. As possible, shrub species should be protected during harvesting (for example, avoid falling trees into “brush patches”).

A mix of conifer species should be used in new plantations. Trees planted at low or variable densities allow shrub species to persist longer (planting should be sufficiently dense to assure good future tree quality). Hand cutting of competing vegetation also enables shrub persistence while assuring eventual conifer dominance.

Threatened and Endangered Wildlife

A 1994 study by Beak Consultants, Inc. of Portland reported that significant Northern Spotted Owl habitat exists. A lone female Spotted Owl was found in the upper Clear Creek area of watershed in 2002. Surveys done several years later did not detect this female, but in 2009, an ODF survey detected a pair of Spotted Owls in approximately the same location. There was no evidence of a nest in 2009. An informal sighting of a Spotted Owl occurred during the 2011 resource inventory. This history of sightings within the watershed illustrates the need to conduct surveys to determine the existence and location of any individual owls or active nesting sites.

Biodiversity and critical habitat improvements

Silvicultural practices can benefit biodiversity with little impact on timber productivity. Long rotations (100 years or longer) provide old forest habitat and provide high timber yields. Thinning of dense stands benefits biodiversity and improves timber yields. A range of canopy reductions in thinning provides further biodiversity benefit.

Existing snags and cavity trees should be protected during harvesting (where they are not a safety hazard). The natural process of tree mortality and wildlife damage (usually from bear) contributed a significant numbers of snags in the years leading up to this plan update. A minor outbreak of Douglas-fir bark beetle damage provided more small pockets of dead trees in 2009. With hundreds of acres of older stands (85-110 years old), natural tree mortality produces large snags that are particularly long-lived and valuable to wildlife.

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

Brush and slash piles create short term habitat when down log habitat is scarce. Logging should avoid disturbing existing rotten logs and snags. Avenues for big game travel should be created where post-harvest slash concentrations are high. Landings and roadsides should be seeded with a grass/forb mix to benefit wildlife and control erosion.

Riparian habitat improvements

Many riparian areas are intact and fully functioning. Excluding riparian and reserve areas from active timber management protects critical biodiversity resources and protects water quality. Management of riparian and reserve areas is limited to restoration practices such as snag and down log creation and restoration thinning of dense young plantations.

Additional riparian habitat improvements are detailed under Water Quality and Aquatic Resources.

Recommended Actions**Wildlife**

- 2.1** Conduct surveys to determine the presence of any Northern Spotted Owls living in the watershed.
- 2.2** Maintain riparian and reserve areas. Limit riparian and reserve management to restoration practices.
- 2.3** Thin dense stands to create a variety of tree densities. Protect snags, down logs, hardwoods, and shrubs during operations.
- 2.4** Mark and retain wildlife and legacy trees in conjunction with timber harvest operations.
- 2.5** When lacking, create down logs in conjunction with timber harvest operations. Provide additional small mammal, amphibian and reptile habitat by creating brush piles
- 2.6** Use a variety of species and planting densities in new plantations. Release conifers from competition by hand cutting.
- 2.7** Seed landings and roadsides after disturbance
- 2.8** Investigate the feasibility of surveying for birds in the AMA.



Timber Resources

Opportunities

- A mix of gentle terrain and good road location above the steeper slopes of the Active Management Areas enables small scale, environmentally sensitive logging techniques.
- Regular road inspection and maintenance helps preserve the current system and protects water quality. The final segment of Deep Creek Road needs to be de-commissioned to protect water quality.
- Tree vigor and wildlife habitat quality can be improved by a program of regular thinning. The range of tree ages and species composition between forest stands can be maintained and expanded. The diversity of tree species and ages within some stands can be increased by thinning and planting (uneven-aged).
- The diversity of tree species can be increased by cutting fir to open small regeneration patches and using a variety of species in new plantings.
- A large land base allows regular harvesting and predictable cash flow.
- Sustainably managed timber at times has a market advantage, especially for projects seeking Leadership in Energy and Environmental Design (LEED) certification.

- The wide variety of forest types and planned operations offer opportunities for demonstration and education.

Roads and Access

A 16.6 mile road system provides good access to most of the ownership. Most roads are generally well located, away from streams and hazardous slopes (see roads map page 26.) Stream crossings are few and mostly via good concrete slab bridges at the lower elevations of the watershed. Many road segments have been upgraded in the past 10 years by improvements in rock surfacing, grading and culvert replacement. The old stringer bridge crossing of upper Roaring Creek was removed and replaced by a re-decked railroad car bridge.

Because of the importance of protecting water quality and aquatic resources and preventing landslides, the maintenance program of routine monitoring of the road network should be continued. The road system is inspected regularly, and should be done at least twice yearly, during an early fall storm event, and in the spring following the wet season. Additionally, roads should be inspected following a major rain event. Routine maintenance should include grading and shaping roads, clearing ditches, cutting roadside vegetation, clearing and replacing culverts as needed, and maintaining culvert marker signs and road mileage signs. Disconnecting ditch lines from streams and directing water into filtering vegetation to prevent sediment from entering streams will be accomplished to the maximum extent practicable.

Road work is needed on the unimproved road section that connects the Potts family property down to Clear Creek Road. This section crosses several small first order streams where old culverts need maintenance or replacement. The final 5,000 foot section of Deep Creek Road is in a hazardous location and is planned for decommissioning and removal of several large fills on creek crossings.

Existing roads access most areas, although several temporary earth-surface logging spurs have been constructed during harvest operations in recent years. These new spurs are minimum-width, small-footprint roads are used for the season and decommissioned after use. The watershed has well-controlled, gated access from two main county roads; trespass has not been a problem. The several limited entry points to the south and west are across adjacent landowners, and gated at ownership boundaries.

Sustainable timber harvesting

The following discussion on the appropriate levels of timber harvest does not include salvage harvest following unexpected tree mortality from fire, wind, insects or disease. See chapter 4, page 37 for the standard and guideline statement regarding salvage harvest.

The forestland within the Active Management Area totals approximately 2,830 acres. These acres are the lowest risk, most manageable areas on the watershed. The

conservation strategy applied here emphasizes managing the forest stands in an adaptive manner, using conservative harvest levels while the effects of management activities are evaluated and monitored.

Methods of Harvest Control

Harvest levels and scheduling are first based on the over-arching management goals of the watershed, and then on the desired future conditions of the watershed and the biological needs of each stand.

In long-range forest planning, there are two methods of controlling the level of harvest, the **volume method** and the **area method**.

Volume Method

The harvest level for the 2013-2022 period is not-to-exceed the estimated periodic (10-year) forest growth within the AMA, which is estimated to be 22.5 million board feet. This is based on an intensive forest inventory conducted in 2011 and projected growth from that inventory data. Harvesting up to the level of the estimated annual growth in the AMA helps to slow the trend toward increasing density and allow for the replacement of some older stands with younger trees (see Desired Future Conditions discussion above).

Using this volume control method, the maximum allowable annual harvest level would be 2.25 million board feet. Harvest levels within each stand are expected to vary widely. Some stands will not be thinned during the next ten years; others may be thinned more or less heavily, based on stand conditions and forest structure goals. Given these constraints and current stand conditions, the estimated growth available for harvest each year is expected to average approximately 1.7 to 2.0 million board feet, which is significantly below the cumulative estimated growth in the Active Management Area.

Area Method (Rotation)

For long range planning, it is useful to consider the optimal acreage of thinning and regeneration harvest (patch cuts or variable retention harvests⁵) to schedule for a given period. Given the finite forest acreage, this is directly related to rotation age, or average age of the older forest stands when they are regenerated.

Area Control Assumptions: (AMA only)

- Some acres within the AMA are not available for harvest in the first 10 years (stands that are young, inaccessible or have no biological need for tree harvest are excluded).
- Thinning is emphasized, based on forest health and wildlife needs.
- The thinning return interval is approximately 10-15 years, based on stand response.

⁵ See Table 3, page 59 for a description of variable retention harvests.

- During the 2013-2022 period, approximately 10 percent of the harvestable area (up to 250 acres) will be regenerated through small patch cuts.
- Optimal age for regenerating forest stands in the AMA zone is >80 years old.

Under these assumptions, each year from 80 to 130 acres can be thinned, and 15-to-20 acres regenerated (e.g. variable retention method and patch cuts). This represents an annual area control limit.

Prior to each harvest, as mentioned in Chapter 4, an annual operational plan will be presented to the City Council.

As forest age and density continue to increase during the next 10 years and several hundred acres of younger plantations mature, harvest levels are likely to increase in the 2023-2032 period to maintain the vigor of forest stands and provide openings and light for new seedlings. General harvest prescriptions are described in the following table.

Table 3. Forestry Prescriptions

Recommended stand treatments can be grouped into five general categories:

Thinning — In some areas overcrowding is resulting in decreasing crown size and declining tree vigor. Individual tree selection thinning may be from above (removing larger trees), below (removing smaller trees), or balanced (removing trees of all sizes). Thinning encourages transition to uneven-aged structure in stands that have two or more crown layers. Each entry is planned to remove no more than 35 percent of stand volume, except where the harvest goal is to encourage understory tree regeneration or shrub layer growth. Thinning intensity will vary according to site-specific needs. Thinning is needed on more than 1,000 acres over the next 10 years.

Regeneration — The goal is to harvest groups of mature or at-risk trees and initiate new seedlings, or create more structural diversity. Group selection and patch cutting create non-contiguous stand openings (up to 5 acres); variable retention harvests (VAR) create larger openings (up to 20 acres if needed in special circumstances). At least fifteen percent of the original stand is retained in openings of 3 acres or larger. 200-250 acres will be harvested and shifted to younger forest over the next 10 years.

Hardwood Release— Madrone and bigleaf maple are being overtopped by faster growing fir in some stands. Maintenance and restoration of these trees may be needed where they are important components of wildlife habitat diversity. Depending on location and stand condition, fir may be either slashed (for seedlings and saplings), girdled, topped (to create wildlife habitat), or commercially logged.

Habitat improvement — Site specific treatments target specific habitat conditions for improvement, particularly restoration thinning in dense, young plantations.

Wait — Stand has no current needs.

Harvest Income

Income from the sale of forest products is credited to the City's Water Division within the Department of Public Works. The income is used to cover harvest expenses, outstanding debt of the water fund, and capital and maintenance needs of the water utility, including implementing the policies and actions of this Watershed Plan.

Recommended Actions	Roads and Timber Resources
3.1	Continue routine maintenance and monitoring of road system. Survey roads using the Oregon Department of Forestry road survey protocols.
3.2	Disconnect ditch lines from streams and direct water into filtering vegetation to prevent sediment from entering streams.
3.3	De-commission the final 5,000 feet of Deep Creek Road.
3.4	Develop a 10-year forest operations plan and annual forest operations plans.
3.5	Present to the City Council plans for watershed activities prior to each harvest.
3.6	Continue a program of sustainable harvests within the Active Management Area.
3.7	Survey watershed boundary lines as needed.
3.8	When advantageous sell logs to FSC or other "green certified" markets.

Vegetation and Botanical Resources

Opportunities

- Stable and healthy native plant communities are present.
- Healthy shrub understory plant communities are abundant, particularly in naturally regenerated forest stands.
- Invasive, non-native species are not widely established across the property, allowing effective early control.
- Some areas of unique old forest are developing, especially in the Reserve Area, and need protection from disturbance and monitoring to ensure continued health.
- Planned habitat improvements offer opportunities for demonstration and education.

The most significant invasive plants in the watershed include Scotch broom, Himalayan blackberry, thistles and reed canary grass. Scotch broom is the species with the greatest chance of spreading widely, particularly in areas where harvests are planned. Spread tends to occur along disturbed corridors, particularly roadsides. Roadside mowing should be considered to slow the spread of this species.

Harvest activity during the period guided by the original plan has not increased invasive plant populations due to management controls and annual eradication efforts. Continued efforts to control invasive plants will be needed in areas of disturbed soils.

Harvest prescriptions and lay-out should protect understory vegetation as much as possible. In variable retention harvests, mark and protect "refugia" (areas of undisturbed trees and vegetation).

Recommended Actions	Vegetation
4.1	Monitor and control invasive vegetation on roadsides and in areas of recent disturbance.
4.2	Protect understory forest vegetation during harvests as much as possible.
4.3	Establish “refugia” that protect native understory plants in regeneration areas.
4.4	Survey for rare or threatened plants.

Other Recommendations

Over the past decades the City of Forest Grove has sought to protect its water source by acquiring forest lands within the Clear Creek hydrological basin. As of 2013, about 160 acres of the Roaring Creek headwater drainage are outside of City ownership. This land is adjacent to the City watershed and in 2013 is managed as an industrial forest plantation.

- **Recommended Action:** Forest acquisition

Renew efforts to acquire forest land in the upper Roaring Creek drainage and (as a lower priority) the Thomas Creek drainage.

The City has a policy of supporting research and education in the community by making the watershed available for such purposes by schools in the area.

- **Recommended Action:** Education

Encourage efforts to make the watershed available for educational site visits and study projects.

The City’s sustainable management practices open up possibilities with various organizations and associations to become a “certified” forest. Such certification would communicate to the public that the City’s Watershed is managed in a sustainable way. Additionally, its sustainable management practices open up possibilities for a market advantage when products are sold, especially for projects seeking the Leadership in Energy and Environmental Design (LEED) certification.

- **Recommended Action:** Research forest certification

To communicate to the public Forest Grove’s sustainable practices in its watershed, and to take advantage of any market advantage that sustainable timber practices may bring, either the City’s forest or its Forester need to have the appropriate certifications. To date, the City has retained a Forester with the Forest Stewardship Council (FSC) certification. The FSC certification currently fits well with the City’s watershed management philosophy, goals and practices. The City will investigate whether its own

forest should carry a sustainably managed certification, and will continue to consider such credentials in awarding a contract for forest management.

Recommendation Timetable Forest Grove Watershed 2013–2022

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

year	action*	activity	notes
2013	1	Develop 10-year watershed operations plan.	Fall 2013
	2	Write operations plan for 2013 watershed activities.	
	3	Bio-engineer slope stabilization for the Clear Creek slide area (sediment source).	Winter 2013-2014
	4	Initiate habitat thinning in young plantations – AMA and Reserve Area.	Fall 2013
	5	Continue annual sustainable harvests in AMA.	
	6	Initiate discussions with Stimson regarding land acquisition in upper Roaring Creek and Thomas Creek drainages.	
	7	Survey macro-invertebrates in Clear and Roaring Creeks.	
	8	Survey yearly for juvenile fish in Clear Creek	Annually
2014	1	Conduct Northern Spotted Owl surveys.	Spring and summer
	2	Survey boundaries of property, install permanent markers	
	3	Survey fish habitat in Clear, Roaring, Deep and Thomas Creeks.	
	4	Monitor and control invasive plants on roads and landings.	
	5	Continue habitat thinning in young plantations – AMA & Reserve Area.	restoration thin only in Reserve Area
	6	Survey road conditions throughout watershed and Correct any deficiencies in surface materials or drainage	
	7	Plan to remove the last segment of Deep Creek Road (west of creek), by adding project to Water Division’s capital improvement program.	Seek funding partners
	8	Conduct a watershed plant survey in areas of Special habitat significance.	

- | | | | |
|----------------|---|---|---|
| 2015-22 | 1 | Continue sustainable harvests (AMA) and wildlife enhancement work (AMA & Reserve). | W/ annual operating plan & public meeting |
| | 2 | Support efforts of local schools, P.U. & Tualatin Watershed council to conduct cooperative research/ monitoring/ educational projects. | |
| 2023 | 1 | Assess 10 year management performance and update Stewardship Management Plan. | |
| | 2 | Inventory forest every 10 years. | |
| Ongoing | | Continue to build an archive management database.
Continue monitoring and maintenance of roads.
Continue monitoring results of management activities.
Pursue acquisition of land in watershed drainage area (adjacent to the watershed). | |

* the order of actions do not indicate priority

Chapter 6 – Monitoring and Adaptive Management

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

Plans

This Stewardship Plan for the City of Forest Grove Watershed shall be updated every 10 years, and revised as needed. Following the stewardship plan update, a 10-year operations plan shall be prepared to outline the location, scope and timing of management activities that are anticipated. The 10-year operations plan will include guidance on how the City chooses a logger, and how it markets and accounts for timber sales. Each year, more specific and detailed annual operations plans shall be prepared. These annual plans include the harvest prescriptions or project specifications, including maps, stand delineations, reserve areas, intended outcomes and implementation details. The furtherance of vegetative and wildlife goals, progress toward the Desired Future Conditions, and any actions from the Recommended Timetable will also be included if pertinent to that year's activities. Brief reports are prepared following completion of the project, detailing immediate results. Annual harvest plans and plans for enhancement of other watershed resources shall describe specific intended outcomes that can be measured and monitored in the future. These annual plans will be presented to the City Council each year prior to the commencement of management activities.

Monitoring

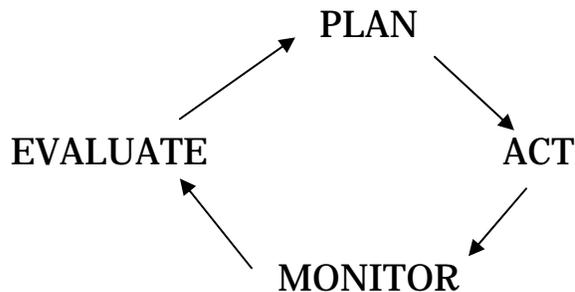
Monitoring provides information to help determine if the watershed management activities are meeting the stewardship plan's objectives and are adhering to the plan's policies and guidelines. Through the monitoring process determinations may be made as to whether the plan needs to be amended or management activities need to be redesigned.

The objectives of monitoring are to:

- Assess the implementation of the plan and strategies.
- Evaluate the effectiveness of the strategies in achieving resource protection and enhancement.
- Assess the assumptions built into the plan.
- Evaluate the extent to which the intended outcomes of management activities are achieved.
- Provide managers with the information necessary to practice adaptive management.

Monitoring is an essential part of an adaptive management loop — a framework for continually improving the state of our knowledge about the overall watershed and its

forest, and acting on new information. This simplified adaptive management process is shown below:



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

Based on the experience of the managing the watershed from 2001 to 2012, the following specific monitoring questions will help evaluate general ecosystem health and the success of management actions:

Table 4: Monitoring Questions

Resource Area	Simple Monitoring Questions	Indicator	Survey Method	Monitoring Frequency
Fish and Aquatic Habitat	Are fish populations changing?	Juvenile coho, trout and steelhead presence	Snorkel Surveys	Yearly in late summer
	Is stream habitat improving?	Channel complexity, presence of down wood	Stream habitat Surveys	Every 10 years
Water Quality	Is water quality being affected by management activities?	Stream Sediments/turbidity	City water plant testing	Daily
		Temperature	Stream sampling	Yearly
Infrastructure	Are roads properly maintained?	Culvert condition, road surface erosion, roadbed stability	Road monitoring	During wet weather events
	Is the fish ladder working?	Juvenile fish populations above and below ladder	Snorkel Surveys	Yearly in late summer
Forests	Is forest health and resilience improving?	Growth of thinned stands Forest response to wind	Forest inventory Field inspections	Yearly or every 10 yrs.
	Is the forest becoming simpler or more complex?	Diversity of forest types and ages	Forest inventory	Every 10 years
	Are High-Value Forest stands (old growth) being protected?	Negative changes due to natural or human disturbance	Field inspections	Annual visits
Soils	Are soils being protected?	Evidence of compaction or loss of structure	Field Inspections	During operations
		Surface erosion channels	Field inspections	First winter after activity
Wildlife	What is the effect of forest harvest on wildlife?	Presence of important habitat elements (e.g. snags, down wood, large trees) Owl and songbird populations	Forest inventory Bird surveys	Every 10 years Establish a baseline within two years
Forest Understory Vegetation	Are there negative impacts from harvests and other management activities?	Presence of invasive plants	Field inspections	Yearly and for 4 years after disturbance
		Changes in shrub layer abundance and diversity	Post-harvest inspections	Yearly

These monitoring plans will be developed in more detail in the 10-year operational plan that is recommended in Chapter 5.

Methods

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

There are several methods, further defined below, that can be used to monitor forest management activities:

- Forest certification audits
- Resource project reports
- Inventory
- Special projects

Certification audits: An auditor that is accredited by a recognized sustainable timber practices association or organization, such as the Forest Stewardship Council, periodically evaluates the progress of plan implementation, the protection of forest resources and the adherence of management performance to the organization's principles and criteria. Auditor reports are made available to the public.

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

Inventory: Measurement of resource conditions on a periodic basis helps to measure change in the forest and impacts of management activities. For the Forest Grove Watershed these include fish habitat surveys, vegetation and wildlife surveys and timber resource inventories. Inventory methods will follow industry best management practices.

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

Appendices

Appendix A - Glossary

Age Class – One of the intervals into which the range of ages of trees in a stand are divided for classification purposes (an age cohort of trees).

All-Aged – Applies to a stand that contains trees of all ages.

Anadramous – Fish species which migrate to the ocean and return to freshwater rivers or streams to spawn.

Aspect - direction toward which a slope faces (exposure).

Biodiversity – The entire spectrum of plants, animals and other life forms, and their associated environments.

Blowdown - trees that have been knocked over by the wind.

Canopy – A collective term for the layer (or layers) formed by the crowns of the trees in a forest.

Clearcut – A harvest and regeneration method that removes the entire stand in one cutting. The area is regenerated by either natural or artificial means, and receives no appreciable site protection (e.g. shading) for the adjacent uncut forest.

Commercial Harvest - a timber stand improvement or harvest operation that results in a net landowner income.

Crown - the canopy of leaves and branches formed by a tree.

DBH - tree measurement; diameter at breast height (4.5 feet above ground).

Diameter Class - Grouping the trees in a forest stand by diameters (usually DBH). Generally this is done in 2-inch, even increments.

Even-Aged - All trees within a forest stand are of the same age (\pm 5 years).

Forest Certification – An independent assessment of management practices and forest conditions, evaluated against a prescribed set of sustainable forestry standards. In this case referring to a program accredited by the Forest Stewardship Council (FSC).

Forest Structure – Refers to attributes of the forest such as snags, down wood, understory shrub layer, gaps in the canopy, tree size variation and multiple canopy layers.

FPA – Forest Practices Act. First enacted into state law in 1972, the FPA is a comprehensive set of rules and regulations designed to protect the forests and sensitive resources of the State.

Forest Stewardship Council (FSC) – an organization which sets international standards for sustainable forest management, and accredits regional certification programs.

Girdle – Killing a live tree by cutting its bark and cambium layer. Usually the cut must extend around the entire circumference of the stem to be effective.

Group Selection – A harvest method that removes merchantable trees in small groups from even-aged stands; the opening size varies from one tree crown width to several acres.

High Grading – Repeatedly removing the best and highest quality trees during harvest operations.

Individual Tree Selection – Trees are selected individually for harvest; the opening size is one tree crown width.

Mature - Condition of optimal tree value, after tree vigor and growth have slowed, yet before the onset of decay.

Merchantable – The quality of having value; when forest products have the size, quality and market to yield a net value.

MBF - log measurement statistic; one thousand board feet. One board foot equals a board one inch thick by 12 inches square.

Mortality – refers to the death of trees or groups of trees from natural causes. Sometimes can refer to dead trees themselves.

Patch Cut - a harvest where small areas (0.5-2 acres, but not exceeding 5 acres) are cut, taking most of the standing trees with the exception of clumps of younger conifers and older residual wildlife trees.

ODF – Oregon Department of Forestry. Administers the Oregon Forest Practices Act.

Operability - ease with which logging machinery could work a site; often limited by rockiness, steep slopes, wetness, etc.

Re-Entry Cycle – (cutting cycle) The period of years between harvests on a forest stand (return interval).

Regenerate - to establish a new stand of tree seedlings.

Regeneration - seedlings of commercial tree species.

Restoration Thinning – Non-commercial thinning for forest health and wildlife habitat.

Riparian Zone - wet soil areas next streams, lakes, estuaries and wetlands.

RMA - riparian management zone (forest practice rules).

Salvage – to harvest trees that are dead or in poor condition but can still yield a forest product.

Scarification – exposing mineral soil mechanically to prepare a harvested site for natural or artificial regeneration.

Seedling - tree greater than six inches tall but less than one inch DBH.

Site Class - a relative measure of site productivity for growing trees, rated on a scale of I to V, with I being most productive.

Slash - tree tops, branches, bark and other debris left after a harvest operation.

Snag - standing dead and/or dying tree. Important habitat element for numerous wildlife species.

Stagnant – trees that have stopped growing because of competition from neighboring trees. Decay has often set in.

Stand – a grouping of trees of similar species and age.

Stocking - stand measurement relative to the optimal number of trees that a unit of forestland could grow.

Stumpage - payment by a logger for purchase of standing timber. The residual value after logging and trucking costs are deducted from mill delivered log values.

Sustainable – able to be maintained into the future with no decrease in quantity or quality.

Timber Type - a homogeneous unit of forestland, delineated because it supports trees of common species, age, potential, etc.

Uneven-aged – a forest stand comprised of three (or more) distinct age groups.

Upland forest – the forest upslope of the riparian zone, continuing to the ridgetop.

Variable Retention Harvest (VAR) a harvest and regeneration system that removes most of the stand while retaining from 15% to 30% of the trees as forest legacies. These larger regeneration openings (6-to-20 acres in this plan) are for the purpose of establishing tree seedlings and increasing the variety of forest structure and wildlife habitat.

Appendix B

FSC Management Plan Addendum

The following additional management planning documentation is required to meet requirements for forest certification under Forest Stewardship Council (FSC) guidelines. To view the entire of FSC-US Forest Management Standards v1.0 visit: <https://us.fsc.org/index.htm>.

High Value Conservation Areas

FSC standards require that management activities in high conservation value forests maintain or enhance the attributes that define such forests (FSC Principle 9). Areas defined as High Conservation Value Forests (HCVF) include those with: high biodiversity value, including RTE species and their habitats; large landscape-level forests; rare ecosystems; critical nature-based services; local needs areas; local cultural identity areas.

The following practices are used for HCVF areas:

- An assessment of conservation values is conducted during management planning
- Consultations are conducted with experts and relevant stakeholders on HCVF location and appropriate management strategy
- Management of HCVF areas will emphasize the precautionary principle – if there is reasonable question that management will jeopardize HCVF values that area will be reserved from management
- All Old Growth Stands will be reserved from commercial management
- Management will use an adaptive management strategy, incorporating results of monitoring into future management
- A site specific monitoring plan is prepared for any operations within HCVF areas

Table 1: HCVF Areas on the Forest Grove Watershed

Type	Description	Acres	Conservation Attribute	Conservation Approach	Experts Consulted
HCVF-1	Old Growth Forest	7	Undisturbed old growth, no past logging	Establish Reserve. No harvesting within Old Growth areas.	ODF, ODFW, USF&W
HCVF-4	Public watershed	4,225	Water quality, quantity	Establish reserves to protect water quality. No harvesting within Old Growth areas.	ODF, ODFW, USF&W, Steve Trask (BioSurveys)

Representative Sample Areas (RSAs)

FSC standards require that representative samples of existing ecosystems within the landscape be protected in their natural state, appropriate to the scale and intensity of operations and the uniqueness of the affected resources. (FSC Indicator 6.4).

The following practices are used in RSA analysis:

- Managers document the ecosystems that would naturally exist on the FMU, and assess their quality. The Forest Grove Watershed occurs within the Willamette Valley Ecoregion.
- Consultations occur with conservation organizations and Agencies; neighbors are consulted when RSA attributes cross property lines

- The status of regional protected properties is reviewed using the Oregon Natural Areas Plan 2010 for underrepresented plant communities.
- RSA stands of Medium or High quality that are underrepresented in the landscape are recommended for further study and possible inclusion in the Oregon Natural Areas Program.
- Management of RSAs is designed to perpetuate or enhance the conservation attributes of the stand.

Chemical Use

In keeping with the goal of sustainable forest management and the desire to minimize the impact of chemicals on the flora and fauna of the forest, every attempt will be made to minimize the use of forest chemicals on the property.

The following are practices observed for chemical usage⁶:

- Silvicultural systems are designed to reduce reliance on routine chemical use
- No aerial application of forest chemicals is permitted
- Pesticides are applied only by licensed operators
- Records are kept of treatment prescriptions, spray records, and efficacy monitoring
- Incidences of spills or worker exposure to chemicals are recorded
- No pesticides are used that are: persistent, toxic or accumulate in the food chain; chlorinated hydrocarbons; banned by international agreement; or World Health Organization Type 1A and 1B pesticides

The Forest Grove Stewardship Plan (FGSP) restricts chemical use to control of invasive weeds. Application is done using backpack sprayer or by stem injection. Herbicides allowed include glyphosate, imazapyr, triclopyr, and/or sulfometuron.

No chemical applications have occurred in the past 10 years.

Social Impact Evaluation

According to the FSC-US Forest Management Standard v. 1.0 (FSC Indicator 4.4.a), forest managers should understand the likely social impacts of management activities, and should incorporate this understanding into management planning and operations.

Social impacts include effects on:

- Archeological sites and sites of cultural, historical and community significance
- Public resources, including air, water and food (hunting, fishing, collecting)
- Public access to and use of the forest, and other recreation issues
- Aesthetics
- Community goals for forest and natural resource use and protection such as employment, subsistence, recreation and health
- Community economic opportunities

⁶ See also FGSP Standards and Guidelines for Forest Chemicals,,chapter 4

Impact Assessment

Timber harvesting is carefully guided by a detailed management plan, and public values are of primary importance in developing the plan. For example, since the lands are a key source of drinking water for the City of Forest Grove, the management plans clearly establish that drinking water protection is the highest land management priority. In these planning processes, many groups are involved in providing input on management priorities and directions, including local watershed councils, state wildlife and forestry agencies, universities and researchers, and many others.

Following is a brief assessment of social impacts for the Forest Grove Watershed:

- The primary cultural value of the site is as a drinking water source. By protecting the lands for water quality, the forest management activities are contributing to an important community need, i.e., a reliable source of clean water. The social impact of producing municipal drinking water is substantially positive.
- A cultural resources file search of was conducted at the State Historic Preservation Office . Findings indicate a low probability that prehistoric or archaeological resources are present. There may be historic sites on the property, primary abandoned homesteads, and early dam and water system features.
- The property is gated and signed to restrict public access. Management of the site as a drinking water protection area means that all forms of recreation are prohibited. This has been the case for many decades. Forest Grove citizens generally accept these restrictions as necessary to ensure safety and security of the municipal water system. The Forest Grove Watershed is surrounded by other forested lands, in a mix of state and private ownerships, most of which is available for hunting and other forms of recreation. The social impact of these restrictions is deemed negligible.
- The property is managed using silvicultural techniques that have minimal negative impact on aesthetics. Generally, thinning and small forest openings are used and the appearance of these treatments closely resembles natural conditions such as those produced by scattered wind-throw events. There is an abundance of closed canopy, older forests that provide substantial aesthetic value.
- The property provides employment opportunities for local logging contractors, road contractors, and related workers such as tree planters, etc. These opportunities are intended to remain relatively steady over the long-term.

Harvest Rates

The FGSP developed initial harvest rates based on current and historical timber cruises. An updated timber cruise was completed in 2011. The new harvest rate calculations use current timber cruise information and FPS modeling. The FGSP requires a timber cruise be conducted at no greater than 10-year intervals.

For 2013-22 the annual growth rate within the active management area is estimated at 2,400,000 board feet, based on the 2,800 acres (66%) of the forest base outside of reserves. The annual allowable harvest during the next ten year period is 2,000,000 board feet.

Monitoring

Monitoring data reside with City staff or the City's consultant. Results of monitoring are presented in the annual Forest Activities Report, periodic monitoring reports, timber inventories, or updates of the watershed stewardship plan, as appropriate.

Stakeholder Consultation Process

Stakeholders for the Forest Grove Watershed include the Forest Grove City Council, the citizens of Forest Grove, Stimpson Lumber Company (primary abutter), State of Oregon (abutter) other neighbors and abutters to the property, Agency regulators (ODF, USFWS), local stewardship organizations such as the Tualatin River Watershed Council and the Washington County SWCS, educators (Pacific University, local schools who visit the forest), and local contractors and mills.

Consultation is done with ODF via conversations and annual field checks with Stewardship Foresters.

With Stimson lumber company (they border most of the watershed) we have had consultations around consolidation and land exchanges to extend City control within the Rock Creek drainage, and concerning their spray plans within the watershed drainage area. The City has consulted with the Tualatin River Watershed Council on stream enhancement projects within the watershed and in coordination with the Gales Creek watershed enhancement plan. Forest Grove partnered with the TRWC and the Oregon Watershed Enhancement Board to secure grant funding for Clear Creek fish habitat improvements. Input from the citizens of Forest Grove is provided during the stewardship plan updates (every 10 years) via public meetings and an ad-hoc citizen planning committee. Annual public tours and management reports also are ways for the public to provide input.

Appendix C

Forest Inventory

Projected timber volume growth for Active Management Area stands
 Developed using Forest Projection and Planning System software
 March 2013

Type	Area (ac)	Current volumes (BF/ac)	Total volumes (BF)	Projected average annual growth (BF)	Annual % growth
N1: Natural stands 51-70 years	1028.35	33,536	34,486,586	880,256	2.6%
N2: Natural stands 71-90 years	720.1	41,435	29,837,343	584,050	2.0%
N3: Natural stands 91-110 years	530.41	46,079	24,440,968	319,209	1.3%
P1: Plantations 1-10 years	87.7	NA	NA	NA	NA
P2: Plantations 20-30 years	154.2	4,960	764,786	171,375	22.4%
P3: Plantations 31-50 years	310.4	19,362	6,009,833	337,178	5.6%
Grand Total	2831.16	33,746	95,539,515	2,292,067	2.4%

Forest Grove Watershed Property-wide species composition and timber volumes

Based on timber inventory conducted in 2011

Species	Ave DBH (in)	Basal area (ft ² /ac)	Trees/ac	Timber volume (MBF/ac)	Total timber volume (MBF)
Douglas-fir	17.3	156	95	27.841	117,593
Western redcedar	20.1	20	9	2.692	11,371
Western hemlock	16.3	7	5	1.255	5,301
Bigleaf maple	14.9	11	9	0.989	4,175
Red alder	13.3	6	6	0.552	2,333
Grand fir	16.5	2	1	0.402	1,698
Black cottonwood	24.8	0	0	0.043	181
Pacific yew	25.1	0	0	0.002	7
Total (average)	17.2	202	125	33.776	142,659

DBH = diameter at breast height

Basal area = the cross-sectional area of all trees in a stand

MBF = Thousand board feet, West-side Scribner scale

Appendix D

Watershed Committee

To assure an open and public planning process, the City Council formed the Watershed Ad Hoc Committee in 2012. The committee was specifically designed to be comprised of community members from a variety of interests including local business (Forest Grove Chamber of Commerce), residential and industrial water users, educators (Pacific University), rural landowners, and advocates for water quality, wildlife and fishery resources. The purpose of the committee, as directed by the City Council, was to serve in an advisory capacity to City Staff, the Watershed Management Consultant, and the City Council.

The committee was an active participant in the planning process, meeting twice monthly for six months, from January through June, 2012, and periodically thereafter, with City Staff and the Consultant. Members were actively and enthusiastically engaged in reviewing and updating all areas of the 2001 plan. Work on each issue continued until a consensus was reached.^{xvii}

Members of the planning team included:

- The Ad Hoc Committee: Bud Bliss, Dallas Boge, Steve Edward, Carla Ingrando, Dave Johnson, Lou Karabinus Teri Koerner, Bob VanDyk and Roy Woo. Three committee members (Edward, Karabinus and VanDyk) were members of the 2001 planning team.
- Trout Mountain Forestry: Scott Ferguson and Barry Sims (consultants)
- City Staff: Robert Foster (Director of Public Works) and Susan Cole (Assistant Director of Administrative Services.)

As an Ad-Hoc Committee, the Committee was not required to keep formal minutes. However, general notes were kept of each meeting. Those notes are included on the following pages. Additionally, notes from the two joint work sessions held with the City Council are also included.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from January 11, 2012

The Watershed Ad-Hoc Committee held its first meeting on January 11, 2012. All members were in attendance. Because the Committee is an ad-hoc committee appointed by the Mayor, and not an ongoing committee appointed by the Council, minutes do not have to be kept. Instead, each meeting will be recorded, and a summary will be completed, but formal minutes will not be taken.

The mission of the Committee was reviewed, which is to provide feedback, suggestions and recommendations to the City's Forestry Consultant, Scott Ferguson of Trout Mountain Forestry, as he updates the 2001 Watershed Stewardship Management Plan. The goals of the Plan will not change as a result of this update. Additionally, the Committee will not focus on the financial resources of the watershed or of the Water Fund.

The Committee discussed the method by which decisions will be made, for example, if by majority or by unanimous decision. Rob Foster described how decisions were made when the Watershed Ad-Hoc Committee formed initially to guide the writing of the 2001 Plan. That Committee in 2001 made decisions by consensus, and defined it as whether each member could live with the decision and move on. If any

member disagreed with an issue or decision to the extent that they could not move on, then the Committee re-evaluated the topic and kept discussing until each member felt comfortable. Each member may not have agreed with the final decision, but could at least live with it enough to move on.

It was pointed out that this method burdens the chair to make sure everyone is heard and that the meeting keeps going. However, it was pointed out that the 2001 Committee had both a chair and a facilitator that aided this process.

The current Committee decided that a consensus method of decision making is a good idea that they would like to employ. Further, voting according to Roberts Rules will be used to gauge where Committee members initially stand on an issue, in order to help frame the discussion.

Rob Foster next described the role of the chair, and then suggested perhaps the Committee would like to also have a facilitator. He encouraged members to consider whether or not they would like to be the chair or facilitator, and whether these should be the same person, or two different people.

Scott Ferguson of Trout Mountain Forestry next gave a brief overview of the 2001 Watershed Stewardship Management Plan. Scott presented a series of bulleted sheets, as follows:

1. Watershed Forest
 - ▶ 4,225 acres, Gales Creek to the Tualatin River
 - ▶ Older Douglas Fir
 - ▶ 5 diversions, ~50% of Forest Grove's water
 - ▶ 13 miles of streams
 - ▶ 16 miles of rocky roads
 - ▶ Steelhead, Coho and spotted owl habitat
2. Management History
 - ▶ 1960-1977 State
 - ▶ 1977-1982 Public Works
 - ▶ 1983-1987 Consultant
 - ▶ 1989 Logging suspended
 - ▶ 1994 Attempt to re-start
 - ▶ 1996 "Pineapple Express"
 - ▶ 2000 ODF Citation
 - ▶ 2001 Stewardship Plan
3. Management Issues
 - ▶ Clear cutting
 - ▶ Roads:
 - maintenance
 - landslides
 - sedimentation
 - ▶ Fish passage
 - ▶ Public access
 - ▶ Harvest level/revenue
4. Plan: Multi-Resource
 - ▶ Water quality/aquatic
 - ▶ Wildlife
 - ▶ Vegetation and botanical
 - ▶ Timber management
 - ▶ Access by public
5. Policy Oriented Framework
 - ▶ Vision
 - ▶ Goals
 - ▶ Resource policies
 - ▶ Resource standards & guidelines
 - ▶ Recommendations by resource
6. Conservation Strategies
 - ▶ Zoning for resource protection:
 - *Reserves 900*
 - *Special management areas 800*
 - *Active management areas 2,600*
 - ▶ Go slow approach
 - ▶ Integrated management
 - ▶ Build complexity and biodiversity
 - ▶ Harvest level not revenue driven

Other items discussed at the meeting include:

- Changing the February 8 meeting to February 7, 2012.
- There is no mandate to update the Plan. The 2001 Plan suggested an update in its 10 list of

activities. Also, the Forest Stewardship Council suggests that plans be updated every 10 years.

- The City is not aware of any particular controversy or outstanding issues regarding how the City has managed the watershed under the guidance of the 2001 Plan.

The meeting adjourned at 7:00 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from January 25, 2012

The Watershed Ad-Hoc Committee held its second meeting on January 25, 2012. All members were in attendance.

The first order of business was to decide if the chair and facilitator should be two separate people or the same person. The Committee discussed the role of the chair and facilitator, and decided to have these roles filled by one person, and revisit that decision if necessary in the future. The Committee then selected Carla Ingrando as the chair and facilitator.

Scott Ferguson of Trout Mountain Forestry next gave an assessment of managing the watershed over the previous 10 years. He summarized the timber growth, the harvests, road maintenance and repair, vegetation, wildlife habitat, and restoration. The Committee asked various questions regarding snags, downed wood, wildlife and the like.

Next, Barry Sims of Trout Mountain Forestry gave a synopsis of the forest inventory that was completed in November of 2011. Overall growth of the forest since the last inventory was taken in 1993 is estimated to be about 30%. However, because the acres measured and age of trees differ between the inventories in 1993 and 2011, it is difficult to estimate the total growth. In the managed area of the forest, the estimated annual growth rate is 2.4%, accounting for the annual harvests.

The meeting adjourned at 7:00 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from February 7, 2012

The Watershed Ad-Hoc Committee held its third meeting on Tuesday, February 7, 2012.

The first item on the agenda was to allow time for questions on the reports from the previous meeting - the 10 Year Assessment of the 2001 Plan and the Forest Inventory. One question pertained to the list of activities at the end of the 10 Year Assessment, inquiring as to why some of the activities were not done, and whose responsibility – the Forester or the City – it was to ensure activities were completed. Rob Foster, Public Works Director, explained that it was the City's responsibility to evaluate the list of recommended activities and determine whether and when activities should be completed, based upon many factors, including the Plan, the advice of the Forester, and budgetary considerations.

Scott walked through the list of activities one by one and explained why some were not performed, as follows:

- ▶ Activity 1.4: Remove old weir dam on lower Clear Creek. The Oregon Watershed Enhancement Board (OWEB) awarded a grant to the City, but this project was put on hold, pending the Plan Update and approval of the project by the City.

- ▶ Activity 1.5: Research minimum flow criteria on Clear Creek. How much water flows over the diversion can effect fish, and the City has not officially determined what the minimum flow needs to be. However, the City has not exceeded its water right, and there has been enough flow for water rights down stream, indirectly assuring enough water for fish.
- ▶ Activity 1.6: Design a subsurface summer overflow for each diversion dam. The Water Treatment Operator, Randy, and Scott agreed that the City does an adequate job maintaining flow, so a subsurface overflow may not be necessary.
- ▶ Activity 1.7: Plant a deciduous riparian corridor at the Clear Creek impoundment. Scott reported that there is enough natural alder and growth so planting is not necessary.
- ▶ Activity 1.8: Survey macroinvertebrates in Clear Creek. This would require hiring a fisheries biologist, which was not done.
- ▶ Activity 1.9: Inventory Thomas and Deep Creeks. These creeks are unlikely to have endangered species, and would require the hiring of a fisheries biologist.
- ▶ Activity 2.8 Plant conifers in riparian zones where lacking. These areas are developing well on their own, so additional planting not necessary.
- ▶ Activity 4.2 Complete vascular plant survey of rock outcrops and riparian forests. The consulting botanist who worked on the 2001 Plan recommended that these are special habitats to be surveyed. It's not known whether they contain rare plants.

The Committee discussed addressing the no action items in the Plan Update. The Committee also discussed having a way to monitor the accomplishments of the activity list, such as setting goals. The activity list for the Plan Update should identify the need, then the goal it is designed to accomplish, and perhaps suggest incremental steps and measurements toward meeting that goal. The Committee speculated about whether to set priorities around the activity list, and to set more specific monitoring programs to measure progress toward the goals. As with the current plan, Scott pointed out, the Plan Update should frame policies and goals and activities over the course of the next 10 years, and not be proscriptive. The Water Department will fold the activities into its annual operational plans each year, considering the health and conditions of the watershed, and the advice of the Forester.

One comment was given regarding the forest inventory that was recently completed, which was: As far as possible, the inventory figures should be as clear as possible in expressing the growth, how much was cut, and the acreage.

The Committee then reviewed the suggested list of future topics supplied by Scott in a hand-out. The Committee was in general agreement with the list of topics and the order of consideration suggested by Scott.

Next, the Committee began discussing the Policies, Standards and Guidelines in Chapter 4 of the 2001 Plan. Scott also handed out Chapter 4, which included embedded questions for the Committee to consider. The topics discussed and questions considered were:

- ▶ Management area classification - Combining the reserve area and the special management area. On the one hand, these areas happen to be stewarded the same way, so it may make sense to combine them. But, on the other hand, a "reserve" area is much more restrictive than a "special management" area, and maybe the Plan should leave these separate, because once an area becomes more restrictive, it may be harder to go back the other way if necessary in the future. Leaving them as is allows for future flexibility.
- ▶ Water Quality and Aquatic Resources – perhaps want to define a way to evaluate and monitor to see if objectives are being met. This section may also want to cross-reference other sections in terms of public access in the use of porta-potties, and the harvest section and public access section in terms of seasonality and accessing the watershed in dry conditions versus wet conditions.
- ▶ Wildlife Resource Management – should the stewardship of the watershed include connectivity between habitats? Or maybe only when there's opportunities & it seems to be advantageous?

Also, what about the age of trees? The current plan says that any tree over 110 years old be treated as a “legacy” tree and left alone. However, Scott pointed out that there are some plantation-like stands that are reaching 103 years old, and probably won’t be in the thinning rotation for a few more years, so maybe the 110 age should be raised. In considering the age of any given tree and defining “legacy” trees to be any tree over a certain age, the Committee discussed evaluating the overall goals of forest functionality, diversity and future conditions, perhaps defining the percent of the forest that is desired in the form of older forest structure, instead of an arbitrary age limit. The Committee did emphasize that unique trees with particular attributes should be preserved regardless of age.

No decisions on the Policies were reached, but were held over for further discussion.

The Committee agreed that a tour of the Watershed would be helpful. The tour was set for February 22, 2012 at 2:00 pm, and the Watershed Ad-Hoc Committee will convene that same day at its regular time of 5:30 pm. Rob offered that if Committee members could not make that time but still wanted to tour the watershed, to contact staff separately and arrangements could be made.

The meeting adjourned at 7:00 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from February 22, 2012

The Watershed Ad-Hoc Committee held its fourth meeting on Wednesday, February 22, 2012.

Prior to the meeting, a tour of the watershed was held that afternoon for Committee members. Those that were able to attend the tour expressed appreciation for the opportunity to see the watershed first hand.

The Committee continued its discussion on Chapter 4, Resource Policies, beginning with the section Vegetation and Botanical Resource Management. The Committee discussed that invasive plants so far have not been a problem due to the diligence of current management practices. The Committee discussed the importance of minimal disturbance to the understory and the soil, and discussed including comments in the Vegetation section as well as the Timber Management section.

The Committee discussed the importance of the overall Plan being clear and unambiguous in terms of resource policies, so that the management of the watershed does not become dependent upon any one person or forester managing it, but instead is based on the clear strategies and policies outlined in the plan. With this in mind, the Committee discussed the advantages of having parameters built into the plan, such as percent of soil allowed to be disturbed during a timber harvest season.

Scott commented that a good way to structure the Plan is to be clear regarding desired future conditions of the watershed. This means, he suggested, having clear goals, policies and standards, and not necessarily defining methods or day-to-day operations. The Plan may therefore describe the percent of forest floor impacted by management practices, and the level of diversity and complexity of the forest. The Plan may also clearly designate various zones for conservation and active management.

The Committee discussed that the State is very proscriptive in its management practices, and Forest Grove’s Plan probably does not want to be that rigid, but instead be structured for flexibility in terms of day-to-day management and operations.

The Committee also pointed out the importance of the work the loggers do each year when harvesting in the watershed, and that they can have a big impact on the watershed. The Committee suggested that the annual Request for Proposals for logging services lay out the parameters of watershed management, to

include items such as soil and understory disturbance, damaging other trees in the course of harvesting, etc. Scott reported that the City has a good history of hiring experienced loggers that take great care in the watershed when harvesting, and have not done damage to the watershed in the course of their work. The Committee suggested that perhaps the Plan Update should include a template Scope of Work to include in each annual Request for Proposal, in order to facilitate keeping the goals of the Watershed Management Plan on the forefront.

The Committee discussed plant restoration, pre-commercial thinning, and plant surveys. The Committee pointed out that loggers may not notice sensitive or endangered plants when harvesting, and the question was asked whether surveys be done each time in harvest areas. Other Committee members and Scott felt this may be too much expense and time-consuming work each year, and Scott assured the Committee that other measures are taken to review and preserve plant life in the watershed. He cited that in his work as Forester, he informally surveys each harvest area, and that the watershed has conservation zones, various buffer areas, and certain patches that are left undisturbed due to their plant and tree diversity. These practices allow ample opportunity for healthy and diverse plant life in the watershed.

The Committee concluded the meeting part way through the Timber Management section of Chapter 4, agreeing to pick up the discussion at the next meeting on page 4-7. Based on the comments made by the Committee thus far, Scott suggested a re-write of the Timber Management section may be the most efficient way to proceed, including the concepts of zoning and future conditions. Also, some items may be moved to a more general monitoring section.

The meeting adjourned at 7:03 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee

Summary from March 14, 2012

The Watershed Ad-Hoc Committee held its fifth meeting on Wednesday, March 14, 2012.

The Committee continued its discussion on Chapter 4, Resource Policies, beginning with the section Timber Management. The Committee discussed various harvest techniques that will be used in the watershed, including thinning, patch cutting, and variable retention harvests. The technique used will depend upon many factors, such as topography, stand growth and longevity, type of trees, buffers needed, and so on. The Committee discussed the zones of reserves and special management areas, but still did not decide whether to combine these two zones into one.

The Committee also discussed the age of trees in the watershed, and at what age trees should be defined as a legacy tree and not harvested. Scott pointed out that managing a stand of trees of a certain age may take a different approach than discovering an individual tree of certain age within a targeted thinning area. The individual tree may be left regardless of its age due to its benefit to the overall health and diversity of the watershed, while an entire stand of trees over a certain age may be thinned. The age beyond which a tree would be left standing was discussed to be 140 years, but not decided upon.

A suggestion was made to add a glossary to the plan. Suggested terms for this glossary so far include professional forester, variable retention harvest, and the various types of forest stands.

Another suggestion was made to keep – but modify – one of the bullets under “Planning and Reports” that refers to completing an annual report. The current bullet suggests a report be sent out to residents in their utility bills. Instead, the Committee suggested an annual report be made to the Council, with notice given to residents that such a report exists, and posting the report on the City’s website for citizen access. This report would contain summary information on the annual harvest, as well as road repairs, restoration efforts and other accomplishments.

The Committee expressed agreement with suggested changes to the timber harvesting section that leave the methods of harvest more open ended, given that technology changes over time. Instead of specific methods, language will be included regarding protecting watershed resources from undue erosion, disturbance and impacts.

The Committee concluded its discussion before the Roads and Culvert section on page 4-13.

The Committee agreed extending future meetings by 30 minutes will enhance productivity.

The meeting adjourned at 7:03 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from March 28, 2012

The Watershed Ad-Hoc Committee held its sixth meeting on Wednesday, March 28, 2012. At the prior meeting of March 14, the Committee decided to extend the meetings from one and one-half hours to two hours, so the meetings will now be from 5:30 to 7:30 pm.

The Committee continued its discussion on Chapter 4, Resource Polices, beginning with the section Roads and Culverts. Before discussing this topic, the Committee first discussed the possibility of considering the desired future conditions of the watershed – that such conclusions may help inform discussions and recommendations regarding Chapter 4. Scott expressed that either sequence would work, but he felt it was good to discuss over-arching policies first, then discuss operational standards which lead to future conditions.

The Committee began on page 4-13, discussing roads and culverts. The Committee asked questions regarding placing rock on the road, and Scott responded by stating that spot rocking is done to avoid damage, and that roads are maintained and rocked as necessary during harvest operations to avoid damage. Skid trails, landings and haul roads were originally specified to be less than 10% of the Active Management Area, but the Committee suggested this be changed to less than 10% of that year's operational area. Culverts and bridges were discussed, and Scott pointed out that the watershed has very few culverts, and that only low bridges cross fish-bearing streams. The Committee suggested that additional language be considered regarding controlling and preventing erosion during road construction and harvest operation, and it should be stated clearly that construction or re-construction of roads and landings should occur during dry periods to control and/or avoid erosion. Remediation was also discussed, that a policy should be considered that road abandonment and reconstruction should fix known or existing problems, and that active efforts should be made to remove or mitigate known legacy problems, or as such problems are discovered. The Committee suggested that as problems are discovered that cannot be fixed or mitigated that year, that they be recorded for future work. Disconnecting ditch lines was also discussed, to allow water to flow over the ground prior to entering into a stream.

Fire Management was the next topic of discussion. The Committee suggested that language be added regarding the guidelines outlined by the Industrial Fire Prevention Levels, to be sure that readers of the Plan understand operators in the watershed understand the risk of fire and take steps to mitigate it. The Committee agreed that waivers during high-fire risk times may be allowed due to the nature of the watershed and the sustainable nature of harvest operations, but that also additional restrictions may be imposed. Waivers or restrictions would be at the discretion of the City of Forest Grove's Public Works Director.

The Committee next discussed Access and Public Education/Demonstration. One Committee member posed the question about the possibility of recreational use in the watershed. Committee members discussed the merits of allowing recreational use, as well as the existence of other recreational opportunities in the area. The Committee suggested that the watershed not be opened up to general recreational use, in order to preserve water quality, minimize erosion, minimize understory and vegetative damage, minimize litter and unsanitary conditions, and also minimize the City's liability. Other logistical and management considerations were discussed if recreation was allowed, such as signage, parking, security, monitoring for damage and illegal activity, etc. These other considerations would impact the budget for the watershed and possibly divert financial resources from other goals and objectives of watershed management. The Committee discussed the value of allowing access to the watershed for educational and research activities, but that such access would follow the standards and guidelines outlined in the Plan, such as permitted by the City, accompanied by a City employee, etc.

The Committee next re-visited the zoning of the watershed, and the value of changing the zoning from three zones down to two, the three being Reserves, Special Management Areas and Active Management Areas. Transitioning to two zones would mean the Special Management Areas (SMAs) would no longer be designated, and instead divided into the Reserve Areas and Active Management Areas (AMAs). The Committee expressed some concern regarding moving acreage from the SMAs to the AMAs, stating that some patches still need special consideration, and shouldn't be too actively managed. Scott reassured the Committee that the AMAs would be reviewed stand by stand as they came up in the harvest rotation, and the harvest method for the year would be dictated by the conditions of the stand and any special or unique characteristics. Staff pointed out that the Committee had previously discussed a recommendation that the Forester draft a harvest plan annually, ahead of each harvest, and such a plan would delineate any special, sensitive, or unique areas, and this annual harvest plan would then outline how the harvest should happen in that year. Scott will bring maps of the proposed two zones to the next meeting for the Committee to review. Also at the next meeting, the Committee will discuss the age of trees, with regard to defining legacy trees and the possibility of harvesting patches of trees over a certain age.

The meeting adjourned at 7:34 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from April 11, 2012

The Watershed Ad-Hoc Committee held its seventh meeting on Wednesday, April 11, 2012.

The Committee continued its discussion on the zoning of the watershed, and the value of changing the zoning from three zones down to two, the three being Reserve Areas, Special Management Areas and Active Management Areas. Transitioning to two zones would mean the Special Management Areas (SMAs) would no longer be designated, and instead divided into the Reserve Areas and Active Management Areas (AMAs). Scott brought maps for the Committee to review, to facilitate the discussion. The maps displayed the slopes and ages of trees within the watershed, as well as how the current zones and new zones relate to those attributes. Scott pointed out areas of the SMAs that would move to either the AMAs or the Reserve Areas.

Members of the Committee expressed once again some concern regarding moving acreage from the SMAs to the AMAs, stating that some patches still need special consideration, and shouldn't be too actively managed. Scott reassured the Committee that the AMAs would be reviewed stand by stand as they came up in the harvest rotation, and stands with unique or special characteristics would be managed more carefully, and would be outlined in the annual harvest plan. The Committee also discussed the concept of eliminating zones altogether, and instead focus on criteria for managing and commercial thinning – such as steepness of slopes, age of trees, buffer areas, wildlife areas, but the Committee

decided that designating zones has value given the current state of the watershed, as well as facilitating public understanding of how the watershed is managed.

The Committee discussed how the zoning is a way to communicate the risks associated with thinning in certain areas, in terms of potential damage to water quality, habitat and diversity. The more risky areas have been placed in the Reserve zone, for example.

In reviewing the maps that Scott provided, the Committee agreed to modify a patch currently in the Reserve Area and place it in the AMA. This patch is flat, and is a portion of what is referred to as “Coyote Ridge”. While most of the area is in the Reserve due to its slope and other characteristics, the map made it clear that a portion of it is on flat ground and Scott confirmed it could be moved to AMA.

The Committee pointed out that the entire watershed needs to be managed, regardless of the zones, and suggested language that clarifies non-commercial management activities will take place in the Reserve Areas, and commercial thinning will take place within the AMAs, but that some portions of the AMAs will be more carefully managed than others, based upon their characteristics.

The Committee discussed the implications of engaging in commercial thinning in the watershed, and suggested that the plan acknowledge that commercial thinning takes place within the policy guidelines of the plan. Staff clarified that the watershed is managed out of the water utility of the City, and so the proceeds from commercial thinning are deposited into the water fund, and the expenses of managing the watershed come from the watershed. The Committee discussed the merits of including language relating to the financial resource need of the watershed. Staff encouraged the Committee to focus on policy guidelines and recommended activities to manage the watershed, which would then help to inform and shape the water utility’s budget request each year. The Committee agreed that the financial resources are an outcome of management, and not a driver.

The above discussion of zones led into a discussion about desired future conditions. The Committee expressed that deciding upon zones within the watershed was contingent upon the desired future conditions. Scott pointed out that since the City has the watershed with certain conditions known already, zones could be designated and desired future conditions within each zone could be discussed. The Committee agreed.

Scott explained that outlining desired future conditions will influence future activities in the watershed to protect water quality and encourage ecological diversity. The Committee discussed the need for both diversity in tree species and age to promote a healthy forest.

Scott facilitated a round table discussion with the Committee on their vision of desired future conditions. Given that clean water is the ultimate goal of managing the watershed, the Committee discussed the importance of minimizing erosion, minimizing landslides, and limiting the use of pesticides and other chemicals. The need to manage the watershed to prevent blow-down from storms was discussed, as well as the need to minimize the potential damage from wild fires. Bug damage is a threat, which can be managed by a diversity of tree species.

Acquiring land outside of the watershed but within the drainage basin was also discussed. Acquiring land within the drainage basin would help protect the source water, and may lead to new sources of surface water supply.

The Committee discussed that over time, trees of the same age and species should not be concentrated, and rotational thinning can help achieve diversity. The Committee expressed the desire that the plan should articulate firm goals in terms of desired future conditions, but not be overly restrictive and instead have broad guidelines. The plan would then have policy parameters that when applied, would lead to the desired future conditions. Separately, each year an annual harvest plan would be created that would support the desired future conditions and policies of the plan.

The Committee decided to continue its discussion on desired future conditions at its next meeting, focusing on forest types and age classes, with a goal of drafting language for the plan that would articulate the desired future conditions of the watershed.

The Chair also expressed a desire to discuss the process by which consensus is reached.

The meeting adjourned at 7:28 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from April 25, 2012

The Watershed Ad-Hoc Committee held its eighth meeting on Wednesday, April 25, 2012.

The Committee began the meeting by discussing various alternatives for determining consensus. One alternative was for the chair to ask for objections, and if none articulated, then the committee would move forward. Another alternative proposed was the “fist-to-five” method, where members register their intensity of agreement by the number of fingers held up: Five fingers indicates full support, whereas a closed fist indicates no support, and three fingers would be neutral, and so on. Another alternative proposed was to call for a vote, and if the “ayes” were unanimous, the issue would move forward, but if there was even one “nay”, the Committee would continue to discuss the topic. The Committee discussed the merits and drawbacks of each alternative. The Committee decided upon the alternative that called the question, with responses either being “aye” or “nay”, to determine consensus on an issue. Even one “nay” vote then would mean consensus had not been achieved, and those voting “nay” would share their thoughts and ideas in order to achieve agreement on the topic.

The Committee next discussed the desired future conditions of the watershed. Scott provided a map for the Committee review that divided the watershed into reserve areas and forest types. Scott asked the Committee to envision the watershed 30 to 50 years hence, keeping in mind that options for the future are constrained by the current conditions of the watershed.

Scott explained that the current conditions of the watershed include even-aged stands of Douglas-fir, and not a lot of hardwoods or other species. Because of the way the watershed was historically managed, the majority of stands are blocks of older forest in the range of 50 to 70 years old, and there are large blocks of older stands in the 71-110 years of age. About 156 acres are multi-species stands, while 166 acres are stands with significant, natural regeneration. Luckily, there is very little invasive vegetation in the watershed.

Scott reiterated that the goal of a statement on desired future conditions is to outline what the forest will look like in general terms. The actions that produce these future conditions are governed, on a day-to-day basis, by the goals, policies and guidelines in the updated Plan that the committee has already discussed. The Plan provides the over-arching guidance, while each year’s harvest and restoration plan is the implementation vehicle. Scott emphasized that the Plan allows the City to meet the triple bottom line in managing the watershed – meeting social, ecological and economic goals.

Scott provided a hand-out to the Committee listing bullets to consider while developing the desired future conditions. This hand-out listed discussion items and general considerations such as reinforcing that the water quality drives the forest management program, that the Reserve areas will provide old forest habitat and connectivity, and that the Active Management Areas (AMAs) provide a model of sustainable, commercial forest management. The Committee discussed desired future stand types in terms of forest health and resistance to fire, insects and disease. The discussion also covered the role of timber harvest in a program that emphasizes maintenance of water quality, forest diversity and wildlife habitat. To meet these goals, a watershed that had stand types of even-age Douglas-fir, hardwoods, uneven-aged conifers

or multi-species, and stands with canopies open enough to support healthy shrub layer would be best. The Committee also stressed that soil structure is important and protects both the water quality and quantity.

The Committee briefly discussed the format the desired future conditions should take in the Plan update. The Committee suggested to Scott that the desired future conditions be articulated in a separate section at the start of the management recommendations chapter, and in the Executive Summary, with references sprinkled through relevant chapters of the Plan. The Committee suggested that the reasons behind the recommendations for desired future conditions be clearly articulated, given the breadth of the audience that may read the Plan. The Committee also suggested that the Plan update have an appendix, which would house various graphs, charts and statistics that would more specifically give guidance for the desired future conditions.

The Committee next turned its attention to the age of the stands in the watershed. Barry displayed a table using the projector that showed the current and proposed age class distribution. Because of the historic harvest methods in the watershed, there are many even-aged stands over the age of 60. The Committee discussed the age classes of the watershed, and how to best achieve a more equal stratification of age classes within the watershed. One goal would be to manage the watershed such that 80% of the AMAs were in even-aged stands, while 20% of the AMAs were in un-even aged stands. To balance age classes, the harvest method in some areas would be patch cut with retention, while in other areas harvests would be done to encourage natural regeneration. Because of the current ages of stands and a bubble of trees that are currently in the 61-80 year age range, timber harvest levels may end up either being somewhat higher in the short term (if managed to balance the ages), or lower in the long term (if the number of acres and age of managed stands are allowed to significantly increase). The Committee also mentioned that the number of acres within certain stands does not necessarily translate to harvest levels, due to inoperability issues and other parameters in the Watershed Plan. In other words, about 10% to 15% of the acreage may not be harvested due to other issues or circumstances. One example is the goal to increase uneven-aged stands, which will affect the age class distribution.

The Committee agreed to leave off the discussion with the age class distribution topic, and pick it up at their next meeting. Barry agreed to modify his age class distribution table to account for uneven-age stands.

The meeting adjourned at 7:35 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from May 9, 2012

The Watershed Ad-Hoc Committee held its ninth meeting on Wednesday, May 9, 2012.

The Committee began the meeting by reviewing Scott's handout on Desired Future Conditions of the watershed. Scott explained that when thinking about the future forest stands and types, it is important to remember the clear cut history of the watershed, which resulted in abundant trees in the age class of 60 to 110 years old, but left gaps in the age diversity of trees under the age of 40, particularly in the age class of 10 to 20 years old. When discussing the forest openings, the Committee expressed wanting to see more detail, so that the result is not a huge harvest with sporadic trees left every 200 feet or so. The Committee suggested language instead that captured the concept of where some seedlings would be able to grow in open sunlight, and that shrubs would be able to grow.

The Committee also talked about forest stands, and a more clear definition of what is meant by the term, and also suggested a definition for plantation, and distinguishing between a plantation and an even-aged stand. Scott agreed to add some clarity, that when speaking of even-aged, Douglas-fir stands, that they

will be approximately 2 to 30 acres in size. Also, when discussing the aging of even-aged stands, and how some may be left to grow, the Committee suggested language that those stands will be re-assessed in the future for management, or de facto added to the reserves, because of accessibility, topography, the existence of other plants, or other such characteristics that are desirable to preserve.

Scott also pointed out that certain stands within the Active Management Area (AMA) may contain special attributes that are discovered in the future, either by the Forester ahead of a harvest, or by a future survey, or other inspection. Scott suggested a modification to the Desired Future Conditions to recognize these sites, referring to them as minor refugias.

The Committee wrapped up its discussion on the Desired Future Conditions, and took a vote for consensus on the principles contained in the statement Scott handed out, with the modifications discussed by the Committee. The Committee unanimously approved the Desired Future Conditions, with the understanding the narrative hand out would be modified per the discussion.

The Committee next turned its attention to the topic of harvest levels in the watershed. Scott explained that harvest levels are typically measured by two metrics: volume and acres. Scott further pointed out that the current Plan, drafted in December, 2001, set a goal of harvesting roughly half of the growth estimated in the AMA, estimated to be about 750 thousand board feet. Additionally, the 2001 Plan assumed that up to 135 acres can be thinned each year, and 15 acres patch cut annually. The 2001 Plan also predicted that harvest levels would need to increase in the time period 2012-2021 to maintain the vigor of larger trees and provide openings and light for new seedlings. Scott reminded the Committee that over the last 10 years, about 100 acres were thinned each year, and roughly 8 acres patch cut.

In this context, and with the Desired Future Conditions in mind, and the goal to create more diversity among age classes, Scott suggested that the watershed could sustain roughly 20 acres of patch cutting in the more mature stands, to allow for regeneration of younger trees. Scott calculated the volume that would result from this to be approximately 750 thousand board feet. The Committee asked for some more detail on the patch-cutting approach, and what a harvest plan may look like according to age class. Scott drew an example of what one year's plan may look like:

Number of Acres	Age of Trees
10 acres	60 to 80 year old trees
5 acres	80 to 100 year old trees
5 acres	100 year old trees and older

The result would be 20 acres patch cut, at approximately 35,000 to 37,500 board feet per acre, for total volume of 700 to 750 thousand board feet each year.

The Committee agreed this approach would create more openings for younger trees, and still meet the over-arching, sustainable goals of the watershed.

Next the Committee discussed thinning. Scott advised future thinning could occur over roughly 100 acres per year for the next 10 years, mostly on stands 45 years of age and older. Scott calculated this would result in approximately one million board feet per year.

Adding together the patch cut and the thinning, the total harvest each year would touch about 120 acres, and result in approximately 1.7 million board feet.

However, Scott pointed out that another goal is to increase the uneven-aged stands in the watershed, and that this could be done by variable density retention. He explained this method could increase the volume by an additional 300 to 400 thousand board feet, so that in any given year, the total volume may be anywhere between 1.7 million board feet and 2.1 million board feet.

The Committee stressed, and Scott agreed, that even with these methods and volume estimated, the City should not cut more than is growing in the watershed. The Committee also pointed out the importance of the acre restriction, because the acre restriction is a control on the footprint in the watershed, and it was good to have this constraint.

The Committee asked about a hypothetical situation in which an event, such as a fire, or over-zealous harvesting, resulted in the 10-year target of volume and acres happening much sooner, for example, within a 5 or 6 year time frame. Scott and Rob explained that if that were to happen, the City Council would have to consider the condition of the watershed in the context of the Desired Future Conditions, and make adjustments to future harvests. Scott suggested that the pace at which the Desired Future Conditions are met be reasonable and cautious, and not over do the risk by being too zealous to reach targets. The Committee agreed with this assessment.

The Committee suggested that in the drafting of the Plan Update, the prior harvest strategy, as contained on page 5-7 of the 2001 Plan, be included for reference, and that the Plan Update clearly articulate the watershed's current conditions as reported in the Inventory Report and 10-Year Assessment Report. This would then provide a good introduction to explaining the basis of the harvest strategy for the Plan Update, to cover the next 10 year period. Examples of concepts to include would be goals to increase the quantity of uneven-aged stands and hardwoods. Also, with the context of the previous 10 years of management, the City now has a better handle on the growth rate of the forest, the risk factors that could impact water quality and the forest, as well as the pace at which the Desired Future Conditions may be met.

The Committee discussed the merits of having only the acreage be a target for each year, and not the dual metrics of both acreage and volume. Scott suggested that the volume target is an important one for harvest management as another control on harvest methods, and it is something that the Forest Stewardship Council looks for.

The Committee also talked about the growth rates changing due to management strategy, and that the percent of growth harvested may vary, and at times even exceed the estimated annual growth. Scott mentioned that the ultimate point is to manage in such a way that the forest proceeds toward the Desired Future Conditions, and that harvests will be less than what is actually growing in the watershed.

The Committee concluded their discussion on harvest levels by agreeing that both metrics of acreage and volume were important. The Committee took a consensus vote, which passed unanimously, that harvest levels would be as described above – approximately 20 acres would be patch cut each year, about 100 acres would be thinned each year, and in general, the volume would range from 1.7 million board feet to 2.1 million board feet, with a cautious, conservative pace to reach the Desired Future Conditions.

The meeting adjourned at 7:20 pm.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee Summary from May 24, 2012

The Watershed Ad-Hoc Committee held its tenth meeting on Thursday, May 24, 2012.

The Committee began the meeting by electing a new chair, upon the announcement that the current chair is moving out of the area. The Committee elected that staff chair the remaining meetings.

Next the Committee discussed the list of 26 recommendations. Of these, the Committee indicated consensus on 11 without further discussion. The Committee discussed the remaining 15, asking clarifying questions, suggesting wording modifications, and in some cases combining statements. A

separate attachment below, using track changes, captures the Committee's work on these recommendations.

The next item the Committee considered was a list of potential action items to accomplish over the next 10 years. Scott provided a list of restoration, resource and habitat needs that the Committee reviewed and discussed. The categories are roads, streams, forest habitat and vegetation. These action items are attached below, and captures the Committee's discussion on these items.

The Committee discussed items for the next meeting, and agreed that the Committee's work could be wrapped up at the next meeting, scheduled for June 13, 2012. The Committee suggested the items to be prioritizing the action item list, and discussing the merits of having the watershed certified by the Forest Stewardship Council, and also discussing the model forest program and what that may mean for the watershed.

The meeting adjourned at 8:00 pm.

May 2012 – After Committee discussion

List of Watershed Ad-Hoc Recommendations

Please indicate your agreement or disagreement, or whether you still have questions, in the appropriate blank by typing an "X", and e-mail back to Susan and Scott by Monday, May 21, 2012. Susan will compile the responses and provide back to the Committee prior to the meeting scheduled for Thursday, May 24. The responses are tallied below. Some folks had some suggested edits, which are incorporated below.

Summary of recommendations:

In general, the 2001 Watershed Stewardship Management Plan has adequate policies and goals. However, certain aspects could be updated and/or modified, according to the following list developed through the work of the 2012 Watershed Ad-Hoc Committee:

1. The 2001 Plan contained a list of action items, most of which were accomplished. The Plan Update will build on this list, and carry forward those items that are still desired to be accomplished.

This statement is too general and needs more specificity. Scott provided a separate handout with more specific action items.

2. The Forester will prepare a general 10-year operational plan that implements the Watershed Management Plan Update. This general plan will suggest sequencing of work that may take advantage of improvements in consecutive years, such as roads or culverts, to minimize the operational footprint. Additionally, an annual operations and harvest plan will be prepared, specifically outlining work to be done that year, prior to commencing work in the watershed. The annual plan will, at minimum, outline the location of the harvest, the harvest methods, any special considerations that need to be managed, avoided or restored, such as understory, tree characteristics, roads, buffer zones, etc. This annual harvest plan will also describe in general terms any sensitive or endangered plants noticed in the planned harvest area that need to be preserved, or invasive species that need to be eradicated.
3. Monitoring progress of activities and goals will be accomplished through an annual report completed each fall, after the harvest is complete, that will be made available to the public, that will discuss what goals and objectives were accomplished in the last year. This report will also include the results of the harvest, including volume of timber and acreage worked in, and how the harvest did or did not further progress toward the desired future conditions. The 2001 Plan suggested this report be provided to residents via the utility bill insert; instead the Committee

recommended the report be linked to the City's website, and then notify the public that the report exists.

4. Zoning – the watershed zones will change from three to two: from Reserve Areas, Special Management Areas and Active Management Areas to just Reserve Areas and Active Management Areas. However, within the Active Management Areas, certain stands need special consideration due to their characteristics and will be managed accordingly.
5. One patch is recommended to be moved from the Reserve Area to the Active Management Area is a flat section of the “Coyote Ridge Clearcut” harvested ca. 1990. .
6. Within Reserve Areas, non-commercial management activities will take place to ensure the health of the forest and restore degraded landscapes that threaten water quality.
7. Within the Active Management Areas, annual, sustainable, commercial harvests will take place. The harvests will be governed by the Plan goals and objectives, be in conformance to Forest Stewardship Council guidelines, and will not be revenue-driven.
8.

Committee opted to delete # 8, and combine it with statement #9.
9. Wildlife management will consider the overall functionality of the forest, forest diversity, habitat connectivity and desired future conditions.
10.

Committee opted to delete #10.
11. Areas within the Active Management Area that have special or unique attributes such as single legacy trees, or a grouping of legacy trees, rare plants, uncommon vegetation communities or wildlife habitat will be considered for “refugia” designation and protected from disturbance. Refugia areas are small in size, from a few trees to a couple of acres.
12. Timber Management – within the policies guiding timber management, the concept of maintaining and improving the long-term ecological productivity will be incorporated, to emphasize clean water and protection of soil structure and ecological function.
13. In managing the annual harvests, making it clear that logging and road building/reconstruction shall occur in dry season conditions to reduce erosion and the impacts of sediments.
14. Logging systems will be used that are appropriate for the site and adequate to protect the watershed resources from undue disturbance and impacts.

15. Skid trails, landings and haul roads should be less than 10% of that year's operational area.
16. In managing the watershed and annual harvests, disturbance to the understory vegetation and soil will be minimized
17. Known and existing legacy problems created by past roads or landslides should be addressed each year, or as discovered, and if such problems cannot be addressed at the time, then they should be recorded for future work. Attempts should be made, when feasible, to disconnect ditch lines to allow water to flow over filtering vegetation prior to entering a stream.
18. Fire Management – the Committee suggested language be added clarifying the application of the guidelines outlined by the Industrial Fire Prevention Levels, and to note varying guidelines for industrial type activities such as logging, versus public use activities, to facilitate the understanding of general public.
19. During high risk fire times, harvest or other work may need to be discontinued. If after appropriate consideration of the potential risks to the watershed the Public Works Director determines that work may safely continue, the Director may apply to ODF for a waiver to allow work to continue, in consideration of the lower risk of fire in the watershed due to how it is managed, but that conversely, the Public Works Director may impose additional restrictions depending upon the circumstances of the year and the area to be harvested.
20. Public Access – In recognition of the purpose of the FG watershed to provide clean drinking water to the citizens, as well as the abundant recreational opportunities in the area, public access to the watershed will be limited to educational and research activities, and will be evaluated on a case-by-case basis. The 2001 Plan has adequate language regarding public access, with the exception of adding that the City will arrange for sanitary facilities when tours are conducted.
21. Desired Future Conditions of the watershed will protect the water quality of the watershed by minimizing erosion, fire damage, landslides, and exposure to chemicals. A forest of diverse species, ages, and density will accomplish this, and will also minimize damage from blow-down, wildfires, insects and disease.
22. In order to better protect or increase the City's source water, the City will consider acquiring land outside the current boundaries of the City-owned watershed, that is deemed to have hydrologic, ecologic or economic benefit to the City.
23. A statement of the Desired Future Conditions will be contained in the Plan Update.
24. Commercial harvests over the next 10 years should be managed in such a way that no more than 20 acres per year will be disturbed by patch cutting, variable retention harvests or other regeneration harvest methods, while no more than 100 acres per year will be thinned. The resulting volume is estimated to be approximately 1.7 to 2.0 million board feet per year.

25. Should the Forest Grove watershed be FSC Certified (Forest Stewardship Council)? (to be discussed at June 13, 2012 meeting)

TO BE DISCUSSED

26. Is the Forest Guild's Model Forest Program appropriate or desirable for the watershed? (to be discussed at June 13, 2012 meeting)

TO BE DISCUSSED

Glossary suggestions:

The Watershed Ad-Hoc Committee suggests that the following terms be added and/or clarified in the glossary of the Plan Update:

- | | |
|------------------------------|--|
| ▶ Variable retention harvest | ▶ Group selection |
| ▶ Patch cutting | ▶ Forest stand |
| ▶ pre-commercial thinning | ▶ Professional forester |
| ▶ Variable density thinning | ▶ Forest Stewardship Council certified |
| ▶ Conventional thinning | |
| ▶ | |

Appendices suggestions:

The Watershed Ad-Hoc Committee suggests that the following be added and/or clarified in the appendices of the Plan Update:

- ▶ Statistics on the inventory and growth rate of the forest, as resulted from the 2011 watershed inventory
- ▶ Statistics on timber volumes by forest type, board feet by age class, forest types and ages in the Reserve Areas and Active Management Areas, snags & dead down wood by forest type
- ▶ Maps displaying the zones, roads, streams, forest types, ages, etc
- ▶ Parameters of management – such as percent of understory disturbed, percent of soil disturbed, percent of forest floor impacted by harvests, percent of acceptable collateral tree damage during harvests, amount of snags per acre, coarse woody debris per acre,
- ▶ An example of the request for proposals/bids for logging services could be included in an appendix, to help guide future annual work in the watershed, and the example scope of work could include language guiding the logger in terms of tree damage, soil damage and understory damage.

Forest Grove Watershed
Restoration, Resource and Habitat Needs

For each item, include why it's an issue, e.g. "Deep Creek Road Project – erosion threatens water quality" Also, maybe give an indication of priority of item, so City can better gauge the sequencing of the items.

(1) Roads

- a. Deep Creek Road Project – Include here why it's needed

Include more information, such as the issue of it being a high risk segment, being a mid-slope road built with fill material. The road is not necessary for logging – can reach trees from above. However, the fire access should be examined before the road is decommissioned.

It's possible that an OWEB grant could be used to fund the project.

- i. 1.0 mile of Deep Creek Road on west side of the creek (the final 5,200 feet) crosses three streams with culverts and large fills. The crossings are unstable and at risk for failure and landslides into Deep Creek.

- ii. This section of the road is not necessary for management access.
- iii. De-commissioning this road segment would be a large project, with an estimated cost of +\$100,000.

b. Potts Connector Road – upgrade or decommission

Pursue vacation of easement, discuss with adjacent home owner if need for easement still exists. The City currently maintains this road because of the easement, and it has culverts that need to be maintained, etc. Road not needed for forest management. However, if home owner still needs this road, then the City should evaluate the road for possible upgrades to minimize potential water quality threats, and program annual maintenance into the budget.

- i. This 0.5 mile road segment was put in as a fire escape route for the Potts residence.
- ii. Not maintained, with several culverts over small, non-fishbearing streams.
- iii. Not needed for management access. De-commission cost estimated at ± \$15,000.

c. Disconnect ditches

(2) Streams

a. Clear Creek (downstream of the fish ladder) - poor fish habitat

- i. Clear Creek is lacking large wood in the aquatic zone, as reported in the 2001 fish habitat survey.
- ii. The 2001 Plan recommended adding large wood to improve habitat.
- iii. In 2010, a \$50,000 OWEB grant was awarded to place 10 large wood structures in clear creek. The grant was extended, but will expire in September 2012.

Consistent with old plan. Committee unanimously recommended this project be done & take advantage of the OWEB grant.

Committee suggested doing a fish survey before this work is completed, to set a baseline to better determine if project was successful.

b. Clear Creek Slide Area. – slide/sediment problem

- i. A small Clear Creek tributary near the head of the drainage was damaged in 1996 by a slope failure and landslide from a logging road upslope
- ii. The 2001 plan called for a re-vegetation project, which was only partially successful.
- iii. To further stabilization is needed

c. Stream Habitat Surveys

- i. The 2001 Plan calls for monitoring stream health and fish populations.
- ii. A stream habitat survey and fish census is recommended for Clear, Roaring, Thomas and Deep Creeks.

Suggest re-doing fish survey on Roaring Creek, and performing such surveys prior to major stream work to identify a baseline of fish population, to better determine the success of projects.

(3) Forest Habitat

a. Snags and Down Wood – for forest health; monitoring only

- i. The 2001 Plan recommended creation of snags and down wood to improve wildlife habitat.
- ii. The snag creation program was discontinued in 2004 as managers became aware of bear damage resulting in new snags.
- iii. In 2009 a dramatic increase in tree kill from Douglas-fir bark beetles created significant numbers of new snags.
- iv. No new effort to artificially create snags or down wood is recommended

The Committee agreed that no additional action is recommended. Although, forest health should continue to be monitored, especially for root rot and beetle damage.

b. Non-commercial Thinning in any area of the watershed – maintain forest health

Specify actions in Reserve Areas and Active Management Areas.

Also, clarify reason – that such thinning of 8 or 9 trees per acre would release growth, and the focus should be on areas and trees that the City is trying to improve. Such thinning is done to improve habitat, forest health, and increase growth. However, the non-commercial thinning needs to be appropriate to scale and also keep fire risk in mind.

- i. Several hundred acres of dense fir plantations could be thinned to release existing hardwoods and large trees (habitat thinning).
- ii. Many of these acres are in the Reserve Area. This type of thinning would increase future stand diversity and large tree development.

c. Spotted Owl Surveys

- i. A spotted owl pair was detected in the 2009 survey.
- ii. Additional surveys are needed to determine their status.

(4) Vegetation

a. Invasive Plant Control – continue to monitor and evaluate

- i. Scotch Broom control is needed on “Coyote Ridge” area and in “shooting range” vicinity.

Committee suggested specifying/clarifying the method – such as by machete or direct, targeted use of herbicides, that no aerial spraying will be done.

CITY OF FOREST GROVE

Watershed Ad-Hoc Committee
Summary from June 13, 2012

The Watershed Ad-Hoc Committee held its eleventh and final meeting on Wednesday, June 13, 2012.

The Committee continued its discussion of the list of recommendations. The Committee suggested that #2 – relating to plans, be modified to suggest that the Forester prepare a 3 year plan also, in addition to a 10 year plan.

The Committee discussed the remaining items, asking clarifying questions, suggesting wording modifications, and in some cases combining statements or deleting statements. A separate attachment below captures the Committee's work on these recommendations.

The next item the Committee considered was whether or not the Forest Grove's watershed should be certified through the Forest Stewardship Council (FSC). Scott explained the additional staff work that would need to be done in order to comply with certification, mainly relating to an annual audit. The annual audit, he explain, takes about 4 days, and he estimated the cost to be roughly \$5,000.

Alternatively, the City could employ a forester with FSC certification, if the City wanted this certification for its forest products. Hiring an FSC certified forester may result in a management style consistent with the City's Watershed Stewardship Management Plan, and may yield higher forest product prices, depending upon the lumber market.

The benefits of the City's watershed being FSC certified would be a statement to the public regarding Forest Grove's watershed, that it meets stringent requirements for sustainability. Also, the forester selected by Forest Grove to manage its watershed would not need to be FSC certified, and could therefore open up a larger pool of foresters, if the City wanted to market its forest products as FSC certified.

The Committee concluded that if the City wanted to market its forest products as FSC certified, the most cost-effective approach would be to select a forester that had FSC certification. The Committee recommends that the watershed forest be managed according to sustainable guidelines, but not incur the additional cost of FSC certification.

The Committee further suggested that the City explore other certification programs, such as the Forest Guild's Model Forest Program, the American Tree Farm System, among others.

The meeting adjourned at 7:15 pm.

List of Watershed Ad-Hoc Recommendations

The Ad-Hoc Committee discussed the following items and recommended they be incorporated into the Watershed Stewardship Management Plan Update.

Summary of recommendations:

In general, the 2001 Watershed Stewardship Management Plan has adequate policies and goals. However, certain aspects could be updated and/or modified, according to the following list developed through the work of the 2012 Watershed Ad-Hoc Committee:

1. The 2001 Plan contained a list of action items, most of which were accomplished. The Plan Update will build on this list, and carry forward those items that are still desired to be accomplished.
2. The Forester will prepare an annual operational plan as well as general 3-year and 10-year operational plans that implements the Watershed Management Plan Update. These general plans will suggest sequencing of work that may take advantage of improvements in consecutive

years, such as roads or culverts, to minimize the operational footprint. Additionally, an annual operations and harvest plan will be prepared, specifically outlining work to be done that year, prior to commencing work in the watershed. The annual plan will, at minimum, outline the location of the harvest, the harvest methods, any special considerations that need to be managed, avoided or restored, such as understory, tree characteristics, roads, buffer zones, etc. This annual harvest plan will also describe in general terms any sensitive or endangered plants noticed in the planned harvest area that need to be preserved, or invasive species that need to be eradicated.

3. Monitoring progress of activities and goals will be accomplished through an annual report completed each fall, after the harvest is complete, that will be made available to the public, that will discuss what goals and objectives were accomplished in the last year. This report will also include the results of the harvest, including volume of timber and acreage worked in, and how the harvest did or did not further progress toward the desired future conditions. The 2001 Plan suggested this report be provided to residents via the utility bill insert; instead the Committee recommended the report be linked to the City's website, and then notify the public that the report exists.
4. Zoning – the watershed zones will change from three to two: from Reserve Areas, Special Management Areas and Active Management Areas to just Reserve Areas and Active Management Areas. However, within the Active Management Areas, certain stands need special consideration due to their characteristics and will be managed accordingly.
5. One patch is recommended to be moved from the Reserve Area to the Active Management Area is a flat section of the “Coyote Ridge Clearcut” harvested ca. 1990. .
6. Within Reserve Areas, non-commercial management activities will take place to ensure the health of the forest and restore degraded landscapes that threaten water quality.
7. Within the Active Management Areas, annual, sustainable, commercial harvests will take place. The harvests will be governed by the Plan goals and objectives, be in conformance to Forest Stewardship Council guidelines, and will not be revenue-driven.
8. Wildlife management will consider the overall functionality of the forest, forest diversity, habitat connectivity and desired future conditions.
9. Areas within the Active Management Area that have special or unique attributes such as single legacy trees, or a grouping of legacy trees, rare plants, uncommon vegetation communities or wildlife habitat will be considered for “refugia” designation and protected from disturbance. Refugia areas are small in size, from a few trees to a couple of acres.
10. Timber Management – within the policies guiding timber management, the concept of maintaining and improving the long-term ecological productivity will be incorporated, to emphasize clean water and protection of soil structure and ecological function.
11. In managing the annual harvests, making it clear that logging and road building/reconstruction shall occur in dry season conditions to reduce erosion and the impacts of sediments.

12. Logging systems will be used that are appropriate for the site and adequate to protect the watershed resources from undue disturbance and impacts.
13. Skid trails, landings and haul roads should be less than 10% of that year's operational area.
14. In managing the watershed and annual harvests, disturbance to the understory vegetation and soil will be minimized
15. Known and existing legacy problems created by past roads or landslides should be addressed each year, or as discovered, and if such problems cannot be addressed at the time, then they should be recorded for future work. Attempts should be made, when feasible, to disconnect ditch lines to allow water to flow over filtering vegetation prior to entering a stream.
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17. During high risk fire times, harvest or other work may need to be discontinued. If after appropriate consideration of the potential risks to the watershed the Public Works Director determines that work may safely continue, the Director may apply to ODF for a waiver to allow work to continue, in consideration of the lower risk of fire in the watershed due to how it is managed, but that conversely, the Public Works Director may impose additional restrictions depending upon the circumstances of the year and the area to be harvested.
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19. Desired Future Conditions of the watershed will protect the water quality of the watershed by minimizing erosion, fire damage, landslides, and exposure to chemicals. A forest of diverse species, ages, and density will accomplish this, and will also minimize damage from blow-down, wildfires, insects and disease.
20. In order to better protect or increase the City's source water, the City will consider acquiring land outside the current boundaries of the City-owned watershed, that is deemed to have hydrologic, ecologic or economic benefit to the City.
21. A statement of the Desired Future Conditions will be contained in the Plan Update.

22. Commercial harvests over the next 10 years should be managed in such a way that no more than 20 acres per year will be disturbed by patch cutting, variable retention harvests or other regeneration harvest methods, while no more than 100 acres per year will be thinned. The resulting volume is estimated to be approximately 1.7 to 2.0 million board feet per year.
23. The Committee recommends the City pursue sustainable forest management, but not pursue certification through the Forest Stewardship Council at this time.
24. The Committee recommends the City continue to explore the Forest Guild's Model Forest Program to determine if it is an appropriate model for the City to follow in managing its watershed.

Glossary suggestions:

The Watershed Ad-Hoc Committee suggests that the following terms be added and/or clarified in the glossary of the Plan Update:

- | | |
|------------------------------|--|
| ▶ Variable retention harvest | ▶ Group selection |
| ▶ Patch cutting | ▶ Forest stand |
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The Watershed Ad-Hoc Committee suggests that the following be added and/or clarified in the appendices of the Plan Update:

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- ▶ Parameters of management – such as percent of understory disturbed, percent of soil disturbed, percent of forest floor impacted by harvests, percent of acceptable collateral tree damage during harvests, amount of snags per acre, coarse woody debris per acre,
- ▶ An example of the request for proposals/bids for logging services could be included in an appendix, to help guide future annual work in the watershed, and the example scope of work could include language guiding the logger in terms of tree damage, soil damage and understory damage.

CITY OF FOREST GROVE

Council Work Session, October 22, 2012

The City Council held a work session on October 22, 2012, to hear an overview of the Watershed Plan Update, and also received draft copies of the Plan Update.

Scott gave a PowerPoint presentation that highlighted the work of the Watershed Ad-Hoc Committee, the process they went through, and changes recommended for the Plan.

Below are the City Recorder's minutes of the work session:

Work Session: Watershed Management Plan Update

Foster, Cole, Downey, and Sykes facilitated the work session, noting the purpose of the work session was to present a summary review of the completed Draft of the Forest Grove Watershed Stewardship Management Plan Update conducted by the Watershed Ad-Hoc Committee.

Staff introduced Scott Ferguson and Barry Sims, Trout Mountain Forestry, City's Watershed Consultant, who advised and guided the Ad-Hoc Committee through the update process. Staff reported the Ad-Hoc Committee met twice a month from January 2012 through June 2012, and reviewed the 10-year history of the watershed management; recently completed inventory of the watershed; and toured the watershed. Staff distributed copies of the Draft Executive Summary and referenced the staff report, Attachment 1, Statement of Desired Future Conditions, and Attachment 2, List of Ad-Hoc Committee Recommendations, noting the Ad-Hoc Committee made no changes to the Plan's goals, which were referenced on Page 1 -3 of the Draft Executive Summary.

Staff outlined the Ad-Hoc Committee's recommendations (reference as Attachment 2), noting the Ad-Hoc Committee made recommendation to modify the zoning of the watershed, from three zones (Reserve Areas, Special Management Areas, and Active Management Areas) to two zones (Reserve Areas and Active Management Area). Staff indicated much of the discussion of the Ad-Hoc Committee focused on the Desired Future Conditions (DFC) of the watershed (referenced as Attachment 1), noting the DFC defines how the two management areas are desired to look and function over time, in terms of ages of trees, species of trees, riparian areas, understory, woody debris, etc. Staff indicated one aspect that came to light in the inventory was a large inventory of trees in age range of 51 to 70 years of age, yet relatively few trees below 50 years of age, noting the DFC calls for more balance in the ages of trees across the watershed. In order to achieve this balance and maintain habitat diversity, the Ad-Hoc Committee discussed whether the Plan update should specify an upper age limit of harvestable trees. As a result of that discussion, the Ad-Hoc Committee made recommendation that up to 20 acres of area be created each year, made up of several smaller openings, for the establishment of younger trees. Staff noted groups of older trees, large down logs and areas of undistributed vegetation would be retained in these openings as forest legacies. The Ad-Hoc Committee also reviewed sustainable harvest levels. In considering the annual harvest, the Ad-Hoc Committee evaluated the recently completed watershed inventory, as well as forest habitat, health and diversity, and the DFC. Staff reported the current 2001 Plan sets a goal of harvesting roughly 750,000 to 1,500,000 board feet annually and the 2001 Plan also predicted that harvest levels would need to increase in time period 2012-2021 to maintain the vigor of larger trees and provide openings and light for new seedlings. Based upon the current conditions of the watershed and DFC, the Ad-Hoc Committee made recommendation that the annual sustainable harvest levels be anywhere between 1.7 million board feet and 2.0 million board feet over the next 10 years. In addition, staff reported the Ad-Hoc Committee also discussed resource policies and how best to protect water quality and forest health. As a result of that discussion, the Ad-Hoc Committee made recommendation that the Plan update be much clearer in terms of resource policies, standards, and guidelines so the management of the watershed does not become dependent upon any one person or forester manager, but instead is based on clearer strategies and policies outlined in the Plan. The Ad-Hoc Committee made recommendation the Plan update not prescribe day-to-day methods, but instead focus on more global goals, such as those outlined in the DFC. The Ad-Hoc Committee also considered public access to the watershed and discussed the merits of opening the watershed up to recreational use, noting the existence of other recreational facilities and opportunities in the vicinity. As a result of that discussion, the Ad-Hoc Committee made recommendation the watershed not be opened to general recreational use, in order to preserve water quality and minimize erosion, understory, vegetative damage, litter, and unsanitary conditions, and also minimizing the City's liability and potential budgetary impacts. The Ad-Hoc Committee supported allowing access to the watershed for educational and research activities, which the Plan outlines the provisions, standards and guidelines for such access. In addition, staff reported the Ad-Hoc Committee also considered whether the watershed should be certified under Forest Stewardship Council's Certification Program (FSC Certified), noting the Ad-Hoc Committee suggested that if Council desires to pursue an FSC certified market, having a forester who was FSC certified was adequate and did not feel the extra costs and effort were worth the added benefit, noting the City can choose to become certified at a later date. In conclusion, staff reported the Ad-Hoc Committee's

recommendations have been incorporated into the Draft Watershed Stewardship Management Plan Update.

Council Discussion:

Mayor Truax opened the floor and roundtable discussion ensued as Council discussed with staff, Ferguson, and Ad-Hoc Committee the recommendations made to the Watershed Stewardship Management Plan. Staff, Ferguson, and the Ad-Hoc Committee responded to the various inquiries, concerns, and scenarios the Council presented.

Lowe voiced concern after reviewing the existing 2001 Plan to re-familiarize herself that she found 50 percent of the foundational recommendations had not been addressed, noting the update is more “timber focused”. Lowe also voiced concern no “biodiversity study” has been conducted to justify additional harvest volumes and pointed out the importance of protecting the City’s water quality. Discussion ensued regarding the reasons for increasing harvest volumes in such a way to regenerate the overall forest.

Thompson voiced concern property lines were not well marked, noting he would like to see the property lines surveyed. Discussion occurred about the City gaining control of surrounding land as a way to control boundary issues.

Johnston spoke about the carbon footprint if more timber is cut and spoke about fire danger areas. Discussion ensued pertaining to the roads being maintained to minimize adverse impacts, such as fire danger, to the watershed. In addition, Johnston indicated he took the watershed tour and appreciates the Ad-Hoc Committee’s hard work and dedication.

Mayor Truax recalled the vision and planning that was conducted by the Ad-Hoc Committee back in 2001 when the existing Watershed Management Plan was drafted and adopted. In addition, Mayor Truax posed several inquiries to the Ad-Hoc Committee who responded that the City has done a remarkable job managing the watershed and maintaining a healthy and diverse forest with an abundance of wildlife habitat. The Ad-Hoc Committee also indicated they spent several months revising the 2001 Plan and assessing the watershed’s progress with Ferguson and staff and had a lot of serious discussions, noting each issue was presented and discussed (and often revised) until each committee member could reach consensus. The Ad-Hoc Committee explained the emphasis for harvesting is to maintain and improve the long-term productivity and biological integrity of the entire forest ecosystem. The committee members indicated they were very honored to be part of the Ad-Hoc Committee and committee members who participated in the 2001 Plan and attended the recent watershed tour indicated it was remarkable to see that ecosystems have began to heal, logging roads along the river have been closed off to use, strategically placed logs in the water are encouraging biodiversity, and fish ladders are leading to yearly salmon runs, noting there is still a lot more that needs to get done, which has been carried over in the update Plan.

In conclusion, Mayor Truax thanked the committee members for their hard work and dedication in draft the Watershed Management Plan Update.

Council took no formal action nor made any formal decisions during the work session.

Topics that were brought up before and during the work session by a few of the Council-members warranted a special meeting in order to take more time to delve into the details. The following points were deemed outstanding and the subject of a follow up meeting:

1. Surveys of botanical and wildlife resources
2. Harvest methods, including variable retention
3. Carbon footprint of the watershed
4. Property boundaries of the watershed
5. Managing the reserve area for circumstances that may threaten the health of the reserve area or the overall watershed

6. Moving roadways away from creeks

The follow up meeting was scheduled for Nov. 2, 2012, as a special work session for the City Council.

CITY OF FOREST GROVE

Council Special Work Session, November 2, 2012

The City Council held a special work session on November 2, 2012, to review the Watershed Plan Update in more detail. Three Councilors, along with the Mayor, were present: Councilor Lowe, Councilor Thompson, and Councilor Johnston.

The following points were discussed:

1. Surveys of botanical and wildlife resources
2. Harvest methods, including variable retention
3. Carbon footprint of the watershed
4. Property boundaries of the watershed
5. Managing the reserve area for circumstances that may threaten the health of the reserve area or the overall watershed
6. Moving roadways away from creeks

The meeting started out by Scott explaining that no philosophical change was made to stewarding the watershed. He pointed out that more is known about the environment and forest practices than when the plan was first drafted in 2001. Scott explained that the Ad-Hoc Committee reviewed new information, especially that provided by the inventory that was completed in the summer of 2012, and gave guidance and suggestions to updating the plan.

The Council members present commented that it would have been easier to go through the Plan Update if Scott had used the "track change" feature in Microsoft Word.

The discussion turned to surveys, and Councilor Lowe mentioned she would like to see more surveys completed to create a new baseline, especially when compared to the surveys that were included in the 2001 plan. Suggested surveys include those for fish, invertebrates, endangered species, threatened species, botanical, etc. Scott mentioned that some specific surveys are called for in the Plan Update, referring to page 5-12.

Some members of the Ad-Hoc Committee suggested other indicators, aside from surveys, may be adequate to judge forest health, such as forest structure and diversity, while other members agreed that surveys are a good way to get quantitative measures.

Councilor Lowe mentioned it may be possible to minimize the cost of survey work by utilizing the Oregon State University's extension program, or through grants. Regardless, she expressed the desire to have resources allocated to monitoring the health of the watershed through surveys. Staff responded by mentioning this would come through the annual budget cycle.

The next topic that was discussed was whether to have the watershed certified under the Forest Stewardship Council's program. Scott described that obtaining FSC certification was voluntary, but to maintain it, the City would have to abide by its rules, one of which would be an annual audit. Not all the Council members agreed that the City's watershed should be FSC certified at this time.

Water quality and turbidity were discussed. Randy Smith, the Water Treatment Operator, mentioned that turbidity is tested daily, and that during a storm event turbidity increases, but overall turbidity at the plant has not been an issue. Also, turbidity will spike when a road or culvert fails.

Councilor Johnston raised the topic of fire safety in the watershed, and that the City may want to explore the cost and feasibility of portable water pumps in the watershed to aid firefighting. Staff also pointed out that the Committee discussed fire hazard, and recommended adding more explanation of fire prevention standards and controls to the Plan Update.

Councilor Johnston also raised the issue of possible carbon credits of the watershed, and trading such credits on the carbon credit market, and if that should be added to the Plan Update. An Ad-Hoc Committee member suggested that perhaps the carbon absorption of the watershed could be used by the City internally to offset other carbon emissions, to help the City become carbon neutral. Scott explained that he could include a statistic on the carbon absorption in the plan's appendix.

The next topic of discussion was marking the watershed's boundaries. Scott and Rob believed that there are some permanent monuments in the watershed marking some of the boundaries. A legal survey was suggested, and then marking all of the boundaries, but staff suggested the cost may be too great to do at once. Enhancing the gates and adding no hunting and no trespassing signs were suggested.

The next topic of discussion was the harvest method of variable retention. Scott explained that variable retention would mean harvesting a patch up to 20 acres, but leaving a certain percent of it behind. The 2001 Plan only allowed for openings up to 5 acres, so this method would be a change from the old plan. The benefits of variable retention harvest were discussed, including leaving larger open patches for bushes to provide habitat, and for seedlings to take root. Council members suggested that perhaps this method be reviewed each year ahead of each harvest, and if variable retention harvest is recommended to be used, then the Forester should outline the reason, and the benefits it has to the watershed.

The meeting adjourned at 4:00 pm.

Endnotes

- i After each issue was presented and discussed (and often revised) each committee member was polled for his level of support. If any member had reservations that could not be put aside, work on the issue continued until consensus was reached.
- ii See the Gales Creek Watershed Assessment Project (Breuner, 1998), for land use information.
- iii From a 1977 management report by Marvin Helland, Or. Dept. of Forestry.
- iv Thomas, Deep, and Smith Creeks also have similar diversions.
- v The “pineapple express” was a 100-year storm event that occurred in January of 1996. Two feet of low elevation snow were followed by three days of warm rains (six inches of rain), causing a tremendous surge of snowmelt and runoff. Many culverts and roads failed throughout the region.
- vi Few 80-to-100 year old stands exist in the region today due to both fire history -- much of the region burned in the Tillamook Burns 50-to-70 years ago -- and the heavy cutting on industrial forest ownerships in the last half of the twentieth century.
- vii From a Beak Consultants report within the 1994 watershed management plan. The report classified the watershed into high, medium and low quality habitat types for owls and murrelets.
- viii There have been observations of Swiss needle cast on the west side of the Coast Range (the 2001 State Survey detected infected stands seven miles west of the watershed), but no symptoms are apparent within the watershed.
- ix Productivity measured on a scale of 1 to 5, with 1 being most productive. From Soil Survey of Washington, Co., Oregon. USDA Soil Conservation Service (1975)
- x Recent research indicates that large, “stand replacement” fires were infrequent in the pre-settlement Coast Range, with some forests achieving ages of many hundreds of years.
- xi The Oregon Forest Practices Act requires only 70 and 50 foot buffers, respectively
- xii Within younger stands individual trees older than 200 years will be protected during any harvest activities.
- xiii Forest structure refers to attributes of the forest such as snags, down wood, understory shrub layer, gaps in the canopy, tree size variation and multiple canopy layers.
- xiv Wildlife trees have special habitat features such as large limbs, defects, decay or high seed production ability (food). Legacy trees are examples of the best trees of each species. They are marked in the field and grown to a very old age. They link this generation of forest to the next. Snags are standing, dead trees.
- xv For FSC standards and criteria information, see the FSC website: www.fsc.org.
- xvi This is nearly twice the industry average.
- xvii After each issue was presented and discussed (and often revised) each committee member was polled for his level of support. If any member had reservations that could not be put aside, work on the issue continued until consensus was reached.