Summer/Fall 2010

WSA Currents & PROFILES

INFORMATION WITHIN REACH

Welcome

to the summer/fall issue of "Currents & Profiles," the National Watershed, Soil, and Air (WSA) Technology and Development Centers' news and notes to the field. In this issue we have updates on our projects as well as a request to the field to provide photos for one of our new projects.

"Currents and Profiles" updates the watershed community on the progress of our projects and newly available publications. This issue includes the following topics:

- CURRENT PROJECTS–UPDATE
- NEW PROJECTS
- COMPLETED PROJECTS
- LINKS OF INTEREST
- WSA STEERING COMMITTEE MEMBERS
- T&D STAFF

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.

Watershed, Soil, and Air Technology & Development Program

1025 1806—SDTDC

• CURRENT PROJECTS – UPDATE

Development of Science-Based Winter Guidelines for Mechanical and Fuels Treatment Operations

Proposed by: John Townsley, Randy Tepler, and Brad Flatten (Region 6)

Objective: Develop science-based guidelines for winter-logging by using low-cost, easily identifiable indicators of frozen soil.

In January 2010, winter logging tests were performed on two units on the Chequamegon-Nicolet National Forest in Region 9. Our focus was to develop practical, low-cost, science-based winter logging guidelines which are easily identifiable in the field by the sale administrator, logger, and soil scientists.

In April 2010, we collected the post-treatment soil data using the Forest Soil Disturbance Monitoring Protocol and found that both units met forest guidelines. On one unit there was more rutting and soil disturbance associated with the logging. Recommendations to prevent adverse soil impacts are similar to findings observed on the Hiawatha National Forest in 2009 and include the following:

1. Use of skidding mats to reduce the equipment impact on soils with low load bearing strength due to high water table.
2. Increase the frozen ground depth by plowing and packing the snow on the main skid trails that access the landing area.
3. Use of frost tubes can give the sale administrator and logger a better idea of depth of frozen ground within the unit so they can implement mitigation measures but be sure to have them in several locations.
4. Placement of slash on skid trails to reduce equipment impacts.
5. Project layout to avoid crossing wet areas even if this may require another landing and access road.

We are currently working on a draft report of our findings from the study results and hope to have this available in September 2010.

For further information, contact SDTDC project leader Carolyn Napper by phone (909) 599-1267, ext 229, or email: cnapper@fs.fed.us.

Literature Synthesis on Effectiveness of Forest Roads Best Management Practices

Proposed by: Carolyn Napper (SDTDC)

Objective: Provide a comprehensive technical reference on the effectiveness of Forest Service national BMPs for limiting erosion on forest roads and protecting water quality.

Pam Edwards, a watershed scientist at the Timber and Watershed Lab in Parsons, WV, part of the U.S. Forest Service, Northern Research Station, is authoring the synthesis. Thanks to all who helped her complete the search for literature on road erosion and sediment control by sending in your references! Pam is currently reading papers and articles, and beginning to write a first draft of the synthesis.

Armored dip on ephemeral stream in Lassen NF, immediately after construction in 2003. Photo by Carolyn Napper.

For further information, contact SDTDC project leader Kim Clarkin by phone (360) 766-4171; (951) 533-2067 (cell); or email: kclarkin@fs.fed.us.

Water Diversion Control Structures

Proposed by: Dave Gloss (Region 2)

Objective: Provide information on planning and layout of surface water diversion and water control structures. Assist diverters and field personnel who work with them in evaluating alternative structures and layouts to meet instream-flow needs, protect aquatic habitat, and minimize detrimental effects on channels and riparian areas.

The draft guide has gone through peer review, and is being edited in response to reviewers' comments. An appendix on Supervisory Control and Data Acquisition (SCADA) systems for water diversion monitoring and control will be added. SCADA systems provide flexible, automatic controls in many applications, and their use for automatic diversion and canal control is expanding. Using SCADA systems would be one way to ensure water diversions do not interrupt environmental flows (e.g., flows needed for spawning migration, riparian flooding, juvenile rearing).

Found-object diversion structure blocking fish and controlling diversion on North Brush Cr, Medicine Bow NF, WY.

For further information, contact SDTDC project leader Kim Clarkin by phone (360) 766-4171; (951) 533-2067 (cell); or email: kclarkin@fs.fed.us.

Low-Cost Fish Screens at Diversions

Proposed by: Mark Weinhold (R2) and Bob Deibel (WO)

Objective: Find or develop moderate-to-low cost fish screens for small diversions to protect most fish from entrainment in diversion ditches. One proposal particularly mentions protecting juveniles that normally inhabit stream margins, where most diversions originate.

Low-cost, simple-to-operate fish screens have been the goal for screen designers for many years. Most designers have given up on the quest after repeated episodes of plugging, dry ditches, and angry irrigators. Mention of a 'simple' fish screen draws wry smiles from experienced people, and we do not plan to invest energy where so many have failed before. Instead, we will catalogue the lowest-technology screens we can find, using contacts in State screen fabrication shops and fish and wildlife agencies. A web page will describe maintenance issues–the principal problem with fish screens–as well as what is known about effectiveness.

Perforated PVC screening water entering a pump. Photo by Kozmo Ken Bates, 2000.

For further information, contact SDTDC project leader Kim Clarkin by phone (360) 766-4171; (951) 533-2067 (cell); or email: kclarkin@fs.fed.us.

Construction Guide for Stream Restoration and AOP Projects

Proposed by: Bob Gubernick, R10, and Brian Bair, TEAMS

Objective: Provide a practical reference for field construction personnel on construction planning, and implementation for stream restoration and aquatic organism passage projects. Include details on construction scheduling, equipment capability, specifications, dewatering, construction methods for various structure types, administering equipment rental contracts, etc.

Because so many restoration construction experts are busy with on-the-ground projects, work this year is limited to drafting an outline of the material to be covered, and taking publication-quality photos and videos of construction projects.
For those of you involved with construction projects this summer, we do need high-resolution photos of many aspects of construction, and would appreciate your assistance. Please convey this request to others involved in construction as well. Photos for publication need to be 300 dpi (300 pixels/inch) at 5 inches by 7 inches. Usually this can be achieved by putting the camera on a photo quality setting of 'fine'. The resulting photo usually approaches 1MB in size, although it seems file sizes are getting smaller with newer cameras. If you want to submit your photos for possible publication, send me (kclarkin@fs.fed.us) one or two trial photos, and I'll make sure they're the right size. A short list of the kind of photos we'll need is below. You may have your own ideas about good topics to highlight, and we'd be happy to hear them and see your illustrations of them. Please be sure to send in full captions with the photos.

Photo Topics:

Health and Safety

- People working with proper safety equipment and attire
- Examples of poor safety equipment, attire, actions, methods

Dewatering

- Sumps and pump installations
- Bypass channels or pipes, outfalls, erosion protection
- Coffer dams and construction
- Sediment traps, sediment disposal activities

Preventing Water Pollution

- Fuel storage facilities with spill protection
- Parking and/or camping sites located away from the stream, with facilities
- Material stockpile with erosion protection
- Sediment ponds with facilities for treating sediment-laden water
- Equipment washing facilities
- Spill protection supplies for heavy equipment

Equipment working

- Various types of equipment
- Constructing various in-stream and bank structures (steps, weirs, log jams, vanes, bank protection)
- Constructing stream simulation culverts, various stages of construction, if possible taken from the same point

People at work wearing hard hats

- Inspecting work, taking notes, talking with operators
- Using a level to check elevations
- Installing an elevation benchmark

For further information, contact SDTDC project leader Kim Clarkin by phone (360) 766-4171; (951) 533-2067 (cell); or email: kclarkin@fs.fed.us.

BAER Hydrology Modeling Tools Review

Proposed by: Cheryl Mulder (R5)

Objective: To identify watershed runoff models and their strengths and weaknesses, used by BAER team hydrologists, while surveying and analyzing the potential effects of post-fire runoff.

We had a tremendous response to the survey on BAER Hydrologic Models conducted this past April. A heartfelt thanks goes out to everyone that took the time to provide information and insights as to the models used and recommendations on further training. The survey results have helped us to better define the project scope and respond to the needs of the BAER community. Initial survey findings identified a great demand for further training on the use of hydrologic models and on rapid assessment tools.

Our current plan of work involves collaboration with University of California, Los Angeles (UCLA), Department of Civil and Environmental Engineering. The Department of Interior has also provided us additional funding for this project since everyone from all agencies understands the importance of this project. UCLA will work with San Dimas T&D to perform the following during the next year.

- Compare selected hydrologic models with observed post-fire flow and sediment data to address model accuracy and performance for a variety of hydroclimatic regimes.
- Develop training case studies to provide guidance on how models are run.
- Develop cross-walk table that illustrates the relationship of different models commonly used by BAER teams.
- Provide recommendations for revising the sections of the 2500-8 form.
- Provide guidance for BAER hydrologic model tool selection in the form of a white paper.

Our goal is to have initial model results available prior to next fire season and training case studies available in February 2011.

At this time the Synthesis of Post-Fire Road Treatments for BAER Teams: Methods, Treatment Effectiveness, and Decisionmaking Tools for Rehabilitation is available from RMRS. Contact rschneider@fs.fed.us for a hard copy or go to the Web site below.

http://forest.moscowfsl.wsu.edu/BAERTOOLS/ROADTRT/Peakflow/

For further information contact project leader Carolyn Napper by phone (909) 599-1267, ext 229, or email: cnapper@fs.fed.us.

Removal of Small Dams: Removal Techniques and Monitoring Environmental Effects

Proposed by: Marty Rye, Jason Butcher, Dana Gauthier , Luke Rutten , Randy Kolka ,Steve Sebestyen – (R9)

Objective: Compile a synthesis of the current knowledge of removal methods, particularly for small structures, as a tool for specialists and decision-makers to evaluate how best to remove unwanted structures. Compile a synthesis of the monitoring methods and environmental effects of small dam removal to aid project managers in preparing environmental documents and ultimately monitoring and documenting the results of dam removals. At this time several documents and resources are available at the following ftp site.

ftp://ftp.mtdc.wo.fs.fed.us/pub/open/Dam%20Removal%20Publications/

For further information contact project leader Brenda Land by phone (909) 599-1267, ext 219, or email: bland@fs.fed.us.

• NEW PROJECTS FOR FY 2011

The committee evaluated 12 new project proposals during the steering committee meeting held in Hot Springs, Arkansas. There was almost near consensus on the projects selected.

Projects accepted:

- WSA Program, San Dimas Technology and Development Center
  - ❑ Eco-Friendly Designs for Developing Springs and Seeps for Watering of Livestock and Wildlife (Proposal 11-03)
  - ❑ Aerial Hydromulch Component Formulation and Effectiveness Testing (Proposal 11-11)
  - ❑ Proposed Contract Language for Fuels Mastication Treatments (Proposal 11-09)

- Air Program, Missoula Technology and Development Center
  - ❑ E-Sampler Extended-Life Power Source (Proposal 11-05)
  - ❑ Portable NOx Analyzer (Proposal 11-12)

Disposition of some nonselected projects:

- Incorporating Stream Base Flow into the WEPP Technology: John Potyondy will follow-up with Bill Elliot to identify why it was not selected and inform Bill of similar work being done on a WRENSS water yield model by STREAM.
- Video Training Series on AOP – Reaching a Wide Audience: The Engineering steering committee voted to work on the one and it is already funded; removed from further consideration by the WSA committee.
- Erosion and Sediment Model for the Francis Marion and Sumter National Forests: Send to RSAC and GSTC for consideration.
- Power Wash Station: Technology already exists. Dexter will send out information to the proposer; removed from voting.
- Road-Crossing Infiltration Gallery for Emergency Water Withdrawal Proposal

Water sources for firefighting are a perennial challenge, and a guide to selecting and preparing water sources is on the Web at: http://www.fs.fed.us/eng/php/library_card.php?p_num=0625%201806

Proposals to develop an infiltration gallery system that would be installed in natural-bottom road crossings have been submitted to T&D 2 years running. They have been turned down because of the risks inherent in such installations. Installing a gallery during construction of a natural-bottom road crossing seems like an elegant way to achieve two goals with one project, and there are undoubtedly some streams (high summer flow volumes, low sediment loads, cold temperatures) where it might be successful. However, infiltration galleries for irrigation water diversions have a very bad reputation among western fish and wildlife agencies because of their tendency to plug with sediment or algae, entrain/trap larval fish, or dry up low surface flow. Maintenance is always required to keep the openings from plugging. Even though an emergency water source would only occasionally be used, limiting the risks to fish during stressful dry seasons and providing for an installation that would not wash out in scouring floods would require each system be engineered individually for the hydrologic and sedimentologic system. Other in-stream diversion systems exist and will be described in the diversion guide. They may be useful in some situations, but controlling withdrawals to avoid drying up the channel would always be an issue to consider. During low flow season when fire withdrawals are most likely, fish may need to be moving in search of cold water, and impeding their movements could put them at risk.

• COMPLETED PROJECTS

Training Curriculum for Potential Users of the Forest Soil Disturbance Monitoring Protocol

Proposed by: Steve Howes (Region 6)

Objective: Develop a training program for employees who collect soil assessment and monitoring information with the Forest Soil Disturbance Monitoring Protocol (FSDMP) and Soil Disturbance Field Guide. The training curriculum has been made into three electronic training sessions which are available to all employees at the following Web site:

http://www.fs.fed.us/t-d/programs/wsa/

For further information on trainings availability contact SDTDC project leader Carolyn Napper by phone (909) 599-1267, ext 229, or email: cnapper@fs.fed.us.

Biomass/Whole-Tree Harvesting, Soil Impacts, and Measurement Methods

Proposed by: Jim Gries (Region 9, Hiawatha NF)

Objective: Provide a literature review of effects of biomass removal on soil nutrient cycling and identify potential tools to determine amount of large and fine woody debris. Share examples of contracts used to implement biomass harvest and achieve the coarse and fine-woody debris requirements.

The following Web page has been created to provide a one-stop shopping of biomass resources now available to soil scientist and other resource specialist. Collaboration between RMRS, Michigan Tech, and SDTDC continues to explore the relationship between long-term soil productivity data and biomass removal effects to the aspen and jack pine ecosystems of northern Michigan.

http://fsweb.sdtdc.wo.fs.fed.us/programs/im/biomass/index.shtml

Water-level Datalogger Upgrade

Proposed by: Robert Kenworthy, R4

Objective: Make available a water-level recorder similar to the AquaRod, but cheaper and with upgraded functionality.

In our last update, we mentioned the TruTrack water level recorder, which is being used by some State agencies, and was looking like it might be the instrument we were looking for. Further correspondence with the company indicated the instrument would not be guaranteed to produce data meeting the USGS accuracy standard (0.01'). Also some spiking similar to that occurring in the Aquarod is expected, although TruTrack users we talked to did not report problems. Given the large number of other sensors and recording instruments available in the private sector and the rapid changes in instrumentation, we have decided to drop this project. Bob Kenworthy continues to search for instruments that may fill the need.

For further information, contact SDTDC project leader Kim Clarkin by phone (360) 766-4171; (951) 533-2067 (cell); or email: kclarkin@fs.fed.us.

• LINKS OF INTEREST

Wildland CPR
http://www.wildlandscpr.org/

Rangeland Management
http://www.landscapetoolbox.org/

Soil and Rangeland Monitoring Methods
http://www.rangelandmethods.org/results/show/35

TR55 User Guide
http://www.wsi.nrcs.usda.gov/products/W2Q/H&H/docs/WinTR55/WinTR-55%20User%20Guide.pdf

• WSA STEERING COMMITTEE MEMBERS

John Potyondy – Chairman; Director,
Stream Systems Technology Center
970-295-5986 jpotyondy@fs.fed.us

Barry Long – National Surface Water Hydrologist,
Washington Office
202-205-1093 balong@fs.fed.us

Meredith Webster – Soils Program Manager, Region 1
406-329-3412 mmwebster@fs.fed.us

Polly Hays – Regional Hydrologist, Region 2
303-275- 5096 pehays@fs.fed.us

Wayne Robbie – Regional Soil Scientist, Region 3
505-842-3253 wrobbie@fs.fed.us

William Goodman – Assistant Regional Hydrologist,
Region 4
801-625-5368 wgoodman@fs.fed.us

Jeff TenPas – Soil Scientist and Watershed Improvement
Coordinator, Region 5
707-562-8955 jtenpas@fs.fed.us

Brian Staab – Regional Hydrologist, Region 6
503-808-2694 bstaab@fs.fed.us

Michael Crump – Hydrologist, Region 8
404-347-3872 mcrump@fs.fed.us

Dave Shadis – Regional Soil Scientist, Region 9
414-297-1902 dshadis@fs.fed.us

Julianne Thompson – Hydrologist, Region 10
907-772-5873 jethompson02@fs.fed.us

Mike Furniss – Research, PNW
541-758-7789 mfurniss@fs.fed.us

Ann Acheson – WO Air Program, WO
202-205-0800 aacheson@fs.fed.us

• T&D STAFF

Vacant – Manager, WO – T&D Program
703-605-4541

Vacant – Center Manager, WO – MTDC
(406) 329-6902

Andy Trent – Program Leader, Air, WO – MTDC
(406) 329-3912 atrent@fs.fed.us

Mary Ann Davies – Mechanical Engineer, WO –MTDC
(406) 329-3981 mdavies@fs.fed.us

John Fehr – Center Manager, WO – SDTDC
(909) 599-1267, ext. 211 jfehr@fs.fed.us

Dexter Meadows – Program Leader, Watershed,
WO – SDTDC
(909) 599-1267, ext. 276 dmeadows@fs.fed.us

Kim Clarkin – Hydrologist, WO – SDTDC
(360) 766-4171 kclarkin@fs.fed.us

Carolyn Napper – Watershed Specialist, WO – SDTDC
(909) 599-1267, ext. 229 cnapper@fs.fed.us

Marty Willbee – Outdoor Recreation Planner,
WO – SDTDC
(909) 599-1267, ext. 231 mwillbee@fs.fed.us