

USE OF AERIAL PHOTOGRAPHS
IN
LOGGING OPERATIONS

SEMINAR F-407

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There is the old saying that a person can not see the forest because of the trees. But through the years aerial photography has been developed, and the aerial photographs enable us to see the forest quite well.

During these years of the use of aerial photographs in forestry, they have been mainly used for forest management and not for production management. But in the last few years it was discovered that the photographs contained a wealth of information for production.

A successful logging operation can result from efficient planning, and it has been found that this planning can be helped by the use of aerial photographs.

Following are the different uses of photographs for the logging operation:

Operating Maps for Logging Plans

Operating maps are those which are designed specially to cover the logging operation in a certain area, usually a single drainage or operating unit. These maps contain all the available data on the area and, consequently, are much more detailed than ordinary cruise maps.

Due to the amount of information which must be shown on the maps, the photographs are enlarged to a scale of one inch to ten chains.

The photographs of the area are studied and this study coordinated with ground work to determine the actual stands of timber to be logged, the photograph study saving many hours of ground work. Once these stands in the operating area are determined, much information can be obtained from the photographs for the logging plans.

Roads are a big factor in logging plans and logging costs. It has been found that aerial photographs are valuable in planning an efficient road system in operating areas. A study of the photographs under the stereoscope helps a logger to visualize the topography, location and volume of timber to be logged. The information from the study will help determine the skidding layout; and then the roads will be planned from the skidding requirements and also from the timber volumes, for roads are not spaced as near in light stands as in dense stands of timber.

The factors that govern the type of equipment that is determined for logging planning can be determined from aerial photographs. Steep topography and dense stands or gentle topography and light stands govern whether high-lead or cat logging will be used. An area with large timber requires heavy logging equipment, and vice versa. Topography also determines truck requirements.

Another part of logging that can be planned from aerial photographs is the landing. Landings have to be spaced just right for efficient yarding, but still can be

located at only certain spots because of topography and loading requirements. The required spacings can be determined, and the possible areas for lands can be located from aerial photographs.

Road Location

Road location cannot be completed without some ground work but much preliminary work can be carried out before going into the field. Starting at the road's point of origin, the photographs are studied stereoscopically. The possible locations are studied and then marked by colored pencils. Following the photograph study an actual inspection is made on the ground of the possible routes to determine the most desirable one. After the route is determined the entire road may be layed out as a series of tangents on the photographs. The point of origin and termination of each tangent is carefully located with respect to the features that can be identified on the photograph. The bearing and distance of each tangent would be computed on the photograph. After this is accomplished, the work would be finished on the ground by the engineering crew.

Logging Costs

Besides stand per acre and total volume, the important factors affecting logging costs are: total miles of branch and main line road, skidding distance, and topographic

features. These factors are determinable from a stereoscopic study of photographs and provide valuable data for estimating costs.

Cut Location

Photographs are also used for mapping cut-over areas. The cut inspector carries them in the field and cuts are located on the pictures instead of maps. With photographs, the inspector has a better picture of the ground on which cutting has taken place. Consequently, he is in a better position for mapping the areas. Ties, such as section corners, can be more easily located to reference the cutting area.

Some companies map the cut-overs right from the photographs. After each logging season, the logging areas are flown and photographs are taken for the mapping purpose. As has been proven, this type of mapping is more accurate than by ground methods.

Photographs for Overhead Personnel

A set of photographs for the logging foreman and one for the bull buck helps the men in their work considerably. Carl Coleman, superintendent of the Kinzua Pine Mills, says that he finds that the men study the pictures at night in order to prepare for the next day's work; they refer to the photographs in their discussions of problems and that they are able to go ahead without close supervision since they

can discuss and settle problems by reference to the photographs before the problems come up.

Breaking in new supervisory personnel is speeded up and accomplished in a more satisfactory manner with the use of photographs of the operating area. The new man is quickly oriented which otherwise would take several weeks of walking over the ground.

Timber Acquisition

Any tool which enables the logger to better determine where timber is located and the most economical way to get it out is a money and time saving asset. This asset can be aerial photographs. A logger who has an accurate set of photographs and the ability to use them can evaluate an area of timberland in dollars and cents within a very short time. This evaluation can result into a decision to purchase a tract of timber in question for a certain price or not to purchase it at all. In dealing for small blocks this method is very valuable. Of course in dealing for large blocks of timber, ground study would have to be carried on along with the aerial photograph study.

If an aerial mosaic can be obtained, a whole acquisition program can be based upon the study of the mosaic. Knowing the needs of the conversion plant, the average volume per acre and the average growth per acre on areas in question, location of desirable acreage is quickly

determined. Priority of acquisition based on quality, volume, and accessibility can be worked out with a minimum of field work.

Fire Control

For efficient fire control planning by a logging or lumber company, timberland is classified for rate of spread of fire and resistance to control. The classification can be determined by inspection of the vegetation type and topography on aerial photographs.

The best routes to fires can be determined by the photographs. A logging crew that has to fight a fire can efficiently be dispatched to a fire where the best routes are already determined.

The crew foreman can also be quickly orientated and familiarized with the area by study of the photographs. By doing this, the foreman can lead his crew to a more effective initial attack.

Estimating Ground Conditions

A person who can interpret aerial photographs can estimate ground conditions by determining the vegetation reflects the general characteristics of the ground. Willows prefer stream banks or other damp areas. Sagebrush and juniper indicate very dry sites, and baldcypress thrives only in swamp land.

From this information, the logger can determine some of the problems he might be faced with for access road construction. For example an area with sagebrush could probably indicate sandy soil. When cuts and fills are required, sandy soil requires a different type of construction than where say clay soil exists. Another example is where many lines of willow trees show up on the photograph probably indicates many small creeks that would have to be bridged.

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