

Forest Management Tech Tips

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Introduction to Helicopter Marking *Bob Monk, Forester*

United Agri Products (UAP) Timberland has developed a helicopter marking system called TimberMark. This system was demonstrated on a Forest Service, U.S. Department of Agriculture, timber sale in Oregon. A review of the system is presented here. The system is new technology and an evolving process. Improvements are being made rapidly. Therefore, this information should be used only as an introduction. Cost data is not included here because of the variability related to volume of work, terrain, location, and improvements to the system.

BACKGROUND

The TimberMark system is used to delineate boundaries. This is accomplished very quickly using a helicopter. Unit boundaries are painted and marked with global positioning system (GPS) coordinates in one step. A pressurized tank of paint is suspended from the helicopter. Distance between marks and volume of paint applied can be programmed into the system or manually controlled from the helicopter. The paint (specifically designed for this system) is sprayed down through the crown to the ground. A short demonstration video can be viewed now ([click here](#)) or at the end of this document.



Figure 1a—Helicopter with spray unit suspended.





Figure 1b. Spray unit being filled with paint and pressurized.

ADVANTAGES/DISADVANTAGES

The TimberMark system may be cost-prohibitive for most timber sales. However, it might have advantages that override the cost concerns, as in the case of the Biscuit Fire Salvage where this system was demonstrated.

Advantages

- Has a high production rate. Can be used where heavy workloads and timing are a concern, such as large salvage operations.
- Can be used effectively in steep terrain.
- Is safe. Avoids hazardous conditions on the ground, such as steep, rocky ground or areas with a high number of snags.
- Can locate units via GPS at the same time that they are painted.
- Has a continuous GPS signal from the air that eliminates concerns for canopy interference.

Disadvantages

- High cost.
- Weather dependent (somewhat) for helicopter use.

DEMONSTRATION PROJECT

The TimberMark system was demonstrated in early May 2004 on the Siskiyou National Forest in Oregon. The forest needed to designate salvage timber resulting from the Biscuit Fire. The project needed to be completed quickly to avoid the deterioration of timber. Much of the area being

salvaged is steep and sometimes rocky. All of the areas have high concentrations of dead trees, creating the potential for hazardous working conditions.

The marking contract included estimated linear feet of marking and provided for time (hours) for reconnaissance prior to marking. The following is information from the Siskiyou National Forest project:

- Acres designated: 1,082.
- Units designated: 30.
- Average unit size (acres): 36.
- Smallest unit (acres): 5.
- Largest unit (acres): 132.
- Linear feet designated: 171,650.
- Days for designation: 9.
- Total flight hours: 26.5.

This production-rate information should only be used as a general guide because it is based on only one project.

CONTRACT PREPARATION

A copy of the contract for this project can be obtained by contacting the Siskiyou National Forest. Several lessons were learned during this project. UAP Timberland has the following suggestions for future contracts.

- Specify horizontal distance as unit of measurement.
- Allow for a range of marking specifications (volume of paint/distance between marks) to account for varying conditions.
- Specify definition of reconnaissance flights. Are they to review units identified in the contract or to look for additional areas not included?
- Incorporate reconnaissance flight time as a stand-alone item in the contract.
- Specify GPS requirements.
- Provide 4-inch-per-mile maps prior to bid submission.
- Have aerial photography available for the TimberMark operator.

For the Siskiyou National Forest project, aerial unit reconnaissance was done as part of this contract. Several modifications were made during reconnaissance. It may be more cost effective for the Forest Service to conduct aerial reconnaissance and GPS layout of units as a separate task/contract. TimberMark would then use the final GPS unit boundaries to delineate units. This would make the helicopter manager the only necessary onsite Forest Service person.

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View demonstration video ([Click Here](#)).

SDTDC's national publications are available on the Internet at <http://www.fs.fed.us/eng/pubs/>

Forest Service and U.S. Department of the Interior, Bureau of Land Management employees also can view videos, CDs, and SDTDC's individual project pages on their internal computer network at <http://fsweb.sdtc.wo.fs.fed.us/>

For additional information on helicopter marking, contact Bob Simonson at SDTDC. Phone: 909-599-1267. E-mail: bsimonson@fs.fed.us

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