CAMNet

Annual Rendezvous

March 8-10, 2009
Holiday Inn and Convention Center
Kearney, NE

SUMMARY

Prepared by
The Meridian Institute

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Headwaters CORPORATION

HDR

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM

KEARNEY visitors bureau

Executive Summary

On March 8-10, 2009, the Collaborative Adaptive Management Network (CAMNet) and local host the Platte River Recovery and Implementation Program (PRRIP) convened the third annual Rendezvous in Kearney, Nebraska. This gathering was designed to provide a forum for innovative natural resource managers, scientists, policy makers, academics, and citizens to:

- share successes and challenges regarding CAM implementation,
- hear examples of mechanisms and strategies for linking science and monitoring results with natural resource decisions and management, and
- discuss skills and competencies needed for successful execution of CAM.

The 2008 Rendezvous was made possible by the support of PBS&J http://www.pbsj.com/ , the Headwaters Corporation http://headwaterscorp.homestead.com/ , HDR http://www.hdrinc.com/ , the Kearney Visitors Bureau, and participant registration fees. The Program for the event was developed by a committee of CAMNet members. Participants came from the Glen Canyon, Missouri River Basin, Upper Mississippi River System, Platte River Basin, Arizona, and the Florida Everglades, and included adaptive management (AM) and collaboration practitioners, scientists, academics, and policy makers from state and federal agencies, universities, non-governmental organizations, and the private sector. A list of participants is included in Appendix B.

The event began with a welcome from W. Don Nelson, publisher of *Prairie Fire* newspaper, a Great Plains publication covering public policy, the arts, and the environment, and former Nebraska State Director for United States Senator E. Ben Nelson, policy adviser to several governors in Nebraska and Wyoming, and investment banker in the private sector for 14 years.

Following this, a panel of representatives from four CAM programs at a variety of scales, geographic locations, and ecosystem types around the country shared successes and challenges associated with advancing from CAM planning to implementation.

Participants then heard about and had an opportunity to discuss the Platte River Recovery Implementation Program's cutting edge adaptive management program and approach to collaborative decision-making and governance. A field visit to Cottonwood Ranch on Monday morning enabled attendees to view first hand a stretch of the Platte River where the Nebraska Public Power District, one of the partners involved in the PRRIP, is conducting restoration actions and preparing for management experiments planned for 2010 to help answer some of the questions identified through their AM program. Following presentation and discussion of AM and ESA, and strategies for connecting science with management and policy, the Platte River Whooping Crane Maintenance Trust, another PRRIP partner, invited attendees to hear about the relationship between habitat needs of migratory birds and the restoration activities planned by the PRRIP. Rendezvous participants enjoyed the use of the Trust's blinds to view tens of thousands of Sandhill Cranes as they returned to the river from nearby fields and settled for the night.

Key points from the presentations and discussions are documented below, and a summary of factors to consider when designing and implementing a CAM approach that emerged over the course of the event is compiled in Appendix A.

Presentations made at the Rendezvous are available at http://www.adaptivemanagement.net/rendezvous2009.php

Welcoming Remarks by W. Don Nelson

W. Don Nelson, Publisher of *Prairie Fire* newspaper and a proud Nebraskan with a wealth of experience in both the public and private sectors, welcomed the group. He shared insights based on experiences from and related to the history, present and future of Nebraska, "the land of ancient wings". He observed that it sometimes takes people time to recognize the links between parts of a regional system like the Missouri River, and offered examples of this from the Everglades where he grew up and the Platte River near which he now resides. Don urged participants to keep in mind the context of geologic time when working to address current issues such as drought and river restoration, and emphasized that we are capable of addressing both economic and environmental challenges in an integrated way.

He encouraged groups like CAMNet to help people understand how the choices we make related to the natural environment in which we live will impact us in the future, and how to participate in a learning process in order make more informed decisions.

CAM Programs Panel – Transitioning from Concept to Implementation

Participants heard from representatives from four CAM programs around the U.S. about successes and challenges associated with implementing CAM on the ground and getting from AM planning to implementation. Panel presentations covered the Glen Canyon Dam Adaptive Management Program (GCDAMP), La Cienegas National Conservation Area, Missouri River Recovery and Implementation Program, and Comprehensive Everglades Restoration Plan (CERP). Presenters discussed key factors in the transition from AM planning to implementation, what they are learning from experiments or field tests, and competencies needed to successfully execute CAM based on their experience. Highlights from the presentations are summarized below.

Glen Canyon Dam Adaptive Management Program
Dennis Kubly, Bureau of Reclamation

Overview

- Power generated by the dam has a value of $130 million.
- A 1996 Record of Decision (ROD) committed to meeting multiple goals, including hydropower supply, ecosystem and species protection, and recreational safety goals. (70% of NEPA actions are not monitored to determine if goals are met.)
- Adaptive management was agreed to for the Glen Canyon Dam because there was disagreement about the ROD. The first experiment was conducted in 1996.

Key factors in the transition from AM planning to implementation:

- Record of Decision by Secretary of the Interior agreed to adaptive management
- Research program in place with NRC review
- EIS Cooperators formed majority of FACA members
- Structure for GCDAMP laid out in EIS
- High uncertainty in EIS predictions

Experiments or field test conducted include:

- High dam releases ~41-45,000 cfs
- Powerplant capacity releases ~31,000 cfs

- Low steady flows-summer or fall
- Non-native fish suppression flows
- Mechanical removal of non-native fish
- Tributary translocation of endangered fish
- Removal/replacement of endangered

What is being learned?

- Sediment-triggered floods temporarily improve beach building and improve sediment retention; long-term sustainability may require additional flow modification or augmentation
- Mechanical removal of non-native fish has markedly reduced their populations
- Declining population of endangered humpback chub stabilized and increasing; nonjeopardy biological opinion
- Other native fish species exhibiting population increases
- Changes to dam releases matter, but it is not the only relevant factor
- Information learned from the first experiments/field tests have generated new questions (e.g. how many beaches are needed?)
- Much has been learned; however, it is very difficult to ascertain why - cause and effect relationships are difficult to identify in a large system

Skills and competencies needed to execute CAM:

- Facilitation and mediation
- Independent Science: modeling, ecosystem function, experimental design
- Interdisciplinary appreciation
- Leadership: Both technical and policy
- Understanding adaptive management
- Understanding psycho-social-political

Challenges being encountered:

- Litigation – there is a lawsuit in progress alleging non-compliance with ESA and NEPA for dam operations and Reclamation's Annual Operating Plan
- Resistance to further large-scale experiments
- Quantification of future desired conditions
- False dichotomy? science vs. management

Adaptive Management at La Cienegas National Conservation Area
Karen Simms, Bureau of Land Management

Overview

- La Cienegas was designated a National Conservation Area by Congress in 2000 to conserve and protect nationally important resources. La Cienegas is native desert grassland. Ownership includes federal, state and private entities, and the Conservation Area is located 1 hour from Tucson.
- Goals for La Cienegas include ecosystem restoration and maintenance of recreational use.
- Five threatened and endangered species are dependent on La Cienegas river habitat.

Key factors in the transition from AM planning to implementation:

- Resource Management Plan (RMP) states that an adaptive management strategy will be implemented
- Las Cienegas RMP completed in 2003 using an open collaborative process involving Sonoita Valley Planning Partnership
- Clear management objectives Partnership with The Nature Conservancy to conduct monitoring of management actions

Management strategies being tested include:

- Flexible grazing management
- Mechanical vegetation treatments
- Prescribed fire

What is being learned?

- No directional trends 1995 to 2003 in vegetation cover or frequency;
- Changes occurred, none were statistically significant
- Certain pastures didn't meet bare ground objectives in 1995 but did in 2003; all other permutations were observed.
- Similar results for range condition (SI)
- Problem: protocol's power to detect change was low
- Importance of assessing monitoring to ensure that what is being monitored addresses a management objective and that the protocol has the power to detect change at the level desired to make management decisions
- With learning objectives may need to be adjusted

What management decisions is adaptive management informing?

- Variation of authorized livestock use annually based on assessment of range conditions
- Implementation of an integrated vegetation treatment program to meet desired vegetation objectives
- Restoration of populations and habitat for priority species

How are decisions made?

- Monitoring data is reviewed two times per year
- A Technical Team evaluates data and coordinates issues with rancher
- A Biological Planning Meeting two times per year provides for public input to grazing

Benefits of AM

- Builds trust, encourages a solution-oriented approach to address potential conflicts over grazing.
- Decision-making based on resource information instead of emotions.
- Increased knowledge of grazing effects to improve resource management.
- Access to different perspectives & expertise.
- Ability to go beyond the vegetation to consider wildlife use/needs.

Discussion

- *How do you deal with changes in number of livestock allowed?* Permittees have to be able to reduce the size of their herd. They do this by bringing in stock herd, which is easy to take off if conditions warrant it, or go to another rancher to arrange a sub-lease.

- *Are cooperators aware going in what the objectives are and how they are being measured?* Yes, they had input on those objectives.
- *What is the effect of ESA? Do you consult with the Fish and Wildlife Service?* Monitoring in the BO is mandatory and the FWS agreed to AM.

Missouri River

Craig Fleming, U.S. Army Corps of Engineers

Status of AM for the Missouri River:

- A jeopardy Biological Opinion (BO) includes adaptive management as part of the Reasonable and Prudent Alternative (RPA).
- In 2006, the U.S. Fish and Wildlife Service directed the U.S. Army Corps of Engineers to do AM.
- The Corps is establishing a structure and process for stakeholder involvement.
- Planning for restoration and AM are taking place in parallel with restoration actions already being implemented
    - Phase I: Apply AM principles to actions already underway
    - Phase II: Use AM to develop and implement Missouri River Ecosystem Restoration Plan (MRERP)
- Management actions underway: sandbar creation, shallow water habitat creation, dike notches, pilot chutes and channels
- Monitoring has been done, no assessment of monitoring data yet

What is being learned?

- Seeing response to actions at the reach scale, but not at the bend scale
- Sufficient information available to adjust monitoring to address this issue
- Need to conduct assessment and transfer what has been learned to decision makers

Challenges implementing AM:

- Actions already underway; AM approach, processes not yet fully developed
- The AM program for the Missouri River has significant responsibility but little authority.
- AM is less effective in its current position in the structure of the restoration program than if it were an "umbrella".
- Belief that AM will be valuable, but resistance to changing the way things are done.

Skills needed to execute AM:

- Analysis – research ecologist, modeling
- Facilitation and social dynamics – for stakeholder involvement and project development

Discussion

- Process/structure not yet in place to incorporate what is being learned into decisions about what management actions are implemented
- In Glen Canyon, used color coding (red, yellow, green) to show the level of uncertainty associated with proposed actions. This helped identify hypotheses to be tested.
- Federal policy on how to integrate AM into NEPA is needed (CEQ guidelines are coming).

Everglades
Tom St. Clair, Everglades Partners Joint Venture and John Ogden, Audubon of Florida

Updates since 2008

- State of Florida has proposed purchasing 180,000 acres of land to do swaps to create a corridor from Lake Okeechobee to Everglades National Park. Restoration is at a halt while negotiations over this purchase ensue. There have been NGO complaints that the South Florida Water Management District and U.S. Sugar negotiations violated Sunshine laws. Since negotiations initiated, the economy has experienced a downturn.
- 2008 NRC review of CERP observed no on-the-ground progress toward restoration. NRC identified the following contributing factors:
    1) Corps planning process
    2) No allocations from Congress for implementation (only for planning) ($2 billion worth of projects have been approved by the Corps)

Progress made

- Since 2008 more people understand AM
- Monitoring has filled data gaps and been used to develop some performance measures, refine some hypotheses, and improve some models.

Challenges

- Project planning began before the AM approach was in place (applaud the PRRIP for developing AM plan first, then implementing)
- Lack of incentives for learning – project managers are evaluated on and rewarded for developing project plans on schedule and within budget. Project managers are not asked to address uncertainty or the need for long term resilience.

Opportunities to move to AM implementation:
Two active AM experiments/field tests are planned to learn how the system will respond to management actions:

1) C-111 Spreader Canal project will put fresh water into Florida Bay, the most productive estuary in the system. The question to be answered is: What flow volume is needed to achieve restoration? The hypothesis to be tested is that a 25% increase in flows is needed to achieve ecological response.
2) The DECOMP Physical Model is a field test designed to answer the question: What rate of sheetflow is needed to re-establish the ridge and slough pattern that was lost as a result of water impoundment?

Featured CAM Program: Platte River Recovery and Implementation Program (PRRIP)

Dr. Jerry Kenny and Chad Smith, Headwaters Corporation

Overview

- The program spans the Platte River in three states: Nebraska, Wyoming and Colorado.
- Program goals include:
    - Reducing the Central Platte flow shortages by 130,000 – 150,000 acre feet water/year
    - Protecting or restoring 10,000 acres of habitat in the central Platte

- Program components include: Adaptive Management, Land and Water
    - Land - Authorizing legislation in May 2008 enabled land acquisition for habitat creation for restoration. PRRIP does not have eminent domain. They aim to be a good neighbor and operate under a "willing seller, willing buyer" approach.
    - Water – The goal is to get more water into the river to reduce deficit flows.
    - AM – Science will guide future direction of land and water usage.

AM – Applied Science Strategy

- Two strategies (a.k.a. priority hypotheses) are being tested:
    1) Flow, sediment, mechanical – using some preparatory work, flow and sediment will be sufficient to maintain form
    2) Mechanical creation and maintenance
- Experiments are planned for 2010. Workshops are planned to develop experimental design to test written hypotheses.
- Structured decision making, a decision analytic framework, is one tool that will be used in the overall AM process on the Platte

PRRIP Structure

- Oversight Committee comprised of the Governors of the three states and the Secretary of the Department of Interior
- Governance Committee which makes management decisions collaboratively, comprised of 10 representatives (3 state, 2 federal (USFWS, Bureau of Reclamation), 2 water user, 3 conservation)
- Advisory Committees advise staff and Governance Committee
- Executive Director, a consultant which serves through contract to implement the program

Panel Discussion with PRRIP Partners

Felipe Chavez-Ramirez, Whooping Crane Maintenance Trust; Mike Drain, Lisa Fotherby, Bureau of Reclamation; Jim Jenniges, Nebraska Public Power District

What is the source of funding?

50% federal through a line item appropriation to the Bureau of Reclamation, 50% states
The annual budget is reviewed by the Finance and Governance Committees.

To what extent is your program restricted by the Farm Bill?

The program exists because of competition for water by environmental and non-environmental uses, so agricultural use is one of the drivers. Otherwise, agricultural water use affects the cost of the program. ESA compliance is required for existing and new water uses.

The strategic framework implies three legs: land, water and AM. Why is AM the third leg of the stool rather than the method?

There is a structural rather than a functional relationship between the three components – the three components of the program represent the three committees.

Do members of the Governance Committee understand AM? Will they use it?

Understanding of AM is still developing. The Governance Committee will use science in their decision-making. The PRRIP represents a negotiated agreement. AM is one piece of that agreement. The Governance Committee deals with policy. The Adaptive Management Working Group (AMWG) deals with technical and science issues.

Are there NGOs on the Governance Committee? Scientists?
Yes, there are 2 NGOs and 2 scientists on the Governance Committee. Also, the Governance Committee members are the people who negotiated the agreement that formed the program, so they have been steeped in the substance for 10 years.

In the Everglades there was a dynamic in which policy makers kept going back to technical staff for more information to help make a decision about an endangered species, the Cape Sable Seaside Sparrow. Has this occurred on the Platte? Not yet
Has there been litigation? How was water quantity established?
Water quantity was established through negotiation. An ESA parameter had to be met. It is all state water, not federal, through a FERC-licensed, private dam.

Is USDA involved? If not, should they be? Who makes decisions (in the Glen Canyon, a FACA Committee makes recommendations and DOI decides)?
The Governance Committee makes decisions.

The process is a good one. Drought is likely to make it difficult to achieve program goals. The normal state of the central U.S. is drought. The last 150 years have been the wettest on record.
AM provides a process to test hypotheses and evaluate the results, so we have the ability to learn.

Collaboration and Adaptive Governance

Dr. Jerry Kenny and Chad Smith described how CDR and other professional facilitators assisted with developing parts of the Cooperative Agreement that lead to the formation of the PRRIP. The 10-member Governance Committee of the PRRIP is now run by a Chair, who is elected by the Committee from among the signatories to the Cooperative Agreement (2 federal agencies and 3 states). A typical Governance Committee meeting is attended by about 50 people, including staff from Committee member agencies and organizations, contractors, and members of the public. Program documents state criteria for determining which issues are to be addressed by the Governance Committee. The agenda is set by the Executive Director, with input from Governance Committee members. Decisions are made by unanimous approval. The Committee does not vote. If any member is opposed, the Committee seeks to understand why and to find a way to address the issue until consensus is reached. Sometimes Advisory Committees or the Executive Director are asked to find additional information or propose ideas for consideration. Advisory Committees do not develop their own agendas; rather they operate when asked by the Governance Committee. The Executive Director is charged with implementing the decisions of the Governance Committee and disbursing funds. Meetings are scheduled over a two and a half day period, providing for two evening opportunities for social time and/or problem-solving. Because of ESA, the U.S. Fish and Wildlife Service has a dual role on the Committee, as both a member and a final authority.

Participants commended the PRRIP for integrating AM into their restoration program, applying the AM approach to restoration activities from the outset, and creating a structure for and practicing collaborative governance.

AEAM and the Endangered Species Act

June DeWeese, U.S. Fish and Wildlife Service

June DeWeese gave a brief overview of ESA and when Section 7 applies. She explained that in circumstances where there is high uncertainty about how a proposed action might affect a listed species, the USFWS is required to err on the conservative side. Given this, she said AM is a tool that can help answer questions and reduce uncertainty. She then shared how no take of sturgeon is currently allowed on the Platte because exiting science cannot prove or disprove activities will harm the fish. She said that the Biological Opinion allows for AM to be used to test hypotheses regarding the impacts of proposed management activities on the sturgeon. On the Platte, the PRRIP has taken responsibility for testing hypotheses related to sturgeon. Representatives from the PRRIP reminded participants that the PRRIP is focused on birds and does not have to improve sturgeon numbers, but cannot do harm to the fish. The Delta Smelt in San Francisco Bay is one example of a BO that has incorporated AM.

Integrating Science, Management and Policy

Dale Humburg, Chief Biologist, Ducks Unlimited

Dale Humburg shared lessons learned and proposed measures of success from implementing adaptive management at the Missouri Department of Conservation (MDC), through the Adaptive Harvest Management Program, and at Ducks Unlimited.

Lessons from the Adaptive Harvest Management of Migratory Waterfowl
Dale noted that the program for regulating duck harvest in North America had several elements in place that facilitated application of an adaptive management approach. Specifically, working relationships with stakeholders were in place throughout the flyway system, harvest management objectives were clear, different hypotheses about hunting mortality had been articulated, management options were identified in the form of regulations options, and monitoring had been conducted since 1960.

Lessons from the Missouri Department of Conservation
Factors that enabled application of AM:

- AM champion with authority
- Leadership support for AM
- Funding for MDC a line item in the state budget (MDC established by legislation in 1936)
- Combination of science programs into one division in 2002
- Co-location of scientists and managers in field offices (put the people asking the questions together with the people doing the science)
- Incentive of funding for proposals that answer management questions

Lessons Regarding Working with Different Interests and Language Used to Describe AM

- Start with stakeholders and "brainstorm" with a focus on objectives and how to achieve them. Do not start with the constraints.
- Capture "stories" stakeholders tell as conceptual models.
- Think of disagreements as competing hypotheses and take advantage of that information by testing the different points of view on the ground.

- A hypothesis is a prediction of what will happen as a result of a proposed management action.
- Clarifying objectives, desired outcomes, and competing views helps allows managers to see the value of more information to make decisions.
- Getting support for AM and monitoring requires instilling confidence that impacts will be measured, that measured impacts will be used to make a decision, and that the decision can be changed.
- Understand what is lost and what is gained with AM for different interest groups (policy makers, resource managers, technical experts, other stakeholders). Recognize indicators of support for AM from these groups.

Lessons about Integrating Science, Management, and Policy – Linking the People Asking the Questions with the People Doing the Science with the People Doing Work on the Ground

- Do not separate management and science. Doing a research "handoff' doesn't work.
- Instead of designing actions to answer research questions, identify management actions already planned and look at how to implement those actions in a way that will answer questions (e.g. use management actions as research opportunities).
- Use the right tool for the job – Do not try to use biology to answer a social question - Political and social scientists are needed to make natural resource decisions in addition to biological scientists.
- Conduct monitoring that is in the context of and supports management and policy decisions.
- The learning process (assess, plan, implement, monitor, adjust) needs to be linked to institutional structures in order for AM to be integrated into an institutional culture and decision-making.

Indicators of AM Success (developed by IWWR, DUC)

- Use of quantitative, measurable goals
- Explicit management and policy decisions
- Models to frame the problem (conceptual to predictive)
- Risk assessments and tradeoffs
- Full range of stakeholders involved
- AM processes are implemented across corporate boundaries
- Budget specifically allocated to monitoring and feedback
- Active consideration of learning in the process
- Staff can communicate AM
- Active use of feedback in decision-making
- AM evident in long range strategic planning
- AM evident in business planning
- AM initiated by managers
- Ownership by others than researchers
- AM expected by policy makers
- AM an active part of high priority decisions
- High degree of uncertainty
- High degree of potential impact of decision

Competencies and Capacities Needed to Execute CAM

Stephen Light, Adaptive Strategies, Inc.

Steve Light discussed the concept of standards of practice, which are characterized by high quality information and based on experience of what works (e.g. lessons learned, bottom-up innovations

to address complex problems, proven track records). He observed that networks are evolving around standards of practices in a variety of disciplines because they accelerate learning and reduce the need for reinventing the wheel, they adapt as new standards outperform existing ones, and because existing regulations are not always capable of responding efficiently or effectively to changing circumstances. He said that standards of practice represent a type of distributive leadership, and that informal networks can help distill and disseminate high quality information. He then raised the following questions for the group to consider:

- How do we close the CAM training and education gap?
- Do Standards of Practice advance the field of restoration and recovery?
- Does CAMNet have a greater role to play in advancing Standards of Practice?
- Will CAM governance only catch on in new institutions?

Participants responded by saying that Standards of Practice are a good idea, and that work is needed up front – including creating and documenting successful examples of AM - before people will be in a position to receive this concept. Attendees also recommended developing "how to" guidance, guidelines on structuring a CAM program, and documentation of potential pitfalls.

Rendezvous Evaluation

Participants shared the following closing thoughts about what worked well, suggested improvements for the future, and ideas for future CAMNet gatherings.

What Worked Well

- Opportunity to hear about the Platte River experience
- Increased understanding of the need to define uncertainties, be clear about desired outcomes, and establish processes/mechanisms to link science and management
- Field visit with local guide
- Great mix of people who presented practical information about CAM implementation

Suggestions for the Future

- Consider if it is time for a national conference on AM – a larger audience needs to hear what CAMNet members have to offer
- Who is training the next generation?
- Go deeper on a smaller set of issues/programs
- Engage social scientists and psychologists
- Apply AM principles to CAMNet's goals and activities

Next Steps

1. Meridian will prepare a summary of the Rendezvous discussions and recommendations and distribute to participants for review and comment. Presentations will be posted on the CAMNet website.

2. The CAMNet Core Advisory Group will meet to plan 2009 activities, incorporating input from this gathering.

APPENDIX A

Factors to Consider in Designing and Implementing a CAM Project/Program

Factors Supporting AM Application:

- Use of an open, collaborative process/collaborative negotiations during the planning phase
- Adaptive management is included or required in a regulatory or planning document (ROD, RMP)
- Management objectives are clear
- High uncertainty in EIS predictions
- Structure for an AM approach laid out in EIS
- Multi-disciplinary science program in place
- Mechanism for independent review in place
- Partnership with an external entity (NGO, etc.) to conduct monitoring of management actions
- AM champion with authority
- Leadership support for AM
- Multi-year funding in place
- Co-location of scientists and managers in field offices (put the people asking the questions together with the people doing the science)
- Incentive of funding for proposals that answer management questions

Challenges to Address for Successful AM Application:

- Resistance to a different way of project planning and implementation
- Resistance to further large-scale experiments
- Challenges quantifying future desired conditions
- Challenges understanding cause-effect relationships
- Separation between science and management staff
- AM approach not integrated into the restoration/management program/institutions
- Insufficient authority to apply AM
- Sequencing – When project planning begins before the AM approach is in place, it is challenging to apply AM principles
- Lack of incentives for learning – project managers are evaluated on and rewarded for developing project plans on schedule and within budget rather than for finding answers to questions or planning for long term resilience.

Strategies for Integrating Science and Management

- Establish set times for review of monitoring data and planning using what is learned from monitoring that include opportunities for discussion between technical experts, resource managers, and stakeholders. (La Cienegas example)
- Identify management actions already planned and look at how to implement those actions in a way that will answer questions (e.g. use management actions as research opportunities. (Maple control/oak regeneration example)
- Engage political and social scientists, in addition to biological scientists, to provide information needed to make natural resource decisions.
- Conduct monitoring that is in the context of and supports management and policy decisions.
- Link the learning process (assess, plan, implement, monitor, adjust) to institutional structures in order to integrate AM into an institutional culture and decision-making.

Skills and Competencies Needed to Execute CAM:

- Facilitation and mediation: for stakeholder involvement and project development
- Independent Science/Analysis: modeling, ecosystem function, experimental design
- Interdisciplinary appreciation
- Leadership: Both technical and policy
- Understanding of adaptive management
- Understanding psycho-social-political

Examples of Learning from AM Field Tests:

- Techniques for beach building and sediment retention
- Methods to reduce non-native fish populations, support endangered fish populations
- Methods for vegetation management
- Changes to dam releases matter, but it is not the only relevant factor
- Information learned from the initial field tests sometimes generate new questions (e.g. how many beaches are needed?)
- It is important to assess monitoring protocol to ensure that what is being monitored addresses a management objective and that the protocol has the power to detect change at the level desired to make management decisions
- With learning objectives may need to be adjusted

Appendix B

2009 CAMNet Rendezvous Participant List

Helene Aarons
Partnership Coordinator
Bureau of Land Management
1849 C Street NW, LS301
Washington, DC 20040
phone number: 202-452-5134
e-mail: Helene.Aarons@blm.gov

Jim Berkley
Great Salt Lake Coordinator
U.S. Environmental Protection Agency
1595 Wynkoop Street, EPR-EP
Denver, CO 80202
phone number: 303-312-7102
e-mail: berkley.jim@epa.gov

Bridget Barron
COO
Headwaters Corporation
3710 Central Avenue, Suite E
Kearney, NE 68847
phone number: 308-237-5728
fax number: 308-237-4651
e-mail: barronb@headwaterscorp.com

Jennifer Bountry
Hydraulic Engineer
Bureau of Reclamation
Denver Federal Center, PO Box 25007
Denver, CO 80225
phone number: 303-445-3614
fax number: 303-445-6351
e-mail: jbountry@.usbr.gov

Bill Beacom
Executive Director
Missouri River Navigation Conference
2423 Jackson
Sioux City, IA 51104
phone number: 712-255-3412
fax number: 712-255-0844
e-mail: bbeacom@pionet.net

Dave Case
President
D.J. Case and Associates
317 East. Jefferson Boulevard
Mishawaka, IN 46545
phone number: 574-258-0100
fax number: 574-258-0189
e-mail: Dave@djcase.com

Lorrie Benson
University of Nebraska, Lincoln
Water Center
524 Hardin Hall
3310 Holdrege Street
Lincoln, NE 68583
phone number: 402-472-7372
fax number: 402-472-3610
e-mail: lbenson2@unl.edu

June DeWeese
Supervisor, Nebraska Field Office
U.S. Fish and Wildlife Service
203 West Second Street
Federal Building, 2nd Floor
Grand Island, NE 68801
phone number: 308-382-6468
e-mail: june_deweese@fws.gov

John Engel
Water Resources Engineer
HDR One Company
8404 Indian Hills Drive
Omaha, NE 68114
phone number: 402-926-7110
fax number: 402-399-1111
e-mail: John.Engel@hdrinc.com

Jason Farnsworth
Natural Resources Specialist
Headwaters Corporation
3710 Central Avenue, Suite E
Kearney, NE 68847
phone number: 308-237-5728
fax number: 308-237-4651
e-mail:
farnsworthj@headwaterscorp.com

Craig Fleming
Fishery Biologist
U.S. Army Corps of Engineers
Gavins Point Project
PO Box 710
Yankton, SD 57078
phone number: 402-667-2880
fax number: 402-667-2588
e-mail: craig.a.fleming@usace.army.mil

Lisa Fotherby
Hydraulic Engineer
U.S. Bureau of Reclamation
Technical Service Center
Denver Technical Center, PO Box 25007
Denver, CO 80225
phone number: 303-445-2476
fax number: 303-445-6351
e-mail: lfotherby@usbr.gov

David Galat
Unit Leader and Associate Professor
U.S. Geological Survey
University of Missouri
302 ABNR Building
Columbia, MO 65211
phone number: 573-882-9426
fax number: 573-884-5070
e-mail: galatd@missouri.edu

Randy Graham
Senior Engineer
PBS&J
13508 Discovery Drive
Omaha, NE 68137
phone number: 402-502-3222
fax number: 402-502-3398
e-mail: rrgraham@pbsj.com

Carol Hale
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
55245 NEHwy 121
Yankton, SD 57078
phone number: 402-667-2887
e-mail: Carol_hale@fws.gov

Dale Humburg
Chief Biologist
Ducks Unlimited
One Waterfowl Way
Memphis, TN 38120
phone number: 901-758-3786
e-mail: dhumburg@ducks.org

James Jenniges
Environmental Specialist
Nebraska Public Power District
Box 2170
Kearney, NE 68848
phone number: 308-236-2293
e-mail: jjjenni@nppd.com

Jerry Kenny
Executive Director
Headwaters Corporation
3710 Central Avenue, Suite E
Kearney, NE 68847
phone number: 308-237-5728
fax number: 308-237-4651
e-mail: kennyj@headwaterscorp.com

Dennis Kubly
Chief, Adaptive Management Group
Bureau of Reclamation
Upper Colorado Region
125 South State Street
Salt Lake City, UT 84138
phone number: 801-524-3715
fax number: 801-524-3858
e-mail: dkubly@uc.usbr.gov

Linda Leake
Deputy Regional Executive, North Central Area
U.S. Geological Survey
1345 Corporate Center Curve, Suite 200
Eagan, MN 55121
phone number: 651-379-2742
e-mail: lleake@usgs.gov

Steve Light
Collaborative Adaptive Management Network
3640 Charles Avenue
Omaha, NE 68131
phone number: 651-208-7001
e-mail: adaptivemanagement@mac.com

Kent Loftin
Principal
HydroPlan LLC
8949 SE Bridge Road, #301
Hobe Sound, FL 33455
phone number: 561-307-2618
fax number: 772-546-1126
e-mail: kloftin@HydroPlanLLC.com

Scott McBain
Geomorphologist
McBain and Trush
980 7th Street
Arcata, CA 95521
phone number: 707-826-7794, x11
fax number: 707-826-7795
e-mail: scott@mcbaintrush.com

Rich McEldowney
Riparian Ecologist
PBS&J
3810 Valley Commons Drive, Suite 4
Bozeman, MT 59718
phone number: 406-587-7275
fax number: 406-587-7278
e-mail: rrmceldowney@pbsj.com

W. Don Nelson
Publisher
Prairie Fire: The Progressive Voice of the Great Plains
7312 Sherman Street
Lincoln, NE 68506
phone number: 402-483-4100
fax number: 402-483-4085
e-mail: donnel@windstream.net

John Ogden
Director of Bird Conservation
Audubon of Florida
444 Brickell Avenue
Miami, FL 33131
phone number: 305-491-9722
e-mail: jogden@audubon.org

Matt Pillard
Environmental Planner
HDR
8404 Indian Hills Drive
Omaha, NE 68114
phone number: 402-399-1186
fax number: 402-399-1111
e-mail: Matt.Pillard@hdrinc.com

Jennifer Pratt Miles
Mediator
Meridian Institute
PO Box 1829
Dillon, CO 80435
phone number: 970-513-8340, x 213
fax number: 970-513-8348
e-mail: jprattmiles@merid.org

Karen Simms
Community Planner, Las Cienegas
National Conservation Area
Bureau of Land Management
Tucson Field Office
12661 East Broadway Boulevard
Tucson, AZ 85748
phone number: 520-258-7210
e-mail: karen_simms@blm.gov

Meghan Sittler
Coordinator
Lower Platte River Corridor Alliance
PO Box 83581
Lincoln, NE 68501
phone number: 402-476-2729
fax number: 402-476-6454
e-mail: msittler@lpsnrd.org

Jason Skold
Missouri River Program Manager
The Nature Conservancy
1025 Leavenworth Street
Omaha, NE 68102
phone number: 402-342-0282, x1006
fax number: 402-342-0474
e-mail: jskold@tnc.org

Chad Smith
Natural Resources Division Director
Headwaters Corporation
3710 Central Avenue, Suite E
Kearney, NE 68847
phone number: 308-237-5728
e-mail: smithc@headwaterscorp.com

Tom St. Clair
Program Manager
PBS&J
701 San Marcos Boulevard, Suite 1201
Jacksonville, FL 32207
phone number: 904-232-1774
fax number: 904-232-1056
e-mail: gstclair@pbsj.com

Matt Steffl
District Supervisor
Nebraska Game and Parks Commission
5109 W Scott Road, Suite 406
Beatrice, NE 68310
phone number: 402-228-0269
fax number: 402-228-0269
e-mail: Matt.steffl@nebraska.gov

Cheryl Ulrich
Senior Client Service Manager
Weston Solutions
329 8th Street
Atlantic Beach, FL 32233
phone number: 904-248-8275
e-mail:
Cheryl.ulrich@westonsolutions.com

Ron Zelt
U.S. Geological Survey
Nebraska Water Science Center
Lincoln, NE 68512
phone number: 402-328-4140
e-mail: rbzelt@usgs.gov

Gene Zuerlein
Assistant Fisheries Division Administrator
State of Nebraska
Game & Parks Commission
2200 North 33rd Street
Lincoln, NE 68503
phone number: 402-471-1542
fax number: 402-471-4992
e-mail: gene.zuerlein@nebraska.gov