FOREST MANAGEMENT PLAN

FOR AGRICULTURAL LAND CLASSIFICATION

Legal Description of Property

5 Schedule #'s totaling 331.53 Acres within the Palmer Lake Quadrangle in El Paso County, Colorado (Location Map, Section 6.0). First 2 Parcels for Agricultural Tax Status.

EL PASO COUNTY (5 Parcels)

1. ***SCH# 7104200011, 156.5 Acres, United Congregational Church*** *PART W ½ SE ¼ NW ¼ SEC 4-11-67 LY S OF EAST PALMER LAKE SUB AND PART OF SW ¼ NW ¼ LY S OF E PALMER LAKE + PART OF N ½ SW ¼ N OF EAST PALMER LAKE FIL 2, TOG W/ E ½ NW ¼ EX WLY 349.50 FT SEC 4-11-67, TOG W/ TRACT IN NE ¼ SE ¼ OF SEC 5--11-67 IN TOWN OF PALMER LAKE LY N + E OF BROWNS FIL UNPLATTED TR IN NE ¼ OF SD SEC 5 LY E OF R/W OF A T + S F RY CO + S OF BROADWAY*
2. ***SCH# 7104000002, 34.29 Acres, United Congregational Church*** *W ½ NE ¼ SEC 04-11-67 EX THAT PORT DES AS FOLS: COM AT NW COR OF NE ¼ SEC 4, TH S 88<23'38'' E 399.42 FT FOR POB, S 00<57'22'' W 2323.35 FT, S 88<22'50'' E 934.39 FT TO A PT ON E LN OF W ½ NE ¼ OF SEC 4, N 00<58'34'' E 800.31 FT TO SE COR OF NW ¼ NE ¼ SEC 4, TH CONT N 00<56'16'' E 1523.26 FT, N 88<23'38'' W 934.18 FT TO POB*
3. ***SCH# 7104000001, 49.84 Acres, Congregational Mission Foundation (EX)*** *PT OF W ½ NE ¼ SEC 04-11-67 DES AS FOLS: COM AT NW COR OF NE ¼ SEC 4, TH S 88<23'38'' E 399.42 FT FOR POB, S 00<57'22'' W 2323.35 FT, S 88<22'50'' E 934.39 FT TO A PT ON E LN OF W ½ NE ¼ OF SEC 4, N 00<58'34'' E 800.31 FT TO SE COR OF NW ¼ NE ¼ SEC 4, TH CONT N 00<56'16'' E 1523.26 FT, N 88<23'38'' W 934.18 FT TO POB*
4. ***SCH# 7104001010, 46.62 Acres, Congregational Mission Foundation (EX)*** *NE ¼ NE ¼ SEC 04-11-67*
5. ***SCH# 7103000028, 44.28 Acres, United Congregational Church (EX)*** *NW ¼ NW ¼ EX RD SEC 3-11-67*

Prepared for:
United Congregational Church
Contact: Roger Sung
(719) 488 0370

Prepared by:
Colorado Forest Management, LLC
3610 Otis Street
Wheat Ridge, CO 80033
(970) 214 7677

Physical Addresses of Property
3195 County Line Road
Monument, Colorado 80132

Mailing Address of Property
3195 County Line Road
Monument, Colorado 80132

This land management plan has been prepared at my request to guide my forest agricultural management activities, which I will voluntarily apply on my property. I believe that the activities recommended in this plan are appropriate to meet my objectives and will benefit the natural resources on my property. I understand that this is an agreement as described in CSFS Forest Agricultural Program guidelines and we intend to implement its recommendations according to CRS 39-1-102.

Date: _____ Signed by landowner: _____

_____

Date: _____ Signed by CSFS District Forester: _____

Date: _____ Signed by Preparer: _____

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SECTION 1.0 INTRODUCTION

1.1 AGRICULTURAL CLASSIFICATION

In 1990, the Colorado legislature enacted House Bill 1229, now recorded in Title 39 of the Colorado Revised Statutes (CRS 39-1-102). This statute allows certain forestlands to receive the same tax valuation as traditional agricultural lands. The Colorado State Forest Service (CSFS) administers a program that determines a landowner's eligibility for agricultural tax status under CRS 39-1-102. This program is referred to as the "Forest Ag Program." Landowners wishing to participate in the Forest Ag program must meet several requirements before becoming eligible. To be eligible for this program, a landowner must:

- Property is a minimum of 40 forested acres (minimum of ten percent (10%) stocking on each acre), all capable of producing a wood product.
- Have a Forest Management Plan prepared by a professional forester that meets the CSFS Management Plan Outline for Forest Agricultural Classification standards; Approved management plan will have the following:
    - A strategy that clearly communicates how objectives will be met.
    - A 10 year implementation schedule that clearly identifies practices and methods. Prepared by a professional forester, approved by CSFS and meets CSFS standards.
    - Addresses forest products(s) to be removed, how they will be managed for and estimated profit generated.
    - Landowner has reviewed plan, and understands the plan and the associated responsibility to implement the plan.
    - Current Landowner has signed Plan.
    - Name as it appears on property deed, legal entity, is listed on plan cover page.
    - If a plan revision is needed, it is documented and scheduled.
- Submit his/her completed and signed Forest Management Plan, completed Forest Agricultural Inspection Request Form and the appropriate fee to the local CSFS district office by October 1 to be considered for the following tax year.
- Manage his/her land according to the approved Forest Management Plan and annual work plan to produce tangible wood products for the primary purpose of obtaining a monetary profit.
- Legal access to property and access for removal of product.
- Land use regulations and covenants are compatible with plan.
- Landowner has paid inspection fee to CSFS and has requested an inspection.
- Landowner has submitted an annual work plan (AWP)
- AWP is based on prescribed practices from the management plan to meet landowner's objectives and follows the implementation schedule.
- Work completed according to plan and accomplishment form completed for that year.
- Landowner is managing for production of forest products for profit.
- Landowner maintains records and other documents to be reviewed during inspection.

This Forest Management Plan (FMP) has been prepared by Stefan Reinold, professional forester of Colorado Forest Management, LLC at the request of Roger Sung on behalf of the United Congregational Church, to guide the implementation of forest stewardship management activities on this property. This plan meets the requirements of CRS 39-1-102 and allows the property to be eligible to receive similar tax valuation as traditional agricultural lands. Along with this tax valuation, Forest Agricultural Producers may be eligible for cost-share assistance programs as mandated in the 2002 Farm Bill. Private non-industrial forestland can be eligible for Farm Bill programs such as EQIP (Environmental Quality Incentives Program), and WHIP (Wildlife Habitat Incentives Program), as well as other possible future programs. Your local NRCS (Natural Resources Conservation Service) office, located in Franktown can be contacted with further questions (303) 688-3042.

This plan discusses the current condition and desired future condition of forest resources on this property. The plan also outlines the goals and objectives of the landowner and recommends management activities that integrate these goals with the requirements of the Forest Ag Program. The FMP represents a ten-year land management strategy that includes completing specific activities on an annual basis. An annual work plan is provided to assist the landowners in planning and documenting all forest management activities. The plan covers the entire 331.53 acres that make up this property, and all 331.53 acres are eligible for agricultural status, however three parcels are already tax exempt for religious worship purposes.

This plan is intended to be a working document that can and should be modified to accommodate unforeseen events that may alter the property's landscape. Events such as wildfires and floods would undoubtedly affect the management of this property and subsequently change the scope of this plan.

1.2 AMERICAN TREE FARM SYSTEM

This Forest Management Plan may also be used to help establish the UCC Property as a Tree Farm. Tree Farms require an inspection from a qualified tree farm inspector on a regular basis. The entire property is eligible for tree farm status. UCC should apply for free membership as soon as possible. The following information was gathered from the American Tree Farm System website. For more in depth information you can visit the site at www.treefarmsystem.org.

"*The American Tree Farm System was established in response to concerns that America's private forests were being cut at unsustainable rates without reforestation. It all began in 1941 when the first Tree Farm was designated in the Washington State. The Tree Farm's purpose was to demonstrate sound forest management practices to area landowners. California's Tree Farm program started later in 1941 and has grown to include nearly 600 Tree Farms covering 3.5 million acres of the state.*

The term "tree farming" was first used in the 1940's to introduce the public to sustainable forestry terminology they could easily understand. Farming implies continual stewardship and production of goods

year after year. By linking the term "farming" with trees, foresters could communicate the concept of sustainable production of forest products over time. Tree Farming implies commitment to the land and was the philosophical opposite of the "cut-out and get-out" philosophy of the early 20th century.

Tree Farms are more than pine plantations or Christmas tree farms. Tree Farms are varied in nature and contain many different habitats and stages of forest regeneration, from seedlings to mature timber. Biodiversity is a critical component of a certified Tree Farm. Tree Farmers must maintain natural forest buffers and other aspects of conservation techniques.

Sound, sustainable forests begin with determining objectives, deciding what resources are available on your land, and developing a written forest management plan that meets ATFS standards and guidelines as well as meeting your forest needs for generations to come.

Sustainable forestry means managing our forests to meet the needs of the present without compromising the ability of future generations to meet their own needs by practicing a land stewardship ethic which integrates the reforestation, managing, growing, nurturing and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat and aesthetics.

There are 9 standards of sustainability for tree forest certification and they are listed below:

- *Standard 1: Ensuring Sustainable Forests*

The American Forest Foundation's (AFF) Standards of Sustainability promote the growing of renewable forest resources on private lands while protecting environmental benefits and increasing public understanding of all benefits of productive forestry.

- *Standard 2: Compliance With Laws*

Forest management complies with all relevant federal, state and local regulations and ordinances.

- *Standard 3: Commitment to Practicing Sustainable Forestry*

Forest owners demonstrate their commitment to sustainability by developing and implementing a long-term forest management plan.

- *Standard 4: Reforestation*

Forest owners provide timely restocking of desirable species of trees, compatible with regional ecosystems on harvested areas and idle areas where tree-growing is the land use objective.

- *Standard 5: Air, Water and Soil Protection*

Forestry practices maintain or enhance the environment, including air, water, soil, and site quality.

- *Standard 6: Fish, Wildlife and Biodiversity*

Forest management activities contribute to the conservation of biodiversity and maintain or enhance habitat for native fish, wildlife, and plant species, with emphasis on natural plant and animal communities and rare plants and animals.

- *Standard 7: Forest Aesthetics*

Forest management practices minimize negative visual impacts of forest activities.

- *Standard 8: Protect Special Sites*

Special sites are managed in a way that recognizes their unique characteristics.

- *Standard 9: Wood Fiber Harvest and Other Operations*

Wood fiber harvests and other forest operations are conducted in accordance with the management plan and with sensitivity to other forest values (e.g., water quality, regeneration, wildlife habitat, biodiversity, special sites, etc.).”

SECTION 2.0 GOALS AND OBJECTIVES

This section discusses the Goals and Objectives for the UCC Property. Goals are defined as the desired end result for the property. To achieve these goals objectives were developed. Objectives are concise statements of measurable and planned results that correspond to pre-established forest management goals. These forest management objectives represent activities that the UCC can implement in order achieve their goals. Their ranked goals are described below with their associated objectives:

GOAL 1: IMPROVE THE OVERALL HEALTH AND VIGOR OF THE FOREST STANDS.

- Keep Insect and Diseases at endemic levels by implementing tested strategies.
- Reduce tree density to increase vigor of remaining trees while also decreasing risk of catastrophic wildfire.
- Monitor mountain pine beetle (MPB) activity and remove active trees, or treat active trees to mitigate spread. If epidemic populations are found, coordinate with neighboring landowners on treatment strategies.
- Monitor dwarf mistletoe activity and remove heavily infected trees, or treat infected branches to mitigate spread. If it easy to distinguish between affected and non-affected areas a buffer zone can be created to slow/stop the spread.
- Address major outbreaks of insects or disease as a priority over all other operations.

GOAL 2: IMPROVE FOREST STAND STRUCTURE TO HELP DECREASE THE EFFECTS OF INSECT AND DISEASE OUTBREAKS ON THE LANDSCAPE.

- Decrease the amount of deadfall throughout the stands. Large downed woody debris can be beneficial in some areas, but should be minimized
- Increase the spacing between trees by removing some of the suppressed, overtopped, and intermediate trees.
- Create and maintain a mosaic stand structure on the landscape by creating openings, spacing new growth, and thinning dense areas.

GOAL 3: IMPROVE AND MAINTAIN HABITAT DIVERSITY FOR WILDLIFE.

- Reduce tree density to increase forage in the understory.
- Remove trees that are overcrowding aspen areas to allow for increased wildlife forage.
- Retain wildlife snags, at least 2 to 3 per acre. Section 4.6 discusses an optimal amount of 7 per acre varying in size.
- Decrease noxious weeds to promote native species growth, therefore increasing forage.
- Maintain small slash piles, 4 feet by 6 feet by 3 feet to promote a healthy rodent population, at least 2 to 3 per acre.
- Provide /maintain areas of sufficient hiding cover for accepted wildlife species.
- Provide sufficient and healthy surrounding grass land for grazing.

GOAL 4: MINIMIZE POTENTIAL THREAT FROM WILDFIRE.

- Evaluate and complete a Fuelbreak thinning along the four wheel drive road that accesses the top of Ben Lomand Mountain.
- Complete and maintain ladder fuel reduction around structures.
- Create and maintain defensible space Zones 1 and 2 as outlined in the Defensible Space Guidelines around structures.
- Reduce overall tree density to help reduce risk of catastrophic wildfire**.**
- Break up continuity of fuels to help decrease high intensity fire behavior should a fire get started.
- Treat Zone 3 as described in Defensible Space guidelines.

GOAL 5: MEET THE REQUIREMENTS FOR FOREST AGRICULTURE TAX CLASSIFICATION.

- Complete work outlined in the annual work plan in a satisfactory fashion.
- Submit Forest Agriculture inspection request form yearly before October 1st. Paperwork from CSFS is usually mailed in August.
- Submit the next year's Annual Work Plan before October 1st. Paperwork from CSFS is usually mailed in August.
- Submit revisions to work plan (if applicable) before June 30th of the year in question.
- Submit the appropriate fee by October 1st for the following tax year. Paperwork from CSFS is usually mailed in August.
- Keep good records of costs and revenues generated from the forest activities.
- Have available suggested documentation for review.

GOAL 6: MAINTAIN AESTHETIC FOREST CONDITIONS WHILE REACHING OTHER GOALS.

- Use harvesting equipment that is light on the land for product removal.
- Treat slash according to desired aesthetic output. Chipping and burn piles leave the most aesthetic look.
- Remove dead and dying trees first with the understanding that some dead trees need to be left standing for wildlife purposes.
- Follow Colorado Best Management Practices (**Section 12.0)** to minimize adverse harvesting effects on the property.

GOAL 7: PRODUCE, MARKET, AND SELL TANGIBLE FOREST PRODUCTS FOR PROFIT.

- Use removed material as firewood and other timber products to help cut operating and maintenance expenses.
- Utilize local contractors to assist in the completion of planned work to help benefit the local economy.
- Thinning operations will produce between 3 to 5 cords per acre. Cord prices vary depending on what the final product is. Cut, split, and delivered a cord can go for $175.00.
- Advertise wood products on Colorado Forest Products Website *(http://www.coloradoforestproducts.org/consumer.htm).*
- Be aware as markets develop for using small diameter material.

GOAL 8: PRACTICE SUSTAINABLE NATURAL RESOURCE MANAGEMENT.

- Utilize tree removal techniques that promote/improve ground cover, reduce precipitation run-off, and increase water/soil infiltration where appropriate.
- Follow Colorado Best Management Practices for watershed stewardship.
- Create a Forest Management Plan that outlines ecologically sound prescriptions while addressing the forest issues of the day.
- Manage the land in accordance to the plans laid out in the conservation easement.
- Actively be involved in the management by promoting the health and wellness of the land by hiring knowledgeable contractors and consultants to assist in completing work.

GOAL 9: MEET THE REQUIREMENTS FOR TREE FARM CERTIFICATION.

- Update certification as a Tree Farm by completing active forest management and filing an application with the American Tree Farm System.
- Certify as required with inspection through qualified Tree Farm Inspector.
- Follow the 9 standards of sustainability.
- Visit the www.treefarmsystem.org *for more information.*

SECTION 3.0 GENERAL DESCRIPTION

3.1 PROPERTY LOCATION

Part of the 331.53 acre UCC Property (**Figure 1**) is located in the city limits of Palmer Lake while the rest is just on the outskirts. The property is located about 7.3 miles south of Larkspur, Colorado, 12.3 miles northeast of Woodland Park, Colorado, and 21.7 miles north (slightly west) of Colorado Springs, Colorado. It is found in the montane vegetation zone of Colorado's Front Range. It is located in El Paso County just south of the Douglas- and El Paso County Line and can be found on the Platte Canyon quadrangle with the legal description as:

> (*NE ¼ NE ¼ SEC 04-11-67NW ¼ NW ¼ EX RD SEC 3-11-67PART W ½ SE ¼ NW ¼ SEC 4-11-67 LY S OF EAST PALMER LAKE SUB AND PART OF SW ¼ NW ¼ LY S OF E PALMER LAKE + PART OF N ½ SW ¼ N OF EAST PALMER LAKE FIL 2, TOG W/ E ½ NW ¼ EX WLY 349.50 FT SEC 4-11-67, TOG W/ TRACT IN NE ¼ SE ¼ OF SEC 5--11-67 IN TOWN OF PALMER LAKE LY N + E OF BROWNS FIL UNPLATTED TR IN NE ¼ OF SD SEC 5 LY E OF R/W OF A T + S F RY CO + S OF BROADWAYW ½ NE ¼ SEC 04-11-67 EX THAT PORT DES AS FOLS: COM AT NW COR OF NE ¼ SEC 4, TH S 88<23'38'' E 399.42 FT FOR POB, S 00<57'22'' W 2323.35 FT, S 88<22'50'' E 934.39 FT TO A PT ON E LN OF W ½ NE ¼ OF SEC 4, N 00<58'34'' E 800.31 FT TO SE COR OF NW ¼ NE ¼ SEC 4, TH CONT N 00<56'16'' E 1523.26 FT, N 88<23'38'' W 934.18 FT TO POBPT OF W ½ NE ¼ SEC 04-11-67 DES AS FOLS: COM AT NW COR OF NE ¼ SEC 4, TH S 88<23'38'' E 399.42 FT FOR POB, S 00<57'22'' W 2323.35 FT, S 88<22'50'' E 934.39 FT TO A PT ON E LN OF W ½ NE ¼ OF SEC 4, N 00<58'34'' E 800.31 FT TO SE COR OF NW ¼ NE ¼ SEC 4, TH CONT N 00<56'16'' E 1523.26 FT, N 88<23'38'' W 934.18 FT TO POB.)*

The approximate UTM coordinates of the site are Zone 13 Northing 4330592 Easting 0508936. The property can be reached by driving north from Colorado Springs on Interstate 25. Follow I-25 north for 21.2 miles until the turn off for County Line Road (aka East Palmer Divide Road, Co Road 404) (EXIT 163). Make a left and follow west for 1.6 miles to the gate (**Figure 1A**). Follow the driveway to the property parsonage. There is also an entrance for the church off of County Line Road, just before the parsonage turnoff. A gate is also found off of Capella Drive, this gate leads to the four-wheel drive road which accesses the top of Ben Lomand Mountain. To get to this gate take Exit 163 from I-25 and head west for 1.1 miles to Indi Drive and make a left. Follow Indi Drive for .4 miles and make a right onto Capella Drive. Follow Capella Drive for .7 miles to the gate (**Figure 1B**).

A:  B: 

Figure 1: (A) The gate to enter the UCC Property form County Line Road. (B) This gate area looking out at Capella Drive.

3.2 TOPOGRAPHY AND CLIMATE

The elevation of the UCC Property Forest ranges from 7240 feet along County Line Road in the west corner, to 7636 feet on top of Ben Lomand Mountain. A good portion (80%) of the property is fully operable with slopes averaging 30%. The remaining areas are considered minimally operable, where

work can only be completed by hand due to slope, rock outcrops, or access. These minimally operable areas are found in Stands 1C and Stand 3. The property is made up of the north and south slopes of Ben Lomand Mountain, therefore it has different aspects depending on where you are on the property. The south facing slopes have more open conifers with dense oak since it is hotter and drier, while the north facing slopes have dense Ponderosa pine/ Douglas-fir mixes.

No specific climate data is available for this property. The closest available meteorological data is for Palmer Lake, Colorado. The Palmer Lake Station is located .3 miles from the west property boundary at an elevation of 7280 feet. The weather on the UCC property is very similar to the Palmer Lake station but may have slightly lower temperatures due to it being higher in elevation.

	Palmer Lake
Average Annual Maximum Temperature (°F):	58.1
Average Annual Minimum Temperature (°F):	31.4
Average Annual Precipitation (in.):	21.75
Average Total Snowfall (in.):	121.3

*(Source: Western Regional Climate Center, 2009)

3.3 HISTORICAL AND CURRENT LAND USE

There were no detailed historical records available for the property. However there is some gathered information about the nearby Larkspur and Palmer Lake areas. The Palmer Lake Historical Society and Larkspur Chamber of Commerce are responsible for the following histories:

The earliest known area inhabitants were native-American tribes - the Mountain Ute, Arapahoe, Kiowa, & Cheyenne. The earliest recorded activity in the area was the Army's Major Stephen Long Expedition of 1820, which discovered the Colorado State Flower, the Columbine, somewhere between Monument and Palmer Lake. Many homesteaded ranches & farms straddled the El Paso/Douglas County line as early as the 1860s.

On January 22, 1862, a territorial post office was established at Huntsville, Douglas County, Colorado. It was discontinued on August 29, 1867 and reestablished on April 8, 1869, and the name was changed December 13, 1871, to Larkspur. The Larkspur post office has been continuously in operation since that date. In 1871, the name Huntsville was changed to Larkspur by Elizabeth Hunt who was the wife of then Governor and she named the town after the flower that grows so profusely in the area.

The Denver and Rio Grande Railway in its construction south from Denver reached Larkspur on September 21, 1871. On September 24, 1871 the railroad reached "Pineland" a station about 4 miles south of Larkspur. There was no Pineland post office established. Subsequently, the name was changed to Greenland, and the Greenland post office was established June 3, 1873. The Greenland post office was discontinued March 31, 1959 and it was replaced by a rural route from Larkspur.

*Early Larkspur was major lumbering site for railroad ties, telegraph poles and firewood with millions of board feet harvested from the area (***Figure 2***). With the railroads providing a shipping point, mining was also a large industry with gypsum, red sandstone and potash. With 2 sawmills, a blacksmith shop, hotel, 2 general stores, a post office, school and even a casino, the population soared at the turn of the century. Although ranching was the mainstay of the area, Larkspur and Perry Park were touted as health resorts. People from both Colorado Springs and Denver would come by rail to enjoy the fresh air. A stage line would take people to Perry Park with trumpeters and dancers waiting to greet the coach. Today Larkspur is more known for its annual Renaissance Festival than its place in history.*

In the 1920's, Larkspur had a reputation as a health and summer resort. At that time, Larkspur had one hotel, a lumber camp adjoining the town, a general mercantile store, blacksmith shop, orphanage, hardware store, grocery store, and the Frink Creamery Company, founded there in about 1900 and known for their popular Black Canyon Cheese. Most of the buildings and businesses along Main Street near Plum Creek were destroyed in the large flood of 1965. The main street of town then moved higher up on the hill to Spruce Mountain Road in front of the old school. In 1972, a large new school was built on Perry Park Road and the old schoolhouse was sold to a private party.

The Palmer-Divide, a geological ridge running from Palmer Lake eastward, creates its own weather patterns and separates the Arkansas River drainage to the South & the Platte River Drainage to the North. The highest point of the divide is about 7352 feet at Monument Hill.

The earliest known area inhabitants were native-American tribes that date to the Folsom period, 10,000 years ago. More recently the Mountain Ute, Arapahoe, Kiowa, Sioux & Cheyenne and others have been present. The earliest recorded activity in the area was the Army's Major Stephen Long Expedition of 1820, which discovered the Colorado State Flower, the Columbine, somewhere between Monument and Palmer Lake. Many homesteaded ranches & farms straddled the El Paso/Douglas County line as early as the 1860s. Mr. David McShane is credited with being one of the first homesteaders, 1865, in the Town of Monument. Henry Limbach and his family were also early arrivals and had much to do with planning and developing of Monument, which prospered as the commercial hub for the area on arrival of the railroad.

General William J. Palmer, a Medal of Honor recipient, came west after the Civil War to found the City of Colorado Springs & start the Denver & Rio Grande Railroad, a 3-ft. narrow gauge line, in 1871. He purchased the land known as the Monument Farms & Lake Property which was to become the Town of Palmer Lake. Palmer Lake was critical to the railroad because the steam trains chugged up to the Palmer-Divide summit and had to take on water to head down. The lake was the only natural water supply available on a year-round basis. Passenger trains would stop for 10 minutes to take on water, or you could get off for a day of picnicking, fishing, and boating or wildflower hikes for a fee of $1.50 roundtrip from Denver.

Dr. William Finley Thompson, a dental surgeon born in Ohio, who had practiced in Omaha, Portland, San Francisco, and London, England, came to Colorado in 1882 and soon platted the Town of Palmer Lake, intending it as a health and vacation resort. He built the Victorian mansion, Estemere, in 1887 for his family, but faced bankruptcy in 1890, when he left Palmer Lake to raise capital. Estemere, beautifully renovated and refurnished, is about two blocks west of the Vaile Museum. Prior to the automobile, Palmer Lake enjoyed visits from Denverites and others wishing to beat the heat of city summer temperatures. The Rocky Mountain Chautauqua - a people's vacation university - was active from 1887 - 1910, hosting programs in music, art, drama, religion, & nature. The Rockland, a sixty-one room hotel, provided all the amenities any visitor could wish for to include a petting zoo.

Past industries in the area included harvesting ice from Monument & Palmer Lakes, which continued until 1941, fox farms, sawmills, Angora rabbit raising, and dry-land potato and grain farming. This method of farming relied on natural rainfall instead of irrigation water from streams or wells. Far more moisture was naturally available at the turn of the 20th century. In

1894 there were over 20,000 acres under cultivation, but in 1895 some of the potato crops did not mature because of a disease (potato blight) and potato growing slowed and finally stopped. At that time, Monument was famous for holding an annual "Potato Bake," a fall celebration where a free feast would be held just across the tracks from Front and Second Streets.

The area around the two towns remained largely as ranch and farmland until the Air Force Academy was opened in 1958. Woodmoor was originally planned to be an area where the staff of the Air Academy and other military retirees could take up residence. From the Monument and Woodmoor area to the south, the land kept to its ranching heritage until the growth of Colorado Springs spawned housing developments starting about the mid 1980's. Most growth along this part of the I-25 corridor has occurred since 1990.

Our area has a remarkable history including events associated with the "wild west." There have been Indian raids and saloon shootings. There were several forts in the area where settlers could hole up until the trouble passed. One of these was the "McShane Fort" located just off highway 105, close to the railroad overpass. Posses have apprehended and strung up murderers on the outskirts of Monument and Palmer Lake. The area was home to five gold mines; however, none hit the mother lode. The Greenland open space area to our North once shipped more cattle to market than any other location in Colorado. The Goodnight-Loving cattle drive from Texas came through our area ca 1866 and over the Palmer Divide. Indeed, the Greenland area was so named by Helen Hunt Jackson as the grass was so plentiful and green in color. Our historical heritage is rich with the knowledge of our pioneer pathfinders who settled the land and left their mark for all to see and learn about.

In 1964 the Palmer Lake Historical Society started a Museum & Library in the former Santa Fe Railroad Section Foreman's house. Lucretia Vaile, our area Museum's namesake, spent summers here with her family starting in 1881. She was instrumental in starting the Yule Log Ceremony, and was a founding member of the Colorado Mountain Club. Always active in community affairs, she left money to be used for cultural purposes, which aided in the building of the present Museum/Library in 1981. The Palmer Lake Historical Society and the Vaile Museum proudly serve as the main repository for Tri-Lakes history. Tour the museum on Saturdays, 10 AM – 2 PM all year and on Wednesdays from 1 PM – 4 PM during June through August. We are located at 66 Lower Glenway St., in Palmer Lake. Visit at our website: www.PalmerDivideHistory.org for additional historical information.

Figure 2: Evidence of old timber harvesting activities.

The property most likely had some logging activity in the past (**Figure 2**), material removed was most likely used as lumber for building in the Denver area, and as mine props for local mining operations. Ranching most likely occurred on the property as well especially with close access to creeks and the multiple meadows in the area.

Today the area is primarily residential with families commuting to the Denver and Colorado Springs Metro areas for work. The Parks and National Forest in the area have high recreational usage. Some ranching still occurs, however it is at a minimal.

3.4 PAST MANAGEMENT

The two western parcels were purchased on November 9, 2009. No forestry work had been completed on these parcels since its purchase. They have seen some pine beetle affected trees but have not done any extensive management. The landowners are aware that approximately 17 years ago an approximate 50 acre portion in the south part of the property was grazed.

Figure 2 shows that active management has taken place on the property in the last century.

3.5 IMPACTS ON NEIGHBORS

Management of this property under a FMP should not adversely affect any neighbors. In fact, management of this property will benefit the surrounding properties by implementing prescriptions to mitigate insect and disease outbreaks as well as the threat of wildfire. Good communication between landowners will ensure the best possible management for the property, as forestry issues never seem to be aware of property boundaries. UCC will try to work closely with neighboring landowner's to allow for some firewood tree removals from the property boundaries. This will help both UCC and the neighbors, see the prescription section 5.0 below for more details.

3.6 SOCIAL, ECONOMIC, AND MARKET CONDITIONS

By implementing this FMP, the landowner will be promoting forest stewardship. This will enable the land to be passed onto future generations in a healthy condition. This plan will serve as an example to other landowners of how land can be conserved and be economically viable at the same time.

By qualifying for agricultural tax status, the landowners will benefit economically from lower county property taxes. In turn the landowners can contribute to the local economy by providing forest products and/or job opportunities for contractors, while also completing sound forest management.

Currently, the market for small-diameter timber is limited along the Front Range of Colorado. An excess of supply and decreasing demand has driven prices down. Air quality restrictions on wood burning have affected the market for firewood in the Denver and Colorado Springs metropolitan areas; however, more rural areas of Jefferson, Park, and Clear Creek counties still utilize a large amount of firewood. These rural areas could serve as a potential marketplace for firewood harvested from this property. The Colorado Wood Utilization and Marketing Assistance Center (*http://csfs.colostate.edu/cowood/*) in Fort Collins is currently working on developing new wood utilization and processing technologies to create new markets for small-diameter timber. Programs such as this and on-going research at the National Renewable Energy Lab in Golden, Colorado, bring promise that new markets and technology will be created for small-diameter timber on the Front Range.

Some of the products produced from this property could be utilized for lumber, fuel wood, biomass, post and pole, or furniture material (if markets are available). The Colorado Forest Products website (*http://www.coloradoforestproducts.org/sustain.htm*) provides an opportunity for private landowners to advertise the products that may be available on their land. The UCC Property will be primarily producing firewood material, with 3 to 5 cords per acre cut being created each year. The UCC Property will also be evaluating the market for selling other forest products if possible including Christmas trees, Christmas boughs, and post and poles. UCC plans to hire contractors to complete much of the work, but will complete some on their own. They own a bobcat and have thought about getting a tree spade to transplant trees on the property. Transplanting should be discussed with a forester before completion.

SECTION 4.0 INVENTORY AND PRESENT CONDITIONS

4.1 FOREST RESOURCES

The property was inventoried in April of 2010 using a combination of variable and fixed plot sampling. Using Geographic Information System (GIS) technology, sampling plot locations were randomly placed throughout the forested portions of the property utilizing an aerial map. The cruise area was 220 acres (**Timber Cruise Map, Section 6.0**) since no plots were analyzed within the meadow boundaries. A total of 70 sample plots were established throughout the forested area of the UCC Property Forest Property. Each plot was surveyed for species composition, stand density, regeneration, forest health, and other factors in order to gain insight on overall forest resources. A prism with a basal area factor (BAF) of 20 was used for each sample plot. At each sample plot, prism-captured trees greater than 5 inches (diameter at breast height (DBH)) were recorded as tally trees. Trees measuring less than 5 inches in diameter were sampled using a 1/100 acre fixed plot to estimate regeneration. The computer software Forest Vegetation Simulator: Suppose was used to process the data from the timber inventory. Three vegetation types (Ponderosa pine/ Douglas-fir, Ponderosa pine/ scrub woodland, and Gambel oak/ Mixed montane shrubland) were analyzed. The sampling error (+ or – one standard deviation) was averaged at 16.8% for the property with 13.4% for trees per acre, 19.2% for cubic feet per acre, 18.8% for board feet per acre, and 16.1% for basal area.

The property was delineated into four Vegetation Types (three forest stands and one meadow vegetation type. To help with prescription differences, Stand 1 was then delineated into four different sub-stands based on slight variations in composition, health or geographic location. Stand 2 was found in two areas, and Vegetation Type 4 was found in three areas. The boundaries, acreage, and composition were determined to represent present conditions using up-to-date technology, even though stand boundaries are not surveyed and maps are not survey grade. Refer to the Stand and Management Unit Map in **Section 6.0**. A descriptive narrative is provided for the property here in this section, along with a Stand Characteristics Table (**Table 1**). The inventory and FVS output data is located in the Inventory and Background Materials Appendix in **Section 9.0**. A descriptive narrative is provided for the property here in this section, along with a Stand Characteristics Table (**Table 1**).

VEGETATION TYPE (STAND) 1: PONDEROSA PINE/ DOUGLAS-FIR (LEANING TOWARDS DOUGLAS-FIR)

Stand 1 is a 139 acre Ponderosa pine/ Douglas-fir stand that seems to exhibit an uneven-aged structure. This stand was broken down into four sub stands based on location and/or composition. Stand 1A had approximately 28.7 acres found in the eastern portion of the property. This area has taller trees with less understory growth than the rest of Stand 1. Stand 1B is approximately 41.4 acres and is found in the center of the property. Stand 1C (32.0 acres) is found in the western portion of the property and has steeper slopes and poor access compared to the other portions of Stand 1. The remaining 36.9 acres (Stand 1D) were found in the transition area from the forested Stand 1 to the open meadows of VT 4. Refer to the Stand Delineation Map for stand locations (**Section 6.0**).

Access is good for most of Stand 1A, 1B, and 1D. Gentle slopes leading from the meadow into the stand make reaching most areas fairly easy. Approximately 29 acres will have minimal operability since they are found within steep gullies, have steep slopes, or have poor accessibility. Minimal operability is defined as

an area where it would be difficult to use equipment due to access, rocky outcrops, or slope. Light manual forest management activities can be completed in these minimal operability areas and material can be removed with assistance from winch equipment, or lopped and scattered if needed. The stand aspect is mostly north facing slopes. Slopes vary in the stand ranging from 0% to 45%, with an average of 30%.

From the inventory data Stand 1 had approximately 281.0 trees per acre that were 5 inches DBH or greater in size. The average DBH of this stand was estimated at 8.5 inches. Regeneration plots estimated that there are approximately 967.9 trees which were 5 inches DBH or less. These smaller trees were not included in the average stand diameter since they are not merchantable, however overall there was 1248.9 trees per acre with an average stand diameter of 4.2". While trees per acre can give us a feel for having too many trees on a property, it is not a good measure of density since it does not take into account the diameters of the trees (i.e. 300 1-inch trees is not as dense as 300 10-inch trees). Basal area is a better measurement of stand density since it takes into account both the number of trees in a stand as well as the tree diameters. The defined measurement of basal area represents the cross-sectional area per acre of trees measured at breast height. The basal area per acre of the stand was 119.7 ft^2 with 7.1 ft^2 found on dead trees. This is considered elevated for this stand and a target of 85 to 90 ft^2 is desired. Stand 1 composition (**Figure 3**) is dominated (59.9%) by Douglas-fir (*Pseudotsuga menziesii*). Aspen (*Populus tremuloides*), White fir (*Abies concolor*), Gambel's oak (*Quercus gambelli*), limber pine (*Pinus flexilis*), Rocky Mountain maple (*Acer glabrum*), other hardwoods and ponderosa pine (*Pinus ponderosa*) were present having 2.0%, .2%, 23.4%, .7%, .2%, .3%, and 13.3% respectively. Other hardwoods include mountain alder (Alnus incana), willow (*Salix spp.)* and narrowleaf cottonwood (*Populus angustofolia*), but mostly alder was found on this property. Rocky Mountain juniper (*Juniperus scopulorum*), was seen very sparsely in the stand but not captured in the timber cruise. There is 8.2% mortality by composition, but only 5.9% by basal area. Most of the dead is made up of small, density dependant mortality of Douglas-fir with a few beetle killed mid-sized ponderosa pine.

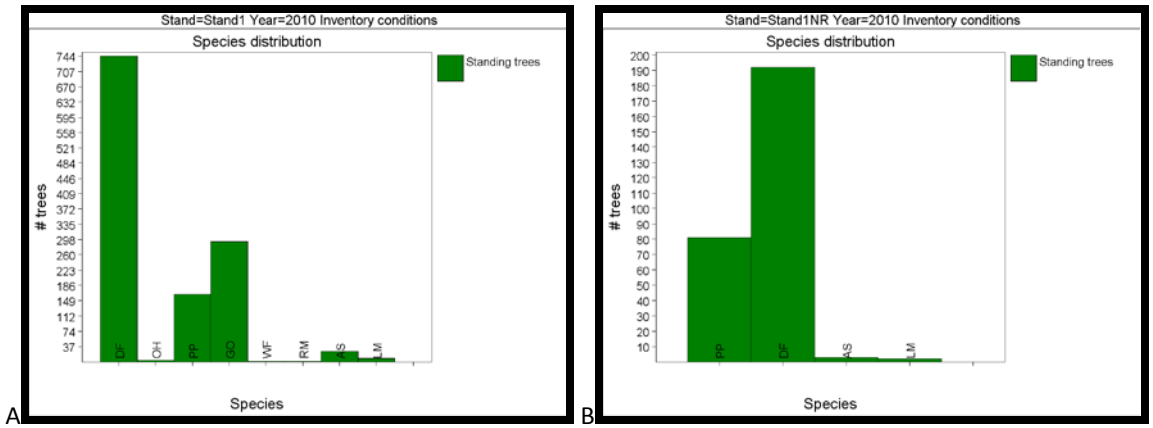


Figure 3: Species distribution for Stand 1. (A) Douglas-fir dominates the stand and (B) the overstory.

The diameter class distribution (**Figure 4**) of Stand 1 shows a lot of trees that fall within the small diameter classes of 6-inches or less. A majority of these trees are Douglas-fir which is thriving under the shaded canopy. Douglas-fir is more shade tolerant than most of the other species. The diameter class distribution curve (**Black Line**) appears to represent an unevenaged stand structure (inverse-J shaped), This structure is best explained when the oldest age class dies, the preceding age class becomes the oldest age class, and regeneration fills the vacated space. This structure is a little misleading since there are

actually many different variations within the stand that when put together create the uneven-aged forest. There are areas with dense Douglas-fir regeneration, Douglas-fir overstory with minimal regeneration, evenly mixed Ponderosa pine/ Douglas fir, transition zones with mostly ponderosa that lead into the meadows. The stand was broken down into the four areas to help capture many of these differences. Stand 1A has tall ponderosa pine/Douglas-fir mix which has minimal understory trees for the most part. Stand 1B has dense Douglas-fir, but also has pockets of aspen. Stand 1C is isolated because of its steep rocky slopes. This area has mostly Douglas-fir with Douglas-fir regeneration being high. And finally Stand 1D is the transition from more Douglas-fir slowly into equal parts ponderosa pine/ Douglas-fir into ponderosa pine encroachment into the meadow. The significant amount of small material (6" or less) is beginning to stagnate the stand. Overstocked stands are more susceptible to insect and disease activity, so thinning is necessary to alleviate this problem. The red curve below shows a desired structure that would allow the overstory trees to release and grow with the removal of some of the understory trees.

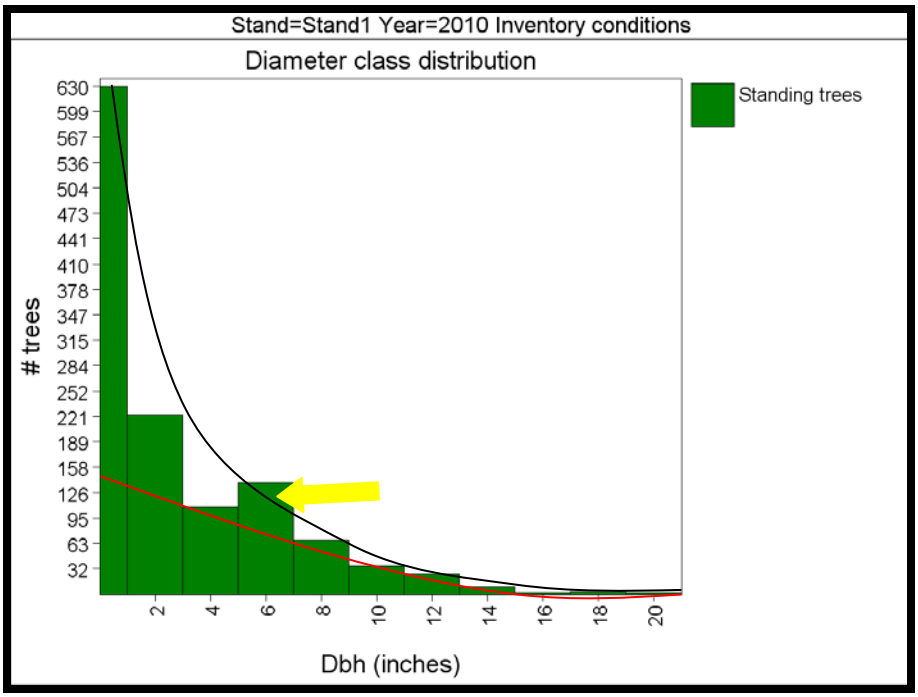


Figure 4: The diameter class distribution of Stand 1 on the UCC Property Forest. The black line demonstrates the inverse J shaped curve that seems to be present. The red line demonstrates the desired future structure.

Stand 1 is estimated to have approximately 5882.6 of merchantable bdft and 1672.1 of merchantable ft^3 per acre. These are low merchantable values even for Colorado standards. Stand and Stock tables are located in **Section 9.0**. These tables are very useful since they break down the density and volume measurements by diameter class and by species. From these tables we see that Douglas-fir makes up most of the merchantable cubic foot and board foot volumes. The 8" to 12" diameter classes account for most of the volume for this stand. Material removed from this stand can be used as firewood, posts and poles, chips, or biomass. There is not enough volume to make selling sawlogs truly profitable.

The estimated site index for the stand is 47 feet based on a 100 year scale. This value is determined by measuring the average total height and age of dominant trees within the stand and using a site index curve to determine the site index. A site index of 47 suggests that at 100 years of age a dominant tree within the stand would be expected to be 47 feet tall. As expected this is a fairly low number and explains

why Colorado is not a leading state when it comes to timber production. **Figure 5** below is an image of how an average acre might look within the stand, although large variations may actually be present on the property. **Figure 6** are actual photos of the stand.

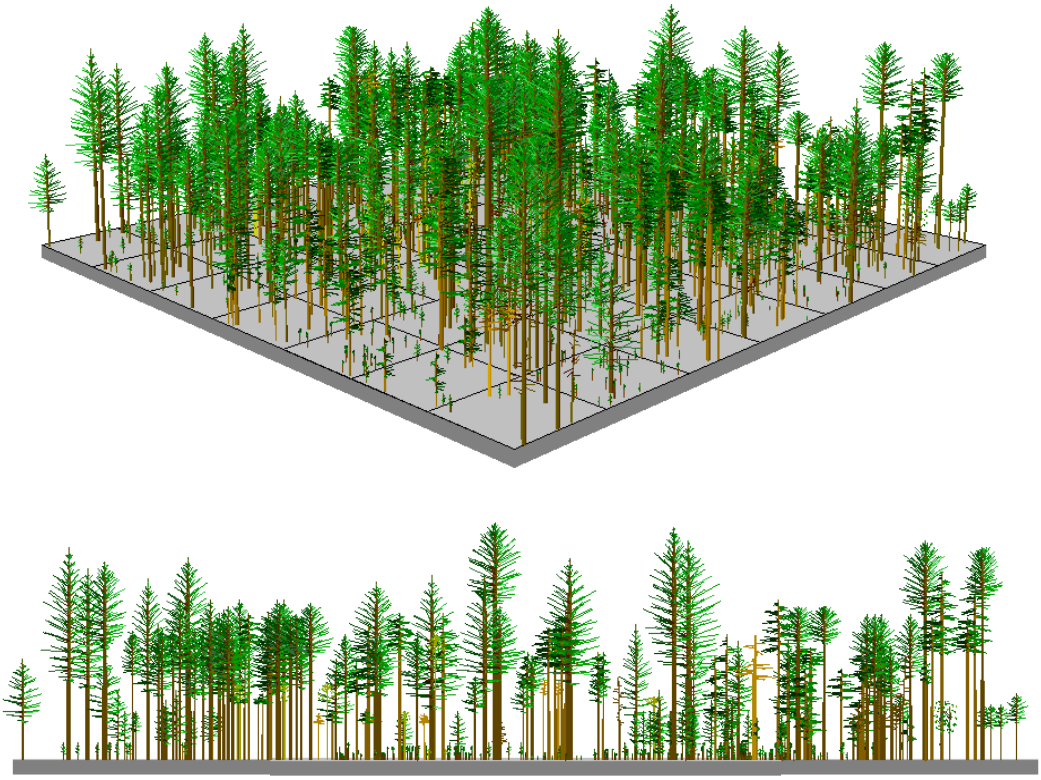


Figure 5: A virtual view of an average acre within Stand 1.

A  B 

Figure 6: Stand 1 on the UCC Property Forest. These photos exemplify the many microclimate variations in Stand 1. (A) Df and aspen pocket, (B, C, D) Douglas-fir regeneration under Ponderosa pine/Douglas-fir overstory. (E, F) Areas with more pure dense Douglas-fir. (G) The transition into and along the meadow has a lot more ponderosa pine.

The understory of Stand 1 was composed mostly of shrubs, grasses, and ponderosa regeneration. The following is a list of species seen on the property and is by no means all inclusive: Ground juniper (Juniperous communis), kinninnick (*Actostaphylos urva-ursi*), mountain mahogany (*Cercocarpus montanus*), wax currant (*Ribes cereum*), red-osier dogwood (*Cornus sericea*), Choke Cherry (*Prunus virginiana*), Gambel oak (*Quercus gambelli*) and skunkbush (*Rhus trilobata*), make up most of the shrub understory. Many grasses such as: blue gramma (*Boutelous gracilis*), mountain muhly (*Muhlenbergia montana*), western wheatgrass (*Pascopyrum smithii*), Arizona fescue (*Festuca arizonica*) and needleandthread (*Stipa comata*) were seen in the stand. Some flowering plants found in these areas included scarlet paintbrush (*Castilleja miniata*), goldenbean (*Thermopsis spp*.), yarrow (*Achillea millefolium*) and lupine (*Lupinus parviflorus*). Most downed woody debris in this stand was small diameter Douglas-fir and aspen. Areas that have heavy jackpots of dead trees on the ground floor can be lopped and scattered to improve decomposition.

VEGETATION TYPE (STAND) 2: PONDEROSA PINE/ SCRUB WOODLAND

Stand 2 is a 43.0 acre ponderosa pine/scrub woodland stand that has multiple stories. At initial glance this stand also appears to have a unevenaged structure. However upon further analysis the property has a two tiered structure with an overstory of uneven-aged ponderosa, and an understory of oak. Stand 2 is found in two different locations. The first area (2A) is 40.2 acres and is found on top of Ben Lomand Mountain and along some of the south facing slopes. The second area is a small 2.8 acre strip following the Ben Lomand ridge to the east. Refer to the Stand Delineation Map for stand locations (**Section 6.0**).

Access is pretty good throughout Stand 2A, with a few of the acres having steep slopes. The Ben Lomand Access road along with gentle slopes makes treatment possible. Stand 2B has no road access even though its slopes are mild. Stand 2 will have 8.0 acres of minimal operability since they are found within the steep slopes, rocky outcrops, or have poor access. The stand aspect is mostly south facing slopes with many slight variations. Slopes vary in the stand ranging from 0% to 45% with an average of 25%.

From the inventory data Stand 2 had approximately 147.9 trees per acre that were 5 inches DBH or greater in size. The average DBH of this stand was estimated at 8.6 inches. Regeneration plots estimated that there are approximately 2663.7 trees which were 5 inches DBH or less. Again, these smaller trees were not included in the average stand diameter since they are not merchantable, however overall there was 2811.6 trees per acre with an average stand diameter of 2.0". The basal area per acre of the stand was 62.1 ft^2 with 2.0 ft^2 found on dead trees. This density is good; however the understory oak can act like a ladder fuel to the overstory trees. Stand 2 composition (**Figure 7**) is dominated (91.2%) by oak. Ponderosa pine and Douglas-fir were present having 6.1% and 2.7% respectively. Rocky Mountain juniper was seen very sparsely in the stand and was not captured in the timber cruise. When we remove regeneration from the analysis, we can see that conifers (ponderosa (97.9%) and Douglas-fir (2.1%)) dominate the overstory, and oak is really on found in its understory shrub format. Stand 2 has .8% mortality by composition, which makes up 3.2% of the basal area. Most of the dead is made up of ponderosa pine in the 6" diameter class. These trees were most likely killed by *Ips* or MPB activity.

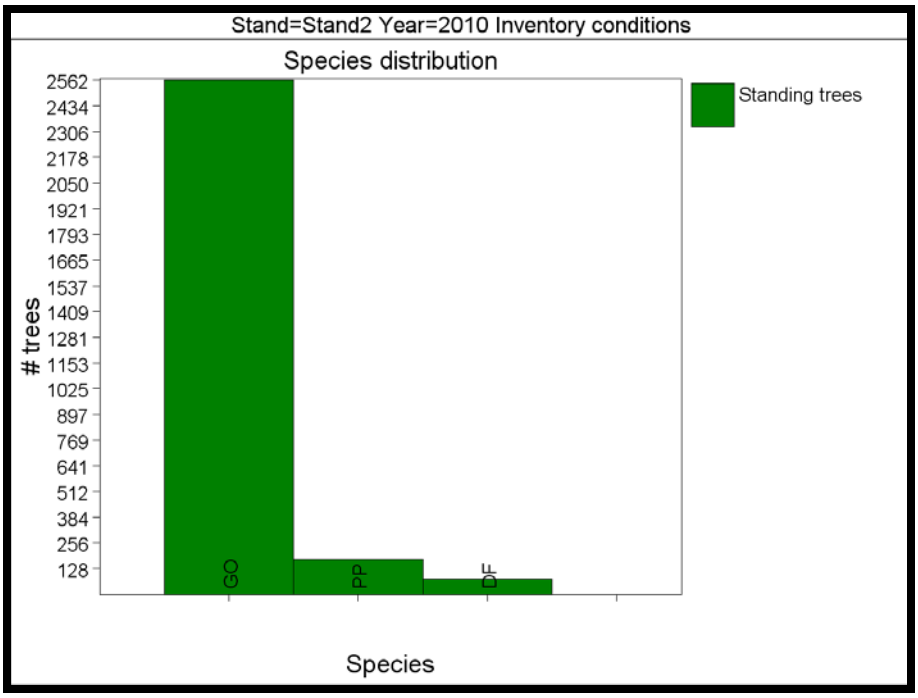
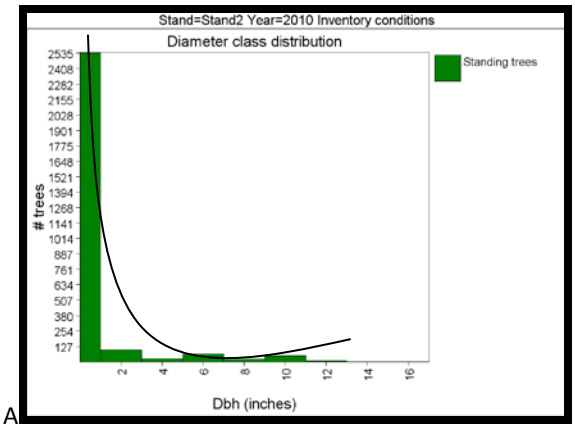


Figure 7: The species distribution found in Stand 2 on the UCC Property. Overall oak is the dominate species in the understory, with ponderosa pine dominating the overstory. It should be mentioned that there are areas where only oak is found and no conifers are in the overstory.

The diameter class distribution curve (**Figure 8**) (Black Line) appears to indicate an unevenaged stand for the overstory sized trees and is said to have an inverse-J relationship, where as the oldest age class dies, the preceding age class becomes the oldest age class, and regeneration fills the vacated space. This stand actually is missing the regeneration portion of the uneven-aged stand since oakbrush dominates the understory. It is what we call a two-tiered stand with conifer trees existing as the overstory over an understory of oak. It is very difficult for conifer regeneration to get started in these stands. The diameter class distribution of Stand 2 also shows a lot of trees that fall within the small diameter classes of 6-inches or less. The majority is actually less than 1" in size. The data is being slightly skewed by the amount of oak found in the understory. There is a lot of variation in the stand though, with pockets of oak only, pockets of ponderosa pine only, pockets of ponderosa pine/Douglas-fir, and true pockets of ponderosa pine over oak.

A 

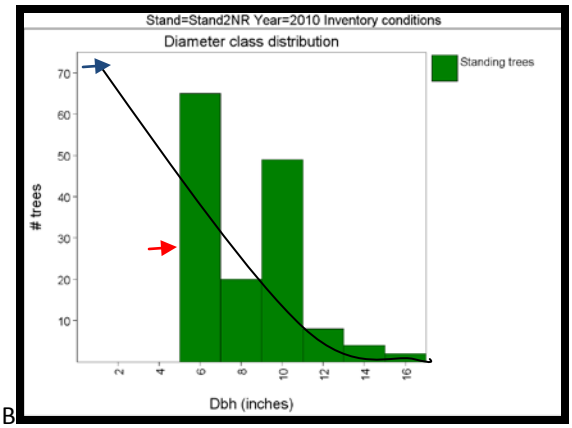
B 

Figure 8: (A)The diameter distribution of Stand 2 appears (Black Line) to be unevenaged. (B) Removing the regeneration gives a clearer view of the structure. The red arrow indicates the number of conifers in the 4" class, and the blue arrow indicates the number of conifers in the 2" class.

Stand 2 is estimated to have approximately 2504.2 of merchantable bdft and 651.8 of merchantable ft^3 per acre. These are very poor merchantable, but the volume is found on very few larger sized trees. Stand and Stock tables are located in **Section 9.0**. Ponderosa pine makes up most of the merchantable cubic foot and board foot volumes in the stand. Material removed from this stand can be used as firewood, furniture material, chips, or biomass.

The estimated site index for aspen within the stand is 40 feet based on a 100 year scale. **Figure 9** below is an image of how an average acre might look within the stand, although large variations may actually be present on the property. **Figure 10** are actual photos of the stand.

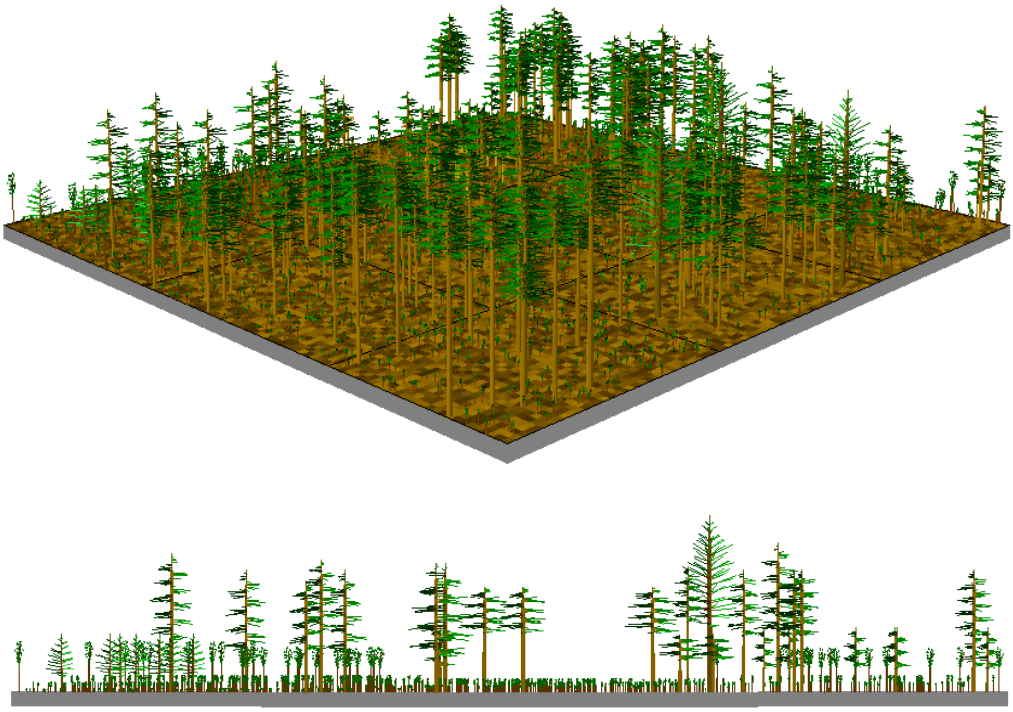


Figure 9: Stand 2 on the UCC Property. The understory of oak needs to broken up to decrease fire hazard.

Figure 10: Stand 2 as found on the UCC Property. (A-F) These photos capture much of the variation in Stand 2.

The understory of Stand 2 was composed mostly of shrubs, grasses, and oak. The following is a list of species seen on the property and is by no means all inclusive: Gambel oak, mountain mahogany, and skunkbush, make up most of the shrub understory with oak being the most common. Many grasses such as: blue gramma, mountain muhly, western wheatgrass, Arizona fescue, and needleandthread were seen in the stand. Some flowering plants found in these areas included scarlet paintbrush, goldenbean, yarrow, and the pasqueflower.

VEGETATION TYPE (STAND) 3: GAMBEL OAK/ MIXED MONTANE SHRUBLAND

Stand 3 is a 38.0 acre Gambel Oak/ mixed montane shrubland stand that also has a two tiered structure. It appears however that seems both the overstory and understory are even aged. Even-aged stands (bell shaped curves) usually have trees that are + or – 15 years in age and usually develop from a single

disturbance. This entire stand probably formed from a wildfire at some point in the past. Ponderosa pine slowly came back in and started to grow sparsely. The oak arrived later after many years of fire suppression tactics allowed oak to grow in unabated. Now we are left with a very open overstory of conifers with a dense understory of oak. Access is poor to most of Stand 3, with only 10 acres being fully operable. The upper portions of the stand near the top of Ben Lomand Mountain and the lower portion near Capella Drive are the operable regions. The remaining areas (~ 28 acres) will have minimal operability since they are found on steep slopes, near rock outcrops, or have very poor access. The stand aspect is mostly south facing slopes. Slopes vary in the stand ranging from 0% to 45% with an average of 35%.

From the data Stand 3 had approximately 61.8 trees per acre that were 5 inches DBH or greater in size. The average DBH of this stand was estimated at 8.4 inches. Regeneration plots estimated that there are approximately 4450 trees which were 5 inches DBH or less. Overall there were 4511.8 trees per acre with an average stand diameter of 1.1 inches. The basal area per acre of the stand was 29.0 ft^2 and .1 ft^2 of this was found in dead trees. This is considered normal for this stand. Stand 3 composition (**Figure 11**) is dominated (98.4%) by oak. Douglas-fir and ponderosa pine were present having .5% and 1.1% respectively. Again when regeneration data is removed we notice that ponderosa pine (79.9%) and Douglas-fir (20.1%) are the overstory of the stand with oak making up the understory. There is .9% mortality by composition in the stand comprising .3% of the basal area. Most of the dead trees are made up of old decadent oak.

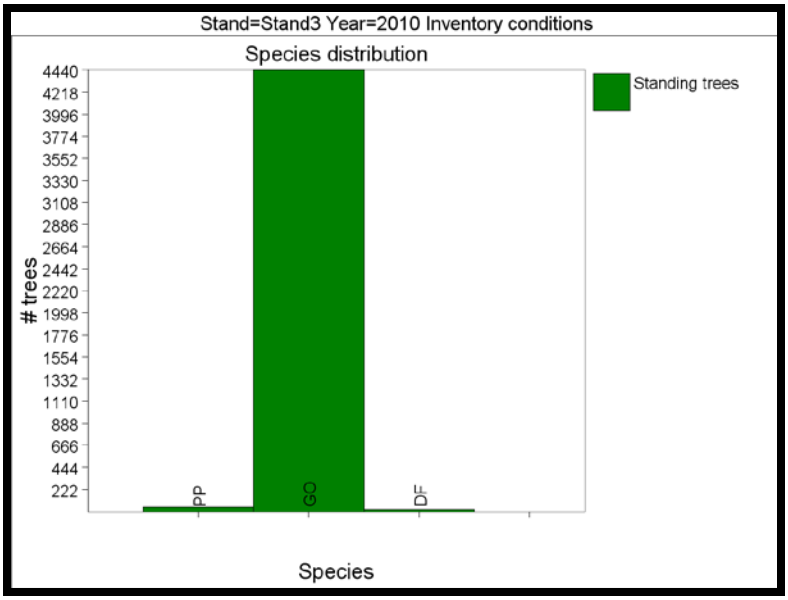


Figure 11: (A) Species distribution for Stand 3. (B) When regeneration is removed from the analysis we see that conifers (Lp, Pp, and Es) play a significant role in the overstory of this stand.

The diameter class distribution (**Figure 12A**) of Stand 3 also shows a lot of trees/shrubs that fall within the small diameter classes of 6-inches or less. The majority is actually less than 1" in size. This is typical for these shrublands. These shrub communities are a very important part of the ecosystem, however the continuity of fuels in the severe brush should be broken up by active management. Small patch cuts within the oak could help break up the continuity of fuels. These mesic oak shrublands are found in large continuous swaths which are only broken up by rock outcrops. Oakbrush was historically held in check by

low intensity wildfires which were frequent in the area. These low intensity fires would help keep a mosaic structure on the property, which would ultimately allow portions of the oak shrubland to rejuvenate. The fires would burn very spotty due to the large variations in fuel allowing the mosaic structure to perpetuate. Fire suppression has allowed oak to get established in very dense continuous quantities across the landscape.

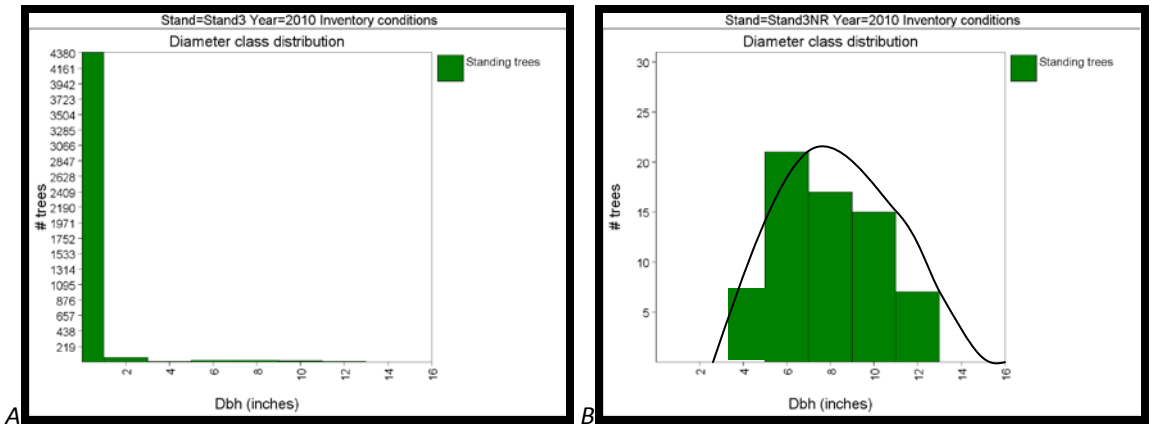


Figure 12: (A)The diameter class distribution of Stand 3 on the UCC Property Forest. (B)This graph (Black Line) demonstrates the bell shaped curve that seems to be present.

Stand 3 is estimated to have approximately 907.4 of merchantable bdft and 272.5 of merchantable ft^3 per acre. These are poor merchantable values but typical of Gambel Oak/ Mixed Montane Shrublands. Stand and Stock tables are located in **Section 9.0**. Ponderosa pine makes up most of the merchantable volume. The few midsized overstory trees (8" to 12") account for most of the volume for this stand. Material removed from this stand will have little to no monetary value.

The estimated site index for the stand is 35 feet based on a 100 year scale. **Figure 13** below is an image of how an average acre might look within the stand, although large variations may actually be present on the property. **Figure 14** are actual photos of the stand.

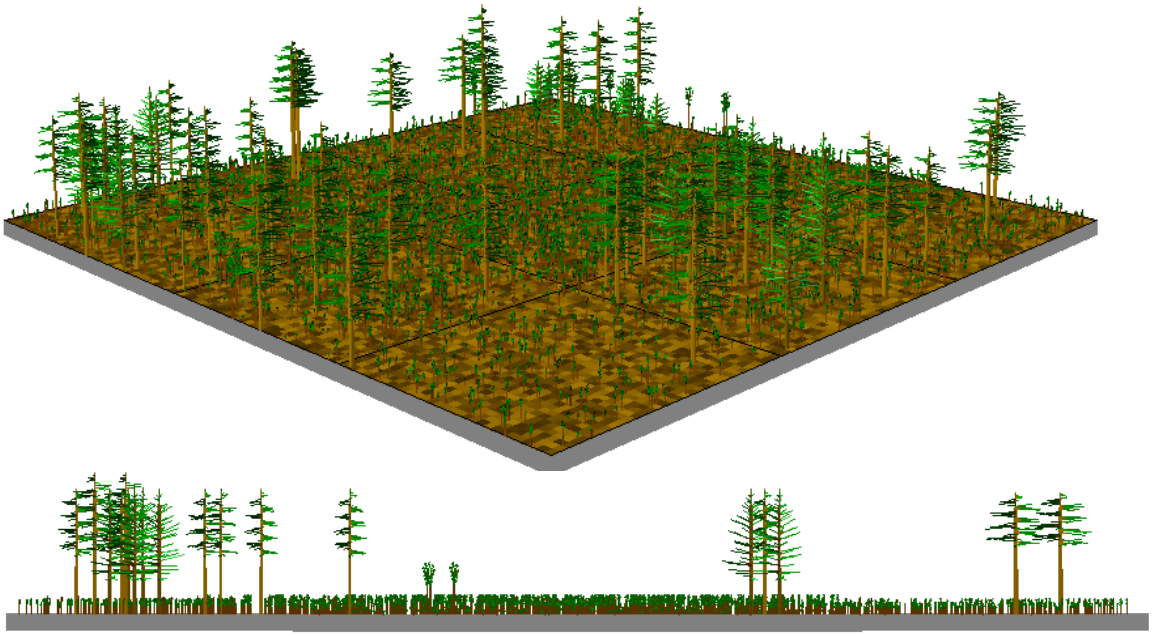


Figure 13: A virtual view of an average acre within Stand 3. Notice how aspen is found in pockets (most likely even-aged). There are also open areas that are primarily ponderosa pine.

E   F

Figure 14: Stand 3 on the UCC Property Forest. (A-F). These photos show the variations in Stand 3.

The understory of Stand 3 was composed mostly of shrubs and grasses with fair amounts of shrubs. The following is a list of species seen in the stand and is by no means all inclusive: wax currant, skunkbush (*Rhus trilobata*), choke cherry, prairie sagewort, (*Artemisia frigid),* mountain mahogany (*Cercocarpus montanus*) and kinnikinnick make up most of the shrub understory. Many grasses such as: blue gramma, mountain muhly, western wheatgrass, Arizona fescue, bluebunch wheatgrass (*Pseudoroegneria spicata*), Parry's danthonia (*Danthonia parryi*), Griffith's wheatgrass (*Elymus lanceolatus*), pine dropseed (*Blepharoneuron tricholepis*) and needleandthread were seen in the stand. Some flowering plants found in these areas included scarlet paintbrush, goldenbean, yarrow, pasque flower, and lupine.

VEGETATION TYPE 4: PERENNIAL GRASSLAND

UCC Property has approximately 111.53 acres found in the perennial grassland vegetation type (**Figure 15**). This meadow area is the most visible portion of the ranch and can be seen while driving along County Line Road. This area seems to be fairly healthy and has undoubtedly been utilized by ungulates for winter forage. This area should be continually monitored for noxious weeds, and a treatment plan to help mitigate noxious weeds should be completed if necessary..

Arizona fescue, western wheatgrass, sheep fescue, mountain muhly, smooth bromegrass, prairie junegrass (*Koeleria macrantha)*, slenderwheatgrass, bluegrass (*Poa spp*), elk sedge (*Carex geyeri*), other sedges (Carex spp), rush (Juncus spp), western dock *Rumex aquaticus*, mountain timothy (*Phleum alpinum*), mountain muhly, reed canarygrass (*Phalaris arundinacea*), spike trisetum (*Trisetum spicatum)*, and common sweetgrass (*Hierochloe odorata*) were all expected to be in the meadow areas. Many of these were seen however the time of year of the timber cruise made precise identification difficult. Rockyscree false golden aster (Heterotheca Fulcrata), elephantella *(Pedicularis groenlandica),* wild onion *(Allium cernuum*), angelica (*Angelica arguta*), wild iris (*Iris missouriensis*), subalpine gumweed, (*Grindelia subalpine),* Indian paintbrush, elephant head *(Pedicularis groenlandica),* and northern bedstraw *(Galium boreale)* comprised many of the flowering plants.

A  B 

Figure 15: Vegetation Type 4 as it appeared on the UCC Property.

STAND CHARACTERISTICS TABLE

This table summarizes the forest stand characteristics of all the forested stands on the property.

Table 1: Stand Characteristics Table-UCC Property

Stand Characteristics Table for the UCC Property			
Stand Name	**Stand 1 Ponderosa Pine/ Douglas-fir**	**Stand 2 Ponderosa Pine/ Scrub Woodland**	**Stand 3 Gambel Oak/ Mixed Montane Shrubland**
Forested Acres	**139.0 Acres**	**43.0**	**38**
Fully Operable Acres	**110.0**	**35.0**	**10**
Access	**Good/Fair**	**Good**	**Poor, except for small section near top.**
Composition	**Df 59.9% Wf .2% Go 23.4% As 2.0% Rm .2% Lm .7% Pp 13.3% OH .3%**	**Df 2.7% Pp 6.1% Go 91.2%**	**Df .5% Pp 1.1% Go 98.4%**
Composition without regeneration	**Df 69.4% Wf 0% Go 0% As .9% Rm 0% Lm .5% Pp 29.2% OH 0%**	**Df 2.1% Pp 97.9% Go 0%**	**Df 20.1% Pp 79.9% Go 0%**
Mortality	**8.2 % by composition, 5.9% by basal area. Understory Douglas-fir (Competition based) and mid-sized ponderosa pine (MPB).**	**.8% by composition, 3.2% by basal area. Ips or MPB ponderosa (6" class)**	**.9% by composition, .3% by basal area. Old Decadent Oak.**
Average Stand Diameter (QMD)	**8.5" for trees > 5" 4.2" for all trees.**	**8.6" for trees > 5" 2.0" for all trees.**	**8.4" for trees > 5" 1.1" for all trees.**
Trees Per Acre	**281.0 > 5" 1248.9 total with 967.9 of regeneration**	**147.9 > 5" 2811.6 total with 2663.7 of regeneration**	**61.8 > 5" 4511.8 total with 4450 of regeneration**
Basal Area Per Acre (ft^2)	**Live: 112.6 Dead 7.1 Total: 119.7**	**Live: 60.1 Dead 2.0 Total: 62.1**	**Live: 28.9 Dead .1 Total: 29.0**
Cubic Foot Volume (Merch)	**1672.1**	**651.8**	**272.5**
Board Foot Volume	**5882.6**	**2504.2**	**907.4**
Site Index	**47**	**40**	**35**
Approx Average Age	**Some Areas Pp is 150 Plus (on overstory trees)**	**150+ (overstory)**	**150+ (overstory)**

4.2 INSECTS AND DISEASES

BEETLES:

Evidence of pine beetle activity was noted on the property. Mountain pine beetle (*Dendroctonus ponderosae*) was observed on the property (**Figure 16 A, B, C,**). MPB attacked trees were seen in both Stands 1 and 2. *Ips* species (Scolytidae family) was also found on the property (**Figure 16 D, E**). *Ips* was found in areas that were stressed due to high tree densities.

MPB is a pest insect that attacks pines. The initial signs of attack are popcorn-shaped masses of resin, called "pitch tubes," on the trunk where beetle tunneling begins and boring dust near the base of the tree or in the bark crevices from the tunneling. Pitch tubes are an attempt by the trees to pitch out sap in order to impede the beetle's entry into the tree. Beetles will overwinter in the tree and as April roles around tree needles will begin to turn red as the tree dies. Beetles will then begin to fly to attack new trees in mid June through September. Areas with large ponderosa should be watched carefully to ensure that these stately trees on the property do not fall victim to a major MPB outbreak. The population of MPB seems to be at an endemic level on the property, but that could change quickly if an outbreak starts nearby.. Yearly monitoring of the property is very important in devising strategies should the outbreak become epidemic on the ranch. Identification and treatment of beetle attacked trees is very important in order to curb further infestations. During endemic activity attacked trees should be felled and immediately debarked, chipped, or removed from the property to decrease outbreaks. If epidemic levels are reached, a professional forester should be contacted to help devise a plan for recovery. Other treatment methods can be found in **Section 10.0**. FVS MPB risk ratings were moderate for the whole property. Stand 1 has a 7 rating out of 12, Stand 2 has an 8 rating out of 12, while Stand 8 has a 7 rating out of 12. Risk is based on the presence of MPB, the basal area of the stand, the average Dbh of ponderosa > 5", and the percent makeup of ponderosa in the canopy. The % composition of ponderosa pine in the stand is what puts the stand at risk.

There are many different species of *Ips*, this property is primarily concerned with the *Ips pini* beetle. *Ips* beetles are very sensitive to stressed and weakened trees. The presence of recently cut trees has even been determined to attract flying adult *Ips* beetles to the area, therefore cutting should be timed in order to avoid beetle flying times (**Section 10.0**). Sometimes it is very hard to notice pitch tubes on *Ips* attacked trees, probably due to many attacks being during drought conditions or the trees being weakened. Weak trees have a harder time producing pitch than healthy trees. Typically the tell tale sign of Ips attacks is the peeling away of the bark by birds who are trying to feed on the beetles. IPs has multiple generations in one year's time, so it is also difficult to pinpoint timeframes not to complete thinning activities. Dense forests often have weakened trees due to competition, therefore are more susceptible to attack. This is amplified during times of drought. Although beetles are a natural part of the ecosystem, high valued areas can be severely affected by outbreaks. The goal should be to maintain the populations at endemic levels, by treating attacked trees while also promoting the health and vigor of the remaining trees. Therefore completely postponing treatment just to avoid flying times is counter intuitive to creating a healthy forest.

Figure 16: (A, B) Close-up of MPB activity on ponderosa pine. (C) Tree tops turning red after being attacked by MPB. (D, E) Ips beetle damage often looks like bark was peeled from trees. This is caused by birds trying to get to the beetles or other insects in the tree.

DWARF MISTLETOE:

Dwarf mistletoe (*Arceuthobium douglasii*) was observed on Douglas-fir in Stand 1 and dwarf mistletoe (*Arceuthobium vaginatum*) was observed on ponderosa pine in Stand 1. Dwarf mistletoe is a parasitic plant that causes swelling of branches and "witches brooms" (an abnormal abundance of foliage on a single branch) (**Figure 17**). If mistletoe heavily infects a tree, it may indirectly kill the tree by weakening it and predisposing it to other, more lethal stressors, such as bark beetles. Dwarf mistletoe is mostly species specific, so it typically does not spread from one species to another. Control of this parasite is best achieved by pruning the most heavily infected branches from the tree, while leaving at least one-third of the crown intact. While pruning will not have an immediate effect on the health of the tree, it can slow the mistletoes spread. If every branch on the tree is heavily infected, the entire tree should be removed. Using the Hawksworth six class rating system in **Section 10.0**, trees with a 5 or 6 rating should be completely removed. Essentially looking at a tree one would divide the crown into three equal sections. Each section would be rated as 0 = having no DMT, 1 = having light DMT, 2 = having heavy DMT. The total of all sections would yield the final rating of 0 through 6. Areas that have heavy mistletoe can also be

isolated to decrease the chance of spread. Creating a 50 to 80 foot buffer between infected and non-infected trees is usually prescribed to keep the parasite in check. Small areas could also be replaced with different species due to the species specific nature of the parasite. The mistletoe on this property can be strategically mitigated against through thinning operations. It is not possible to fully eliminate the parasite since DMT is widespread, but when work is being completed in an area that has mistletoe, these infected trees can be the target for removal.

Figure 17: (A, B) Close up of dwarf mistletoe fruiting to help in identification on ponderosa and Douglas-fir respectively. (C, D, E) Witches broom is usually the first easily identifiable sign that dwarf mistletoe is affecting a tree. (F) Mistletoe affected trees are more prone to attacks from other forest pathogens such as this area in Stand 1B.

WESTERN GALL RUST

Western Gall Rust (WGR) (*Endocronartium harknesii*) is also thought to be present on the property. (**Figure 18**). The disease causes the appearance of spherical galls on the branches of pines of all ages. Trunk or hip cankers are common on lodgepole pine, where they do not look like a typical gall, but a

diamond shape canker. Most rusts spread through the use of an alternate host, and can be controlled by removing this alternate host. However WGR does not need an alternate host, and infects other trees by releasing spores from the galls. Control is very difficult since the spores have a latent infection rate of 1 to 2 years. Since this is not a timber producing stand, WGR can be for most practices ignored, except for cankers which may cause trees to fall creating a recreational or safety hazard.

Figure 18: WGR was not seen on the UCC Property, but may be present in ponderosa pine.

WESTERN SPRUCE BUDWORM

A lot of evidence of western spruce budworm (WSBW) (*Choristonuera occidentalis* Freeman) was seen in the area, but none was noted on the property. WSBW can be identified by dieback in a tree's terminal branches, heavy concentrations of small moths (late-June through early-August) and caterpillars (mid-May through mid-July) on the trees. WSBW feeds on the new growth of trees and can be particularly harmful to young understory trees. Spruce, Douglas-fir, and true firs are all susceptible. Larger trees may be killed if persistent (3 to 5 years) defoliation occurs. More importantly larger infested trees will become weakened, therefore more susceptible to other insects and diseases. The Douglas-fir beetle (*Dendroctonus pseudotsugae* Hopkins) is a secondary insect that often follows defoliation by WSBW, and typically is responsible for the death of larger Douglas-fir trees. Control of WSBW is costly and difficult once established. Thinning to increase remaining tree vigor can be very effective at prevention, as well as promoting a mixed species stands. For larger outbreaks, aerial application of chemical or microbial insecticides may help abate an epidemic. Recent evidence has suggested that stands with heavy Douglas-fir regeneration within the understory are more prone to attack. Removal of the understory may help decrease populations of WSBW and help minimize the overall impact.

Information concerning the identification and control of pine beetles, dwarf mistletoe, western gall rust, western spruce budworm or other diseases common to ponderosa pine is included in **Section 10.0** the **Insect, Disease, and Weed Appendix**.

4.3 WILDFIRE HAZARDS AND STRUCTURES

This section discusses wildfire hazards on the property. The fuel models found on the property were identified and are discussed below. Any questions related to what to do during a wildfire or how to gain burning permits for burning slash should be directed to the local fire protection district. The property is protected by the:

Palmer Lake Volunteer Fire Department (PLVFD)
12 Valley Crescent

Palmer Lake, Colorado 80133-0302
719-499-1066
CHIEF: Shanna Ball

Tri-Lakes Fire Protection District
Station 1:
18650 HWY 105 Monument, CO 80132
719 484 0911
CHIEF: Curtis Kauffman
CKauffman@Tri-Lakesfire.com

FUEL MODELS

The best representative fuel models describing fuel conditions on this property are Fuel Model (FM) 1 in the meadows, FM 2 in the very open stands, FM 4 in the oakbrush and shrublands, FM 8 in areas with little to no understory grasses, FM 9 where density levels are higher, and FM 10 where there is a lot of downed woody fuels. The FMs for this property were determined using the United States Forest Service (USFS) publication, *Aids to Determining Fuel Models For Estimating Fire Behavior* by Hal E. Anderson.

FUEL MODEL 1

This fuel model was evident in all of the meadow areas of the property (Vegetation Type 4). FM 1 describes fuel conditions in grasslands and grass shrub combinations (**Figure 19**). Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or nearly cured. Fires are typically surface fires that move rapidly through the grass and associated material. A fire with 5MPH winds and a moisture content of 8% would produce a rate of spread of 78 chains per hour, and flame lengths of 4 feet. Very little shrub or timber is present, however nearby areas can be adversely affected by the fast moving fire. Total fuel loads range from 0 to .74 tons per acre with an average fuel bed depth of 1 foot or less (Anderson 1982).

Figure 19: Fuel Model 1 as found in the meadows on the UCC Property.

FUEL MODEL 2

This fuel model was evident on the property where there are open treed areas with good grass layers underneath. It is found in the transition from Stand 1 into VT 4. FM 2 describes the fuel conditions in open shrub lands and open pine stands (**Figure 20**). Such areas may include clumps of fuel that generate higher intensities and that may produce flare-ups and firebrands. In this FM, fire spread is primarily through the fine herbaceous fuels, either cured or dead. A fire with 5MPH winds and a moisture content of 8% would produce a rate of spread of 35 chains per hour, and flame lengths of 6 feet. Fires are generally surface fires where the herbaceous material, in addition to litter and dead-down stem wood from the open shrub or timber overstory, contribute to the fire intensity. Dead fuel loads in this FM range from .5 to 2 tons per acre with an average fuel bed depth of 1 foot or less (Anderson 1982).

Figure 20: FM 2 as found in Stand 2. The heavy grasses tend to carry a fire quickly, but this often allows for good tree survival especially in ponderosa which has the thick fire resistant bark.

FUEL MODEL 4

This fuel model takes place throughout Stand 3 on the UCC Property (**Figure 21**). FM 4 describes in stands of mature shrubs 6 or more feet tall. Fire intensity and fast-spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous secondary overstory. Besides flammable foliage, dead woody material in the stands significantly contributes to fire intensity. A deep litter layer may also hamper suppression efforts. Dead fuel loads in this FM range from 2 to 5 tons per acre with an average fuel bed depth of 6 feet or less. This FM also has 5 tons or less of live fuel per acre (Anderson 1982).

Figure 21: FM 4 as seen on the UCC property.

FUEL MODEL 8

FM 8 was found where there was minimal live understory underneath the ponderosa pine/ Douglas-fir overstory (**Figure 22**) (Stand 1, portions of Stand 2). FM 8 describes the fuel conditions in closed canopy stands of short-needle conifers that have leafed out to support fire in the compact litter layer. This layer is mainly needles, leaves, and occasionally twigs because little undergrowth is present in the stand. In this FM, slow-burning ground fires with low flame lengths generally occur, although the fire may encounter an occasional "jackpot" or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures, low humidity, and high winds do the fuels pose fire hazards. A fire with 5MPH winds and a moisture content of 8% would produce a rate of spread of 1.6 chains per hour, and flame lengths of 1 feet. Dead fuel loads in this FM range from 1 to 2 tons per acre with an average fuel depth of .2 feet or less (Anderson 1982).

A  B 

Figure 22: FM 8 as found in Stand 1(A) and Stand 2(B), Notice how there is minimal understory plants.

FUEL MODEL 9

This model was identified in large portions of Stand 1 (**Figure 23**). FM 9 describes the fuel conditions in closed stands of long- needled pines like ponderosa pine. In this FM, fire runs through the surface litter faster than model eight and has longer flame lengths. A fire with 5MPH winds and a moisture content of 8% would produce a rate of spread of 7.5 chains per hour, and flame lengths of 2.6 feet. Concentrations

of dead-down woody material will contribute to the possibility for torching of individual trees, spotting, and crowning. Dead fuel loads in this model range from .15 to 3 tons per acre with an average fuel bed depth of .2 feet or less (Anderson 1982).

Figure 23: FM 9 as found on the UCC Property. Increased densities and more surface fuel separate this fuel model from FM 8.

FUEL MODEL 10

This fuel model was observed in pockets of Stand 1 where there is a lot of downed woody debris and slash, along with ladder fuels leading to the overstory (**Figure 24**). Fires will burn in the surface and ground fuels with greater fire intensity than other timber models. Dead down fuels include greater quantities of 3 inch or larger limb wood resulting from natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees is more frequent in this fuel situation. Dead fuel loads in this model range from 2 to 5 tons per acre with an average fuel bed depth of 1 foot or less (Anderson 1982).

Figure 24: FM 10 as found on the UCC Property. Heavy fuels can cause fire fuel ladders which lead to the vulnerable overstories. This can cause a groundfire to move into a crown fire.

HOUSING STRUCTURES

There are three main structures on this property with some additional out buildings (**Figure 25**). The three main structures are the parsonage, the church, and the fellowship house. Defensible space is an area

around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to the surrounding forest and provides room for firefighters to perform their jobs (Dennis 1999). The parsonage house already has good defensible space; and the church and fellowship house have good protection as well. The main structures should be monitored and treated for new growth in order to maintain Defensible Space Zone 1 and 2 as outlined in the '*Creating Wildfire Defensible Zones'* pamphlet in **Section 11.0**. Defensible space should be evaluated and created around any new structures built on the property. New landscaping around the home should follow recommendations set forth in Firewise publications. It is important to follow safety protocol with fuels and oils used for the equipment operations. Poor placement of these flammable materials will increase the risk of structure fires escaping the structure and entering the forest.

A  B 

Figure 25: A few of the structures found on the property. (A) The parsonage as viewed from the main gate and (B) the church as viewed from the north.

Information regarding the creation of wildfire-defensible zones, use of fire-resistant landscaping, forest home fire safety, creating fuelbreaks, and fire-wise plant materials are included in **Section 11.0**.

4.4 RIPARIAN FEATURES

There are no natural riparian areas found on the property, however there may be some areas that are wetter than others and these areas may harbor riparian species. Drainages from Ben Lomand Mountain would be the location for these species. Species that may be in these wetter areas include alkali sacaton (*Sporobolus airoides*), inland saltgrass (*Distichlis spicata)*, tufted hairgrass (*Deschampsia cespitosa)*, switchgrass *(Panicum virgatum)*, and redtop (*Agrostis scabra*). Shrubs might include snowberry, alder, choke cherry, and many species of willow including: flat leaved willow (*Salix planifolia*), Scouler's willow (*Salix scouleriana*), and Grey leaved willow (*Saliz glauca*). Vegetation Type 4 has a man-made pond (**Figure 26**). This pond improves the ability for wildlife to utilize the property, providing a water source for migrating animals. The southern portion of this property drains into Monument Creek which makes its way to Monument Lake. The northern portion of the property drains into Carpenter creek which flows to east Plum Creek. A small portion of the property does drain west and may end up in Palmer Lake.

Proper care needs to be taken when working or moving soil around riparian or drainage areas. Any work completed in these areas should follow Best Management Practices for Colorado which are provided in **Section 12.0.** Temporary crossings can be utilized to minimize damage from equipment

Figure 26: The pond that is found in the center of the property.

4.5 SOIL TYPES

The Natural Resource Conservation Service describes five soil types that exist on or around the UCC Property forest. The El Paso County Area Soil Survey covers the property. The following is a brief description of each soil type and the associated plant communities as collected and described using the NRCS Web Soil Survey. Only major soil components are described. Section 6.0 provides a soil type map for the property. More in depth soil information can be found in the inventory and background material appendix in Section 9.0, or by visiting the NRCS soil website at HTTP://SOILDATAMART.NRCS.USDA.GOV/OR HTTP://WEBSOILSURVEY.NRCS.USDA.GOV/APP/HOMEPAGE.HTM

SOIL TYPE: 41—KETTLE GRAVELLY LOAMY SAND, 8 TO 40 PERCENT SLOPES

Component: Kettle (85%)

The Kettle component makes up 85 percent of the map unit. Slopes are 8 to 40 percent. This component is on uplands, hills. The parent material consists of sandy alluvium derived from arkose. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This soil does not meet hydric criteria. Ponderosa pine, Douglas fir, and White fir are typical overstory trees while wheatgrass, gambel's oak, arizona fescue, mountain muhly, pine dropseed and true mountain mahogany are typical understory species.

Component: Other soils (7.5%) Generated brief soil descriptions are created for major components. The Other soils are a minor component.

Component: Pleasant (7.5 %) Generated brief soil descriptions are created for major components. The Pleasant soil is a minor component.

SOIL TYPE: 42—KETTLE-ROCK OUTCROP COMPLEX

Component: Kettle (60%)

The Kettle component makes up 60 percent of the map unit. Slopes are 8 to 40 percent. This component is on uplands, hills. The parent material consists of sandy alluvium derived from arkose. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This soil

does not meet hydric criteria. Ponderosa pine, Douglas fir, and White fir are typical overstory trees while wheatgrass, gambel's oak, arizona fescue, mountain muhly, pine dropseed and true mountain mahogany are typical understory species.

Component: Rock outcrop (20%) Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.
Component: Other soils (%) Generated brief soil descriptions are created for major components. The Other soils are a minor component.

SOIL TYPE: 69—PEYTON-PRING COMPLEX, 8 TO 15 PERCENT SLOPES

Component: Peyton (40%)
The Peyton component makes up 40 percent of the map unit. Slopes are 8 to 9 percent. This component is on uplands, hills. The parent material consists of arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the Sandy Divide ecological site. This soil does not meet hydric criteria. Mountain muhly, little bluestem, prairie junegrass, prairie sandreed, sand bluestem, western wheatgrass, needleandthread, fringed sagewort, and spreading buckwheat are common rangeland species.
Component: Pring (30%)
The Pring component makes up 30 percent of the map unit. Slopes are 8 to 15 percent. This component is on hills. The parent material consists of arkosic alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the Loamy Park ecological site. This soil does not meet hydric criteria. Mountain muhly, arizona fescue, bluegrass, needlegrass, parry's danthonia, gambel's oak, prairie junegrass, fringed sagewort, and western wheatgrass are common vegetation.
Component: Other soils (%) Generated brief soil descriptions are created for major components. The Other soils are a minor component.
Component: Pleasant (%) Generated brief soil descriptions are created for major components. The Pleasant soil is a minor component.

SOIL TYPE: 71—PRING COARSE SANDY LOAM, 3 TO 8 PERCENT SLOPES

Component: Pring (85%)
The Pring component makes up 85 percent of the map unit. Slopes are 3 to 8 percent. This component is on uplands, hills. The parent material consists of arkosic alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the Loamy Park ecological site. This soil does not meet hydric criteria. Mountain muhly, arizona fescue, bluegrass, needlegrass, parry's danthonia, gambel's oak, prairie junegrass, fringed sagewort, and western wheatgrass are common vegetation.
Component: Other soils (%) Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.
Component: Pleasant (%) Generated brief soil descriptions are created for major components. The Pleasant soil is a minor component.

SOIL TYPE: 93—TOMAH-CROWFOOT COMPLEX, 8 TO 15 PERCENT SLOPES

Component: Tomah (50%) The Tomah component makes up 50 percent of the map unit. Slopes are 8 to 15 percent. This component is on alluvial fans, hills. The parent material consists of alluvium derived from arkose and/or residuum weathered from arkose. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the Sandy Divide ecological site. This soil does not meet hydric criteria. Gambel's oak, prairie sandreed, western wheatgrass, mountain brome, mountain muhly, needleandthread, arizona fescue, and prairie junegrass are common vegetation.

Component: Crowfoot (30%) The Crowfoot component makes up 30 percent of the map unit. Slopes are 8 to 15 percent. This component is on alluvial fans, hills. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the Sandy Divide ecological site. This soil does not meet hydric criteria. Bluestem, mountain muhly, mountain brome, needleandthread , arizona fescue, bluegrass, fringed sagewort , other perennial forbs, prairie sandreed, and prairie junegrass are common vegetation.

Component: Other soils (%) Generated brief soil descriptions are created for major components. The Other soils are a minor component.

Component: Pleasant (%) Generated brief soil descriptions are created for major components. The Pleasant soil is a minor component.

4.5 NOXIOUS WEEDS

Definition of a Noxious Weed from the 1974 Federal Noxious Weed Act: "*Noxious Weed means any living stage, such as seeds and reproductive parts, of any parasitic or other plant of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation, or the fish or wildlife resources of the United States or the public health.*"

The following was copied from the Colorado Noxious Weed Act Title 35 Article 5.5, enacted 1996:

> *"The Colorado general assembly clearly recognizes the profound negative impacts of noxious weeds on the economic and environmental values of Colorado's private and public lands. Consequently, the assembly has placed all Colorado lands under the jurisdiction of local governments that have been delegated the responsibility and power to assure the management of state and locally designated noxious weeds. Definition of a Noxious Weed: The law defines noxious weeds as plant species that are not indigenous (non-native) to the state of Colorado and meet at least one of several criteria regarding their negative impacts upon crops, native plant communities, livestock, and the management of natural or agricultural systems. This definition applies to species listed by both the state and local governing bodies. "*

The law goes on to provide lists of noxious weed species that are of concern within the State of Colorado (**Section 10.0**). List A species are the most crucial to control because they are not yet widespread in Colorado but pose a serious potential threat. These species are designated for eradication. List B species have (or will have) a state noxious weed management plan developed to stop their spread. The

eradication of these species may be very difficult since they have been established in the state for a long time. List C species are noxious weeds that can be a problem in some areas of the state, and state resources can be gained for jurisdictions that choose to manage these species. The following noxious weeds are expected to be in the area and should be monitored for and treated if necessary: musk thistle (*Cardus nutans*), leafy spurge (*Euphorbia esula*), dalmation toadflax (*Linaria dalmatica*), diffuse knapweed (*Centaurea diffusa*), yellow toadflax (*Linaria vulgaris*), field bindweed (*Convolvulus arvensis*) and Russian knapweed (*Centaurea repens*). Use of insects as biological control has also proven effective in keeping this weed at bay (http://www.integratedweedcontrol.com/). No noxious weeds were noted during the timber inventory, but extensive field surveys were not completed. Being close to County Line Road almost guarantees that one or more of the above mentioned species will be found on the property. **Section 10.0** contains information regarding the identification and treatment of common noxious weeds in Colorado. A plan should be developed to monitor and address noxious weeds if found on the property.

4.6 WILDLIFE

Wildlife species expected to be resident or transient on the property during all or parts of the year include, mule deer, elk, porcupine, mountain cottontail rabbit, whitetail jackrabbit, Abert's squirrel, golden-mantled ground squirrel, chipmunk, various small mice and rodents, raccoon, skunk, coyote, red fox, grays fox, bobcat, mountain lion, and black bear. Birds include: various song birds, Steller's Jay, Clark's nutcracker, northern flicker, raven, red-tailed hawk, Cooper's Hawk, great horned owl, turkey vulture, northern goshawk, sharp-shinned hawk, blue grouse, downy woodpecker, three-toed woodpecker, gray jay, flammulated owl, common nighthawk, common poorwill, broad-tailed hummingbird, rufous hummingbird, red-naped sapsucker, Williamson's sapsucker, willow flycatcher, Say's phoebe, saw-whet owl, mountain bluebird, Townsend's solitaire, white-crowned sparrow, dark-eyed junco and the golden eagle. The landowners have been witness to many of these during ownership of the property, but have noticed that levels have been declining over the years. This is most likely due to the increased development in the area around Palmer Lake which has caused many of the former wildlife travel corridors to close. During the timber inventory two coyotes were seen but not photographed, however many birds and many signs of wildlife were seen including nesting holes (**Figure 27**)

Figure 27 (A) Many birds were seen on the property. (B) Shed antlers, (C, D) and bird nesting holes were seen and photographed.

One of the UCC Property Forest goals is to maintain the property for wildlife habitat, in particular for ungulates such as elk and mule deer. Using Forest Vegetation Simulator, it was determined that elk hiding cover was good throughout the property. Elk hiding cover is determined by the ability of a stand of trees to hide an elk at a distance of 200 feet, and is measured in percent of elk covered. This can be loosely translated to other ungulates including deer and antelope. Stand 1 had a 90.8% rating, Stand 2 had a 72.2% rating, and Stand 3 had a 65.2% rating (**Section 9.0**). Ratings above 90% are considered very good, while anything above 70% is considered good coverage. The difference in rating is attributed to needing both overstory and understory vegetation to hide elk. Stands 2 and 3 have good understory, but the overstory is not very dense. As long as good hiding cover is nearby then ungulates will utilize the areas that don't have as good of coverage. The good hiding cover in Stand 1 coupled with the large meadows make this property ideal for use by ungulates. Both Mule Deer (*Odocoileus hemionus*) and Rocky Mountain Elk (*Cervus elaphus nelsoni*) regularly use UCC Property as part of their habitat, including both their summer and winter ranges. The limiting factor for ungulates in the Front Range of Colorado is winter range. This property fits the profile for this winter range, therefore it is important to maintain the property as good habitat.

Maintenance of wildlife snags for roosting provides habitat for raptors and other tree bound animals. The Property provides nesting habitat, summer habitat, and winter habitat for a large variety of avian life, including habit for migratory birds. Live trees with broken tops, dead tops, or mechanical damage are likely candidates to become wildlife trees (**Figure 28**). Criteria for selecting wildlife snags are as follows:

- Trees already with signs of woodpecker, or other raptors (nests, holes, cavities, etc)
- Trees with dead or broken tops which are likely to develop heartrot.
- All wildlife snags should be at least 8 inches and have their bark intact.
- Snags can range anywhere from 5 -10 per acre, but the size is more important in deciding if a tree should stay or go.

- One large snag per acre greater than 20 inch DBH for use by large woodpeckers and owls.
- Four medium sized snags between 10 and 20 inch DBH for use by smaller raptors, kestrels and also squirrels.
- Two smaller snags per acre between 8 and 10inch DBH for smaller birds such as chickadees and nuthatches.

Figure 28: Snag found in Stand 3 on the UCC Property. Maintenance of snags for wildlife use is very important, however significant amounts of dead standing material needs to be addressed.

Slash piles 3 feet tall, 4 to 6 feet wide should be left throughout the property in order to promote rodent populations. There should be 2 to 3 piles per acre.

4.7 THREATENED AND ENDANGERED SPECIES

Extensive species surveys have not been conducted, but no threatened and endangered species are known to utilize this property. According to the Colorado Natural Heritage Program's (CNHP) GIS data set and the Colorado Division of Wildlife's (CDOW) Natural Diversity Information Source (NDIS), from 2010 the following species may exist in El Paso County, therefore they may utilize the property. Federally listed, State listed, and State species of concern in El Paso County are listed below in **Tables 2, 3** and **4** respectively. Of these listed the Preble's Meadow jumping mouse utilizes land within the Palmer Lake Quadrangle, but no evidence of their required habitat was found on the property.

Table 2: Federally Listed: El Paso County

Status	Common Name	Scientific Name	Occurence	Abundance
Federal Candidate Species	Lesser Prairie-chicken	Tympanuchus pallidicinctus	Known to occur	Uncommon
Federal Candidate Species	Yellow-billed Cuckoo	Coccyzus americanus	Known to occur	Rare
Federally Endangered	Least Tern	Sterna antillarum	Known to occur	Unknown
Federally Endangered	Southwestern Willow Flycatcher	Empidonax traillii extimus	Known to occur	Unknown

Federally Endangered	Whooping Crane	Grus americana	Likely to occur	No Occurrence
Federally Threatened	Mexican Spotted Owl	Strix occidentalis lucida	Known to occur	Very Rare
Federally Threatened	Piping Plover	Charadrius melodus	Known to occur	Unknown
**Federally Threatened	Preble's Meadow Jumping Mouse	Zapus hudsonius preblei	Known to occur	Uncommon

Table 3: State Listed: El Paso County

Status	Common Name	Scientific Name	Occurence	Abundance
State Endangered	Least Tern	Sterna antillarum	Known to occur	Unknown
State Endangered	Plains Sharp-tailed Grouse	Tympanuchus phasianellus jamesii	Known to occur	Casual/Accidental
State Endangered	Southwestern Willow Flycatcher	Empidonax traillii extimus	Known to occur	Unknown
State Endangered	Whooping Crane	Grus americana	Likely to occur	No Occurrence
State Endangered	Wolverine	Gulo gulo	Known to occur	Extirpated
State Threatened	Bald Eagle	Haliaeetus leucocephalus	Known to occur	Unknown
State Threatened	Lesser Prairie-chicken	Tympanuchus pallidicinctus	Known to occur	Uncommon
State Threatened	Mexican Spotted Owl	Strix occidentalis lucida	Known to occur	Very Rare
State Threatened	Piping Plover	Charadrius melodus	Known to occur	Unknown
**State Threatened	Preble's Meadow Jumping Mouse	Zapus hudsonius preblei	Known to occur	Uncommon
State Threatened	Western Burrowing Owl	Athene cunicularia	Known to occur	Uncommon

Table 4: Species of Concern: El Paso County

Status	Common Name	Scientific Name	Occurence	Abundance
State Special Concern	Black-tailed Prairie Dog	Cynomys ludovicianus	Known to occur	Fairly Common
State Special Concern	Botta's Pocket Gopher	Thomomys bottae	Known to occur	Fairly Common
State Special Concern	Ferruginous Hawk	Buteo regalis	Known to occur	Uncommon
State Special Concern	Greater Sandhill Crane	Grus canadensis tabida	Known to occur	Unknown
State Special Concern	Long-billed Curlew	Numenius americanus	Known to occur	Rare
State Special Concern	Midget Faded Rattlesnake	Crotalus viridis concolor	Known to occur	Uncommon
State Special Concern	Mountain Plover	Charadrius montanus	Known to occur	Uncommon
State Special Concern	Northern Leopard Frog	Rana pipiens	Known to occur	Unknown
State Special Concern	Northern Pocket Gopher	Thomomys talpoides	Known to occur	Common
State Special Concern	Peregrine Falcon	Falco peregrinus	Known to occur	Unknown
State Special Concern	Plains Leopard Frog	Rana blairi	Known to occur	Unknown
State Special Concern	Swift Fox	Vulpes velox	Known to occur	Fairly Common
State Special Concern	Townsend's Big-eared Bat	Plecotus townsendii	Known to occur	Uncommon
State Special Concern	Western Snowy Plover	Charadrius alexandrinus nivosus	Known to occur	Unknown

The Colorado Division of Wildlife may be contacted for further inquiries into habitat preservation for desired species or if a T&E species is observed.

4.8 KNOWN ARCHEOLOGICAL SITES

There are no known archeological sites on the property. If any archeological sites are ever found on the property, the Colorado Historical Society's Office of Archaeology and Historic Preservation (OAHP) should be contacted at: *http://www.coloradohistory-oahp.org/*.

4.9 UNIQUE RECREATIONAL QUALITIES

The UCC Property Forest has many unique recreational opportunities on the property and nearby. The planned management activities should allow the property to maintain recreational and aesthetic qualities into the future. The surrounding area can provide hiking, wildlife viewing, camping, fishing, river access, mountain biking, road biking, and horseback riding. There are many scenic views on and from the property (**Figure 29**). There are also many wildflowers on the property (**Figure 30**).

Figure 29: Aesthetic views of and from the UCC Property Forest. Views of (A) Elephant Rock, (B) Pike's Peak, (C) Cheyenne Mountain (On Left), and (D) a view of Palmer Lake.

Figure 30: Wildflowers seen during the timber cruise.

SECTION 5.0 PRESCRIPTIONS AND IMPLEMENTATION

Silvicultural prescriptions are defined as a planned series of treatments designed to change current stand structure to one that meets management goals (Helms 1998). The set forth prescriptions for each stand below were developed from the forest management goals stated at the beginning of this plan. Appendix materials regarding management actions can be found in **Section 12.0**.

With the use of Silvicultural prescriptions, (i.e. appropriate mechanical alterations or modifications to the land), the landowner should be able to counteract some of the less desirable forest issues present on the property. The following is a list of different types of treatments that are appropriate for the landowner to implement.

- **"Thin from below"** - the removal of trees from the lower crown classes to favor those in the upper crown classes.
- **"Thin from above"** - the removal of trees from the dominant and co-dominant crown classes in order to favor the best trees from these crown classes.
- **"Free thinning"** - the removal of trees to control stand spacing and favor desired trees, using a combination of thinning criteria without regard to crown position.
- **"Sanitation cutting"** - the removal of trees to improve health by stopping or reducing the actual or anticipated spread of insects and disease.
- **"Pruning"** - the removal, close to the branch collar or flush with the stem, of live or dead side branches (ladder fuels) to decrease fire hazard or improve growth and form.
- **"Patch Cuts"-** the complete removal of overstory vegetation to facilitate the growth of advanced regeneration or to allow a stand to naturally regenerate.

5.1 STAND AND VEGETATION TYPE PRESCRIPTIONS

The UCC Property Forest has been previously managed in the past; but very minimally. There are many areas that need significant work. Most areas are very healthy, but forest management activities are needed to improve overall densities and health. The **number one priority** for the property should be the monitoring and treatment of epidemic insect and disease outbreaks. Endemic Insect and disease activity will always need to be monitored and treated yearly, however during years with heavy tree loss (acreage) due to beetle outbreaks (or other I and D issues), attention should be focused on a treatment strategy before the management actions outlined in the implementation schedule are addressed. It should be remembered that completing the prescribed management actions are necessary for the forest to better resist insect and disease outbreaks in the future, and are necessary to comply with the forest Ag program. Always contact your forester and/or the CSFS before making any changes to your workplan. **Section 6.0** contains **a Work Area Map** outlining where the proposed work areas (by year) are located. Each stand as a whole will receive a prescription below, followed by a clarification for each work type.

VEGETATION TYPE (STAND) 1: PONDEROSA PINE/ DOUGLAS-FIR

Stand 1 has some areas that are open, some that are dense, and some that are dog-haired in nature. Overall the stand density is elevated and should be reduced. As mentioned earlier this stand has an elevated density with 119.7 ft^2 of basal area. A more desirable basal area for this stand would be in the 85 to 90 ft^2 range. To reach this density we should begin by removing at least 95% of all mortality. Only

wildlife appropriate trees (as described in Section 4.6) should be retained. Removal of these dead trees would reduce basal area by about 6.7 ft^2. To reach the final desired density across the stand free thinning of the Douglas-fir will be implemented. To do this follow the guidelines set out in **Table 5**, which would reduce the density by an additional 25 ft^2. The general guideline will to leave 15 foot spacing between tree stems of trees greater than 5" diameter. Along meadow edges thinning can also be completed a little heavier to help feather the work into the meadow. When choosing trees to cut, overtopped, weakened, poor formed, or diseased trees should be removed first. DMT affected trees found in treatment areas should be chosen against. All DMT trees rated 4 or greater should be cut.

Firewood sized material removed during thinning operations should be sold for a profit. Remaining slash and branches can be treated in multiple ways. This material can be chipped, it can be removed, it can be piled for future burning, it can be lopped and scattered, or it can be buried. Chipping and lop and scattering is best for the soil, removal is best for aesthetics, and burning is best for fuels reduction. Depending on the comfort with burning burn piles, it is recommended either burning or chipping is completed. If cost share assistance is received in the future it should be utilized to chip slash since it will leave the best overall treatment to a stand. A central location could also be chosen to process all material if desired. Basically full length trees could be hauled (atv, tractor, or other) to a central site where they would be processed to firewood or other product

1A and 1B can be thinned to the above prescription. In a perfect world 1C would receive the above treatment, but access will preclude this. 1D should be thinned a little heavier since it is the transition area into the meadow and would respond well to thinning, allowing the meadow to remain prominent and discourage meadow encroachment.

Table 5: Removal guide for treatment in Stand 1. This table is based on removing Douglas-fir as the target species. Some areas may be mostly ponderosa pine, but the same guidelines should ensue based on diameter class with the understanding that a 15 foot spacing between tree stems (>5" dbh).

DIAMETER CLASS	EXISTING BASAL AREA (DF)	EXISTING TREES PER ACRE (DF)	RX = % REMOVAL	TREES PER ACRE REMOVED	RESIDUAL BASAL AREA (Df)	RESIDUAL TREES PER ACRE (Df)
DEAD TREES	7.1	102	95%	95	.4	7
2" Class: 0 to 2.9"	1.7	423	75%	317	.4	106
4" Class: 3 to 4.9"	3.8	60	75%	45	.9	15
6" Class: 5.0 to 6.9"	18.5	93	50%	47	9.2	46
8" Class 7.0 to 8.9"	11.7	34	30%	10	8.2	24
10" class: 9.0 to 10.9"	12.5	24	30%	7	8.7	17
12" Class: 11.0to 12.9"	14.0	18	30%	5	9.8	13
TOTALS	**62.2**	**652**	**n/a**	**431**	**37.5**	**221**

VEGETATION TYPE (STAND) 2: PONDEROSA PINE/ SCRUB WOODLAND

The goal in Stand 2 is to decrease density by removing dead and weakened trees and to increase diversity by decreasing oak. Density in this stand is within its normal range however the vertical arrangement of fuels is an issue. Oak is found underneath the dripline of many ponderosa and Douglas-fir trees. This oak can act as a ladder fuel and cause significant damage during wildfire activities. Ground fires can easily move from the ground into the canopy causing severe crown fire potential. Treatment in this Stand would require the removal of this dripline oak to decrease the chance of losing all overstory trees in the event of a wildfire. Dead standing trees should be cut from the stand, but the number of wildlife trees recommended should be followed. Areas that appear to be more pure ponderosa pine should be thinned very similarly to Stand 1. Small Douglas-fir (6" or less) should also be removed since these south facing slopes should be almost free of Douglas-fir.

VEGETATION TYPE (STAND) 3: GAMBEL OAK/ MIXED MONTANE SHRUBLAND

If this stand had better accessibility and was on milder slopes it would be treated to break up the horizontal continuity of fuels and create more of a mosaic structure. Brush reduction is necessary to maintain healthy shrub communities while removing old stagnant shrubs. There are various carrier-type equipment which can be outfitted with a brush mower attachment. To complete the work, areas of healthy oak clumps should be chosen for retention, and these clumps should be retained while the unhealthy clumps in between are cut. The cuts should be approximately 2.5 times the height of the remaining healthy patches. This should result in a range of spacing between remaining patches of 15 to 35 feet. This will allow this important ecosystem to be retained while also decreasing the threat of catastrophic wildfire on the property. Mosaic forest structures are always better able to withstand insect, disease, and wildfire situations. If the material is cut by hand an herbicide such as Garlon can be used to minimize the sprouting of oak. Garlon needs to be applied directly to stumps within an hour or so of cutting to be most effective. It is a localized herbicide and application directly to the stumps minimizes its exposure to other neighboring plants. Native grass seed mixtures should always be applied after an oak patch has been cut. Seeding is best completed in the fall before an oncoming snow has arrived. If herbicide is not used these open areas may need to be revisited every few years with a brush mower piece of equipment to keep sprouting down.

As it stands the accessible areas fall under the Fuelbreak Buffer area discussed below and some small patch cuts will be completed. Conifer found in this stand should be freed of oak under their driplines to decrease this dangerous ladder fuel.

VEGETATION TYPE 4: PERENNIAL GRASSLAND

Noxious weed identification and treatment should be completed annually. Areas where conifers are encroaching should be thinned to make sure the meadow acreage remains on the property.

5.2 IMPLEMENTATION SCHEDULE

Included in this section is an implementation schedule for the UCC Property and a completion record to keep track of the work done. The landowner should use these sheets to record and track all management

activities implemented on the properties. It is understood that annual funding levels, market availability, and mechanical feasibility often limit what management activities can be completed. For example if cost share assistance is received the management plan may be accelerated. If the landowner plans to complete significant work ahead of schedule they should contact the CSFS office to discuss. Therefore the following implementation schedule is to serve the landowner only as a guideline for making forest management decisions. This schedule is to be reviewed every few years; it can and should be amended to accommodate any changes in management priorities. The estimated acreage below does not take into account rock outcrops that may be present in the work area, which could drastically affect the total acreage completed. Since these work areas were also drawn on a map without being 100% ground truthed, the actual acreage may vary. Yearly, the landowner will be responsible for determining actual work areas

The Colorado State Forest Service requires an annual work plan to be filed with the yearly inspection request forms. This inspection request is due by October 1st each year. The annual work plan should be written each year using the suggestions outlined in the implementation schedule and stand prescriptions. Some acres mentioned below will be easier to complete than others, please take this into account when planning annual work plans. Keep detailed records of any wood products sold or given away from the property. When products are given away, these transactions should be assigned a value even if no money changes hands. A detailed record of contracted work and labor should also be kept.

Five categories of work areas have been created. The first category involves **Monitoring** for insect and disease, removing infected trees, spraying for noxious weeds, and determining if priorities will remain the same during the proposed 10 year plan. **Thinning Work** is the completion of thinning to decrease densities, remove ladder fuels, and increase residual spacing of trees. The work starts with the removal of dead, weakened, diseased, or poor formed trees before any live trees are cut. **Fuelbreak Buffer Work** is thinning work completed along the four-wheel drive road that leads from the Capella Street Gate to the top of Ben Lomand Mountain. This road will be improved and a fuelbreak will be centered along its path. There is also a portion of a hiking trail that extends north to the meadow area, and this should also see a fuelbreak centered on its path. **Oak Patch Cuts** are located within the Fuelbreak Buffer and are designed to help create a mosaic structure in this vegetation type while also improving the effectiveness of the planned fuelbreak. And finally, the **Neighbor Agreement Evaluation** areas are locations where the landowner should discuss with neighbors the ability to collect firewood that is in close vicinity of their homes.

MONITORING

The entire property should be evaluated twice yearly once in the spring and once in the fall. The property should be walked to identify insect and disease and noxious weed issues. Identified insect and disease problems should be addressed yearly to ensure that these issues remain endemic on the property. Noxious weeds should be treated yearly to minimize the spread. This is often a much undervalued activity on forest properties, but it can help catch issues before they spiral out of control.

THINNING WORK

Free thinning as mentioned above is a method of selecting trees for removal based on location, not necessarily based on size. The goal is take trees from across the diameter ranges in order to decrease

density and increase spacing. For this property, no trees greater than the 12" diameter class need to be cut, unless they are dead, have active beetles, or pose a safety hazard (Near trail, house, structure, fence etc). During the course of the 10 year plan, free thinning will only take place in Stand 1. Following the prescription above for Stand 1, a spacing of approximately 15 feet between tree stems (>5" dbh) should be achieved. This 15 foot guideline is helpful since we can reduce the prescription to a much simpler visual measurement such as stem spacing (**Figure 31**). It should be remembered that spacing numbers should be increased as the average diameter increases, so areas with larger trees should have more space. Clumps of 5 or 6 trees can also be left to avoid the unnatural look of perfectly spaced trees. However, when leaving clumps extra space should be left in between two clumps to help achieve the same effect of breaking up the continuity.

Figure 31: Using the thinning prescription guidelines yellow arrows were placed on trees that should be removed from the above area.

FUELBREAK BUFFER WORK

This work is designed to create a shaded fuelbreak along the four-wheel drive access road (**Figure 32**) starting at Capella Street and making its way following the ridge of Ben Lomand Mountain. UCC plans on improving this forest access road to make it an emergency fire access road. This would result in the road being at least 20 feet wide with a 45 foot radius turnaround at the end. El Paso County and the local fire department should be contacted to determine the proper road width and building guidelines. The fuelbreak will have a total width of at least 300 feet (150 feet each side). This fuelbreak buffer was divided into 5 different areas based on geography and work type. Section 1 is a 5.3 acre area in Stand 1B that would be an extension of the planned thinning work. The work would actually be centered on a hiking access trail as opposed to the four-wheel drive road. Residual spacing will be a minimum of 10 feet (12 feet preferred) between tree crowns, and the work would focus on removing dead, diseased and dying trees that are in the 12" diameter class or less. Some live trees will need to be cut to reach prescription. Section 2 is a 8.9 acre area that begins at the entrance from Capella Drive and makes its way to the ridge. This area is in Stand 2A and Stand 1B. The same guidelines set forth for Section 1 should be followed, but this area has a lot more oak in the equation. In addition to the thinning, oak found underneath the dripline of overstory trees will need to be cut to remove this dangerous ladder fuel. Section 3 is a 10.3 acre area found along the ridge in Stands 2A and 1B. This area has significantly more

oak and will need to see some small opening made in the oak to create a mosaic structure on the property and break up the horizontal fuel arrangement. Conifer areas will be treated the same as Section 1 and 2. Two .2 acre areas were identified for these patch cuts, although on the ground determinations for number and size of patch cuts will need to be made before project commencement. Section 4 is a 8.7 acre area in portions of Stand 1C, 2A, and 3. It is located along the Ben Lomand Mountain ridge. Four .2 acre patch cut locations were identified, although again ground truthing will be necessary. Conifer areas will be treated the same as Section 1 and 2. Section 5 is a 7.1 acre area in Stand 2A and 3 which is found in the western most portion of the property. Four .2 acre patch cut locations were identified. Conifer areas will be treated the same as Section 1 and 2.

Figure 32: The four-wheel drive two track on top of Ben Lomand Mountain is being encroached by tree ingrowth. Improving this road will provide access to perform forestry treatments, while also allowing an anchor point for fire mitigation strategies should a fire get started in the area.

OAK PATCH CUTS

In the fuelbreak buffer there will be areas that are made up of contiguous oak thickets (Figure **33**). These areas should see the creation of small patch cuts to help create a mosaic structure on the property. The work will also help rejuvenate old decadent oak. These areas will re-sprout so the areas must be revisited every few years to maintain effectiveness or some sort of herbicide needs to be used to stop the sprouting.

Figure 33: The yellow line is the approximate location of the four wheel drive road. Small patch cuts anchored to the road will help improve the road's use as a fuelbreak.

NEIGHBOR AGREEMENT EVALUATION

There are a few areas on the property that are inaccessible except from a neighboring property (**Figure 34**). These areas present a good opportunity to work with neighbors to decrease fire hazards. These neighboring landowners can be given permission to remove designated firewood material in return for completing the thinning work. The areas can be marked with tree marking paint to ensure only the proper trees are removed according to the area prescription. UCC will need to contact neighbors and if interested put together a written agreement to ensure they are protected from liability and to demonstrate the value associated with the removed product sized materials. Four different areas were identified with 6 acres of forest that could easily fall under this agreement. Please refer to **Section 6.0** for the **Work Area Map** to see the different locations planned for treatment.

Figure 34: Some inaccessible areas border neighbors property and may be perfect for developing a neighbors agreement for gathering firewood.

Table 6: Implementation Schedule and Record

IMPLEMENATION SCHEDULE			
YEAR	**TREATMENT**	**STAND LOCATION**	**COMPLETION RECORD**
2010	Have Forest Management Plan Written.	All	Done
	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Monitor Noxious weeds and treat if needed.	All	
	Call NRCS to apply for EQIP funding to assist in completing forest thinning work. (not required)	All	
	Visit the Colorado Forest Products website to post information about firewood or other products that will be available from the property. Contact forest contractors to begin gathering bids for completing work	All	
2010-2011	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Monitor Noxious weeds and treat if needed.	All	
	Apply for American Tree Farm System Status.	All	
	Complete **Thinning Work** in area in new parcel 710400002 working from the meadow into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.5 Acres.**	Transition from Stand 1D into 1B	
	Begin process of contacting neighbors to see if any neighbors are interested in entering a **neighbor agreement**. Areas where this can be done should be marked with tree paint to identify which trees can be removed.	All	
	Begin the process of evaluating the improvement of the four-wheel drive road that accesses the top of Ben Lomand Mountain. This road should meet the minimum guidelines for an emergency access road which is typically 20 feet width with a 45 foot radius turnaround at the end. As road work is being completed the different sections of the fuelbreak 1-5 can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or	All	

	firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned		
2012	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area west of 2010-2011 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.3 Acres.**	Transition from Stand 1D into 1B	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
2013	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area east of 2010-2011 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.3 Acres.**	Transition from Stand 1D into 1B	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
2014	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area east of 2013 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.3 Acres.**	Transition from Stand 1D into 1B	
	Continue evaluating the improvement of the four-	Stand 1B and C	

	wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
2015	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area northeast of 2014 work. Work in this area will be primarily focusing on improving the spacing of remaining trees to at least 17 feet between tree stems. Some clumps (3 to 4 trees) can be kept but the average spacing should be 17 feet. Refer to work area map for location. **Approximately 8.8 Acres.**	Stand 1D	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
2016	Evaluate the work that has been completed and what still needs to be done. Catch up if needed. Implementation can be re-prioritized if needed.	All	
	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area east of 2014 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.0 Acres.**	Transition from Stand 1D into 1B	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
2017	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust	All	

	implementation schedule if needed. Monitor Noxious weeds and treat if needed.		
	Complete **Thinning Work** in area east of 2016 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.2 Acres.**	Transition from Stand 1D into 1A	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
2018	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area east of 2017 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.0 Acres.**	Transition from Stand 1D into 1A	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
2019	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area east of 2018 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.7 Acres.**	Transition from Stand 1D into 1A	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or	All	

	piled and burned		
2020	Evaluate the work that has been completed and what still needs to be done. Catch up if needed. Implementation can be re-prioritized if needed.	All	
	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Complete **Thinning Work** in area east of 2019 work starting from the meadow and entering into the forest. Follow the prescriptions as outlined above. Refer to work area map for location. **Approximately 4.2 Acres.**	Transition from Stand 1D into 1A	
	Continue evaluating the improvement of the four-wheel drive road and the associated fuelbreak work areas (1-5) that can be completed.	Stand 1B and C Stand 2A Stand 3	
	Sell or utilize large material as post and poles or firewood. Approximately 3 to 5 cords of firewood per acre should be removed. Slash should be chipped, or piled and burned	All	
Future	Have new 10 year Forest Management Plan written to reflect changes in the forest and changes in goals.	All	
	Walk and **Monitor** the property and address Insect and Disease issues as they arise. Adjust implementation schedule if needed. Monitor Noxious weeds and treat if needed.	All	
	Continue thinning to the eastern boundary and completing fuelbreak thinning if not complete.	All	

SECTION 6.0 MAPS

(While all efforts are made to ensure maps are accurate, they are not survey grade and thus not legally binding)

SECTION 7.0 GLOSSARY

acre: one acre is approximately 209 feet by 209 feet or 43,560 square feet.

basal area: the cross-sectional area of a single stem, including the bark, measured at breast height (4.5 feet).

blowdown: trees felled or broken off by wind.

codominant trees: trees with crowns forming the general level of cover and receiving full light from above and very little from the sides.

cohort: an aggregation of trees that starts as a result of a single disturbance

coppice: the production of new stems from the stump or roots; to cut the main stem at the base or to injure the roots to simulate the production of new shoots for regeneration.

defensible space: an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure.

density-dependent mortality: trees which die as a result of other (usually larger) trees being able to out-compete them for light, water, and nutrients.

diameter at breast height (DBH): the diameter of a stem of a tree at 4 ½ feet above the ground.

dominant trees: trees with crowns extending above the general level of cover and receiving full light from above and partly from the sides.

endemic insect and disease activity: localized natural populations of insect and disease.

epidemic insect and disease activity: an outbreak of insect and disease that spreads more quickly and more extensively than would normally be expected

even-aged stand: a stand of trees composed of a single age class.

fuel loading: the oven-dry weight of fuel per unit area.

improvement cutting: the removal of less desirable trees of any species in a stand of poles or larger trees, primarily to improve composition and quality.

individual tree selection: the removal of single mature trees to allow for growing space for new regeneration to take place.

intermediate trees: trees shorter than codominant and dominant trees, which receive little direct light from the top and none from the sides.

ladder fuels: vegetative materials with vertical continuity that allows fire to burn for the ground level up to the branches and crowns of trees (Dennis 1999).

litter: the surface layer of a forest floor that is not in an advanced stage of decomposition, usually consisting of freshly fallen leaves, needles, twigs, stems, bark, and fruits.

minimally operable: an area where normal forest management activities are difficult due to access, slopes, rocky outcrops, or dangerous situations. These areas may not be accessible for product harvesting and growth, but can see some minor (pruning, felling of I&D trees, removal of ladder fuels 3" or less) forest management activities.

noxious weed: a plant specified by law as being especially undesirable, troublesome, and difficult to control.

overtopped or suppressed trees: trees with crowns entirely below the general level of the crown cover, and receiving no direct light from above or from the sides.

patch: a small part of a stand or forest.

prism: a forestry tool used to visually capture trees at certain distances based on their diameter.

pure stand: a stand composed principally of one species, conventionally at least 80 percent based on numbers, basal areas, or volumes.

riparian area: related to, living, or located in conjunction with a wetland, on the bank of a river or stream but also at the edge of a lake or tidewater.

serotinous: pertaining to fruit or cones that remain on a tree without opening for one or more years.

skid road: a road on which logs are hauled.

snag: a standing, generally un-merchantable dead tree from which the leaves and most of the branches have fallen.

stand: a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

stand improvement: after a stand is successfully established, various tools are used to track stand development, treatment during this stage may include altering composition, pre-commercial thinning, fertilization and commercial thinning.

thinning: a cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or recover potential mortality.

uneven-aged stand: a stand composed of multiple age classes.

windbreak: a strip of trees or shrubs maintained mainly to alter windflow and microclimates in the sheltered zone, usually farm buildings.

windfirm: trees able to withstand strong winds and resist windthrow, open grown trees tend to grow slower and develop deep root systems whereas some species grow within a stand which acts as a buffer, thinning in this second type needs to be completed in stages to allow remaining trees to increase their windfirmness.

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SECTION 9.0 INVENTORY AND BACKGROUND MATERIALS APPENDIX

SECTION 10.0 INSECT, DISEASE AND WEED APPENDIX

SECTION 11.0 FIRE, FUELBREAK, AND DEFENSIBLE SPACE ETC. APPENDIX

SECTION 12.0 MANAGEMENT ACTIONS APPENDIX