

0071-2862-MTDC • United States Department of Agriculture • Forest Service

# TAD NEWS

JULY

AUGUST

San Dimas Technology and Development Center (SDTDC)  
444 East Bonita Avenue; San Dimas, CA 91773-3198  
Phone: 909-599-1267 • Fax: 909-592-2309  
Forest Service Intranet Web Site: <http://fsweb.sdtc.wo.fs.fed.us>

(MTDC) Missoula Technology and Development Center  
Building 1, Fort Missoula; Missoula, MT 59804-7294  
Phone: 406-329-3900 • Fax: 406-329-3719  
Forest Service Intranet Web Site: <http://fsweb.mtdc.wo.fs.fed.us>

## Missoula Technology and Development Center

### “Constructing Trail Switchbacks” Video



“Constructing Trail Switchbacks” video.

MTDC recently mailed a new video, *Constructing Trail Switchbacks*, to all Forest Service and BLM offices. In this 28-minute program, Liz Gupton, a trail designer with the Lolo National Forest, explains how to plan, design, lay out, construct, and maintain switchbacks. The step-by-step program shows two new switchbacks being constructed to reroute a problem section of the River Trail on the Lolo National Forest in Montana. Forest Service and BLM employees who may need another copy of the video may request one from MTDC. Distribution outside the Forest Service is being done through the Federal Highway Administration’s (FHWA) Recreational Trails Program. Orders to FHWA may be faxed to 202-366-3409.

For information about other trails reports available from FHWA, check their web site: [http://www.fhwa.dot.gov/environment/rt\\_pubs.htm](http://www.fhwa.dot.gov/environment/rt_pubs.htm).

For additional information, contact Brian Vachowski, Project Leader, at MTDC:  
Phone: 406-329-3935  
Internet: [bvachowski@fs.fed.us](mailto:bvachowski@fs.fed.us)  
Lotus Notes: Brian J Vachowski/WO/USDAFS

### Aerial Retardant Pattern Prediction Model

The Aerial Delivery Systems Group at MTDC conducted an extensive series of drop tests using a variety of retardant delivery systems from 1993 to 1995. Helicopter bucket systems, helitankers, and conventional and constant flow fixed-wing airtankers were tested. Each drop was performed over a field of cups arranged in a grid. The weight of retardant in each cup and its location in the grid were recorded. Also recorded were the aircraft height, aircraft speed, tank evacuation flow rate, tank volume, tank geometry, retardant type, and weather conditions. Computer analysis of this information revealed a specific ground pattern of deposition.

In October 1999, Continuum Dynamics, Inc., was awarded a contract to develop a computer model that would predict ground pattern deposition based on these data. The Aerial Delivery Systems Group has worked closely with Continuum Dynamics

# Missoula Technology and Development Center

## Aerial Retardant Pattern Prediction Model (continued)



Tests using a field of cups arranged in a grid reveal the pattern of deposition for fire-retarding chemicals dropped from aircraft.

answering questions about the database, providing additional information, and reviewing progress reports. This computer model is scheduled to be completed in October.

Other deposition prediction models exist, but none incorporates such a wide range of input variables, nor are the other models based on as large a data base. This model will give firefighters more insight into the capabilities and tactical uses of new and existing retardant systems. The model will be able to predict ground deposition from delivery systems that have not been drop tested and will assist in designing new systems.

A series of Drop Guides are being prepared based on the drop test data. These guides give a brief description of the delivery system and include tables and graphs indicating the optimum drop parameters needed to produce the desired retardant pattern on the ground. The tables are derived from the actual ground patterns measured during the drop tests. The guides are designed

to help firefighters and pilots adjust parameters to produce the most effective drop pattern for given fire conditions. About a half-dozen Drop Guides are available now. To order, check the listing under Aerial Delivery Systems in *Recent Reports From MTDC* below. Drop Guides for all systems tested should be available by late fall.

For more information on aerial retardant delivery systems, contact Greg Lovellette, Physical Scientist: Phone: 406-329-4815 • Internet: [glovellette@fs.fed.us](mailto:glovellette@fs.fed.us) • Lotus Notes: Greg Lovellette/WO/USDAFS

## Accessible Boating For Persons With Disabilities

Safely getting into or out of a boat can pose problems for anyone. The boat may be moving and unstable. If a floating dock is involved, the dock will probably be moving as well. Boarding a boat that has been pulled up on shore may require negotiating a rocky or steep shoreline. These situations pose problems for persons with disabilities, about 15 percent of the general population.

*Accessible Loading Platform for Boaters*, 0023-2837-MTDC, addresses the problem of providing accessible boating ramps. It describes safe methods that disabled persons can use to board watercraft pulled alongside loading ramps near the water. The report includes plans for three ramp designs and explains how to properly site the ramps.

For additional information, contact Bob Beckley, Project Leader, at MTDC: Phone: 406-329-3996  
Internet: [rbeckley@fs.fed.us](mailto:rbeckley@fs.fed.us)  
Lotus Notes: Robert G Beckley/WO/USDAFS



Properly constructed loading platforms can make it easier for persons with disabilities to board boats.

# Missoula Technology and Development Center

## West Fork Energy Audit



A summary of an energy audit at the West Fork Ranger District compound near Darby, MT, provides information that can help other Forest Service ranger districts save energy.

The West Fork Ranger Station in the Bitterroot National Forest underwent an energy audit in the late 1990's. The findings have been summarized in a short report available on the Center's intranet web site: <http://fsweb.mtdc.wo.fs.fed.us>. The findings would probably apply to many Forest Service ranger station compounds across the nation, particularly those located in colder climates. A number of energy-saving measures were suggested, such as installing timers on electric hot-water heaters, installing

setback thermostats in office buildings occupied only during the day, and properly maintaining the heating and cooling systems.

For additional information concerning facility energy audits, contact Steve Oravetz, Program Leader:  
Phone: 406-329-1037 • Internet: [soravetz@fs.fed.us](mailto:soravetz@fs.fed.us) • Lotus Notes: Steve Oravetz/WO/USDAFS

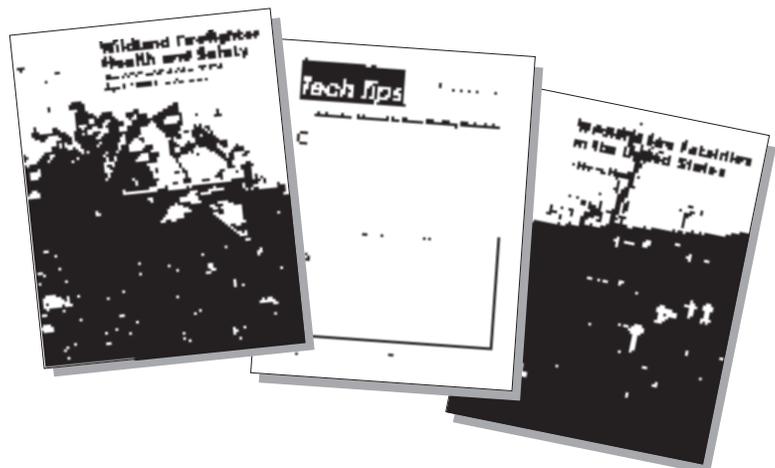
## Recent Reports From MTDC

### Engineering

- Overview of Siding Materials for Forest Service Facilities (0071-2308-MTDC)
- Overview of Roofing Materials for Forest Service Facilities (0071-2314-MTDC)
- Choosing Computerized Maintenance Management Systems for Facility Management (0071-2322-MTDC)
- How to Prevent Woodpeckers From Damaging Buildings (0071-2847-MTDC)

### Fire

- Keeping Warm on Fires (0051-2307-MTDC)
- Improving Firefighter Safety in the Wildland-Urban Intermix (0051-2811-MTDC)
- Handheld Infrared Viewers for Wildland Fire Applications (0051-2312-MTDC)
- Evaluating Digital Meters for Fire Weather Observations (0051-2315-MTDC)
- Trail Buster: Portable Powered Fireline Builder (0051-2319-MTDC)
- Wildland Firefighter Health and Safety Report No. 1 (0051-2825-MTDC)
- Understory Biomass Reduction Methods and Equipment (0051-2828-MTDC)



# Missoula Technology and Development Center

## Recent Reports From MTDC (continued)

### GPS

- Two Decades of Development and Evaluation of GPS Technology for Natural Resource Applications: Missoula Technology and Development Center (9971-2826-MTDC)

### Recreation

- Accessible Loading Platform for Boaters (0023-2837-MTDC)
- Geosynthetics for Trails in Wet Areas: 2000 Edition (0023-2838-MTDC)

### Safety

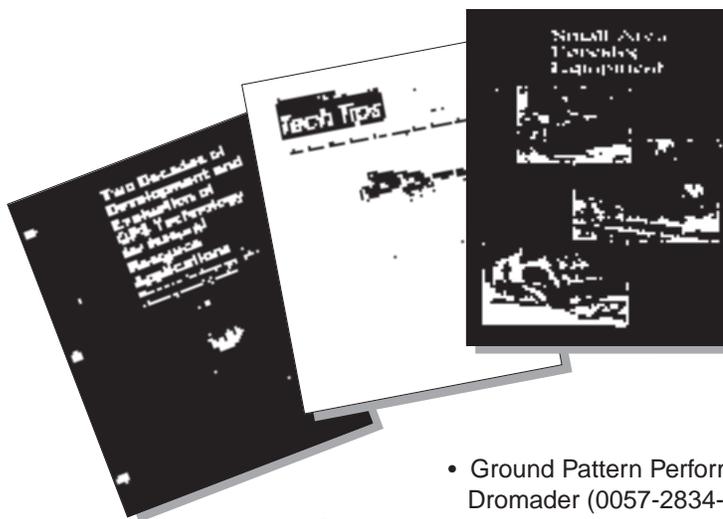
- Violence Awareness Training for Field Employees: Fiscal Year 1999 Findings and Recommendations (0067-2820-MTDC)
- Working Safely in Areas With Africanized Honey Bees (0067-2313-MTDC)

### Timber

- Small-Area Forestry Equipment: Island Park Demonstration (0024-2309-MTDC)

### Watershed, Soil, and Air

- Miniature Data Loggers Record Temperature Inexpensively and Reliably (0034-2305-MTDC)



### Aerial Delivery Systems

- Ground Pattern Performance of the SEI Industries Bambi 324-Gallon Helibucket (0057-2802-MTDC)
- Ground Pattern Performance of the Sims Rainmaker 2000-Gallon Helibucket (0057-2816-MTDC)
- Safe Drop Height for Fixed-Wing Airtankers (0057-2317-MTDC)
- Ground Pattern Performance of the Griffith Big Dipper Model 100 Helibucket (0057-2829-MTDC)
- Ground Pattern Performance of the Western Pilot Services Dromader (0057-2834-MTDC)
- Ground Pattern Performance of the Marsh Turbo Thrush (0057-2835-MTDC)

Forest Service and BLM employees may order reports electronically at MTDC's intranet web site: <http://fsweb.mtdc.wo.fs.fed.us/ordering.htm>.

To order documents from MTDC, please include the eight-digit document number and the title. Contact us at: Phone: 406-329-3978 • Fax: 406-329-3719 • Internet: [wo\\_mtdc\\_pubs@fs.fed.us](mailto:wo_mtdc_pubs@fs.fed.us)

# San Dimas Technology and Development Center

## Aerial Retardant Delivery Systems

The Aerial Retardant Delivery Systems Program is being moved to the San Dimas Technology and Development Center. The move is expected to be completed within a year. San Dimas will be responsible for testing airtankers, developing Interagency Airtanker Board (IAB) criteria for Board approval, answering questions, and handling all other aspects of the program.



*The Forest Service program that tests airtankers is being moved to the San Dimas Technology and Development Center. This photo shows Tanker 66, a DC-7, using an Aero Union retardant delivery system.*

San Dimas is working with the IAB to improve the availability and dissemination of information on airtanker capabilities and history. We envision using the internet and intranet, electronic data bases, and other media to support the IAB, the field, and the airtanker industry.

*For additional information about this article, contact Carl Bambarger, Aviation Program Leader:*

*Phone: 909-599-1253 • Internet: [cbambarger@fs.fed.us](mailto:cbambarger@fs.fed.us) • Lotus Notes: Carl D Bambarger/WO/USDAFS*

## Interactive Computer-Based Training

San Dimas is developing the Risk Management Module for the Forest Service's Aviation 2000 training initiative. The interactive computer-based training is intended for helicopter managers and helicopter operations specialists. The training will use several case studies to examine whether other means of suppressing a fire (such as sending an engine or firefighting crew) might be more appropriate than using aircraft. The module is currently scheduled for completion by October 2000. The initial release will be on a CD-ROM. Studies have shown that the use of interactive training methods increases retention of information from 25 to 80 percent.

*For additional information about this article, contact Carl Bambarger, Aviation Program Leader:*

*Phone: 909-599-1253 • Internet: [cbambarger@fs.fed.us](mailto:cbambarger@fs.fed.us) • Lotus Notes: Carl D Bambarger/WO/USDAFS*

## Video Training For Aircraft Acquisition

The Center is developing a video to help helicopter operations specialists work with law enforcement officers who need to acquire aircraft. The video will provide tips for helicopter operations specialists. It will also help law enforcement officers understand the benefits of acquiring aircraft through the Forest Service's Aviation Program. The script is planned for completion by late summer. Shooting will begin before the end of the year.

*For additional information about this article, contact Carl Bambarger, Aviation Program Leader:*

*Phone: 909-599-1253 • Internet: [cbambarger@fs.fed.us](mailto:cbambarger@fs.fed.us) • Lotus Notes: Carl D Bambarger/WO/USDAFS*

---

The Forest Service, United States Department of Agriculture (USDA), has developed this information for the guidance of its employees, its contractors, and its cooperating Federal and State agencies, and is not responsible for the interpretation or use of this information by anyone except its own employees. The use of trade, firm, or corporation names in this document is for the information and convenience of the reader, and does not constitute an endorsement by the Department of any product or service to the exclusion of others that may be suitable. The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.