USDA Forest Service

STREAM
SYSTEMS TECHNOLOGY
CENTER

2004
STREAM
Strategic Planning Workshop Summary

Results of a workshop held
March 30-31, 2004
Fort Collins, Colorado

August 5, 2004

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Program Manager

The Stream Systems Technology Center -
A joint national effort of the Watershed, Fisheries and Wildlife Staff &
Rocky Mountain Research Station

2004 STREAM Strategic Planning Workshop Summary

The STREAM Strategic Planning Workshop was held on March 30-31, 2004 in Fort Collins, Colorado. The **primary objective** of the workshop was to review the National Stream Systems Technology Center (STREAM) work plan and charter with the intent of looking ahead at nationally significant emerging issues and evaluate opportunities for STREAM to address and provide relevant technology to meet anticipated needs. After more than 12 years of leadership by Larry Schmidt since 1992, the transition to new leadership under John Potyondy made this an appropriate time for this mid-course evaluation.

Secondary objectives were to:

1. Assure that future STREAM work remains relevant to the needs of National Forest Systems (NFS) field specialists,
2. Improve communication with field and research units, and
3. Strategically position the Forest Service to address important emerging watershed issues, including the "Guiding Principles for Water Resources."

Invited participants were limited to the Forest Service and included representatives from Research and NFS in the disciplines of hydrology, geomorphology, and riparian ecology. NFS emphasis centered on representation from the Regions and Forests, Washington Office, and collaborative Forest Service work units. A list of the 35 participants is enclosed as Appendix A.

The workshop used a small group process to solicit information from participants followed by reporting back to the entire group. The workshop consisted of three parts:

1. A half day presentation by STREAM Staff covering past accomplishments and planned future work to provide a common understanding of stream accomplishments since 1992;
2. Group input pertaining to activities that could be accomplished under the existing STREAM Charter and Program Elements, and
3. Open-ended group input pertaining to the identification of short-term and long-term needs.

The group process and questions used are detailed in Appendices B.

Executive Summary of Findings:

National Forest System and Research customers are generally pleased with the past work of STREAM pertaining to technology development and information transfer, analysis tools and products, training, support to the ground, and response to emerging issues. Participants largely endorsed the existing Charter of the Stream Systems Technology Center feeling that it adequately encompasses the scope of STREAM's work. However, they suggested that STREAM should broaden its focus on instream flows beyond channel maintenance and address all of the ecosystem components of instream flows, including fisheries and riparian vegetation. Similarly they suggested a more broadly based consideration of vegetation-hydrology relations to include management effects on riparian functions and values rather than limiting our analysis to effects of flow alterations. The group also wanted to see increased emphasis on issue-based science synthesis documents, status of our knowledge assessments, cumulative effects analysis, watershed analysis, TMDLs, Best Management Practices, and an expanded involvement in facilitating training.

Part 1: Review of Existing STREAM Program Elements

The existing STREAM Program Elements contained in the STREAM Charter are:

1. Instream Flow Approaches;
2. Technology Development;
3. Technical Support and Training;
4. Streamside Vegetation Influences; and
5. Sediment BMP Effectiveness.

Each of the 5 groups was provided with a listing of FY 2004 and out-year planned projects (Appendix C) for one of the Program Elements to stimulate deliberations. The listing also provided an indication of direction and specific projects presently planned by STREAM.

Group discussion results are summarized with respect to the following questions:

Question 1-1: What has STREAM been doing well?
Question 1-2: What areas need changed or increased emphasis?
Question 1-3: Which activities and projects would you recommend for priority implementation?

Results have been edited for spelling and clarity and summarized and condensed where necessary to avoid duplication. They are listed in bullet format under common topic areas. The original unedited comments from each of the groups can be found in Appendix D. An attempt was made to have the final listing include only significant findings to improve the readability of this report. Consequently, some of the insignificant or irrelevant suggestions coming from the groups may have been lost through this process. However, every attempt was made to maintain high fidelity with the original group intent.

Responses to Review of Existing STREAM Program Elements

Question 1-1:
What has STREAM been doing well?

- Technology and information transfer
- Stream Notes, STREAM Website
- Software and analysis tools and products have been useful
- Excellent production of user-friendly tools
- Facilitated and increased support to the ground
- Flexibility and willingness to help (technical support and funds) with local and regional issues is great.
- Facilitating line officer course
- Training has been great
- Opportunistic style, up to this point, has been very effective
- Good collaboration between NFS and R&D and non-agency entities
- Have hit the right balance between science and practical applications
- Good at linking up with the right people in the research and academic community
- Have taken channel maintenance science a long way
- Very good at leveraging funding to accomplish work
- Very responsive to emerging issues
- Effort to link stream to riparian vegetation is important

Question 1-2:
What areas need changed or increased emphasis?

- Provide information beyond channel maintenance, such as biological (flora and fauna) needs, so we can answer "so what" questions
- Provide for a more broadly based consideration of vegetation-hydrology relations; linkages and feedbacks; management effects on riparian functions and values (not just instream flow alterations) including consideration of riparian areas where flow is not controlled; interject collaboration/negotiation/facilitator/arbitrator skills into instream flow science
- Coordination with other water-related groups could be improved (e.g., Fish and Aquatic Ecology Unit, National Riparian Service Team; San Dimas and Missoula Technology and Development Centers, Pacific Northwest Research Station Boundary Spanners; FERC Hydropower Team, Inventory and Monitoring Institute; Remote Sensing Applications Center; Kerry Overton at Boise Aquatic Lab, NRIS, and so on)
- Improve coordination; identify who does what, where, why, and how in order to avoid duplication, enhance leveraging, discover gaps, and provide a means to assign responsibilities to fill the gaps
- Provide a clearinghouse for the functions and products of each national based service centers – provide a forum for telling practitioners who is doing what.
- Establish mechanism to improved "connectedness" to the field (Steering Committee is not entirely adequate); "Sounding Group" with geographically diversified representation from management and research to sense emerging issues and needs and maintain relevance to Forest Service management
- Synthesis should be given greater weight; it should focus on broad issues, be issue driven and provide state-of-knowledge and method syntheses
- Web-based Guidance Document/Website (Toolbox and Suite of Tools) with search engine to provide state of the art literature references and tools to address specific NEPA issues and develop a linked literature review and suggested tools for assessment and measurement of specific areas and conditions
- Increase emphasis on cumulative effects/watershed analysis - it is not the role of STREAM to solve all cumulative effects problems, but rather to provide expertise in synthesizing existing knowledge and techniques; protocols for processes that addresses cumulative effects at multiple scales, multiple ecoregions, and linkages for physical and biological processes; provide validation of assessment processes that are working/not working
- Need follow-up to information dissemination; understand who is doing what with the products; conduct a survey to find out; what tools are used/ how often; focus work on what is being used/not used
- Increase emphasis on BMPs; facilitation of existing Forest Service BMP effectiveness monitoring; validation of the effectiveness of BMPs in protecting stream health
- Provide institutional support for career development and training
- Increase emphasis in the Eastern U.S.

Question 1-3:
Which activities and projects would you recommend for priority implementation?

- Stream Web Site/***Stream Notes***
- Continued development of bedload trap technology, WinXSPro, STAGE2Q, and bedload prediction technology but expand to fisheries applications and non-gravel bed rivers and step-pool systems
- Develop guidelines and a protocol guide for establishing the relationships between vegetation and hydrology (both surface and groundwater) specifically concentrating on montane wetlands and stream systems but don't limit it to montane systems; include different physiographic regions; discuss how much riparian areas can be used and impacted while still maintaining important riparian functions
- Develop riparian monitoring protocols for determining the status of riparian vegetation and detecting change in response to altered flow regimes but not just in response to altered flow regimes; expand to address anthropogenic sources (e.g., recreation, horse, ORV, and other management activities) and natural disturbance (fire, floods, cumulative effects); include indicators for determining the status of riparian vegetation and detecting change
- Assess the status of knowledge of the relationships between flow regime, water stage, and streamside and floodplain vegetation, physiology, structure, and function but it needs to be more specific and should be done in partnership with other projects and researchers
- Assist in development of a national BMP monitoring program; work with National Team/Regions to review/modify/augment the existing Region 5 procedure; assemble a core national set of BMPs and associated supporting documents regarding effectiveness; develop and assist implementation of a formal QA/QC for BMP monitoring protocols; develop training videos and technology transfer; facilitate an independent third party assessment of nationally reported results
- Develop an update of the WRENSS vegetation water yield estimation methodology for use in project development and planning; update coefficients and include new logging technology and different disturbances (e.g., fire management and fuel treatments); develop standardized BAER water yield calculations and protocols

Part 2: Identification of Short-term and Long-term Needs

Participants met in small groups for one day to identify and prioritize short-term and long-term emerging issues and needs. Short-term was defined as items that need to be accomplished within the next 3 to 5 years and long-term was defined as more than 5 years in the future. Participants however had a hard time separating short-term from long-term needs so responses are combined for reporting purposes. Several groups were asked to address how STREAM might contribute to the action items identified in the 2/6/2004 draft of the "Water Resources Guiding Principles."

Groups addressed the following questions:

Question 2-1: What are the priority issues that need to be addressed immediately or in the next 3-5 years?

Question 2-2: What are the priority issues that need to be addressed in the future or more than 5 years from now?

Question 2-3: What specific projects or actions should STREAM support or sponsor in the short and long-term?

Question 2-4: What changes in emphasis or direction, if any, need to be made to the STREAM Charter and Mission?

Question 2-5: How can STREAM help implement the Water Resources Guiding Principles (2/6/2004 draft)

Responses to Short-term and Long-term Needs

Question 2-1:
What are the priority issues that need to be addressed immediately or in the next 3-5 years?

- Provide responsive input regarding Agency emphasis on fire, fuels, and vegetation condition
- Incorporate physical process understanding into the Healthy Forest Restoration Act (FHRA); recognize that fuel treatments are adding to cumulative watershed effects
- Support techniques for analysis of cumulative effects
- Support strategies for assessing the impact of diversions and water developments

Question 2-2:
What are the priority issues that need to be addressed in the future or more than 5 years from now?

- Impacts on NFS water supply demand and use by changing populations; clean drinking water will continue to be needed from the forests
- Assess the nature of competition for water; instream flows; water is more valuable for domestic uses than agriculture
- Recognize the cumulative impacts of land uses on water; no longer just timber issues; cumulative watershed effects; watershed assessment methodologies
- Describe expected flow regime effects of global climate change
- Synthesize the effects of fuels reductions treatments on watersheds; influence of fire on water quality and quantity; watershed vulnerability as a result of fire; fire management issues

- Articulate emerging water issues; organize workshops; publish proceedings
- STREAM should step up to a leadership role in the Forest Service network; stay connected with universities, organizations; be a voice for water within and outside the Forest Service; add WATER to Chief's Four Emphasis Areas as a 5th element
- Provide technology transfer of stream restoration techniques; network with other organizations; champion and support stream restoration nationally; promote scientifically sound practices that are defensible
- Develop protocols for BMP effectiveness monitoring
- Burned-Area Emergency Rehabilitation (BAER) effectiveness; political and environmental component to this issue; technology transfer of research developed BAER monitoring protocols
- Synthesis of monitoring methods by ecoregion; emphasize simplification of method selection; basic monitoring design

Question 2-3: What specific projects or actions should STREAM support or sponsor in the short and long-term?

Instream Flows

- Turn instream flow work into National direction; work with WO staff to provide technical input into FS Manual/Handbook for how to define instream flow needs as condition of special use permits; include Fisheries staff in WO and help to conduct programmatic consultation at National Level
- Develop instream flow quantification tools for biology (e.g., fish, riparian vegetation)**;** improve instream flow biological linkages; facilitate a conference to bring instream flow community together
- Develop knowledge tools and approaches to assess causes and consequences of altered flow regime; include hyporheic zone influences; interactions between vegetation and flow; connection between physical habitat metrics and biological condition (beneficial uses; macroinvertebrates, etc.)

Cumulative Effects

- In the short-term, look at cumulative effects, specifically develop a science synthesis of fuel reduction effects
- Map areas of high fire risk relative to watershed condition; help FHRA communicate credible change in watershed condition as well as vegetation conditions
- Improved cumulative watershed effects models and analysis tools
- Need framework process for doing cumulative effects analysis; synthesis of procedural guidance; how to approach CWE; steps in analysis and tools to do it. (e.g. Puffer's 'decision tree'); need good examples of useful CWE analyses; deliver and support framework through 1900-1 NEPA course
- Need tools to handle larger scales than the site scale where measurements/analyses are usually made; analyze responses to management at watershed scale; tools can be models, syntheses of monitoring results; landscape dynamics CD
- Landscape dynamics and ecosystems CD meant to be kickoff for 2nd generation CWE analyses; users haven't become aware of this; transmittal needs to cover this and explain what will it do for you?

TMDL Process

- Aid in getting more scientific rigor into TMDL process; network with cooperating agencies (EPA, NOAA, USFWS, States, etc.) to develop a process for establishing

scientifically meaningful TMDLs, listing and delisting procedures, and implementation plan standards
- Work with EPA Headquarters Office to get more consistent implementation direction to EPA Regions
- Serve as clearing house for state-of-the-art literature and protocols about TMDLs

Watershed Analysis

- Capture decade of experience; examples of good analyses; summarize 10 years of experience in doing EAWS and make it available to the field; concentrate on examples of analysis that have caused District on-the-ground management to change; develop how to guides and examples
- Validate utility of hydrologic analysis product; need to identify what questions are appropriate to ask at what scale; how to apply knowledge at different scales; link to biological assessments (BA's), TMDLs, and other required analyses; restoration priorities, other opportunities, etc.; help people realize that EAWS results in the information to develop those other products
- Work with planners on what tools they need to address water issues, including instream flows and water yields

BMPs

- STREAM should assist in getting BMP monitoring prototyped across the country
- Assemble a master comprehensive set of BMPs applied across the U.S; develop a compendium of State BMPs; what is the science behind each BMP, if any
- Assemble grey literature related to BMPs and make it searchable;
- Coordinate research to address key BMPs; connect with research to facilitate BMP validation monitoring

Training

- Tie to mission of Stream Team; if scope of mission changes, scope of training will need to change.
- Make sure that training doesn't expand too much to take over Stream Team time/energy;
- Focus on training products rather than training sessions
- Update/continue education for physical scientist practitioners
- Continue Water Resources for Line Officer Training; we continue to need line officer support
- Develop training package for USFS Water Resource Professionals; field practitioners; new hires; mid-career professionals; include skills of working in an interdisciplinary fashion and problem solving; making field people into better critical thinkers; develop decision support systems; standardized training for watershed resource specialists, current system is fragmented
- Facilitate development of a training package on Legal Aspects of Managing Water Resources (e.g., Clean Water Act 101; Water Law 101; Laws for Hydrologists; Organic Act, etc.)
- Adapt the "Water Resource Management for Line Officers" course into a "Water Program Managers Short Course" for Forest/District level employees (Staff Officers, Forest Program managers, District hydrologists); legal overview; how to run an effective program, etc.
- Find ways to bring information from Water Resources for Line Officers to a broader audience using, for example, a shorter We-based presentation; consider taking best speakers from history of course and recording them in a studio setting; develop a professional product

- Develop a Leadership/Mentoring program; model after senior leader program, but within the scope and confines of the discipline/profession.
- Develop a Forest specialist mid- to late-career development training; 1-2 per year funded by STREAM
- Support formal education in key areas (graduate training)
- Assemble a compendium of existing training programs; there is lots of existing training out there (EPA, USGS, USFS, private consultants, universities)

Miscellaneous Ideas

- Develop issue based synthesis documents; determine what we need; determine what we don't know; convene experts, managers and users on emerging issues for dialogue exchange
- Develop case studies as part of a synthesis and compendium of existing tools Capture institutional memory of those ready to head out the door perhaps through videos or exit interviews; make information available to others.
- Examine ways to formalize networking; who has experience with what; issue focused contact lists
- Assist in developing measures of accountability for the water resources program; help facilitate process
- Develop tools to define and communicate watershed health
- Work on appropriate way and effective methods to defining reference conditions
- Develop ecoregion specific decision trees to identify appropriate tools or metrics for watershed analysis
- Evaluate management effects/climate effects on low flow characteristics & hydrograph
- Stream restoration
- Buffer design – one size does not fit all
- Watershed scale erosion prediction and routing
- Dam decommissioning effects.
- ATV impacts on streams and riparian areas
- BAER design storm protocols
- Implementation and treatment effectiveness monitoring; large-scale validation versus current efforts at research plot scale
- Road decommissioning training and guidance documents and videos (coordinate with San Dimas T&DC)
- Automated water quality monitoring protocols
- E-mail flyer for latest and greatest information

Question 2-4:
What changes in emphasis or direction, if any, need to be made to the STREAM Charter and Mission?

Existing Charter: "The National Stream Systems Technology Center is a joint national effort between the National Forest System and Research and Development to provide technology development and technical support to Forest Service field units and policy makers in all aspects of watershed hydrology, physical stream processes, and water requirements for streamside vegetation."

- The existing Charter appears to adequately summarize scope of work
- Add "…and aquatic dependent biota" to last sentence to broaden the scope

Question 2-5:
How can STREAM help implement the Water Resources Guiding Principles
(2/6/2004 draft)

Principle 1C*:* *Participate in adjudications of water rights involving NFS lands to ensure the interests of the public are preserved.*
Needed Actions:

- Continue to provide expert witness capacity
- Continue to support research to improve water quantifications

Principle 2D: *As demands for water resources continue to increase, allocation of remaining water is becoming critical to the well being of the national forests. A consistent means is needed to establish ecologically supportable diversion regimes across a diversity of landscapes that will maintain forest uses and resources. Develop a national protocol, applicable to all regions of the nation, for determining flow regimes necessary to maintain favorable conditions of flow to maintain riparian vegetation, associated aquatic and wildlife species, recreation, and provide firefighter safety.*
Needed Actions:

- Develop a methodology to determine instream flow needs consistent with Federal Land Management Policy Act.
  - Stage 1: A quick & simple method for identifying instream flows
  - Stage 2: Protocol requiring rigorous technical evaluation

Principle 3H: *Annually monitor implementation and effectiveness of a representative sample of restoration projects, at a regional scale, to document and improve their effectiveness.*
Needed Actions:

- STREAM should look into becoming more involved in watershed restoration technology, assembling case studies, monitoring success, effectiveness and validation, etc. (coordinate with San Dimas T&DC).

Principle 4 B: *Create a national set of core Soil and Water Conservation Practices (Forest Service BMPs) for all NFS land. Regions may add practices to address local conditions*

Principle 4C: *Monitor a portion of our management actions to determine BMP implementation rates and effectiveness, and continuously upgrade our practices based upon those monitoring results.*
Needed Actions:

- We want STREAM to engage in water quality
- The highest priority is to develop a core set of BMPs and their effectiveness

Principle 4D: *Develop streamlined procedures to facilitate interagency funding of TMDL work undertaken by the Forest Service.*
Needed Actions:

- Develop streamlined procedures for TMDLs; provide a tutorial for developing landscape level TMDLs

Principle 4E: *Update and clarify Forest Service policy with respect to Clean Water Act Section 401 certifications, Section 402 NPDES permits and Section 404 Dredge and Fill permits.*
Needed Actions:

- Integrated strategy between Research/State and Private Forestry/NFS for managing and sustaining water resources

Principle 6A: *Identify high value water dependent resources (i.e. fens, bogs, seeps, aquifers, wetlands, or valuable aquatic resources such as T&E organisms, where reductions in natural water flows cannot be authorized.*

Needed Actions:

- Develop a classification system for identifying high value water dependent resources and consistent definitions and delineation for fens, bogs, wetlands, and riparian areas.

Summary and Conclusions:

Participants provided many useful observations and input to help guide the future program of the Stream Systems Technology Center.

For the most part, customers seem pleased with the past work of STREAM pertaining to technology development and information transfer, analysis tools and products, training, support to the ground, and responding to emerging issues. In spite of maintaining a STREAM Web page that contains most of the products produced by STREAM and publishing a quarterly newsletter that also discusses on-going work, many field units are apparently still poorly informed about STREAM's output and products. In addition, the level of coordination maintained by STREAM with the diverse and numerous various water-related groups in the Forest Service does not appear to be apparent to many field units.

Participants largely endorsed the existing Charter of the Stream Systems Technology Center feeling that it adequately encompasses the scope of STREAM's work. The following broad areas of change were suggested:

- Instream flows – STREAM should broaden its focus on stream flows beyond channel maintenance and address all of the ecosystem components of instream flows, including fish and riparian vegetation.
- Streamside vegetation – STREAM should provide for a more broadly based consideration of vegetation-hydrology relations to include management effects on riparian functions and values rather than limiting itself to effects of flow alterations.
- Synthesis – Issue based synthesis documents and status of our knowledge assessments should receive increased emphasis, especially in areas such as fire management issues and fuel reduction treatments.
- Cumulative effects - An improved framework process for doing cumulative effects at multiple scales is needed along with improved cumulative watershed effects models and analysis tools.
- Watershed analysis/TMDLs – More scientific rigor needs to be brought to the TMDL process and decades of experience doing watershed analysis needs to be synthesized to demonstrate the utility of hydrologic analysis.
- Best Management Practices (BMPs) – STREAM should assist in developing a national BMP monitoring framework and in assembling a master list of BMPs and the science supporting them.
- Training – STREAM should continue to support "Water Resource Management for Line Officers" and expand this type of training to lower levels of the organization and foster programs to support career development.

Appendix A: List of Participants

NAME	UNIT
National Forest System (25 participants)	
Stouder, Deanna J.	WO, WFW
Glasser, Steve	WO, WFW
Knopp, Chris	WO, WFW
Sullivan, Tim	R1, Water Team
Sylte, Traci	R1, Lolo NF
Weinhold, Mark	R2, White River NF
Hays, Polly	R2, RO
Bevenger, Greg	R2, Shoshone NF
Davis, Bob	R3, RO
Lefevre, Bob	R 3, Coronado NF
Heffner, Ken	R4, RO
Collette, Michael	R4, Water Rights & Uses
Page, Tim	R4, Boise Adjudication Team
Staab, Brian	R5, RO
Roby, Ken	R5, Lassen NF
McCammon, Bruce	R6, RO
Clifton, Caty	R6, Umatilla NF
Holcomb, Jack	R8, RO
Clingenpeel, Alan	R8, Ouachita NF
Geier, Ted	R9, RO
Ilhardt, Bonnie	R9, RO
Crotteau, Michael	R10, RO
Thompson, Julianne	R10, Tongass NF
Clarkin, Kim	San Dimas TDC
Coles-Ritchie, Marc	PIBO Effectiveness Monitoring Team
Research & Development (9 participants)	
Ryan, Doug	WO, WFWAR
Dwire, Kate	RMRS, Laramie WY
Ryan, Sandra	RMRS, Laramie WY
Jemison, Roy	RMRS, Albuquerque
McKean, Jim	RMRS, Boise
Lisle, Tom	PSW, Arcata
Grant, Gordon	PNW, Station Corvallis
Furniss, Mike	PNW, Corvallis
Marion, Dan	SRS, Hot Springs
Stream Systems Technology Center Staff	
Potyondy, John	Current Program Manager
Schmidt, Larry	Former Program Manager
Merritt, David	Streamside vegetation Specialist
Williams, Penny	Office Manager
Chambers, Carl	R2, Arapaho-Roosevelt NF (Facilitator)

Appendix B: Agenda

2004 STREAM Strategic Planning Workshop

March 30-31, 2004, Fort Collins, CO
Building C, Main Conference Room 2000

Primary Objective:

Mid-course review of the National Stream Systems Technology Center work plan/charter and transition to new leadership with intent of looking ahead at nationally significant challenges and evaluate opportunities for STREAM to address emerging issues and to provide technology relevant to priority National Forest System needs.

Secondary Objectives:

1. Strategically position the Forest Service to address important emerging issues, including the "Guiding Principles for Water Resources
2. Assure that future work is relevant to the needs of NFS field specialists
3. Improve communication with field and research units.

Product: Report summarizing workshop results and conclusions that will guide future STREAM efforts

Agenda Overview:

1. Review the current Stream Systems Technology Center program of work and accomplishments (1/2 day)
2. Identify opportunities related to existing STREAM Program Elements (1/2 day)
    a. Adapt Instream Flow Approaches
    b. Develop and Transfer Technology
    c. Provide Technical Support and Training
    d. Improve Understanding of Streamside Vegetation Influences
    e. Support Efforts to Improve Sediment BMP Effectiveness
3. Identify near term (3-5 years) and long-term (> 5 years) program elements and emerging issues that STREAM ought to address (1 day)

Daily Agenda

Tuesday March 30, 2004
Day 1 AM - (Presentations by STREAM Staff)

8:30 – 8:45	Introductions	Carl Chambers
8:45 – 9:00	Objectives of Workshop	John Potyondy
9:00 – 9:15	STREAM Charter and Operating Philosophy	Larry Schmidt
9:15 – 9:45	Break	
9:45 – 10:30	STREAM Accomplishments (1992-present)	John Potyondy
10:30 – 11:15	On-going Work – Streamside Vegetation	David Merritt
11:15 – 11:30	Organize small groups	Carl Chambers
11:30 – 1:00	Lunch	

Day 1 PM (STREAM Program Elements - Small Work Groups and Report Back)

1:00 – 3:00 Meet in small groups to discuss existing STREAM Program Elements that are part of the STREAM Charter and report back to the entire group

Group 1: Instream Flow Approaches	Bldg. C, Room 2000
Group 2: Technology Development	Bldg. A, Room 122
Group 3: Technical Support and Training	Bldg. A, Room 123
Group 4: Streamside Vegetation Influences	Bldg. A, Room 124
Group 5: Sediment BMP Effectiveness	Bldg. A, Room 344

Each group will be given a list of FY 2004 and out-year planned projects for one of the Program Elements to stimulate their deliberations. Each group will be asked to discuss their assigned Program Element and another of their choosing. The list will identify:

- The direction we are planning for each Element
- Specific projects we intend to implement in each Element

Suggested questions to address as a group:

- What has STREAM been doing well?,
- What areas need changed or increased emphasis?
- What do you think of the planned direction and projects?
- Which ones would you recommend for priority implementation?
- Are there other directions or projects within the scope of this Program Element that STREAM ought to pursue? What are they? Why?

3:00 – 3:30 Break

3:30 – 4:45 Report back (5 groups @ 15 min. each = 1 hour 15 minutes)
4:45 – 5:00 Discussion

Wednesday March 31, 2004
Day 2 AM (Address Short-term (3-5 years) Needs and Report Back)

8:00 AM Meet in Bldg. C, Main Conference Room 200 – Organize into small groups

8:00 – 9:30 Meet in small groups to identify and prioritize short-term emerging issues and needs and prepare presentations. Short-term is defined as items that need to be accomplished within the next 3 to 5 years. One group is topic specific while the others have no restriction on topic areas.

Group 1: NFS - Water Resource Guidelines	Bldg. C, Room 2000
Group 2: NFS - Water Resource Guidelines	Bldg. A, Room 344
Group 3: Short-term needs	Bldg. A, Room 122
Group 4: Short-term needs	Bldg. A, Room 123
Group 5: Short-term needs	Bldg. A, Room 124

Questions to address as a group:

- What are the priority issues that need to be addressed immediately or in the next 3-5 years?
- Is the issue National in scope or limited to a specific Region?
- What specific projects or actions should STREAM support or sponsor?

9:30 – 10:00 Break

10:00 – 11:15 Report back (5 groups @ 15 min. each = 1 hour 15 minutes)

11:15 – 11:30 Discussion

11:30 – 1:00 Lunch

Wednesday March 31, 2004
Day 2 AM (Address Long-term (>5 years) needs and Report Back)

1:00 PM Meet in Bldg. C, Main Conference Room 200 – Organize into small groups

1:00 – 2:30 Meet in small groups to identify and prioritize future long-term emerging issues and needs and prepare presentations. Long-term is defined as items that need to be addressed more than 5 years into the future. One group will consist of research scientists while the others will be primarily NFS specialists. Groups may be self-organized by topic areas or other areas of concern at the discretion of participants.

Group 1: Research scientists	Bldg. C, Room 2000
Group 2: NFS Specialists	Bldg. A, Room 122
Group 3: NFS Specialists	Bldg. A, Room 123
Group 4: NFS Specialists	Bldg. A, Room 124
Group 5: NFS Specialists	Bldg. A, Room 344

Questions to address as a group:

- What assumptions are you making about the future?
- What issues will need to be address in the future?
- Is this issue National in scope or limited to a specific Region?
- What specific actions need to be taken to address this concern?
- What changes in emphasis or direction, if any, need to be made to the STREAM program?

2:30 – 3:00 Break

3:00 – 4:15 Report back (5 groups @ 15 min. each = 1 hour 15 minutes)

4:15 – 5:00 Summary and Close-out Discussion

5:00 Adjourn

6:00 PM Larry Schmidt's Retirement Party (Mulligan's)

Appendix C: Summary of Future Direction and Proposed Projects

Group 1: Instream Flow Approaches (Improve knowledge of stream systems and processes)

Summary of Direction:

Some work remains to be accomplished regarding the science of channel maintenance flows, however, future instream flow analyses needs are expected to expand to include identification of instream flows that meet geomorphic, aquatic, and riparian ecosystem needs. The need to support instream flow quantifications involving adjudications and negotiations is expected to decrease and shift toward finding ways to protect instream flow needs either in Forest Plans or on a case-by-case basis at the Ranger District level. Science and tools to quantify instream flows under these scenarios need to be developed.

Future Projects:

- Develop a strategic a strategic assessment tool to help forest specialists and managers assess and identify geomorphic, aquatic biology, and riparian vegetation instream flows to sustain these water related values on Forest Service administered public lands. Provides a tool to evaluate the instream flow problem and build hydrograph components to protect geomorphic, biological, and riparian vegetation resources and processes? (FY2004)

- Develop an approach that looks at the entire watershed as a network and which assesses the influences of water withdrawals on physical, aquatic, and riparian vegetation stream values using flow and sediment facts as a basis for making water allocation decisions (FY2004)

- Develop a prototype "water infrastructure" database and analysis approach that can be used to identify the critical inventory data and measurements for a comprehensive assessment of diversion effects off-stream versus instream on physical, aquatic, and riparian vegetation for application at the District Ranger level (FY2004)

- Evaluate channel changes and develop geomorphic monitoring protocols and develop an analysis of the sensitivity of channel monitoring protocols to accurately and precisely detect reach and segment scale channel change (FY2004)

- Develop a conceptual approach to assess physical and biological changes to stream channels from peak flow increases due to snowmaking and clearing (FY2004)

- Develop a guide to piecewise regression analysis for channel maintenance (FY2004)

- Compare at selected field sites different approaches (visual/piecewise (Helley-Smith data)/piecewise (bedload trap data)/Klamath approach/Whiting-King approach/Pitlick method) for determining the beginning of Phase 2 transport to gain insight into variability

- Develop an approach for quantifying channel maintenance flows in rain-dominated regions? Other regions?

- Develop an approach for estimating roughness coefficients for high gradient channels for use in estimating discharge for applications such as FishXing

Group 2: Technology Development

Summary of Direction:

We are continuing work to develop bedload trap technology to allow for rapid determination of the initiation flow for channel maintenance insteam flows. We expect to have the WinXSPro stream channel cross-section program available to the field soon and to continue work on the STAGE2Q series of programs to allow the field to maintain and reduce streamflow data. Work is also underway to provide the field with a set of programs and guidance to estimate bedload transport in gravel-bed rivers. An updated version of WRENS is in the works to allow the field to estimate water yield increases due to vegetation changes, including thinning for fire planning.

Future Projects:

- Maintain STREAM Web site and quarterly publish the STREAM NOTES newsletter
- Continue development work of bedload trap technology to support channel maintenance quantifications. Expand technology to larger rivers. (FY2004)
- Complete software development of WinXSPRO – A Stream Channel Cross-Section Analyzer and continue work on STAGE2Q – Streamflow Data Reduction (FY2004)
- Develop improved bedload prediction technology for gravel-bed rivers. Develop software, user guide, and conduct training. Will provides guidance on how to do these predictions at sites without field data as well as at sites with measured data. (FY2004)
- Develop an update of the WRENSS vegetation water yield estimation methodology for use in project development and planning (software/user guide/training). Will include an update of the science as well as the computational algorithms. (FY2004)
- Develop improved suspended sediment monitoring technology developed by PSW Research Station and transfer information to users (FY2004)
- Support development of stereo camera channel monitoring technology (FY2004)

Group 3: Technical Support and Training

Summary of Direction:

We will continue to provide support on an as-needed-basis concentrating on projects of significance to the agency.

Future Projects:

- Provide support as requested to the Washington Office, Regions, and Forests
- Continue to assist with Water Resources Management for Line Officers training (FY2004)
- Help to plan the WO National Watershed Conference for physical scientists (FY2004)
- Assist Dept. of Justice attorneys and provide expert testimony in United States v. Hage water rights/riparian vegetation court case (FY2004)
- Complete work on developing a training CD/DVD guide to the identification of bankfull stage in the northeast United States (FY2004)
- Explore development of a training CD guide to the identification of bankfull stage in the southeast United States addressing incised channel systems (FY2004)
- Develop similar bankfull videos/CDs in other geographical regions? (Alaska/coastal streams/southwest)
- Continue to provide geomorphic input and support development of AEUI monitoring protocols
- Continue to support R-6 Monitoring and Evaluation Workshop
- Re-do Channel Reference Sites publication to include newer technology (lasers, GPS, etc.)
- Produce a video/CD training product on the proper way to characterize surface particle size distributions in gravel-bed rivers (pebble counts)
- Establish a National Field Hydrologist and Hydrologic Scientific Technical Excellence award for Forest hydrologists

Group 4: Streamside Vegetation Influences

Summary of Direction:

Current emphasis is directed toward understanding the linkages between riparian vegetation and instream flows and developing methodologies for determining essential instream flows to sustain riparian ecosystems. As a first step we will define the state of the science to predict the flow regimes necessary to sustain viable riparian vegetation and to understand the consequences of altered conditions on the channel and the riparian ecosystem. The goal is to develop quantification approaches for restoring flow regimes and riparian ecosystems with special emphasis on developing and expanding this knowledge to riparian areas and wetlands in montane watersheds.

Future Projects:

- Assess the status of knowledge of the relationships between flow regime, water stage, and streamside and floodplain vegetation, physiology, structure, and function (FY2004)

- Develop guidelines and a protocol guide for establishing the relationships between vegetation and hydrology (both surface and groundwater) specifically concentrating on montane wetlands and stream systems. This method will assist in the quantification of flows necessary to maintain valued qualities of riparian vegetation (FY2004)

- Investigate the relationship between flood hydrology and the maintenance of streamside vegetation similar to work done for the Klamath Adjudication, but in a different geographic setting (FY2004)

- Maintain riparian bibliography with increased emphasis on building the "gray" literature portion (FY2004)

- Develop riparian monitoring protocols for determining status of riparian vegetation and detecting change in response to altered flow regimes

Group 5: Sediment BMP Effectiveness

Summary of Direction:

STREAM will assist in the development, application, evaluation, and transfer of BMP technology by supporting national and regional efforts to evaluate the effectiveness of BMP technology. We will seek answers and strategies for the most challenging problems. Specific tasks remain to be identified.

Future Projects:

- Make the Dissmeyer BPM evaluation materials available on the STREAM Website
- Work with Pete Robichaud on training people in the use of sediment fence monitoring techniques
- Review historic research on road BMPs

Appendix D: Original Unedited Group Comments

Day 1 - Tuesday AM Group Reports:

Group 1: Instream Flow Approaches

What has STREAM been doing well?

Technology transfer; facilitating support to the ground; have taken channel maintenance science a long way; training has been great; facilitating line officer course; opportunistic style up to this point has been very effective; created a very good link between NFS and R&D and collaboration with non-agency entities; shock and awe technology may not be working.

What areas need changed or increased emphasis?

Information beyond channel maintenance, such as biological (flora and fauna) needs so we can answer the "so what" questions; recognizing we may not get the whole enchilada, what is need to get incremental changes that improve on-the-ground conditions; current mission is beyond original, this creep may be good but needs to be well managed to ensure it addresses priorities and the money is well spent; linkage to ESA consultation; move from reach scale to watershed scale; need more emphasis in the Eastern U.S.

What do you think of the planned direction and projects?

List appears reasonable; like the expansion into other aspects of instream flow; additional ideas include ensuring all appropriate laws etc are being considered and not just Organic Act; since the current drought cycles appear to be pervasive are more drought considerations needed; list could be written to be more concise; is "water infrastructure" project a real need; interject collaboration/negotiation/facilitator/arbitrator skills into instream flow science.
Interject social scientist (socialist) skills into instream flow science.

Which ones would you recommend for priority implementation?

Since all are on-going, STREAM needs to ask themselves whether project by project energy is at the right level or if more should go into bullet 1 and less into bullet 3.

Are there other directions or projects within the scope of this Program Element that STREAM ought to pursue? What are they? Why?

Concerns on exact roles and responsibilities; transition to new leadership (new program manager and going from R&D to NFS); areas of the country STREAM works in; in other words "what are the sideboards?"; if STREAM moves more into flora/fauna sides of instream flow will other funds besides NFVW be used.

Group 2: Technology Development

What has STREAM been doing well?

Info Transfer: Stream Notes, Web Site,
Software and Analysis Tools: Great job.
Physical Tools: Great job.

What areas need changed or increased emphasis?

1. Issue: Delivery systems and Packaging

- Need institutional support for career development and training
- Need follow-up to information dissemination
    - Stream Notes – continue
    - CDs follow up with site visits
    - Email flyers for recent updates on webpage
    - More documents and dissemination of tools like: Rapid Sediment Assessment – Reid
    - Web-based training and awareness

2. Issue: Cumulative Effects/Viability Assessments: Protocol for processes that address cumulative effects at multiple scales, multiple ecoregions, and linkages for physical and biological processes. Validation of assessment processes that are working/not working.

3. Mechanism to improved "connectedness" to the field (develop what this is, but steering committee is not entirely adequate).

4. Continue increased relevance and support to practitioners. Validation of products. Get feedback from the field. Understand who is doing what with the products. Conduct a survey to find out. What tools are used/ how often. Focus work on what is being used/not used).

What do you think of the planned direction and projects?
Which ones would you recommend for priority implementation?

In general, Stream has increased support to practitioners – WHERE WE NEED TO BE – good job.

1. Stream Web Site/Stream Notes – high priority
2. Bedload Trap Technology - high
3. WINXSPro/STAGE2Q – high priority
4. Bedload Prediction Technology – high priority (expand to fish applications and non-gravel bed rivers and step-pool systems).
5. WRENSS – Chapter 3, Water Yield, Medium priority
6. Suspended Sediment - need more information, but could be very useful. Good priority
7. Stereo Camera – need more information, but could be very useful. Good priority
8. Velocity Head Rod - need more information, question priority
9. River Morph license as an agency – Don't really support, Question application for forest use considering typical work and existing data bases

Are there other directions or projects within the scope of this Program Element that STREAM ought to pursue? What are they? Why?

- TMDLs and Water Yield
- Software development for stage and water quality data
- Provide a clearinghouse for the functions and products of each national based service centers – provide a forum for telling practitioners who is doing what.
- Web-based Search Engine and Guidance Document/Website – Toolbox and Suite of Tools. Provide state of the art literature and tools to address specific situations and conditions. Searchable by Ecoregion, current applicable literature, local experts identified tools for assessment and measurement for specific areas and conditions. Examine NEPA issues and develop a linked literature review. Provide references.
- Evaluation of current water yield models – need coefficient updates, consideration for new logging technology/equipment and disturbance
- Standardized BAER water yield calculation and protocol
- Interface with NRIS – need to address and link to them
- Quick application to determine a minimum flow for fish habitat that is somewhere between PHABSIM and R2Cross.
- If we are going to develop technology for the future, need to develop it at a scale that is useful

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Group 3: Technical Support and Training

(Transcribed from original PowerPoint)

1- What has STREAM been doing well?

- Very good at leveraging funding to accomplish work
- Good at accessing people
- Linking up with the right people in the research and academic community. This has given their efforts scientific credibility.
- Tools and products have been useful (w/in program focus)
- Have hit the right balance between science and practical applications(w/in program focus)

2 - What areas need change or increased emphasis?

- Coordination with other Groups (e.g. FERC, Kirchner's Group, San Dimas T&D) could be improved
- Are there questions that may be falling through the cracks of the charters or missions for the various groups that periodic coordination could address (e.g. R6 peak flow)
- "Sounding Group" with representation from mgmt. and research and geographic spread to sense emerging issues and needs and to maintain relevance to FS management
- Are there new customers and new questions as water adjudications wind down?
- See question 6 for a suggestion of possible focus statement

3- Planned direction and projects?

- Synthesis should be given greater weight
    - Broad Issue/concept development

    - Issue driven State of Knowledge
    - Method synthesis
- Tools
- New data/ knowledge acquisition
- Tech transfer (Stream notes, Web, CD's, training)

4- Which projects should be priorities for implementation?

- Ranking of priority strongly contingent upon who perceived customers are

5- Are there other directions or projects that ought to be pursued

- Is the focus on instream flows the correct focus for STREAM? Are STREAM's sideboards the right ones
- Should a broader focus be considered
    - Causes and Consequences of Altered Flow Regimes
        - Causes- Dams/diversions, forest mgmt., climate, fire
        - Consequences-Channel, sediment, habitat
        - Flow-Water, sediment, wood, temp
- STREAM does not need to provide all the answers, but could expand in their existing role as a convener and synthesizer

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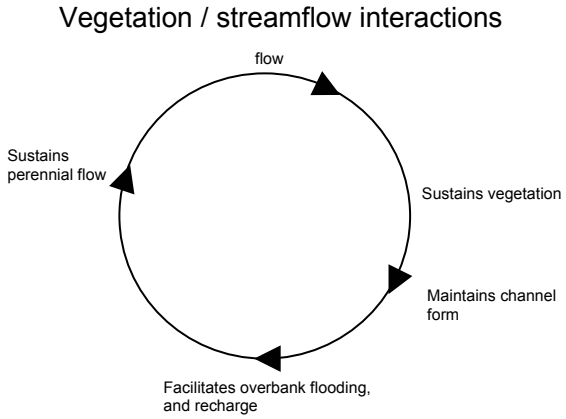
Group 4: Streamside Vegetation Influences

What STREAM is doing well?

1. Hired an excellent riparian ecologist.
2. Effort to link stream to riparian vegetation is good.
3. Tucson 2003 workshop (although had a Western US focus) was great.
    a. Need a product. Consider writing up 2-4 key ideas/concepts from workshop as a first step, rather than trying to summarize the entire workshop (which could be overwhelming).
4. Outreach (support to District-level projects) is good. Keep it up and expand geographically where possible.
5. Excellent production of user-friendly tools, i.e. bankfull videos.
6. Flexibility and willingness to help (technical support and funds) with local/regional issues is great. Very responsive to emerging issues.

What needs to be changed, increased or emphasized more?

1. More broadly based consideration of vegetation-hydrology relations.
    a. In addition to in-stream flows, consider other hydrologic variables
        i. Groundwater
        ii. vegetation ← → stream interactions. Riparian vegetation affects stream as well as stream affecting riparian vegetation (linkages and feedbacks).



2. Consider management effects (not just instream flow alterations) on riparian functions and values.
3. Include consideration of riparian areas where flow is not controlled, i.e. Eastern US, high elevation.

Planned direction and projects?

"Assess the status of knowledge of relationships…" (MEDIUM PRIORITY)

- Great, but too broad. Needs to be more specific. Break into components. Partner with other projects/researchers to address these relationships.
- Establish link on web page to other governmental studies in order to improve communication and to share information.

"Develop guideline and protocol guide…" (HIGH PRIORITY)

- Not just montane.
- How much can riparian areas be used and impacted while still maintaining important riparian functions?
- Different protocols based on physiographic region, i.e. Klamath adjudication.

"Maintain riparian bibliography…" (LOWER PRIORITY)

- Advertise? Or discontinue?
- Synthesize information to address questions such as recreation, management effects. Includes analysis of unpublished data.
- Link to existing databases
- Annotate

"Develop riparian monitoring protocols INCLUDING INDICATORS for determining the status of riparian vegetation and detecting change NOT JUST IN RESPONSE TO ALTERED FLOW REGIMES, BUT ALSO TO " (HIGH PRIORITY)

- Anthropogenic: recreation (horse, ORV, etc.) management activities.
- Natural disturbance: fire, floods,
- Cumulative effects.

Group 5: Sediment BMP Effectiveness

~~Sediment~~ BMP Effectiveness

1. **What has stream been doing well (re: BMP effectiveness)?**
   Not much done is this arena.
2. **What areas need changed or increased emphasis?**
   In general, we agree with the new interest/emphasis on BMP effectiveness.
3. **What do you think of the planned direction of and projects?**
   Publish Dissmeyer BMP evaluation materials.
   - Seems premature. See below.

   Training on use of sediment fence monitoring
   - Seems too narrow for right now.

   Review of historic research on road BMPs
   - See below.
4. **Which projects do you recommend for priority implementation?**
   Work with National team to assemble a core National set of BMPs and associated supporting documents regarding effectiveness.
   Assist in development of a National BMP monitoring program.
   - Needs…work with Nat'l Team/Regions to determine whether existing R5 program sufficiently addresses full range activities on NFS lands nationally.
   - Methods…work with Nat'l Team/Regions to review/modify/augment existing R5 implementation & effectiveness methods to meet national needs.
   - Develop and assist implementation of a formal QA/QC for final BMP monitoring protocols.
   - Training videos/tech transfer.
   - Provide 3rd party independent assessment by reporting National results.
5. **Other directions or projects that STREAM ought to pursue? Why?**
   BMP validation studies.
   - Key to demonstrating compliance with CWA and agency objectives.
   - Responsive to State interests.

   More visible connection WO Fish & Aquatic Ecology Program.

Day 2 - Wednesday AM Group Reports:

Group 1: NFS – Water Resource Guidelines

<u>Guiding Principles</u>

Principle 1C (participate in adjudications):
Expert witness capacity - ongoing.

Principle 2D(consistent National protocol for determining flow regimes necessary for favorable conditions of flow):

Develop a methodology to define instream flow consistent with Federal Land Management Policy Act.

Stage 1: Quick & simple method for identifying instream flows (sets the bar)

Stage 2: Rigorous technical evaluation High

Principle 3(general):

Stream should look into becoming more involved in watershed restoration technology, assembling case studies, monitoring success, effectiveness and validation, etc. (Coordinate with San Dimas).

Principle 4 (general):

We want Stream to engage in water quality issues.

Principle 4 B & C (develop core set of BMPs and effectiveness):

See yesterday's discussion. Highest Priority

Principle 4D (Develop streamlines procedures for TMDLs) :

Provide a tutorial for developing landscape level TMDLs High

Principle 4E (Integrated strategy between research/state and private/NFS for managing and sustaining water resources)

Principle 6A (Develop a classification system for identifying high value water dependent resources):

Consistent definitions and delineation for fens, bogs, wetlands, riparian, etc.

Implementation "A" (Support research to improve water quantification):

Ongoing

<u>Short Term Needs Other</u>

- **Turn instream flow work into National direction:**
  - Specifically: Work with WO staff to provide technical input into FS Manual/Handbook for how to define instream flow needs as condition of special use permits. Include Fish staff in WO and help to conduct programmatic consultation at National Level. (Field identified – see 2D above)
- **Training:**
  - Specifically: adapt the "Water Resource Management for Line Officers" course into a "Water Program Managers Short Course" for Forest/District level employees (Staff Officers, Forest Program managers, district hydrologists). Legal overview/how to run an effective program, etc. (Field identified)
- **Aid in getting more scientific rigor into TMDL process:**
  - Specifically: Network with cooperating agencies (EPA, often NOAA and USFWS, States, etc.) to develop a process for establishing scientifically meaningful TMDLs, listing and delisting procedures, implementation plan standards. Work with EPA Headquarters Office to get more consistent implementation direction to EPA regions. (Field identified – see 4D above)
  - Assist in developing measures of accountability for the water resources program. Help facilitate process

Group 2: Short-term Needs

- **Priority Issues in the next 3-5 years**
  - Agency emphasis is on fire, fuels, and vegetation condition
  - Watershed program viability is at risk-
  - Incorporating physical process understanding into HFRA
    - Recognize that fuel treatments are adding to cumulative watershed effects
    - What role do century long changes in stream systems play in forest health and fire risk
- **Scope of issue: National or regional**
  - Expand the understanding that STREAM is a national resource
  - Not all issues will be national in scope _ regional. multiregional
- **Specific tasks for STREAM**
  - Continue Line officer training
  - Water resource inventory: how much, where, when
  - Water needs on NFS lands
  - Tools to define and communicate watershed health
  - Exploit existing tools to new needs, e.g., bedload tools to crossing design
  - Map areas of high fire risk relative to watershed condition
    - Help HFRA communicate credible change in watershed condition as well as vegetation conditions

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Group 3: Short-term Needs

Foundation – Organic Act
Define mission and customers:

- Validate that primary clients are Forest Service field units at a national scale
- Include in Mission aquatic biota

Develop knowledge tools and approaches to assess causes and consequences of altered flow regime
Develop issue based synthesis:

- Strategery
- Determine what we need
- Then determine what we don't know

Issues:

- diversions, water developments; cumulative effects

Group 4: Short-term Needs

Highest Priority:

- ✓ Instream flows for biology (e.g., fish) (including riparian)
- ✓ Hyporheic zone influences (Water Quality) – e.g., spring development, wetland impacts (including groundwater)

Medium Priority:

- ✓ BMP's – sediment monitoring (other than bedload – water quality) including grazing
- ✓ Decision tree to identify appropriate tools or metrics based on ecoregion
  Defining reference condition – range of conditions (more appropriate way and effective methods)
- ✓ Management effects/climate effects on low flow characteristics & hydrograph (How to plan for)

Lower Priority:

- ✓ Stream restoration
- ✓ Water needs for near channel vegetation (interactions between vegetation and flow)
- ✓ Connection between physical habitat metrics and biological condition (beneficial uses – i.e., insects)
- ✓ Buffer design – one size does not fit all

Other Ideas:

- ✓ Watershed scale erosion prediction (routing) – effects to streams (i.e., conclusions from Tucson)
- ✓ Cumulative Watershed Effects Models
- ✓ Dam decommissioning – effects/staging, etc.
- ✓ ATV impacts on streams and riparian areas

Group 5: Short-term Needs

BAER teams

- BAER design storm protocols
- Implementation and treatment effectiveness monitoring; large-scale validation versus current efforts at research plot scale; how to implement treatments guides

FERC team

- Continue current coordination

STREAM NOTES and information exchange recipients

- E-mail flyer for latest and greatest information
- Provide a clearinghouse for the functions and products of each national based service centers; provide a forum for telling practitioners who is doing what.

NFS specialists (hydrology, soils, aquatics, planning, range conservationists)

- TMDLs – serve as clearing house for state-of-the-art literature and protocols; provide in STREAM NOTES
- Watershed analysis - how to guides
- Standardized training for watershed resource specialists – current system is fragmented
- Web-based Search Engine and Guidance Document/Website – Toolbox and Suite of Tools. Provide state of the art literature and tools to address specific situations and conditions. Searchable by Ecoregion, current applicable literature, local experts identified tools for assessment and measurement for specific areas and conditions. Examine NEPA issues and develop a linked literature review. Provide references.
- Water yield and flow regime – support continued WRENSS work, STAGE2Q, WINXSPRO (get it done) or other analysis tools

- NRIS – continued involvement, coordination and avoid cross-purposes
- Improved coordination with others (e.g., Kirchner's group) to get better tools for linking physical to aquatic biology relative to sustaining fish habitat;
- Road decommissioning training and guidance documents and video; coordinate with San Dimas
- Forest specialist mid- to late-career development training; 1-2 per year funded by STREAM
- Cumulative effects – science synthesis of fuel reduction effects
- Work with planners on what tools they need to address water issues, including flow regime
- Automated water quality monitoring protocols
- Continued support with large scale and large area mapping and remote sensing

Other agencies and academia
- Reaching out to academia for methods that makes it easier for ground-pounders to find journal articles of interest
- Provide academia and other agencies NFS research needs (i.e., here's a hole in the science we need filled)

Citizen watershed groups
- Provide STREAM NOTES

NF policy makers (i.e., WO)
- Continue line officer training; perhaps develop "target audience" criteria (i.e., which line officers are higher priority than others)
- Convene experts, managers and users on emerging issues for dialogue exchange

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Day 2 - Wednesday PM Group Reports:

Group 1: Long-term Needs - Research

Long Term and Emerging Issues brought to you by Research
Water supply and use by changing populations
- Clean drinking water needed from the forests
- Water is more valuable for domestic uses than agriculture

Flow regime effects of global climate change
- Lack of water
- Fire

Be a voice for water within or outside FS
- Add water to Chief's list as a 5th element

Cumulative impacts of land uses on water
- No longer just timber issues

Water
- Value
- Uses (agriculture > domestic)

Effects of fuels reductions treatments on watersheds

Articulation of coming water issues

- Organize workshops
- Publish proceedings

Step up to leadership role in FS

- Network
- Stay connected with universities, organizations

Fire

- Influence of fire on water quality and quantity
- Watershed vulnerability as a result of fire
- BAER effectiveness
    - Political
    - Environmental
    - Monitoring at NFS level
    - TT of research developed monitoring protocols
    - Raise awareness of availability monitoring funds through BAER
    -

Technology Transfer of <u>stream restoration</u> techniques in Southeast

- Network with other organizations (NCED) to increase coverage area
- Champion and support stream restoration nationally
- Promote best practices that are defensible

Monitoring

- Aquatic biota
- Water
- Fish
- Synthesis of monitoring methods by ecoregion
- Simplification of method selection

Historic range of natural variability

- Use and definition of reference condition
- Affect of climate extremes (floods and droughts)

Track R & D data bases for current research

Make new tools and technologies available

Group 2: STREAM TEAM Mission

Charter

The National Stream Systems Technology Center is a joint national effort between National Forest Systems and Research and Development to provide technology development and technical support to Forest Service field units and policy makers in all aspects of watershed hydrology, physical stream processes, and water requirements for streamside vegetation.

- Add "…and aquatic dependent biota" to last sentence

Operating Philosophy

- Change 4th bullet to - A source of scientific solutions to water ***resource*** issues

Program Elements

- Consider expanding 1st bullet – "Adapt instream flow approaches" to "Adapt instream flow approaches to evaluate effects of change in flow on the physical environment and aquatic dependent biota
    - If the first bullet is expanded, the fourth bullet could be dropped
- Add bullet emphasizing cumulative effects/watershed analysis
    - It is not the role of STREAM to solve all CE problems, but rather to provide their expertise in synthesizing existing knowledge and techniques
- Add bullet concerning BMP
    - Facilitation of existing FS BMP effectiveness monitoring
    - Conduit for research into effectiveness of BMP's in protecting stream health (validation)
- Emphasis – STREAMS role in these two items is to provide Technology Development and Technology Transfer

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Group 3: Training

Training Assumptions:

- Tied to mission of Stream Team – if scope of mission changes, scope of training will change.
- Need to make sure that training doesn't expand too much to take over Stream Team time/energy. Focus on training products rather than training sessions.
- Line officer support will continue to be critical.
- Losing many experienced professionals. Will need to train replacements, whether as new hires/mid career.
- Update/continue education for current practitioners.
- Target audience will involve managers and practitioners who manage aquatic resources

What Issues will need to be addressed in the future? (All are national or multiregional in scope).

- BMP Effectiveness Monitoring, consistency – web based product
- Basinwide TMDL. – web based product
- Instream Flows
- CWEs
- Assessment Methodologies
- Logic
- Basic Monitoring Design
- Some items may be ongoing and just need coordination with other existing NFS efforts.
- Reality check at regional/field/station level to ensure that priorities are still relevant.

Specific Actions:

1. Continue Water Resources for Line Officer Training – This is critical!!! We continue to need line officer support.
2. Training package for USFS Water Resource Professionals (field practitioners)
    - New hires
    - Mid Career (include skills of working in an interdisciplinary fashion, using logic)

3. Facilitate putting together training course/training materials on legal aspects of managing water resources:

- Clean Water Act 101
- Water Law 101
- Laws for Hydrologists
- Organic Act

4. Using tools well: logic, monitoring design

Other ideas:

- Capture institutional memory of those ready to head out the door – how to do this, make available to others.
- Case studies as part of a synthesis and compendium of existing tools.
- Ways to bring info from Water Resources for Line Officers to a broader audience a shorter web based presentation – consider taking best speakers from history of course, and recording them in a studio setting, professional product.
- Clearinghouse/assemble compendium of existing training programs – there is lots of existing training out there (EPA, USGS, FS)
- Leadership/Mentoring program - Model after senior leader program, but within the discipline/profession.
- Ways to formalize networking: who has experience with what. Issue focused. Experience and contacts.
- Support formal education in key areas (graduate training).

Group 4: Cumulative Effects/Watershed Analysis

Cumulative watershed effects

Need Framework: Process for doing cumulative effects analysis ---- as affected by legal framework? Synthesis of procedural guidance---how to approach CWE. Steps in analysis and tools to do it. (e.g., Puffer's 'decision tree') Need good examples of CWE analyses

a. Deliver and support framework through 1900-1 NEPA course.
b. Need Tools to handle larger scales than what measurements/analyses are usually made on (site scale). (to analyze responses to management at watershed scale). Tools can be models, syntheses of monitoring results, e.g., Landscape dynamics CD.
c. Landscape dynamics and ecosystems CD meant to be kickoff for 2nd generation CWE analyses. Users haven't become aware of it. Need better distribution system---transmittal needs to cover explanation: what is it for? What will it do for you?

Watershed analysis (EAWS)

STREAM could play role in Hydrologic analysis portion of EAWS
1. Capture decade of experience.

- STREAM could provide tools (GIS), examples of good analyses. Summarize 10 yrs of experience in doing EAWS and make it available (before Bruce retires). Need to come up with an effective means of distribution.
- Find example of the analysis that have caused district management to change .

2. Validate utility of hydrologic analysis product
   - Need to identify what questions are appropriate to ask at what scale. Structure and process for a large-scale assessment, how to apply knowledge at different scales.

3. Link to RAP, BA's, TMDLs, identification of management priorities, restoration priorities, other opportunities, etc. Help people realize that EAWS results in the information to develop those other products.

4. Water for line officers course might be a place to demonstrate to decision makers the utility of successful EAWS. Need a line officer spokesman.

Group 5: Cumulative effects/Watershed Analysis

(Transcribed from original PowerPoint)

Riparian Veg…

- Dave M. position overly focused on flow issues
  - Expand Dave's job description
    - Water-vegetation interactions very important
- Move emphasis to upper network (lose the in-channel and upslope dichotomy)
- Look at 3-D in the system
- Inventory (NRIS bridging solution)
- DFC Guidance
- Network with others working on methods
- INA
- Fire and riparian areas

Link to other TT Units…

- San Dimas T&D
- Missoula T&D
- F & A E Unit
- National Riparian Service Team
- PNW Boundary Spanners
- Kerry Overton at RMRS/R-&4
- Inventory and monitoring institute
- Remote Sensing Applications Center
- NRIS
- And so on….
- Roundup of activities and priorities
- Who does what, where, why, how
- Avoid duplication, enhance leveraging
- Discover and assign gaps
- PIBO and AREMP is a good example of coordinating common tasks
- STREAM and SanDimas T&D Soil and Water linkage continued and strengthened

BMPs …

- STREAM to assist in getting BMP monitoring prototyped across the country
- Help round up the master superset of BMPs applied
- Implementation should be included in any effort
- Connect with research to facilitation validation monitoring of BMPs
- Assemble grey literature related to BMPs and make it searchable
- Develop a "compendium of State BMPs
- What is the science behind each BMP, if any
- Science basis
    - e.g., Get rid of all headwater stream buffers, as "there is no science behind them."
- Coordinate research to address key BMPs

Instream biological linkages

- Facilitate a conference to bring entire instream flow community together
- Strengthen linkages between STREAM physical and riparian work and aquatic biotic consequences
- Population increases = ARG!
- Beaver reintroductions
- Regurgitators
- Making field people into better critical thinkers. Decision support systems
- Back to the future…."Let's remove the phreatophytes for more water."
- Aquatic and Riparian Invasives?