Fall 2006

WSA Currents & PROFILES

INFORMATION WITHIN REACH

Welcome

to the fall issue of "Currents & Profiles," the National Watershed, Soil, and Air (WSA) Technology and Development Centers' news and notes to the field.

This issue of "Currents & Profiles" provides an opportunity to propose new projects for selection by the steering committee in February 2007. Also, this issue updates the watershed community on the Technology and Development (T&D) program, the progress of our projects, and newly available publications. You will find the following topics in this issue:

Mission Statement

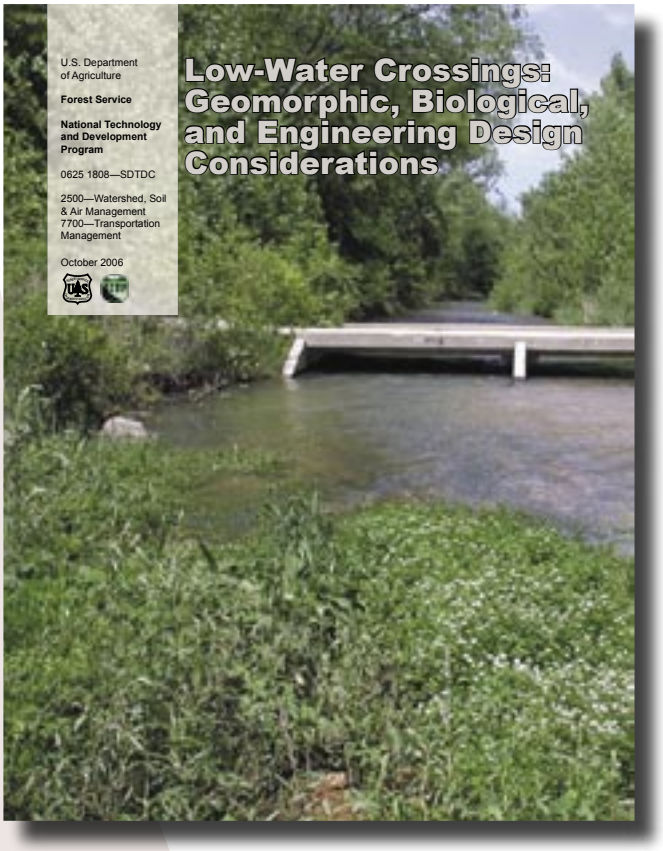
To systematically apply scientific knowledge and advanced technology to create new or substantially improved equipment, systems, materials, processes, techniques, and procedures to meet the challenges and objectives of sustainable forest ecosystems management practices.

Watershed, Soil, and Air Technology and Development Program
0625 1811—SDTDC

• PROJECT HIGHLIGHTS

Low-Water Crossings Guide: Geomorphic, Ecological, and Engineering Design Considerations

Proposed by: Gary Harris and Rick Patten, Idaho Panhandle National Forest (Region 1)



The low-water crossings guide is available on SDTDC's WSA Intranet Web site (http://fsweb.sdtdc.wo.fs.fed.us/pubs/pdf/LowWaterCrossings). As an introduction to the intent and contents of the guide, here are some excerpts from the Foreword.

> *Low-water crossings are road-stream crossing structures designed to be overtopped by high flows or by debris- or ice-laden flows. They can be desirable alternatives to culverts and bridges on very low-volume roads and trails, and they can offer substantial environmental advantages in some stream environments. They are useful, for example, where streamflow is highly variable and large amounts of woody debris pose a risk to crossing structures. This guide reviews both the advantages and disadvantages of different low-water crossing structures in various stream environments and illustrates situations in which low-water crossings may be the optimal choice of crossing structure.*
>
> *The guide is organized into five chapters.*
>
> *Chapter 1 defines and introduces the various types of low-water crossings and explains in general terms where and when they can be useful.*
>
> *Chapter 2 addresses key questions necessary for evaluating roads and sites in the larger context of the watershed and transportation system. This evaluation is critical in successfully launching a crossing replacement or construction project.*
>
> *Chapter 3 describes the process of selecting the best structure for a site. For example, if the structure should be a low-water crossing, then what type of low-water crossing should be used? What considerations go into these decisions?*
>
> *Chapter 4 brings together the basic tools and procedures for engineering design of low-water crossings, and shows how applying these tools and procedures can achieve various objectives.*
>
> *Chapter 5 summarizes the observations and recommendations about the benefits and risks of ten types of low-water crossings.*
>
> *Appendix A contains 21 case studies, some with plans and drawings from the actual construction contracts. Appendix A also lists the names of forest staff and other individuals who provided the information for each case study so readers can contact them for more information. In addition, several case studies include information on similar structures in other locations.*

The guide will be posted on the Internet in January 2007. A limited number of printed copies will be available later in the year.

• CURRENT PROJECTS – UPDATE

Water Diversion Control Structures

Proposed by: Dave Gloss, Medicine Bow National Forest (Region 2)

Photo: Christine Dingman, Ashley NF

The scope of this project was expanded after initial scoping was completed. The phase 1 product will be as described in the spring 2006 issue of "Currents & Profiles." It will be a field guide to diversion installations and devices that land managers and permittees can use to plan, design, and construct structures capable of meeting stream flow needs below water diversions. The guide will cover low- to high-technology installations and will highlight what works in different stream and valley environments. We hope to cooperate with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service on this phase of the project.

The goal of phase 2 will be to find–or develop and test–a device that controls the volume of water diverted based on flow variations in the main channel. The USDA Forest Service anticipates that such a device will be needed in the future to implement the complicated in-stream flow claims currently being formulated. In certain cases, claims may require specified peak- and low-flow volumes and durations, and hydrograph recession rates keyed to fostering riparian vegetation.

This first year (FY2007) we will begin developing an intranet page to display phoase 1 informmation. Starting with low-tech installations, we will also clarify the objectives and specific tasks for a phase 2 contract or partnership.

Remote Sensing for Improved Smoke Forecasting and Nitrogen Deposition Assessment

Proposed by: Rich Fisher (WO)

This project tested and evaluated the effectiveness of the Remtech Sonic Doppler and Ranging (SODAR) wind profiling system for smoke dispersion forecasting. (See full project description in the spring 2006 issue of "Currents & Profiles.") (http://fsweb.sdtdc.wo.fs.fed.us/programs/wsa/newsnote/index.htm). Field testing of the SODAR system is complete, and a project report is in preparation. For more information, contact project leader Andy Trent by phone: (406) 329-3912 or e-mail: atrent@fs.fed.us.

Smoke Monitoring Training Aids

Proposed by: Pete Lahm, WO Fire

The purpose of this project is to develop Web-based operating manuals for several smoke monitoring systems. Photography and videotaping are complete, and Web development of the training aid will be started soon. For further information, contact MTDC project leader MaryAnn Davies by phone: (406) 329-3981, or e-mail: mdavies@fs.fed.us.

Erosion Control for Roads

Proposed by: Jennie Fischer, Boise National Forest (Region 4)

Erosion control for roads is a resource for watershed specialists to use in identifying the effectiveness of road Best Management Practices (BMPs). Since the spring version of "Currents & Profiles," Colorado State University has completed a synthesis of existing published literature for road BMPs. At the same time, Sherry Hazelhurst and other individuals are working on a national set of BMPs for all forest activities. Once the national set of BMPs is approved, the erosion control for roads synthesis document will be reevaluated to ensure consistency prior to its release. For further information, contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Collocation Study of Smoke Monitors with Different Fuels

Proposed by: Trent Wickman, Superior National Forest (Region 9)

This project tested several real-time smoke monitors by comparing their results to a gravimetric standard. The report detailing the tests is complete and will be available in December 2006 at http://fsweb.mtdc.wo.fs.fed.us/programs/wsa/ under Products. For further information, contact MTDC project leader Andy Trent by phone: (406) 329-3912 or e-mail: atrent@fs.fed.us.

Soil, Water, Road Condition Index (SWRCI)

Proposed by: John Bell, WO Engineering, and Keith Simila, Alaska Region Engineering

Great progress was made on development of a soil and water road condition index this summer, thanks to the help of many individuals from forests across the country. Field reviews were conducted on the Los Padres, San Bernardino, Bighorn, Tongass, White River, Lake Tahoe Basin Management Unit, White Mountain, Ozark-St. Francis, and Ouachita National Forests. On each trip forest resource specialists shared the tools they are using to evaluate road impacts to soil and water resources and provided recommendations to a standardized soil and water road condition index. In addition to the forests visited, many other individuals sent copies of the forms they use to evaluate conditions.

The next steps include the following:

- Revision of the SWRCI form, and photo guidebook available for review in December 2006.
- Development of a Web page containing forest examples of existing road condition forms used to evaluate impacts to soil and water resources.
- Case studies of how forests have funded road condition surveys, implemented treatments, and monitored for effectiveness.
- Additional field testing of the soil and water road condition index form to ensure consistency.

If you are interesting in field testing the form on your forest, or in reviewing the draft document, contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Measuring Soil Moisture to Lower Risk of Compaction from Equipment Operations

Proposed by: Wayne Johannson, Plumas National Forest (Region 5)

Initially, this project was to examine tools to evaluate soil water content. However, more emphasis will be placed on soil strength as the index for evaluating risk of compaction from equipment. Work on the project will begin in February 2007. If you have examples or comments on this project, contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail cnapper@fs.fed.us.

Compaction Monitoring Technologies

Proposed by: Edward Huffman, currently on the Cibola National Forest (Region 3)

This project will be a literature review of existing techniques for evaluating soil compaction. Identification of strengths and weaknesses of each method will be included. The Soil Field Guide project will show how a visual soil disturbance class rating may be used to stratify soil monitoring locations. If you have examples or comments on this project, contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

OHV Trail Restoration: Landscape Restoration

Proposed by: National Recreation Program T&D Steering Committee

The new travel management rule requires that all off highway vehicle (OHV) use be on designated routes. There are many nonsystem OHV trails and some system trails that need to be removed. This guide will present a number of methods for removing these trails and restoring the native landscape, and hopefully the ecological function of the land. The project leader is Ellen Eubanks at (909) 599-1267, ext. 225, or e-mail: eeubanks@fs.fed.us.

• NEWS FROM THE WSA T&D STEERING COMMITTEE

The committee plans to meet at the end of February 2007 to review proposals for new projects. If you have an idea for a project, we encourage you to submit it using the form on the SDTDC WSA Web page (http://fsweb.sdtdc.wo.fs.fed.us/programs/wsa). The formal FY2008 call letter has not been sent out yet, but WSA is currently accepting proposals.

Proposals should be in line with program objectives: to seek out the latest technology, processes, methods, and equipment that will facilitate solutions to field problems. The criteria the committee uses to evaluate proposals are listed on the Web page under "Selection Criteria." Note that proposals should have nationwide application or significance, and should not be requests for funding forest projects.

You may want to consider discussing your ideas with your regional representative. They may be able to help you flesh out the proposal and better address the evaluation criteria. Early awareness and/or involvement in preparing the project proposal positions the regional representative to better explain and advocate for the project.

The deadline for submitting proposals for FY 2008 projects is February 13, 2007. The committee looks forward to your active participation in the program. To submit a proposal click on: http://fsweb.sdtdc.wo.fs.fed.us/proposal/online.shtml.

Submitted by: John Potyondy, Watershed, Soil, and Air Committee Chairman

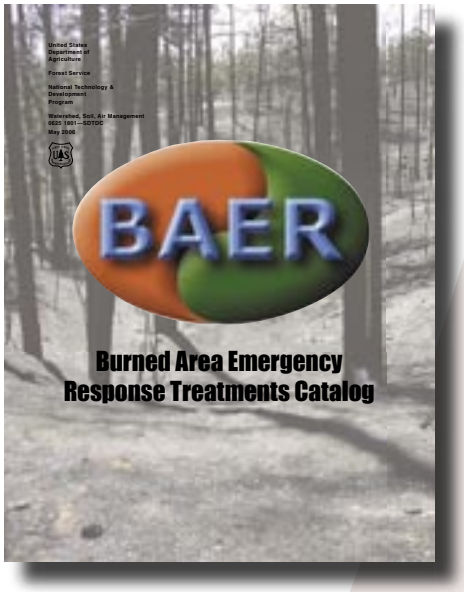
• FOREST HIGHLIGHTS

The Fishlake National Forest (Region 4) has been monitoring water quality impacts from OHVs at forded stream crossings since 2001. Parameters measured include turbidity, fine sediment accumulation, and the presence of petroleum hydrocarbons. There are only a limited number of similar studies in published literature, and the data may help forests as they make travel management decisions under the new travel rule. Findings are summarized in a PowerPoint presentation and the datasets are available upon request.

For more information visit the Fishlake National Forest Intranet Web site at http://fsweb.fishlake.r4.fs.fed.us/unit/eco/index.html, or call Dale Deiter at (435) 896-1007.

• PUBLICATIONS AND VIDEOS

The Burned Area Emergency Response Treatments Catalog (BAERCAT)
BAERCAT is an assessment and implementation tool providing current information on lands, channels, roads and trails, and safety and protection treatments. The BAERCAT provides implementation teams with photographs, diagrams, equipment lists, and monitoring questions for treatments. Sample contracts for all treatments including helimulching are in the appendix. The document is available at the following Web site: http://fsweb.sdtdc.wo.fs.fed.us/programs/wsa/index.htm. The document will also be available in a printed version. If you are interested in receiving a copy, please send your name and address to jybarra@fs.fed.us.



Helicopter Straw Mulching – Planning and Implementation – This electronic tech tip was posted in 2003 on the SDTDC Watershed Web page at http://fsweb.sdtdc.wo.fs.fed.us/programs/wsa/helimulch_etip/june2003etip/. The USDA Forest Service BAER Web site also has a link to the e-tip at (http://fsweb.gstc.wo.fs.fed.us/baer/research/technology.htm).

Helimulching: Equipment and Techniques, by Bob Skeen, is available from the Fire and Aviation program. The paper has not been formally published yet, but is available from project leader Ryan Becker by phone: (909) 599-1267, ext. 260, or by e-mail: rbecker@fs.fed.us. The paper is addressed primarily to helicopter managers, but it may be helpful to BAER team members. The following paragraph from the introduction states the purpose of the paper.

> *All of the techniques (for aerial delivery of straw mulch) so far involve the non-standard use of equipment. The problem of using equipment for aerial mulching in a way for which it was not intended has been recognized. The Missoula Technology and Development Center (MTDC) is working on developing specialized equipment for this application. Until that time this guide is intended to represent the current best practices and provide technical guidance for the aviation personnel tasked with accomplishing aerial mulching projects.*

The MTDC project referred to above is the heliclaw project managed by Tim Lynch. The goal is to develop a piece of equipment that does not have the drawbacks associated with loading and dropping straw from nets. The claw, which is 10 feet square when fully open, is designed for delivery of both straw and shredded wood. Using the claw, the helicopter pilot will be able to pick up wood or straw from a pile and distribute it without the aid of a ground crew. Flight testing is planned for the near future. For more information, contact MTDC project leader Tim Lynch by phone: (406) 329-3958 or e-mail: tlynch@fs.fed.us.

Watersource Toolkit – by Carolyn Napper, SDTDC, is a resource for soil scientists, hydrologists, engineers, and fire specialists in the location and design of water sources for drafting. The toolkit provides an evaluation checklist for existing drafting sites, and discusses methods for drafting water to ensure best management practices are obtained. The document is available at the following Web site: http://fsweb.sdtdc.wo.fs.fed.us/programs/wsa/index.htm.

Riparian Restoration: Roads Field Guide hard copy is now available. Contact jybarra@fs.fed.us to obtain a copy.

Lifelines Your National Forest Roads – The USDA Forest Service, in partnership with USDOT FHWA Federal Lands Highway Program, developed this DVD that explores the relationship between the people and the land – past, present, and future – as it celebrates the partnership between these agencies, and State and local communities in providing continued stewardship and access to our national forests. Contact jybarra@fs.fed.us to obtain a copy.

Forest Roads and the Environment – The USDA Forest Service, in partnership with U.S. Department of Transportation Federal Highway Administration Federal Lands Highway Program, has available a DVD that includes six segments about forest roads. Topics include: Forest Roads and the Environment, Reading the Traveled Way, Reading Beyond the Traveled Way, Smoothing and Reshaping the Traveled Way, Maintaining the Ditch and Surface Cross Drains, and Dangerous Travelers (which provides information about noxious and invasive plants). To request a copy, send your name and mailing address to jybarra@fs.fed.us.

• LINKS OF INTEREST

What is **SoLo**? SoLo is a computerized and networked collection of representative documentation on **So**il quality monitoring and **Lo**ng term ecosystem sustainability, linked electronically by topic and geography. Visit http://forest.moscowfsl.wsu.edu/smp/solo/.

Visit the National Technology and Development Centers' Intranet Web sites:
Missoula Technology and Development Center at http://fsweb.mtdc.wo.fs.fed.us

San Dimas Technology and Development Center at http://fsweb.sdtdc.wo.fs.fed.us

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