Silvicultural Prescription
Unit G3

Completed for the City of Ashland by
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March 2001

Introduction

The City of Ashland owns approximately 650 acres within the topographical confines of the Ashland watershed These lands are being actively managed to help achieve predesignated objectives as defined by the City. Watershed protection and enhancement to provide a stable supply of drinking water for municipal Ashland is the primary land management objective for City-owned lands. To help achieve this primary objective, three major areas of management emphasis have evolved.

1. Wildfire management strategies have been designed and implemented to manipulate vegetation in ways to minimize the potential for large scale, high intensity wildfire.

2. Assessment of geologic hazard and potential instability has been undertaken, with appropriate modification of management strategies in those areas so identified.

3. Silvcultural and stand management strategies designed to improve overall forest health values (e.g. reduction in stand densities, improvement in tree vigor, etc.) and maintain and/or improve (on the Winburn parcel) late-successional values.

In the last five years, the City has accomplished considerable vegetation manipulation designed to achieve the above-stated objectives. As part of that ongoing process, the City is beginning to consider vegetation manipulation on steeper lands identified as having geologic concerns. To initiate experimental work in yhis arena, the City has selected an area, Unit G3, in which to begin this work. Billy Hicks, consulting engineering geologist, completed an analysis of slope stability issues in Unit G3 in February,2001. The following silvicultural prescription recommends treatments to be implemented in this unit based on the analyses and recommendations supplied by Mr. Hicks.

Silvicultural Prescription

Unit G3 is a 5 acre unit located on the west side of Ashland Creek just north of and across the creek from the City of Ashland water treatment facility. The unit is located primarily on 40 to 70 percent easterly aspects, with some oversteepened slopes in the inner gorge immediately above Ashland Creek. Soils, as throughout the City of Ashland ownership, are highly erosive decomposed granitics of the Tallowbox soil series. The northern boundary of the unit is marked by a massive debris avalanche that occurred in the New Years Day storm of 1997. This major erosional feature is described in detail in Hicks' report (2/13/01).

Unit G3 is currently dominated by a dense stand of 40 year old mixed conifers and hardwoods initiated after the intense 1959 wildfire. In that event, almost all of the vegetation in Unit G3 was removed as the wildfire burned all the way to the creek. Natural regeneration of Douglas-fir, as well as stump-sprouting of Pacific madrone and California black oak (and perhaps some natural regeneration of these hardwoods) following the wildfire has totally restocked this unit.

Permanent inventory plots installed in 2000 indicated the following stand measurement data:

	Trees Per Acre	Basal Area (ft^2/acre)	Quadratic Mean Diameter (inches)	Relative Density
DF	248	34	5.0	
PM	233	56	5.7	
CBO	143	8	3.2	
Total	623	98		.434

These numbers clearly indicate that the existing stand is overstocked and could definitely benefit from a non-commercial thinning to improve stand densities and maintain a vigorous stand of dominant trees. Thinning at this stage of stand development is much preferable to waiting until excessive stand densities have occurred and preferred leave trees are suppressed and of low vigor. This condition has occured throughout much of the City of Ashland ownership in 90 to 100 year old stands that developed in the absence of stand disturbance (i.e. frequent,low-intensity fire).

Non-commercial thinning should be "from below" in this stand, as the preferred leave trees are consistently the larger, more vigorous dominants. These larger leave trees are currently exhibiting the best crowns and superior growth rates, and will be most likely to respond to the more favorable stand conditions and sudden availability of site resources following thinning. Over two-thirds of the stems in this unit are below 6 inches DBH, and these are the trees in which removal should be focused.

There are approximately 100 Douglas-fir per acre above 6 inches DBH and these should form the basis of the coniferous component of future stands. Virtually all of these exhibit crown ratios of 40% or higher- indicative of trees that can release quickly and dramatically following thinning. Obviously, 100 trees per acre would be insufficient if a conifer plantation was desired. However, given the objectives of the City of Ashland, there is not a compelling reason for trying to convert this stand from a mixed species stand of hardwoods and conifers to one solely dominated by conifers, in this case Douglas-fir. Pacific madrone is currently as vigorous and dominant as Douglas-fir, and in many places in the unit appears more abundant, vigorous, and appropriate as a leave tree than adjacent Douglas-fir. Quadratic mean diameter is actually higher for Pacific madrone (5.7") than for Douglas-fir (5.0") in this even-aged stand, indicative of the rapid early growth rates of Pacific madrone. There are many good reasons for maintaining a mixed stand of hardwoods and conifers at this time in Unit G3 including wildlife habitat, site productivity and perhaps wildfire management benefits (i.e. there is some limited evidence that mixed stands may in fact be less susceptible to wildfire that single species stands, particularly as compared to dense early-successional stands of conifers). Furthermore, hardwoods may be just as efficient as conifers at providing slope stability support and promoting a stable supply of water.

Snags can also be retained in the unit for their inherent wildlife habitat value unless they are a safety hazard or if they extend above the existing canopy. The rare taller snag should be felled to minimize potential wildfire spread towards the water treatment facility.

Being an aggressive early-successional species, Pacific madrone is well poised to respond to stand density reduction, perhaps even moreso than Douglas-fir. Maintaining vigorous Douglas-fir in this stand may require a somewhat more aggressive removal of hardwoods, particularly in the immediate vicinity of a preferred, vigorous, dominant Douglas-fir leave tree.

California black oak are generally much smaller and more suppressed than other species in the unit, with a quadratic mean diameter of only 3.2 inches and no individuals greater than 8 inches DBH, at least in the plots inventoried. This species should be prioritized for a leave tree if any can be found (this may be difficult given the small, suppressed stature of the trees in this unit) that are well-exposed to sun and reasonably vigorous, as larger black oaks contain inherently valuable wildlife habitat values. The rare occurence of any other species (e.g. incence cedar, bigleaf maple, ponderosa pine, etc.) should be prioritized for a leave tree as well to promote species diversity within the unit.

Overall, it is suggested that approximately 250 to 350 trees per acre be retained in this initial non-commercial thinning from below. This may seem like a high number (most tree planting occurs at a rate of 300 to 450 trees per acre), but maintenance of full site occupancy is important from a slope stability perspective in this unit. Thinning-from-below to these numbers per acre should maintain relative densities close to 0.35- the point of initiation of full site occupancy. After stand stabilization has occurred following thinning, a second entry can occur in the future to establish more desirable stand conditions if needed.

Approximately equal numbers of Pacific madrone and Douglas-fir should be retained in the overstory at this time, with a leaning towards promotion of vigorous Douglas-fir, everything else being equal. The more shade tolerant Douglas-fir can be retained as a small, understory tree if it looks vigorous enough to grow to full maturity in the thinned stand. Shade intolerant Pacific madrone should not be retained as an understory tree, however. Inventory analysis indicated that all Pacific madrone 8 inches DBH or less had crown ratios of 25 percent or lower.

The above-described prescription should pertain to all areas delineated in the Hicks report in which 100% thinning could occur. This prescription should result in stand conditions very similar to the small sample areas already treated that are described in the Hicks report. In the areas delineated by Hicks in which 50% thinning could occur, it is recommended that these areas be treated in equal and alternating treated and non-treated contour strips.

No treatment areas as outlined in Hicks report should be retained for slope stability reasons. These areas can serve as comparisons with adjacent treated areas over time to assess differences in stand conditions and slope stability.

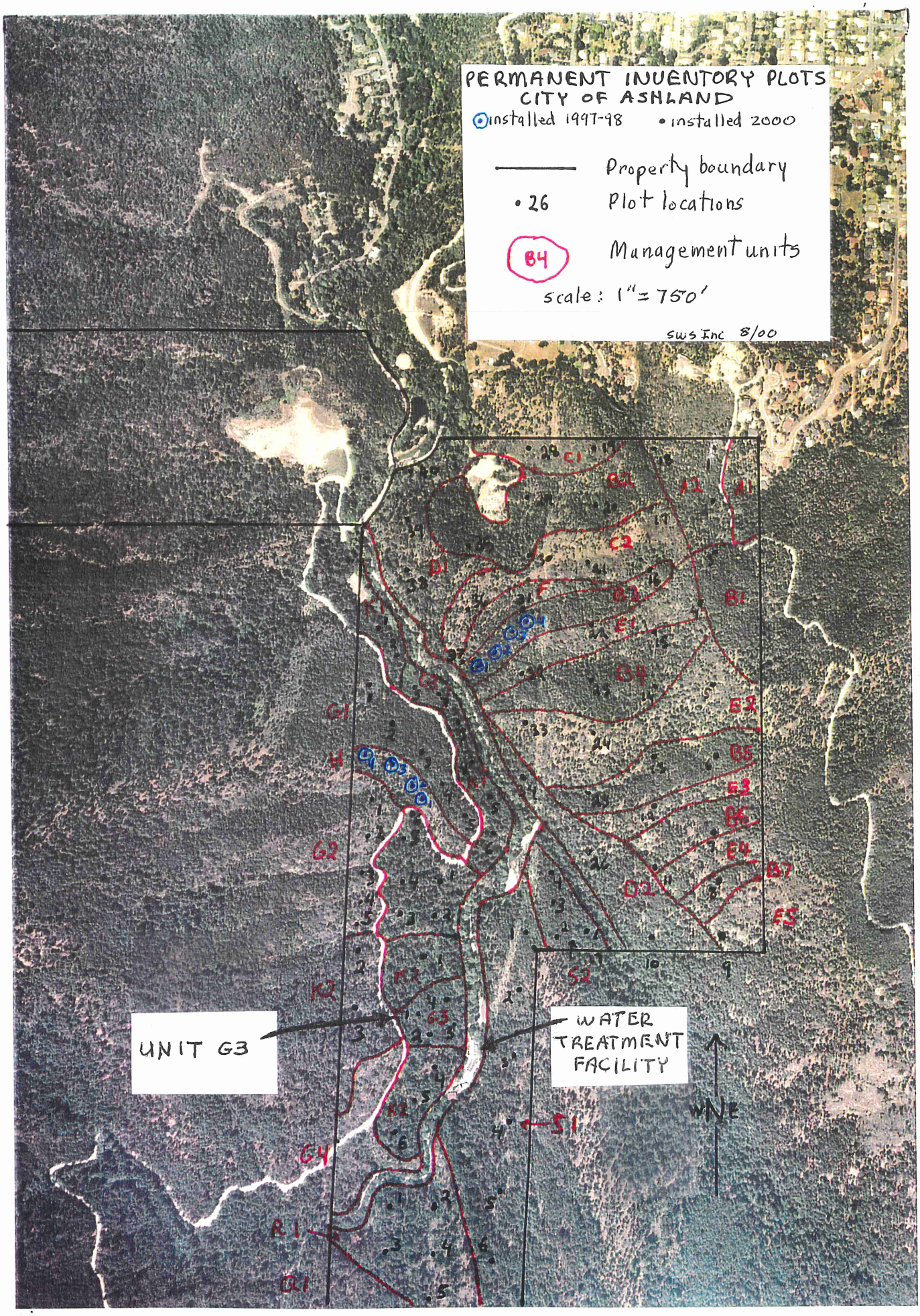
All thinning slash developed in this operation should be piled-and-burned. Although this unit is not in an ideal topographical location from a wildfire management perspective, its location immediately downcanyon from the water treatment facility make ongoing fuel reduction and potential minimization of wildfire behavior a high priority. Numerous old decayed stumps and rotten logs from the 1959 wildfire will make pile burning in this unit quite tricky, however, and careful pile placement,monitoring and mop-up will be needed to prevent long-term holdover fire.

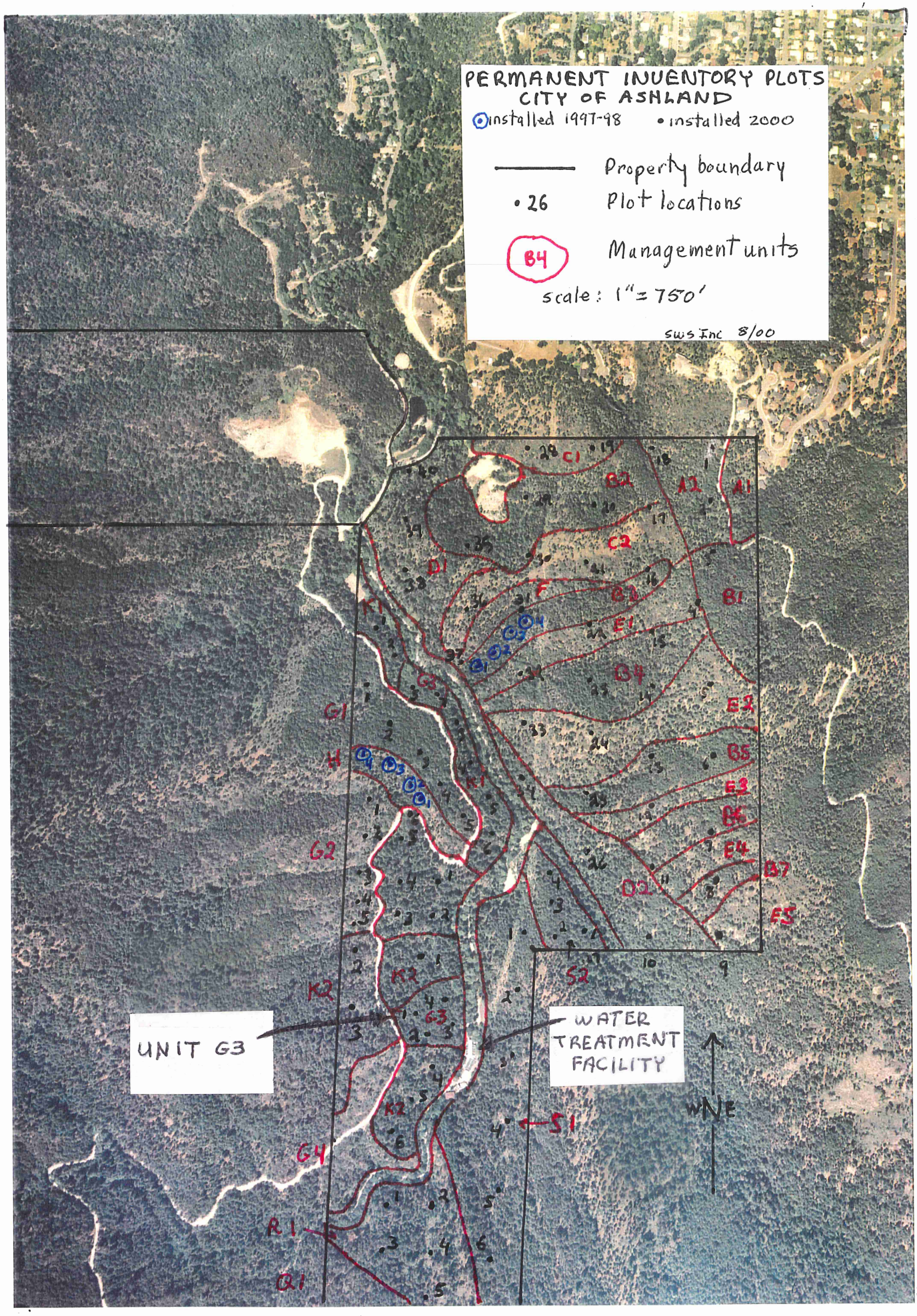
Long-term management direction should be towards an older mixed conifer/hardwood

stand, with increasing emphasis towards encouraging larger diameter fire-resistant Douglas-fir. This vegetation type, dominated by larger overstory conifers with a noticeable lack of understory and/or mid-canopy ladder fuels, is probably the preferred type from a wildfire management perspective, while still maintaining other important slope stability, forest health, and wildlife habitat objectives. It is suspected that this type was well-established throughout the watershed in the pre-settlement era. Intense wildfire (e.g.1901,1910,1959) followed by extended periods of fire exclusion (unlike frequent, low-intensity fire as the dominant disturbance type in the pre-settlement era), have encouraged development of much denser, multi-canopied stands with extreme fuel loads and stand structures that have increased the likelihood of yet another large-scale, high intensity, highly destructive wildfire. Breaking this cycle of infrequent, high intensity disturbance should be a high priority on City-owned lands in the Ashland watershed.

Infrequent, high intensity disturbance regimes initiated within the last 100-150 years have also greatly increased the abundance of those species that thrive in these disturbance types. In this unit, the most notable of those species are the hardwoods that are well-adapted to respond to and even benefit from wildfire by increasing their abundance through rapid sprouting from below-ground root crowns. It is unlikely that hardwoods were as abundant in the pre-settlement era when frequent, low-intensity fire would have prevented establishment of hardwoods that grow quite slowly as seedlings. On the Winburn parcel, a City-owned parcel in the late-successional reserve portion of the Ashland watershed, inventory results indicate that older, larger hardwoods (16" DBH and greater) pre-dating the turn of the century are quite rare, but much more common (up to 100 trees per acre) in smaller, younger classes. Conversely, intense disturbance, such as clearcut logging or high intensity wildfire, has increased hardwood composition in most low to mid-elevations in southern Oregon (including the Winburn parcel), often discouraging development of conifers in the process.

Determination of desired future stand conditions in units like Unit G3 (e.g. similar to pre-settlement stands dominated by large conifers; mixed species stands with greated amounts of hardwoods more typical today; etc.) is a topic that should be discussed in the years to come. In the meantime, this prescription maintains options for an assortment of future stand development trajectories, while improving stand conditions and reducing wildfire potentials in the short-term. Monitoring the different management strategies in treated and non-treated areas in this project should help provide insight in the years to come as to appropriate stand structures, densities and species mixes for achieving desired management objectives (i.e. effects on slope stability; differences in stand development responses; long-term changes in wildfire management potentials; etc.).


PERMANENT INVENTORY PLOTS
CITY OF ASHLAND
installed 1997-98
installed 2000
Property boundary
26
Plot locations
B4
Management units
scale: 1" = 750'
sws Inc 8/00
UNIT G3
WATER TREATMENT FACILITY
WNE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