



# CALIFORNIA FORESTRY NOTE

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## A Comparison of Techniques for Measuring Canopy in Watercourse and Lake Protection Zones

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### Abstract

We investigated seven methods for estimating overstory crown canopy. Subjective ocular estimates were compared with the more objective sampling tools; vertical sighting tubes and spherical densiometers. Intensive and controlled measurements allowed us to compare accuracy. We also present the time required to complete the different methods. Ocular estimates based on a walk-through of the riparian area proved sufficient for most pre-harvest evaluations. These estimates were always underestimates, which is conservative from a public trust resource perspective. Estimates that are more accurate require the use of a vertical sighting tube. We recommend the use of the vertical sighting tube to sample canopy along transects rather than plots, as the former are more efficient.

### Introduction

California forest practice regulations establish minimum overstory canopy retention levels in Watercourse and Lake Protection Zones (WPLZs). Additionally, guidelines for protecting the habitat value for federally listed threatened and endangered fish species incorporate canopy retention standards as a surrogate for shade (Anon. 1997). Overstory canopy, in the context of the California Forest Practice Rules, has usually been evaluated via ocular estimation. When more objective estimates were desired, practitioners have primarily used spherical densiometers (Lemmon 1956), a curved mirror with an etched grid and bubble level. Recent literature criticizes the spherical densiometer as a tool for measuring overstory canopy cover (Bunnell and

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