

Forest Land Analysis

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Introduction

This inventory and analysis is intended to provide an overview of the forest lands, present and historical. The process used was to: review aerial photography, review watershed analysis documents completed by the Bureau of Land Management (BLM) and United States Forest Service (USFS) and conduct field reconnaissance. The emphasis area was the non-industrial private forest lands (NIPF) in the Illinois Valley floor and associated uplands.

Summary of Concerns

The overall picture of the non-industrial private forest lands shows there are treatment needs. Much of these lands could use a long-term forest management plan, detailing the type of treatments that are needed. Also identified is a shortage of information on the non-industrial private forest lands. Data needs include: inventorying forest roads, landings and skid trails to identify erosion/sediment problems and soil compaction concerns, inventory of riparian areas to identify inadequately vegetated areas and species composition of present riparian zones, and forest stand inventories for the development of treatments to aid in management decisions. Along with the data needs is the need for educating landowners about forest/tree management so sound decisions can be made based on their objectives and the health needs of the forest.

Historical Overview

Prior to the 1850's, the native Americans set, or allowed to burn, fires that maintained a balance in the forested vegetated community. In the 1850's, with the discovery of gold in the valley, the influx of miners started the change of the forested plant community. Miners harvested trees to provide them with timbers needed for mining. Settlers followed the miners, clearing bottomlands and gently sloping uplands for agricultural use. With more and more settlers, wildfire became a concern.

The pre-settlement plant community of the forest land was very diverse. This was due to the diverse geology, soils, precipitation and terrain. But, with fire suppression, timber harvesting and land clearing, the plant community have drastically changed. This was noted in the BLM Kerby watershed analysis. In the analysis, their review of the O&C Land Survey Notes (of 1916) described the forest. Sugar and Ponderosa pine were abundant and dominated most of the stands. Douglas-fir was present, but was growing under the pine overstory. The pine species were large (32 to 36 inches) in diameter, and even though large and dominant, only a few (3 to 8) trees per acre were present. The forested landscape was also open. Dense stands were described as having 20 trees per acre and normal stands were 10 to 15 trees per acre. This was probably the flatter slopes

and bottom lands where it is possible that tree harvesting had been done prior to the survey.

Harvesting of the non-industrial private forest lands took off in the late 1940's and lasted into the mid-to-late-1950's. The pine species (Ponderosa and sugar) were the desirable species and the largest ones present in the forest. As the pine ran out, the Douglas-fir that was already present took over the stands. Harvesting dropped off in the 1960's, 1970's and most of the 1980's. In the very late 1980's and early 1990's, with harvesting on Federal lands declining, harvesting of non-industrial private forest lands quickly increased. The non-industrial private forest lands that were logged in the late 1940's and early 1950's and regenerated, are now in the 49- to 50-year age class.

The exclusions of fire, mostly low-intensity fires, has lead to conversion of forest stands, heavy build up of forest fuels, increased brush component in the understory and higher potential insect outbreaks.

Current Conditions

Vegetation Conditions East of Highway 199: The non-industrial private forest lands are generally in poor condition and do not resemble what they looked like 100 years ago. The forest lands that were once pure pine or pine/Douglas-fir mix have become Douglas-fir dominated stands. These conditions generally occur on droughty soils, shallow soils and on southeast-to-westerly-facing hillsides (100 to 270 degrees). This has occurred due to two factors: harvesting of Ponderosa and sugar pine, and the exclusion of fire.

Overstocked conditions are a result of poor forest management decisions. When the pine was harvested, the remaining shrub and/or hardwoods quickly filled in the voids left. The pine, which need full sunlight and little-to-no competition to get established, were out-competed by the existing vegetation. This led to a majority of the stands being converted to hardwood, hardwood/pine mix or Douglas-fir/pine mix. Where pine is present, it is in a limited amount or vegetation manipulation has occurred that benefits the pine.

Where forest stands are overstocked, it is usually a mixture of conifer and hardwood trees. On south-facing slopes, hardwood species are abundant and make up a moderate-to-high percentage of the stand. On north-facing slopes, Douglas-fir dominates and hardwoods make up a low-to-moderate percentage of the stand. The commercial trees (pine and Douglas-fir) are generally small, averaging 8 to 12 inches in diameter. They are small due to the growing conditions (soils, space and moisture) not being able to support the current number of trees. The productivity (amount of biomass produced per acre) may be the same as a stand with fewer trees, but it is produced on a larger number of trees, thus trees are smaller. Fewer trees per acre would lead to increased growth on the existing trees, producing larger trees which are easier to market.

The overstocked conditions can also lead to poor tree health. A less vigorous tree is more susceptible to insect attack and/or disease. Vegetation changes (conifer acreage and

density) have increased the habitat for potentially damaging insects. Needle feeding insects, Douglas-fir tussock moth, western spruce budworm, and other populations could dramatically increase, leading to a disastrous outbreak ending in large areas with tree mortality or significant growth reduction for a number of years. Drought can also increase stress on trees, which can add to possible insect outbreaks.

The overstocked stands have also benefited from years of fire suppression. It is thought that low-intensity fires occurred approximately every 20 years in the lower elevations and 25 to 35 years in the higher elevations. These fires would keep shade-tolerant trees from growing up through the shade-intolerant species. The fires would also keep brush and dead material from building up on the forest floor and becoming a high fire hazard area. Since fires have been suppressed for many years, the opposite now exists.

The forest is overcrowded and has very high fuel loads and dense brush, creating a fire ladder into the tree canopy. These three factors contribute to the increased forest fire hazard potential. Where fires were once considered low-severity, they are now considered moderate- and/or high-severity.

The cut overlands were once well stocked with Ponderosa and/or sugar pine or Douglas-fir. As the stands were harvested, regeneration of pine in the forest has been poor. When harvesting started, the pine species were the most desirable. The pine stands were high graded when harvested. High grading is the practice of taking the best and largest trees (greater than 12 inches diameter base height) and leaving everything else. This type of forest management leads to poor quality stands that generally do not regenerate and end up with low production. Where Douglas-fir was left in the overstory, it regenerated. These stands are now dominated by Douglas-fir.

The stands that were once dominated by large oaks or were oak/pine mix have been invaded by Douglas-fir. Through the exclusion of fire, Douglas-fir seedlings were able to get established under the oak overstory. Through time, the seedlings grow up through the canopy of the oaks and eventually overtop them. The oaks eventually die due to being shade intolerant.

Vegetation Conditions West of Highway 199: Most of the forest lands in this area are unique. The vegetation is heavily influenced by the ultramafic (serpentine) geology. As soils develop from the serpentine rock, heavy minerals are released, creating a chemical imbalance in the soil. The vegetation adapted to these conditions are very unique and are not found on any other geology or soils within the Illinois Valley. These serpentine areas are lightly stocked with trees but have a heavy shrub component. When trees are removed from these soils, natural or artificial regeneration is difficult. Much of the forested area that has been harvested has not regenerated. Currently, brush species dominate these site.

Roads

Road development allowed for the removal of timber for the last 50 years. Early on in timber extraction, little planning went into putting in a new road. If a road was needed, it was pushed through. On the private lands, most roads are natural surfaced, with the exception of roads servicing homes, which have some type of all-weather surface. These natural-surface roads can produce significant amounts of runoff, carrying sediment into streams. Proper road design, culvert placement and erosion control practices are needed to protect water quality in streams.

Skid trails from logging operations also contribute to water quality problems. Any heavy equipment that makes several trips over the same path compacts the soil. These compacted soils have a much slower infiltration rate and a much higher runoff rate. Skid trails and roads that direct runoff water into streams create adverse impacts through siltation. The silt negatively impacts water quality and fish spawning.

Road development near streams has led to parts of streams being somewhat channelized. Channelization has removed back eddies and stream meanders that create habitat for fish.

Riparian Areas

The valley, which is a series of flood plain terraces, was once a wide, treed valley. Large conifers, probably Ponderosa pine, were present along with black oak, white oak, Oregon ash, black cottonwood, shrubs and grasses. The pine were probably spaced far apart, but were high above the hardwoods. Black oak, white oak and Oregon ash made the remaining canopy cover in varying degrees.

Riparian habitat on the Illinois Valley floor has been manipulated greatly. Much of the riparian vegetation has been cleared for agricultural use. Sections of riparian areas along streams have no vegetation. Where there is vegetation, it is a narrow bank of trees, mostly hardwoods, along the stream/creek banks. Some of the creeks/streams have been channelized, too. This has sped up the water movement in the channels. Less flooding now occurs due to more rapid movement of the water through the stream channel.

In the forested riparian areas of the valley and the uplands, there is a general mix of tree species. In some areas, conifers dominate and in other areas hardwoods dominate. In the 1940's, 1950's and 1960's, much of the conifer component of the riparian areas was harvested and removed. This has caused a loss of coniferous large woody material in the streams and the recruitment of conifer material in the future. Generally, what now exists are hardwood stands with scattered Douglas-fir entering the canopy of the hardwoods. Given enough time, the conifer will outgrow and overtop the hardwoods. If enough conifers are present and create enough shade, over time the hardwood will decline in the canopy.

Results/Discussion

Much of the forested soils west of the highway are not productive because of the serpentine influence. The areas where forested conditions do not exist, due to harvesting

or fire, need to be revegetated. An evaluation of re-establishing trees or letting natural processes take place needs to be completed. The environmental positive and negative impacts need to be weighed against the costs of establishing trees.

The forests east of the highway are manageable. Sound management decisions need to be made based on the expertise of local professional foresters. Where stands are overstocked, thinnings are needed to improve the health of the trees. Also, trees left to manage should be based on soils, precipitation and growing environment. Where stands are overstocked with conifers and hardwoods, the conifer trees need release by removing or killing the hardwood species. Where the current stands are mostly brush or hardwood trees, stand conversion to pine or Douglas-fir should be considered. When stands are to be entered with heavy equipment for thinnings or harvesting, establishing and using designated skid trails is highly desirable. Establishing permanent skid trails will reduce the amount of soil damaged by compaction. The compaction of the soil is recognized as reducing the productivity of trees.

Roads, skid trails and landings can and do contribute silt to streams. Data could not be found inventorying the non-industrial private forest road system. A detailed inventory needs to be completed, locating and identifying the severity of soil erosion on roads, skid trails and landings that contribute sediment to the stream system.

In the riparian areas, what now exists are hardwood stands with scattered Douglas-fir entering the canopy of the hardwoods. Given enough time, the conifer will outgrow and overtop the hardwoods. If enough conifers are present and create enough shade, over time the hardwood trees will decline in the canopy. Where vegetation does not exist or is not adequate, planting tree and shrub species is needed. New plantings or enhancement of existing riparian areas should be of adequate width to meet the intended purpose.

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