WORKSHOP PROCEEDINGS

Bureau of Land Management
NATIONAL ADAPTIVE MANAGEMENT WORKSHOP

October 23-25, 2007
Hampton Inn Denver West Federal Center
Denver, CO

Prepared by
U. S. Institute for Environmental Conflict Resolution
Meridian Institute

November 16, 2007

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EXECUTIVE SUMMARY

> *"Adaptive management is a great tool, it could add huge flexibility to our work, and it could dramatically improve how we use science. But it also implies greater commitment to monitoring, and to the funding and staffing that's required to do this work well."* Sally Wisely, BLM CO State Director

On 23 – 25 October, 2007, the Bureau of Land Management (BLM) sponsored a national workshop to explore opportunities for expanding and institutionalizing the use of adaptive management. The meeting, held in Denver, Colorado, was designed to achieve the following goals:

- Provide a venue for dialogue and exchange about key concepts, implementation approaches, and means for evaluating the use of adaptive management in BLM natural resource management programs
- Identify practical management approaches and steps that contribute to successful implementation of AM within the current BLM planning system and permitting process
- Discuss the application of modeling and monitoring approaches to BLM resource management approaches
- Identify tangible plans and next steps for developing effective adaptive management programs within BLM

Participants were invited from all levels within BLM, as well as from other Interior agencies; USDA Forest Service staff, university-based scientists, and field practitioners also attended the workshop. Initial panel discussions provided general overviews on the concepts and applications of adaptive management in resource management programs, as well as the current legal, policy, and regulatory context for applying adaptive management in BLM planning and permitting efforts. Panelists also discussed the pivotal role of monitoring within adaptive management programs.

Following the panel presentations, participants worked to identify constraints and opportunities for integrating adaptive management within planning, permitting, and ongoing monitoring programs. Through these discussions, participants outlined practical recommendations related to training, development of appropriate departmental guidance, and related institutional and policy reform.

The U.S. Institute for Environmental Conflict Resolution (U.S. Institute) and Meridian Institute provided design and facilitation support for the workshop, and have drafted this summary report of the discussions.

Adaptive management defined

Recognizing a history of misunderstanding about the meaning and use of adaptive management, participants embraced the recently formulated definition of adaptive

management, as outlined in the Department of Interior's Technical Guide to Adaptive Management (2007):[1]

> *Adaptive management promotes flexible decision making that can be adjusted in the face of uncertainties, as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders.*

While many acknowledged that BLM and DOI have been doing "pieces and parts" of adaptive management for some time, participants shared concerns that it has not necessarily been conducted in either a consistent or systematic way. Nevertheless, examples from the Las Cienegas National Conservation Area, the Little Snake Field Office, and the Northwest Forest Plan highlighted the experience and insights gained from these extended planning processes. These projects – their successes, challenges, and lessons learned to date – provided an important reference point for discussions throughout the workshop, and are seen as offering opportunities for continued learning about the practical applications of adaptive management principles

During the past few years, interest in developing a stronger commitment to applying adaptive management principles can be seen in a variety of milestone events and initiatives:

- DOI National Workshop on Adaptive Management, April 2004
- The establishment of the DOI Adaptive Management Working Group – from May 2005 to the present
- DOI Secretarial Order No. 3270, issued in March 2007
- Publication of the Department of Interior's Technical Guide (April 2007), and the forthcoming Council on Environmental Quality (CEQ) Handbook on Adaptive Management

As Rich Whitley noted, these developments "demonstrate that there is a clear intention by the Department and by CEQ to encourage agencies to begin implementing adaptive management on a broader scale."

[1] A complete version of the Technical Guide can be found at: http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf

The challenges of institutionalizing adaptive management

Discussion groups identified a range of challenges and constraints for integrating adaptive management approaches into BLM planning and permitting processes, including the sustained monitoring necessary to make these efforts more effective. These include:

- A lack of common understanding about the basic definition and principles of adaptive management, leading to inconsistent application in the field.
- The challenge of building partnerships – that BLM cannot do adaptive management without effectively engaging communities and partner organizations. This includes the recognition that BLM does not have the resources (funding, staffing, or expertise) to do this alone.
- Cultural and institutional barriers, particularly the BLM's more traditional, linear approach to planning, and a general inability to embrace change and adapt to it.
- A lack of trust, both internally and externally, including the transparency in decision-making and accountability necessary to build success.
- Lack of clarity and/or understanding of legal authorities (e.g., NEPA, FACA, FLPMA) and how they apply to implementing adaptive management.
- Challenge of securing sustained funding, particularly for monitoring activities.

Thematic Discussion Group Recommendations

Following the discussion of constraints to the implementation of adaptive management in planning and permitting processes, participants identified several important cross-cutting themes for further discussion and planning. The recommendations of these groups are outlined below:

Training

The training group suggested developing or repackaging existing training efforts in cooperation with other agencies or organizations, including the Collaborative Adaptive Management Network (CAMNet), university programs (CSU, University of Wyoming, University of Michigan), and related DOI training initiatives (e.g., the Partnership, or "P" Series, and the National Riparian Service Team). The primary audience for these trainings would be BLM practitioners and collaborators. The group identified a preliminary training design team, and committed to organizing a conference call to begin the process of: a) Compiling a list of existing training, resources, and publications, b) prioritizing training modules, c) developing a timeline, d) determining delivery methods, and e) refining objectives and target audience. Cathy Humphrey (BLM National Training Center) will circulate an announcement about the planning call.

Cultural and institutional change

Group members offered the following recommendations to further institutionalize adaptive management within the BLM and DOI:

- Integrate adaptive management with major high-profile BLM programs (e.g., the Healthy Lands Initiatives, Sagebrush Steppe, and mitigation programs)
- Secure support for establishing a series of adaptive management pilot projects – which participants suggested calling the "Adaptive Management Laboratory"
- Establish adaptive management as an explicit budget theme within BLM
- Gain support for adaptive management as a major priority for the National Operations Center (NOC)
- Incorporate adaptive management into BLM's Assessment, Inventory and Monitoring (AIM) Strategy.
- Develop measurable, relevant indicators for evaluating the success of adaptive management programs.

Guidance

The group focused on recommendations related to the development and/or revision of two important guidance documents:

- The BLM Land Use Planning Handbook, scheduled to be updated in 2008, should include a chapter on adaptive management. Jeremy Casterson is prepared to assist with adding sections on adaptive management into the planning handbook

- The completion of a new Adaptive Management Handbook (currently in draft form and referred to as the Adaptive Management Field Guide). The group recommended that Jim Turner coordinate the finalization of the Field Guide, working with Deb Rawhauser, Jack Hamby, Sandra Meyers, and others

The group also recommended maintaining an adaptive management "guru" or program lead within DOI, in order to maintain a strong focus on these issues, help follow through on workshop recommendations, and assist in convening DOI groups such as the AMWG.

Practical next steps (The Big Picture)

A fourth group worked to summarize the priority next steps for implementing overall workshop findings and recommendations. Suggested actions include:

- The U. S. Institute and Meridian will produce a full report and executive summary by 11/15; the report will be distributed to workshop participants for review and comment, and these comments will be incorporated, as appropriate, into the final report. Estimated date of completion: 12/15/07.
- Rich Whitley and Ron Huntsinger will develop a strategy for briefing BLM's Executive Leadership Team, the NOC, Field Committee, DSDs and others on workshop outcomes, and particularly on the Adaptive Management Laboratory concept, by January 2008.
- An oversight group, comprised of Field Managers, field staff, and Washington office staff will develop a strategy for linking emerging guidance documents to the AM Laboratory and to policy development.

- Rich Whitley and Jim Turner will oversee and coordinate incorporation of workshop input into the Adaptive Management Field Guide, which is the basis for BLM guidance. They will also determine how to ensure that the Field Guide can have greater influence on BLM program development, including plans for the guide to become a handbook.
- Ron Huntsiner, Rich Whitley, and Carl Shapiro will work on refining concepts and plans for the development of the Adaptive Management Laboratory.
- Ron Huntsinger and Jack Hamby will develop plans for integrating Adaptive Management within AIM.
- The U. S. Institute and Meridian will send recommendations to the discussion groups for follow up, and assist as appropriate in organizing, facilitating, and documenting conference calls.

Complete details of participants' presentations, discussions, and recommendations, are to be found in the Workshop Proceedings.

INTRODUCTORY REMARKS

Sally Wisely (Bureau of Land Management (BLM), Colorado State Office)
Sally Wisely welcomed attendees to Denver and Colorado. She noted that the important and timely question participants will attempt to address in this workshop is: How do we take this concept of adaptive management (AM) and make it work on the ground?

Ms. Wisely observed that on some level, the BLM has been doing pieces and parts of adaptive management all along, but that there is much work to be done to bring all the pieces and parts together – both in terms of resource management and in terms of finding new ways of working with and serving communities. She stated that adaptive management is a great tool that could add flexibility to BLM's work and dramatically improve how BLM uses science. She noted that it also implies a greater commitment to monitoring, and to the funding and staffing that is required to do monitoring well.

She acknowledged the need to improve trust – both within the BLM and with the communities in which BLM operates – by setting clear guidelines for deciding when AM is appropriate and by following through when a decision is made to apply AM.

Rich Whitley (Speaking on behalf of Bud Cribley)
Rich Whitley began by reviewing the fact that the Department of Interior has issued a Departmental Technical Guide and the Council on Environmental Quality (CEQ) is working on a similar handbook. These two efforts demonstrate that there is a clear intention by the Department and by CEQ to encourage agencies to begin implementing adaptive management. It is interesting to note that in these guidance documents, some consideration is offered for when and how to use adaptive management, and even when not to.

He noted that while there is a policy that supports the use of adaptive management, and handbooks available, these do not outline how adaptive management will be implemented on the ground. He explained that workshop participants represent a range of expertise from around the country, and that BLM has invited attendees to try to address the practical questions about how we implement adaptive management.

Mr. Whitley noted that another key message is that AM will not be successful without engaging partners. From a practical standpoint, BLM does not have the resources to do this alone, so it is critical to conceive of this work in terms of partnerships. He said that there *is* an expectation from DOI and CEQ that BLM will consider how to access resources in non-traditional ways, not simply in terms of appropriations.

Rich Whitley (Coordinator, Citizen Stewardship and Adaptive Management)
Rich stated that historically, BLM has taken a very linear, and a very prescriptive approach to programming. He said that BLM is now looking at defining a new way, a non-linear way – and an approach that more closely approximates the real-world reality of working with the public. He asked how many participants believe that BLM's

planning, permitting, and monitoring systems are working well? He proposed that those people who think things *are* working well are probably already working in close partnerships with their communities.

Mr. Whitley said that most bureaucracies don't embrace change – some parts of BLM do, but as a whole, agencies are uncomfortable with change. He reiterated that this workshop is about asking the question about how to make adaptive management work, and offered the following additional questions for participants to consider:

- What are the enabling conditions for adaptive management? and
- What can DOI/BLM do to make it easier for all of us to effectively implement adaptive management?

He asked participants not to put aside their skepticism, but to use it in a positive way. He invited people to talk candidly about the problems and barriers they have experienced while trying to implement AM, and encouraged participants to think positively about how to overcome them. In addition, he suggested that BLM needs to establish:

- measurements for success,
- monitoring protocols, and
- methods for incorporating learning into decision making.

Mr. Whitley provided an overview of the workshop, stating that the panels on the first and second day will help set the stage and provide an opportunity for participants to ask questions. On the second and third days, a considerable amount of time is allocated for discussion sessions, to focus on the challenges to integrating adaptive management into BLM's planning and permitting processes, and to building strong monitoring programs. He noted that the goal is to identify positive, practical recommendations for encouraging a system-wide change within BLM and DOI.

PANEL 1: WHAT IS ADAPTIVE MANAGEMENT? HOW CAN IT BENEFIT ECOSYSTEM MANAGEMENT PROGRAMS?[2]

Moderator: Rich Whitley

Carl Shapiro (United States Geological Survey (USGS)) – DOI Technical Guide on Adaptive Management

Carl Shapiro, the primary author of the DOI Technical Guide, reviewed the process and outcomes of developing the Guide. He explained that in 2004, DOI conducted a high level workshop to look at what AM means for the Department, and concluded that the Department did not have an agreed upon definition of AM or when it should be used. As

[2] Participants' PowerPoint presentations are available on the U.S. Institute's website at http://blmamwg.ecr.gov/

a result, USGS was given a directive to convene an AM Working Group with DOI bureaus to provide guidelines for the effective use of AM, review the implications of legal issues for adaptive management, and develop training in AM for DOI. The DOI Technical guide was published April 2007.

Maria Fernandez-Gimenez (Colorado State University (CSU)) – Communities and Monitoring in Adaptive Management

Ms. Fernandez-Gimenez shared three case examples of communities engaged in monitoring and adaptive management: Wallowa Resources, the Public Lands Partnership (PLP), and the Northwest Colorado Stewardship (NWCOS). She emphasized that the ideal goal is to get to multi-loop learning, which entails going beyond learning that a management action does not work, to learning why it did not work and understanding how we learn and how our institutions influence our values and assumptions.

Wallowa Resources – In this case, community members played a key role facilitating a collaborative assessment process, including 70 individuals from government, tribes, and NGOs. They used a watershed assessment to prioritize action on public lands and were able to do so at a per acre cost much lower than the traditional government process. Their commitment to shared learning was evident throughout the process, and specifically in a step at the end where they took a look at what they did well and what could be improved. They learned that there was success within work groups; however, they had trouble bringing them back together at the end of the process. As a result, they decided that in the future they would like to begin with a more integrated approach.

Public Lands Partnership – The PLP serves as the "table of trust" in western Colorado, and a forum for community dialogue around many issues, particularly public lands management. As part of convening people to discuss a controversial salvage sale, PLP organized a field tour. Once out on the land, an NGO representative who had been opposed to the salvage sale observed that the ground was level and perhaps the sale would not do as much damage as originally thought. As a result, the NGO agreed not to appeal the sale if monitoring were conducted. The group developed replicated monitoring sites, with one control. Colorado State University (CSU) has helped them analyze their data.

NWCOS OHV Working Group – A CSU graduate student worked with NWCOS to design and facilitate the development of a system model for OHV use; the model included objectives and a monitoring protocol that the group could implement themselves. CSU assisted the group in analyzing their data. However, maintaining stakeholder participation has been a challenge in this group. Initially this was genuinely a multi-party effort. Over a two year period, OHV user participation has declined and they are concerned about how data gained from the monitoring program will be used. They are worried that it could limit their access to the area.

Potential community roles:

- Convene and manage monitoring/assessment
- AM/monitoring design and objective setting

- Data collection
- Data analysis
- Interpretation of results
- Communication of results
- Think through how science can be applied to management decisions, and hold decision makers accountable

Potential benefits of community involvement in monitoring:

- Shared understanding
- Identification of locally relevant indicators
- Increased trust

Limitations to community involvement in monitoring:

- Difficult to sustain participation
- Lack of technical capacity for monitoring design, data collection, and analysis

Steve Light (Adaptive Strategies, Inc.) – Adaptive Management and Monitoring

Steve Light discussed adaptive management as a framework for confronting problems with data. He said that single loop learning (e.g. plan, act, learn, adjust) is not adaptive management, but rather it is Total Quality Management (TQM). He described the difference between these two concepts as follows:

- TQM is the equivalent of the "thermostat" – it focuses on a single target
- AM tests multiple hypotheses and requires multiple methods for testing those hypotheses and providing information and learning.
- AM does not use the word plan, it uses the word design, because the emphasis is not on any given solution, but on defining problems and identifying solutions through learning.
- Three phases of AM are:
  - Adaptive learning
  - Assessment
  - Policy design
- In adaptive management, monitoring is used to update the hypothesis, the model(s), and the monitoring itself.

He stressed that it is key to define the management problem to be solved and design the science to address them (rather than simply identifying the science questions).

He also distinguished between experimental design, and non-experimental designs, such as descriptive surveys, observational surveys, analytical surveys, and impact surveys. He noted that designed experiments have a higher strength of inference and degree of control than non-experimental designs.

Harold Bergman (Institute for Environmental and Natural Resources (IENR), University of Wyoming) – Case Studies in Adaptive Management

Bergman discussed three efforts to implement adaptive management, some of which have been successful, others which have not.

Kemmerer – This effort involved questions about the distribution of cattle on a grazing allotment. Cattle were put at one end of the allotment at the beginning of the season and gathered up at the other end of the allotment at the end of the season. A group of ranchers, state Game and Fish staff and others decided to add some fencing to control where the herd could graze, and they collected monitoring data. Based on their results, they put in additional fencing. This was all conducted outside of the planning process and they probably broke some rules, but the people who were concerned about the issue were at the table, so it was a success in collaborative problem-solving and adaptive management, without these words actually being used at the time.

CAL-FED – This project involves state and federal agencies managing water for the aquatic ecosystem and endangered fish species. CAL-FED established an independent science advisory group, which provided input to the collaborative group that designed and implemented the monitoring program. This helped to avoid questions about the objectivity of the science and about how adaptive management was used to inform decision making.

Resource Advisory Councils – A Wyoming Resource Advisory Committee (RAC) identified alternatives for improving land management for habitat restoration and oil and gas development. In order to negotiate a gain for the oil and gas development, the NGOs agreed that industry participants would be forgiven a percentage of their royalty payments. The agreement was discarded, however, due to the lack of authority of the collaborative group to make this type of decision, and this caused a serious breech of trust among participants.

Pinedale Anticline Working Group – Before Chuck Otto arrived, the Working Group encountered a number of struggles. They were established as a FACA Committee to implement the Record of Decision (ROD) on the Pinedale Anticline assessment. It was delayed in order to design a monitoring program so that the project could be implemented correctly. However, drilling proceeded before the monitoring was in place. As a result the public trust was lost. Two ideas to consider for re-building trust include:

- Establish an independent science review board; and
- Engage an independent, third-party collaborative dispute resolution/facilitator.

The key lesson learned from all of these cases is that trust must be built from the start. Once trust is lost, it is extremely challenging to rebuild.

PANEL 2: WHEN SHOULD AM BE USED? WHEN IS IT INAPPROPRIATE – WHAT ARE ITS LIMITATIONS AND CONSTRAINTS?

Moderator: Ron Huntsinger

John Fay (USFWS) – Section 7 – Interagency Cooperation - Consultation Process
John Fay explained that Section 7 obligates federal agencies to support the Endangered Species Act and to refrain from authorizing funding or carrying out an activity that would jeopardize a listed species or adversely impact habitat. He noted that USFWS is looking for ways to streamline consultation efforts and to ensure return on investment for consultations. One way to do this is to place greater responsibility on action agencies. USFWS has provided training to some agencies for 30 years and in some cases has adopted counterpart regulations, which allow action agencies to take the first step in assessing potential adverse affects of actions. He concluded by saying, "Trust is like oxygen – you cannot see, hear, or smell it, but if it is not there, you can't do anything."

Karen Simms (BLM Tucson Field Office) - La Cienegas Partnership
Karen Simms described the Tucson Field Office's approach to adaptive management and how they overcame several obstacles to integrating AM into BLM planning. After encountering challenges applying the traditional BLM planning approach in the La Cienegas National Conservation Area in southwest Arizona, the Tucson Field Office worked with community members on a collaborative approach to RMP development. Ms. Simms explained that the RMP had specific objectives for desired land use conditions, some modeling concepts and the beginning of a monitoring program, all of which were an important foundation for adaptive management. The initial goal was to have four allotments without a set permitted use number to allow flexibility to adjust for changes in conditions. The thinking was that permit numbers would be based on conditions. However, this approach was not accepted by the State and Washington BLM offices, which required a specific number. To address this, the Tucson Field Office documented a process in the La Cienegas plan that would allow them to adjust permit limits each year based on conditions observed. Ms. Simms shared how they created a new mechanism to accommodate interested stakeholders after the State BLM Office determined that a rangeland resource team was not an appropriate venue to solicit input on the development of the AM plan. Ms. Simms stated that La Cienegas also has a technical advisory team comprised of federal, state and local agency representative and academics who help interpret the monitoring results and work with the public as they provide their input. She said the Partnership has successfully made several changes in how pastures have been used, and that she considers ongoing stakeholder involvement a key element of success.

In closing, Ms. Simms observed that the following have been factors in the successful use of AM by the La Cienegas Partnership:

- From the beginning, there has been uncertainty and disagreement among stakeholders about how to achieve the plan's objectives (e.g., whether grazing is an appropriate use or a negative impact on the land), which made the management of La Cienegas a good candidate for AM.
- The AM process was built into the land use plan.
- A monitoring plan was already in place.

- The context is one that holds an inherent opportunity to apply learning to decision making because there is a recurrent management decision – every single year a decision must be made about the number of livestock that will be permitted on the land based on resource conditions.

Jeremy Casterson (Little Snake Field Office) - Northwest Colorado Stewardship (NWCOS)
The Little Snake Field Office (LSFO) discussed the question of when it is appropriate to use adaptive management within a collaborative forum. The process of coming to agreement on criteria for making that decision was helpful, and the criteria the LSFO uses are:

- The proposed use is consistent with what is allowable in the land use plan.
- The decision or outcome is performance-based and has performance standards
- The actions to achieve the outcome can be adapted based on monitoring or new information. (for example, BLM cannot retract a lease right once it has been granted)
- The effects of management actions are unknown.
- There are firm funding and workload commitments to conduct monitoring.
- BLM decisions control the outcome

Mr. Casterson indicated that these six filters went a long way toward reassuring skeptical stakeholders and staff that adaptive management is not a way to have prescriptions waived and that monitoring would be required.

Bernard Bormann (USDA Forest Service) – Scaling Issues in Effective Adaptive Management; Theories and Examples of Practice
Mr. Bormann noted that it is important to define AM, because if it isn't defined, it isn't meaningful. If AM isn't implemented in a systematic, planned way, it won't work. AM must include multiple hypotheses, paths, or alternatives. He noted that in many cases institutions are the key impediments to AM, and that it is useful to understand these impediments to adaptive management.

Mr. Bormann shared the following lessons learned from experience with AM in the Pacific Northwest Forest Plan:

- Priority questions must be defined in the beginning.
- People learned that it made sense to do thinning in late successional reserves (LSR) from the AM projects and from the regional monitoring program.
- New regional directions emerged from the 10-year interpretive report.
- Focus on important and controversial questions (small steps were ineffective).
- Implement an adaptive management system that:
    - Focuses on priority questions
    - Applies learning modes appropriate to the question
    - Promotes multi-scale learning loops

- Some people don't want to know the answers. If you implement one pathway that they don't agree with, they may attack the credibility of the adaptive management strategy.
- Openness to the analysis of uncertainties is a key to credibility.
- Institutionalize the multi-scale adaptive management activity (if AM is simply an add on, it will not work).

Questions and Discussion

What is the relationship between plan objectives and uncertainty?
What is important is having a process for updating objectives based on learning. We decided not to include the objectives and desired outcomes in our Resource Management Plan (RMP) because we did not want to be tied to going though an RMP update process in order to update our objectives based on the monitoring results. Instead, we will capture the objectives in a separate document, so they are there, they are just not in the RMP.

Are you concerned about the impact on stakeholder trust if you say that if you run out of funds for monitoring, you will revert to the RMP as a fall-back?
BLM spends $178 million/year on monitoring. Monitoring is controlled locally. It is the local manager's decision how to allocate that funding.

Nothing in NEPA or BLM planning process prevents us from doing AM, except the traditions of how things have been done. I agree that some of the strategies people who are trying to make AM work may be risky, but they deserve credit for breaking ground in areas where there is not guidance in place yet.

BLM has a lot of monitoring that is NOT currently used to inform decision-making. We can probably take advantage of some of that existing monitoring data. It is important to examine the challenges of planning and conducting an adaptive management monitoring program in the context of an annual budget.

Is there any way to fund the cost of doing adaptive management through increases in lease fees?
A lot of our permittees are interested in AM, so are paying for monitoring voluntarily. There are different opportunities based on the permittee group.

How did you incorporate the testing of the multiple hypotheses into the plan?
Multiple hypotheses to be tested were included in one or more NEPA alternatives. In our case, the multiple hypotheses to be tested were included in four or five of the NEPA alternatives.

We have to fill the gap between design and management needs and you have started to show how that can be done at multiple scales.

Sometimes it is challenging to replicate tests of hypotheses in the field.

A lot of people say you can't do experimentation at the landscape scale. I think that is largely because they haven't tried it. We found it pretty easy to design the large scale experiment in our fuel reduction study.

You may have to do large-scale AM sequentially, rather than simultaneously.

Sometimes the risk is very high.
I would say the greater risk is not knowing.

PANEL 3: LAWS, POLICIES AND REGULATIONS RELATED TO ADAPTIVE MANAGEMENT

Moderator: Mike Mayer

Veronica Larvie (Office of the Solicitor, Department of the Interior (DOI)) – Legal Authority and Other Advice
The authority for adaptive management is Secretarial Order No. 3270 (March 9, 2007), "Take Pride in America." There is no firm statutory requirement to do adaptive management; however, in 2003 CEQ issued guidance on adaptive management, and in DOI's new NEPA Departmental Manual, published in 2004, DOI said bureaus "shall do adaptive management". Currently, there is policy related to AM, but no regulation. Ms. Larvie indicated that this means DOI employees are bound by the policy as a condition of employment, but a third party cannot sue employees for not implementing it, since there is no regulation in place.

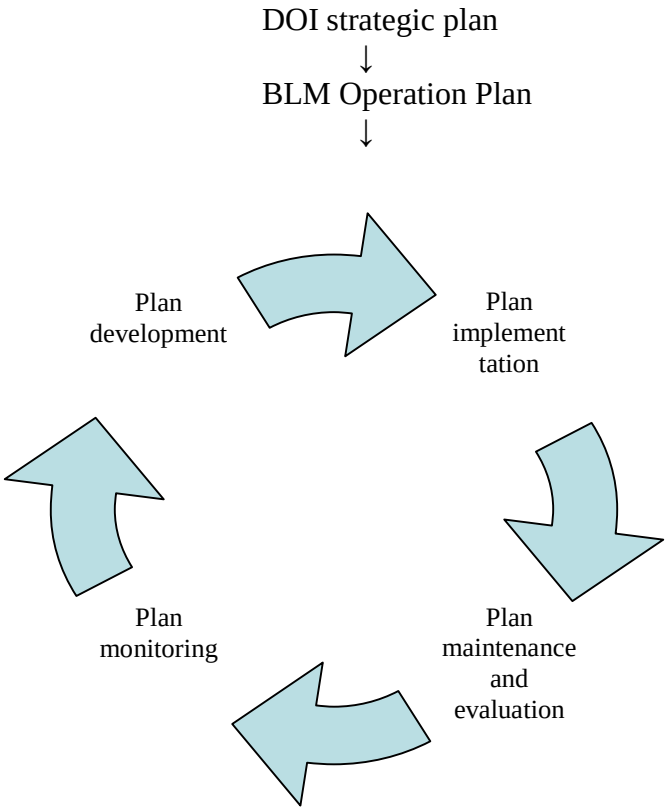
Ms. Larvie shared key points from 40 cases she had reviewed involving adaptive management. As part of this review, she noted that the Interior Board of Land Appeals (IBLA) uses the following definition of adaptive management, which differs from the definition in the DOI Technical Guide: "landscape units designated for development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives." In one court case, IBLA said in order to apply mitigation measures, they must be considered through NEPA analysis. IBLA says if you plan on signing a FONSI, and mitigation is used to eliminate significant impacts, then NEPA requires analysis of the proposed mitigation measures and how effective they are at reducing the impact to insignificance.

In terms of federal case law, in once case in which BLM had a document outside its land use plan covering listed species it would monitor due to lack of sufficient information, the court said when resources are re-allocated, more than "plan maintenance" is required. The court also said adaptive management does not mean endless planning without ever making a decision.

She also discussed implications of the Federal Advisory Committee Act (FACA), the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA) for adaptive management. She noted that FACA requires an

organized group to take consensus advice to federal agencies, and that state and local governments and Tribes are exempted from FACA. BLM has discretion to do AM through FLPMA; not all decisions have to be memorialized in the land use management plan, but that documentation is needed for NEPA so the agency has a basis for decision making. The criteria is that DOI cannot allow unnecessary and undue degradation (UUD).
In conclusion, Ms. Larvie noted that more concrete guidance might alleviate legal challenges to implementing adaptive management.

Sandra Meyers (Branch Chief for Planning) – Integrating AM into the DOI Planning Cycle
The DOI planning cycle includes:



Ms. Meyers discussed the following possible opportunities for incorporating adaptive management:

- Transition from plan development to implementation
- BLM regulations requirement that plans establish intervals for monitoring and evaluation.
  - Effectiveness monitoring
  - Annual reports documenting monitoring and how monitoring results are used are suggested

In addition, she noted that collaboration and trust are not static and require maintenance, and that ongoing attention to trust building can facilitate a smooth transition in the case of changes in leadership/elected office.

Vijay Rai (Office of Environment, Policy and Compliance (OEPC))
Mr. Rai stated that from his perspective, adaptive management can be implemented consistent with NEPA, as long as it is implemented within the existing framework. He will be authoring a chapter on this subject for the DOI Manual and will be looking to participants for suggestions on what guidance should be included.

Questions and Discussion
In the Everglades, the U.S. Army Corps of Engineers developed programmatic regulations for the Comprehensive Everglades Restoration Program (CERP) and it set the implementation back two years. Now they have determined that the regulations are too prescriptive. The Department should accept feedback from the field on how the guidance needs to be modified to support adaptive management implementation. The State of Louisiana developed a framework with strong legislature and constituency support without specifying projects the way that CERP did.

What is the take away message for DOI? What should DOI do regarding adaptive management based on the legal context?
DOI has a policy statement from the Secretary of Interior that binds employees to do adaptive management and has discretion within the boundary of refraining from UUD.

We have not had a court say "don't use adaptive management". Courts have instead said which approaches will not work and where more rigor is required.

If there are conflicts between the CEQ and DOI guidebooks, how will those be resolved?
DOI must abide by CEQ's implementing procedures for NEPA. DOI is part of CEQ's working group.

Is the Forest Service developing a regulation on AM?
The Forest Service is making a regulation on NEPA procedures, and adaptive management is a component of them.

Closing Remarks
Rich Whitley stressed that concerns about litigation should not deter BLM from doing adaptive management. He noted that the cases he has reviewed were situations that were called adaptive management, but were not – the term was used as an afterthought. He stated that the intent for this workshop is to help the BLM apply adaptive management correctly. He suggested that if/when there is litigation regarding AM in the future, it will be an opportunity to learn and make necessary changes.

Mr. Whitley closed by saying that the intent of this first day was to frame the issues for the conversations about planning, permitting and monitoring on the next day. He

explained that on the final day of the workshop, participants can expect to discuss next steps, including training, program support and policy making related to AM.

DAY 2 – Wednesday, October 24, 2007

PANEL 4: INTEGRATING ADAPTIVE MANAGEMENT INTO THE BLM PLANNING SYSTEM

Moderator: Chuck Otto

Karen Simms (Tucson Field Office) - La Cienegas Resource Management Plan
Ms. Simms explained that planning for La Cienegas started in 1989, less than a year after BLM acquired the 47,000 acres of land in the area, which is smaller than many RMPs, but comparable to others. She stated that BLM started with a traditional public involvement process to gather input for the development of alternatives, but decided to put the planning process on hold due to significant controversies and other commitments. Ms. Simms said that BLM decided to use an alternative planning process when they restarted the planning process in 1995, which included a community potluck attended by 300 members of the public. From that event, a community group called the Sonoita Valley Partnership emerged, which later worked side-by-side with BLM staff to draft the RMP. At first this was facilitated by an independent facilitator, and then facilitation was transitioned to the BLM. The extension of the planning process to 8-10 years was the result of BLM funding availability for planning, rather than the collaboration, as some have assumed. The group decided to write the objectives on an ecosystem/watershed level, rather than for just the BLM lands. People wanted to be involved in the activity level planning, beyond the RMP level plan, so the two were combined. Due to direction from Washington, the implementation steps were modified to be more general and to allow flexibility. Although this was a problem at the time given the collaborative way in which the implementation plan had been drafted, it ended up providing needed flexibility.

They framed their plan as an adaptive management plan by stating in the plan that they would use AM, including a definition of AM, creating a mechanism for stakeholder involvement, and articulating explicit, but flexible objectives. In addition, the plan included a monitoring framework and plan as well as a provision to adjust the objectives as new information became available.

Ms. Simms observed that most of what is written about adaptive management is focused on implementation level decisions and not on land use allocation. Implementation is where the flexibility seems to be, rather than in the designation of allocations. While there is an opportunity through plan amendments to change allocations in an RMP, this is seen as a significant obstacle because the amendment process is so onerous and lengthy. She suggested that if Field Managers are going to be successful implementing adaptive management at the RMP level, assistance is needed from BLM to address this challenge.

Chuck Otto (Pinedale Field Office)
The Pinedale plan as primarily an oil and gas RMP and stated that the former plan was completed in 1998 and assumed that 900 wells would be drilled. The average density would have been 1 well per section with a maximum of 4 wells per section. In 1992 new technology was developed that dramatically increased industry's ability to access natural gas reserves. During the same time, natural gas prices increased significantly. He said that drilling now occurs in a 5 - 10 acre spacing, and this has transformed the area, which was formerly rolling sagebrush hills, to a dense oil and gas field.

In both the Pinedale Anticline and Jonah Field, impacts to sage-grouse and habitat have been substantial. New research indicates that sage-grouse can only tolerate one well per 500 acres. BLM has not yet accepted these research findings, but did conduct a workshop last week to discuss how to respond to this research. He stated that mule deer and antelope are the primary species of concern in Pinedale, which is a primary winter feeding ground for these animals. The Pinedale RMP is trying to use AM techniques to learn about and minimize impacts to these species. The Pinedale Field Office has set up an intense monitoring plan, and information from this is reviewed by an inter-disciplinary team that also suggests appropriate changes based on their findings.

Currently there is a 46% decline in winter mule deer use on the Pinedale Anticline. In the Pinedale RMP the mitigation techniques are primarily voluntary in nature; however BLM can apply other measures as necessary. Companies have been responsive and have accepted almost any mitigation measures that BLM has proposed. BLM received 98,000 comments on the RMP, about 96% of which expressed dissatisfaction with the proposed RMP. Most of these comments were electronic and in the form of form responses; however, 1,600 actual hand-written letters were also submitted, which is an extraordinary response.

John Husband (Little Snake Field Office) - Integrating Adaptive Management into the Little Snake RMP
The final version of the Little Snake RMP is expected to be completed in Summer 2008. The following challenges were encountered in integrating AM into the plan:

- RMPs provide general management guidance for a large planning area (millions of acres) over a long period of time for the range of uses.
- RMPs are not that easy to change, it is desirable to write a plan such that going through the amendment process is not necessary.
- RMP decisions are not implementation level decisions – AM seems to lend itself to implementation level decisions.

The Craig Field Office approach includes a two tiered adaptive management framework which is included in the RMP. The two tiers are System level (RMP/landscape level), and Project level. The system and project levels are linked via the following steps:

- Evaluate project level monitoring to see if system monitoring changes are needed.
- Evaluate project level changes to see if system level changes are needed.

An Assessment Guidance document will be developed collaboratively within 2 years of the Record of Decision (ROD) on the RMP to describe the AM process and how it will be implemented, including monitoring protocols and how stakeholders can be involved. The Field Office's decision to use land health standards as indicators is important, the principle difference between what BLM has been doing and the adaptive management approach used in the LSFO is that AM is systematic.

Questions and Discussion

It's probably important to question whether adaptive management is really conducive to the context of oil and gas leasing.

Yes, and the truth is that the decision space may be quite limited in terms of the permitting process, their rights, and national policies.

What are you doing to look at impacts on your resources from activities outside your planning unit? What are you doing to look at an ecosystem approach? The ability to achieve your objectives is not solely dependent on what you are doing – activities of others on non-BLM land can affect your ability to achieve your AM objectives.

In Pinedale we are looking at water and air quality impacts from activities on our land and outside our land. We are also looking at impacts to wildlife habitat.

In the La Cienegas RMP, this is an important issue, since the RMP covers such a small area. In the RMP, we look at state lands in addition to BLM land. The Sonoita Valley Partnership is broader than just BLM lands and encompasses three watersheds, so it provides the opportunity for communication across jurisdictions. It is probably not as systematic as it could be.

The Jonah and Pinedale RMPs disclose an extirpation of a species, with provision for off-site habitat for the species. Where is the off-site? You are right, that a lease is a right granted; the room you have is before that right is granted. You can let lessees know in advance, what the conditions of the right will be.

The off-site provisions are voluntary. The companies have co-offered a mitigation fund, around $60 million dollars for off-site mitigation and monitoring in the drilling field. They are looking at off-site mitigation primarily on private land, some on state land. With the money we have, we have to look outside the immediate county.

Could each of you share a key lesson learned that BLM should consider?

- Adaptive management lends itself better to the project level implementation, than to the RMP level. What is important to do at the RMP level is to tee up the questions that will need to be addressed.
- Guidance is needed for how to prevent break-downs in trust and how to re-build it when it is lost.

- Have a process for keeping stakeholders involved as you transition from planning to implementation. We found there were multiple interpretations of what was written in the plan.
- BLM should find a way to make plan amendment process easier, or create another process for making adjustments based on adaptive management learning.

PANEL 5: INTEGRATING AM INTO BLM PERMITTING PROCEDURES

Moderator: Chuck Otto

Jack Hamby (BLM Washington Office)
Some aspects of the grazing program are quite flexible. For example, BLM can issue temporary permits, change the terms and conditions of leases, and issue a decision to encourage a permittee or lessee to do something that needs to be done. At the same time, the BLM should start looking at grazing from more of a biological perspective.

FLPMA and the PLIA (Public Lands Improvement Act) allow BLM to do activity-level plans and make any changes to these as long as they conform to the management plan.

Documenting understandings helps build trust through accountability. Trust is built and issues are resolved at the local level. Mr. Hamby recommended building adaptive management elements into land use plans from the beginning, in order to avoid the need for amendments.

Steve Salzman (BLM)
The time to decide to lease or not is in the planning stage. Once BLM has made those decisions, the agency can no longer prohibit an operator from drilling, but it can prescribe how, when, and where drilling can occur.

One example of how adaptive management has been applied to certain aspects of the permitting process: In the late 1990's, in the Buffalo Field Office, people became interested in developing the coalbed methane reserves in that area, and they suddenly had 4,000 – 5,000 APDs in their field office. In an effort to find a better way for processing all these requests, they developed a "Plan of Development" approach by which they can analyze four sections of land at the same time. Through this approach, all of the people involved are brought to the table to outline all of the elements of the plan – the flow lines, the access roads, the water disposal plans, etc. Mr. Salzman suggested that this approach may be useful for the Pinedale Anticline, Powder River Basin and other BLM permitting situations.

Diane Simpson (BLM Recreation Planner)
Because of the discretionary nature of recreation permitting, it is fairly simple for BLM to address requests for recreation events, including outfitting or guiding activities. Proponents and/or members of the public interested in such activities can be engaged in

the permitting process and can provide input to BLM on how to structure, monitor, and if necessary, adapt the permit in subsequent years. On the other hand, it is hard to envision how to involve members of the public who view any activity as having a negative impact on the resource.

Adaptive management can be used in the permitting process at the RMP level by describing activities that are best permitted. Dispersed camping on the Carrizo Plain National Monument is a useful illustration. In the past this has not been much of an issue, but more recently she is seeing increased attention and use patterns. The current thinking is that the areas open to dispersed camping will stay open; if impacts to the resource are observed, a permitting process may be established. If the impacts are still unacceptable, BLM can designate key camping areas for use. Should it become necessary, more extreme measures, such as closures, could be used.

Questions and Discussion:
For Carrizo, have you thought of using a more multi-pronged approach, where you'd use different approaches for different parts of the Monument?
We're already sort of moving in this direction.

In the Las Cienegas, we described the recreational activities and said that if our monitoring shows impacts, we can change the designation. We've zoned the NCA for different purposes, and we need to continue to monitor the impacts to those zones. In terms of getting other stakeholder perspectives into your recreational planning process, we tried to set up a forum that gave us input on these issues – it started in the early planning process, but we've continued to use this forum for recreation issues.

Trying to incorporate adaptive management into user conflicts is another area that deserves attention.
We also tried to write those processes into the plan – they're implementation level processes. So, for example, we basically said that the informal access points would not be closed, but we wrote a tier of management steps we would take if we saw impacts.

That's what our cooperators want to see – if a threshold is hit, certain triggers will kick in. Many people want specifics about this.

Are you afraid that you might not be seeing the impacts because you are not doing enough monitoring.
My concern is that recreation activities are very discretionary. So the challenge is finding the balance. Adaptive management fits well in many of these situations, but some, as I've said, are so local, that we don't have the resources to do what needs to be done in terms of monitoring. For recreation activities, we might issue a five year permit, but we want to look at the impacts after each event. For example, we're using photo points to monitor changes. It's still rather informal; we're not using the formal adaptive management approach, but we're setting goals, using monitoring information, and making adjustments as needed.

This should be a condition for all permits, that the permittees are involved in the monitoring and in assessing the impacts with us.
In year-round elk habitat, we would have about 15 – 20 different allotments that provided elk habitat through the winter. We developed open and closed roads depending on their rest patterns. We would meet on an annual basis and assess their monitoring results (e.g., stubble heights) – and this was very effective. Because we met on an annual basis, and met with key organizations (e.g., Rocky Mountain Elk Foundation), it was a fairly effective mechanism.

The question is, how can we be more strategic, or develop better guidance? In our office we have 320+ permits and one range conservationist. We clearly can't do monitoring and adaptive management at the level of intensity on all these allotments, but somehow in our RMPs we need to come up with some criteria.
We don't necessarily want the Washington office to get involved in defining this guidance. Washington operates on the best current politics available, and their priorities will shift over time.

The thing that struck me the most is that you've got to have the maximum level of participation from as broad diversity as possible; that's the way to end up with the fewest number of surprises. You've got to deal with conflict management as much as with resource management.

When the research people talked about adaptive management, I had the impression that targets and thresholds and triggers were not a big part of adaptive management.
Targets and triggers are critical tools in AM. Your target is your best guess – then you've got the uncertainty about whether your indicators are the right ones, and then whether you have the right targets. But it seems to me that the WO is hindering adaptive management, primarily through the budgeting process, and performance analyses. There's a lack of flexibility in the budgeting process.

We have performance measures, we have the budgeting process – but having worked for both the BLM and the Forest Service, I'm not sure whether the two agencies are working for the same government. However, unlike the Forest Service, the BLM is much more bottom up in its orientation. We look to the field offices to define their targets and performance measures.

PANEL 6: INTEGRATING AM INTO THE EXISTING BLM MONITORING SYSTEM

Moderator: Renee Dana

Jack Hamby (Washington Office)
There is no adaptive management without monitoring. Monitoring is the Achilles heel, because it is always the item that gets cut first when money gets tight. The single biggest mistake a manager can make is to make a promise and not keep it. Monitoring must be

designed to answer the questions in the land use plans and activity plans, and must be analyzed in order to be useful for decision-making. He observed that monitoring can be scientific and still not be useful for adaptive management if it does not answer the questions. BLM must question whether monitoring that does not directly address these questions should be continued.

Ron Wiley (Prineville Field Office)
Monitoring is a requirement for effective resource management, and collaboration is an integral part of monitoring and how it can be integrated. A lesson learned from experience is that despite doing a good job of passing on the science, the local unit has to buy into the information and the information has to make sense to the local office in order for the science to be integrated into decision making. The request for science and monitoring should come jointly from the local office and stakeholders. It's important to have everyone who has a stake in the decision engaged, including those who could obstruct a decision. The Prineville Field Office conducts a pre-situation analysis to sort out what is on people's minds and what the issues are, and then designs the monitoring plan with this information in mind. Joint fact-finding is getting folks on the same page regarding the science; informed consensus decisions are good, while uninformed consensus decisions can be bad decisions.

The following different types of problems are frequently encountered in monitoring efforts:

- Agreement on values (can be addressed by science)
- Different values (get agreement on ecosystem functions required to provide different values, then it is a societal choice about how to allow a range of uses without negatively impacting ecosystem functions)

At the Prineville Field Office, they monitor to see if there's a need to change their management, rather than to achieve their objectives. It's important to ask why? Management actions should be designed to answer questions. Tests should be designed to help provide information needed to make decisions, and to reach agreement on which data will answer which questions. It's important to work with stakeholders to identify what monitoring is needed and who will conduct it, noting that monitoring does not necessarily have to be done by BLM. Trust has to be earned by parties following up on what they say they will do.

Gita Bodner (The Nature Conservancy (TNC)) – Monitoring for Adaptive Management of the Grassland-Watershed at La Cienegas NCA
BLM and TNC signed a cooperative agreement in 2004, which stated that TNC would provide a quantitative review of existing monitoring data and protocols to evaluate how well they met BLM's stated needs and management objectives, whether they had the statistical power to detect change, and the implementation cost. TNC's role was to identify gaps in monitoring, propose ways to fill them, and help implement monitoring on the ground.

The RMP contains agreed-upon ecologically-based management objectives despite the fact that there remains disagreement on how to achieve these goals. They were able to accomplish this because there was agreement on the desired landscape conditions and on the ecological models that translated those conditions into measurable objectives. Based on their assessment, TNC concluded that one of the existing BLM protocols was not needed, and that one would need to be added.

A key lesson learned from this experience was that the conceptual model clarified thinking about what the real drivers are in the system, and so enables stakeholders to see where and how BLM thinks different variables are affecting the system and which hypotheses are being tested. This type of model can help boost confidence and buy-in, by making assumptions and reasons for actions explicit. Furthermore, she shared that as a result of developing the model and monitoring, it was learned that unexpected factors were playing a greater role than had been thought. In addition, experience confirms the statement in the DOI Guide that says "…Imprecise monitoring can provide misleading evidence…" In this case TNC recommended that in one area BLM increase data points from 100 to 1000 in order to be able to detect the change outlined in their objective.

The following "take home" points are worth noting:

- Increasing our power to detect change has increased confidence that we actually have an accurate picture of what is going on on the ground
- If you have made a commitment to act upon changes, there is an incentive to increase the accuracy of the monitoring
- Development of the state in transition model has boosted confidence that the system is focused on real drivers in the system, rather than on someone's pet project or following preconceived ideas.
- Openness and transparency have served us well. We have made the data and analyses available as soon as possible and these reports are available online at www.azconservation.org

Questions and Discussion

Do you have suggestions about funding for monitoring for our third and final AM broadcast?

When you can identify that an increment of funding is necessary for getting the information needed to make decisions, it is often easier to get funding.

We have used a citizen steward program to build capacity for monitoring.

There are opportunities for monitoring that we miss due to insufficient communication.

BLM should develop the ability to assess information regionally. Oregon has developed a lot of tools that other states could use and these should be shared by BLM nationally.

In the Northwest Forest Plan, the regional executives bought off on $50 million worth of monitoring over ten years, but then said the monitoring does not address their questions. The regional executives then took responsibility for defining the questions.

DAY 3 – October 25, 2007

DOI AM WORKSHOP RECOMMENDATIONS

Workshop participants, via self-selected work groups, presented the following recommendations to DOI for how BLM can integrate AM into their existing planning, permitting and monitoring processes.

PLANNING

Planning Guidance

1. Incorporate AM into the BLM Planning Manual and Handbook and NEPA Handbook, by incorporating the following into the relevant sections of these documents:
    a. Definition of AM from the DOI Technical Guide
    b. Description of AM process
        i. Diagram of AM process
        ii. Description of each step/element of the AM process
    c. AM screening process (9 Questions Tech Guide/Little Snake filter questions)(to ID if and where AM is appropriate)
    d. Goals and objectives
        i. Update the handbook to show how to write meaningful goals and objectives (and management strategies/actions)
    e. Priority questions (to describe what we are trying to learn)
    f. Alternative development
        ii. Assumptions
        iii. Modeling
        iv. Examples
        v. Resources
        vi. Describe several options to prepare flexible management alternatives in LUP and/or Imp. Level Plans
    g. Develop purpose and benefits of each option
        vii. Multiple pathways within an alternative
        viii. Describe prescriptions as a range rather than a specific number
        ix. Describe a linear, step-wise "if-then" progression
    h. Environmental consequences
        x. How to analyze flexible alternatives to minimize the need for future NEPA
    i. Monitoring (Tie back to objectives and concept of learning)
        xi. Weave in recommendations from Monitoring group
        xii. Emphasis of expanding capacity for monitoring through partnerships

2. Include examples and resources in each handbook section (resources = website, literature, people, training).

3. Incorporate AM into all four cycles of the planning process.
4. Expand the description of implementation plan to incorporate AM and the monitoring and assessment loop.
5. Add the development of an Assessment Strategy document – This includes steps to be taken if actions are not achieving desired/expected results.

Strategies to Address Cultural Roadblocks to AM in BLM Planning

6. Tie AM to Bureau initiatives.
7. Show examples of effective AM plans (e.g. La Cienegas).
8. Illustrate the benefits of AM.
9. Show several different ways resources could be acquired to conduct monitoring over multiple years.
10. Provide two types of training:
    - "How to do AM" for field staff
    - "Benefits of AM" for managers

PERMITTING

Funding: How we prioritize the use of our funding

1. Direct funding to the "right" place, re-organize sub-activities, give AM a priority in funding allocations
2. Landscape approach to monitoring (example: fund air monitoring at a landscape scale) cooperate with other state and federal agencies to get an integrated, regional monitoring program.
3. Beneficiary pay to do the work. If applicant does not want to wait to go through the first-come, first-served, and they can pay to do the work, they can go to the top of the list. Criteria – projects must benefit general public and local public. clearances and NEPA or reimburse agency
4. Change the focus from meeting/reporting targets to accomplishing what we need to do "on-the-ground".

Outreach

5. Develop materials to inform the public of adaptive management programs and requirements. Public participation
6. Conduct a public gathering to inform about the AM process and how to participate effectively.
7. Develop BLM training programs for staff for AM.
8. Educate upper management to gain support for adaptive management.
9. Develop internal BLM websites on AM successes and failures and reasons for success and failure.

MONITORING

Institutional Issues: Lack of institutional support for long term AM monitoring program. There is no mechanism to ensure there is a steady flow of funding for monitoring.
Recommendations:

1. Re-focus institutional mindset on monitoring as an integral, non-discretionary aspect of adaptive management planning and projects.
2. Field offices evaluate existing monitoring and develop strategy to focus monitoring on decision-making.
3. Washington Office makes funding available through BPS for AM
4. Establish a set of pilot AM projects at different scales to test the use and implementation of new outcome-based measures.

Human and Funding Resource Issues*:* Adequate resources and capacity are required to design and carry out long-term, effective and consistent monitoring are needed for adaptive management experiments and monitoring
Recommendations:

5. Identify different partners to fill gaps: universities, NGOs, industry, permitees, volunteers.
6. Match volunteers with tasks based on their skills and agency needs
7. Identify and develop internal capacity and resources to apply AM monitoring
8. Identify long term resources needed for monitoring at project planning (identify a percentage of project cost to be dedicated to monitoring)

Technical Issues*:* Develop a strategy for addressing technical issues and questions that arise during the implementation of adaptive management monitoring.
Recommendations:

9. Create connected and accessible databases (AIM strategy) for monitoring data.
10. Ensure that the range of indicators identified includes both those that are sensitive to short term and long term response.
11. Develop conceptual models to identify factors affecting resource issues and would require monitoring.
12. Make sure monitoring is used answering AM questions (review resolution, frequency and scale).
13. Discontinue unneeded legacy monitoring.

CROSS CUTTING RECOMMENDATIONS

Participants offered the recommendations below on themes that relate to planning, permitting and monitoring, including: Training, Cultural/Institutional Change, and Guidance.

TRAINING

1. Develop or repackage existing training in cooperation with other agencies/groups.
    a. Existing trainings to reference include:
        i. CAMNet – ½ day, 1 day, 2 day, 5 day
        ii. CSU – overview of AM (1 day)
            - simulation (1 day)
            - monitoring (1 day)
        iii. Steve Yaffee training
    b. SWOT AM Practitioner Team as needed
    c. Audience: BLM practitioners and collaborators – "how to" mechanics, line officers managers
    d. AM Practitioner Team (BLM, University, etc.) – coaching a field office on a project
    e. Partnership Series – status?
    f. National Riparian Service Team
    g. Instructors: BLM, other agencies, universities, other groups
    h. Suggested modules for BLM training include*:*

AM Overview

½ day	What is AM? What isn't AM? Process Case studies/examples What can it do for you Definitions

Source: DOI 1st AM broadcast

½ day	AM for Managers What it is What it can do for you How it fits into decision making Legal ramifications What's manager's role in AM How to get info you need as a decision maker

Target Audience: BLM practitioners collaborators, invite managers

1-1.5 days	Monitoring: How to design effective and efficient monitoring to answer specific questions
2 hours	Writing effective objectives How to develop the right questions that guide the learning and actions
1 day	Engaging stakeholders

½ day	Maintaining stakeholders – Advanced
½ to 1 day	Developing and Using Conceptual Models (Mike Runge NTC course) ½ day intro ½ day working on models
1 day	Monitoring Data Evaluation and Analysis and Use. Is it meeting your needs? What if its not?

i. Design Team:
- Maria – monitoring, AM, collaboration, writing case studies
- Steve Light – AM theory, history, context, large scale systems
- Harold Bergmann – stakeholders, collaboration, partners
- Cathy Humphrey – coordinator
- Karen Simms – on the ground practitioners
- Gita Bodner – monitoring, modeling
- Mike Runge – modeling

j. Action Items (conference call):
- Compile a list of existing training, resources, publications, etc.
- Prioritize modules
- Develop timeline
- Determine delivery methods
- Refine objectives and target audience

CULTURAL/INSTITUTIONAL

1. Integrate AM with major, high-profile Bureau Initiatives (e.g. the Healthy Lands Initiative, Sagebrush Steppe, and mitigation programs).
2. Secure support for establishing a series of adaptive management pilot projects – which participants suggested calling the "Adaptive Management Laboratory".
3. Establish AM as a specific budget theme within BLM.
4. Make AM a major priority for the National Operations Center (NOC).
5. Incorporate AM into BLM's AIM Strategy.
6. Develop measurable, relevant indicators for evaluating the success of AM programs.

GUIDANCE

1. The DOI Department Manual is scheduled to be updated with an AM Chapter. Sandy Meyers will draft the BLM AM section.

2. The completion of a new Adaptive Management Handbook (currently in draft form and referred to as the Adaptive Management Field Guide). The group recommended that Jim Turner coordinate the finalization of the Field Guide, working with Deb Rawhauser, Jack Hamby, Sandra Meyers, and others.
3. The BLM Land Use Planning Handbook, scheduled to be updated in 2008, should include a chapter on adaptive management. Jeremy Casterson is prepared to assist with adding sections on adaptive management into the planning handbook
4. DOI should maintain an AM "guru" within the Department to convene groups such as the AMWG.

NEXT STEPS (THE BIG PICTURE)

A fourth group worked to summarize the priority next steps for implementing overall workshop findings and recommendations. These actions include:

- The U. S. Institute and Meridian will produce a full report and executive summary by 11/15; the report will be distributed to workshop participants for review and comment, and these comments will be incorporated, as appropriate, into the final report.
- Rich Whitley and Ron Huntsinger will develop a strategy for briefing BLM's Executive Leadership Team, the NOC, Field Committee, DSDs and others on workshop outcomes, and particularly on the Adaptive Management Laboratory concept, by January 2008.
- An oversight group, comprised of Field Managers, field staff, and Washington office staff will develop a strategy for linking emerging guidance documents to the AM Laboratory and to policy development.
- Rich Whitley and Jim Turner will oversee and coordinate incorporation of workshop input into the Adaptive Management Field Guide, which is the basis for BLM guidance. They will also determine how to ensure that the Field Guide can have greater influence on BLM program development, including plans for the guide to become a handbook.
- Ron Huntsiner, Rich Whitley, and Carl Shapiro work on refining concepts and plans for the development of the Adaptive Management Laboratory.
- Ron Huntsinger and Jack Hamby will develop plans for integrating Adaptive Management into BLM's Assessment, Inventory and Monitoring (AIM) Strategy.
- The U. S. Institute and Meridian will send recommendations to the discussion groups for follow up, and assist as appropriate in organizing conference calls.

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APPENDIX B: WORKSHOP PARTICIPANTS "LIGHT BULB MOMENTS" ABOUT ADAPTIVE MANAGEMENT

- Ideas obtained from CAMNet about how to get communities involved.

- Looking at the complete scope of the adaptive management concept, and how that could incorporate community and other agency participation, and how this further improved the products of our management efforts on the ground.

- Challenge of fitting AM into an adaptive, landuse plan, which is usually a very fixed process – once we realized we could tier a document off the RMP, we realized we could develop a more flexible approach that would enable us to do adaptive management at the project level.

- Discovering in one of the stakeholder meetings that some were afraid that robust monitoring might mean that the data could be used against them. But over the last few years, we've found that it really puts everyone on an even footing, and builds trust.

- Noticed no weeds on oil pads, weeds spreading between, thought we need a new approach as an alternative to the prescriptive one

- As we loosened up, became more flexible and did citizen monitoring in the context of a NEPA process, we had great success. Now I am trying to bring that to the national level

- In a multi-stakeholder process, a participant told us if we really wanted him to be a player we would help him with border crossings, because he was not able to see his family under the current situation. As a result, we recognized that we did not have anyone from border crossing involved in our collaborative process. It caused us to step back and examine what the values of the participants were. We helped this gentlemen with his personal issue and he was one of the biggest contributors to the project.

- The disbanding of the Riparian Service Team made me realize that you've got to keep telling the story and keep infiltrating adaptive management and collaboration into the agency.

- If BLM is to meet its goals, we will have to trust our customers and stakeholders more

- In planning and NEPA processes, we don't have the data, knowledge or wisdom to look 20 years ahead to make the type of planning decision we are asked to

make. Through this I realized that we have two choices: 1) we can learn as we go, or 2) we can put something on the table and fake it.

- It is critical to link science with decision making.
- We need to figure out how to implement AM consistent with NEPA requirements.
- The level of trust required is high in order to do collaborative learning – many times a lot of promises were made and outside groups have suspended disbelief and see if the agency would follow through.
- AM is a tool to address the inability to predict the future for EIS
- If you get everybody on board, others will defend the proposed actions because they were involved in helping to create them.
- How can we make adaptive management cost-effective so we can use it for smaller projects?
- Money for monitoring is critical; without it, we cannot do adaptive management.
- People often understand AM only once they are engaged in the process of setting up a monitoring plan and using the information to inform decisions. AM reveals itself in the process of implementing it.
- partners with us all along through planning process etc, until it came down to make the decision, our partners could not handle how it was not “black and white” enough for them – trust
- The planning process sometimes takes longer than major shifts in ecosystem take. Adaptive management is an approach that can help address this so plans do not hit the ground obsolete.

APPENDIX C: WORK GROUP NOTES

Obstacles to Integrating AM into BLM Planning, Permitting and Monitoring Systems and Proposed Solutions for Addressing these Challenges

PLANNING
Political and policy support are critical to adaptive management success.

Obstacles

*FACA
Cost
Funding
Leadership
NEPA – realization that more NEPA may be required
*Planning regulations
Cultural barriers
ESA – change triggers the need for consultations
*Lack of examples
How to integrate science into planning
*Different levels of understanding of AM
How are we going to do training?
Risk aver people/culture – take silly risks, not doing up front work
How to deflect litigation bullets
Adversaries are adapting
How to do, and engage others, in good science
*Lack of skills in and acceptance of writing explicit objectives
*System vs. project-level AM
*Learning isn't identified as a part of planning

Proposed solutions:

Issues related to FACA

- Improved training opportunities for FACA
- Identify how projects have creatively addressed FACA issues
- Deal with FACA question early on in the process, so that there is adequate time to charter if necessary
- Streamline the process and/or delegate authority to charter FACA groups to BLM Director or State Director level
- Seek narrow exemption to FACA (e.g., FWS, ADRA)

Identify different types of stakeholders and how they can be involved:

- Add to the guidance a menu of options and concrete examples for encouraging stakeholder involvement, (e.g., options for cooperating agencies – federal, state, local, tribal)
- Encourage risk-taking in terms of engaging stakeholders in collaboration

How can we build more flexibility into land use planning?

- Incorporate B. Bormann's multiple pathways (landscape management studies)
- Stepwise progression of things that would happen (action/impact thresholds or trigger points to the level that's reasonable (e.g., how to manage recreational use in Las Cienegas)
- AM filters which let you do adaptive management where appropriate. Ask yourself if you need to include a number, or is a range okay?
- More explanation and disclosure of uncertainty in the analysis – addressing uncertainty provides a range of actions (i.e., if you can make a case for uncertainty, it's an argument for adaptive management).
- Identify learning objectives as the purpose and need, which would make it the focus of the federal action. The NEPA document would have to respond to that, and success would be measured against how far you succeeded (e.g., Five Rivers Project).
- Describe the adaptive management process in the plan.

Explanation/examples of adaptive management objectives and actions

- Make available good writing examples
- Menu of training opportunities of stepwise process of how to write SMART objectives, triggers, indicators
- Define the appropriate question
- Workshops with decision makers to define reframe question with appropriate timeframe
- Simple model of the decision process, actions, impacts, thresholds, decisions
- List of contacts of resource persons and exemplary projects, and a means for updating these

Where does adaptive management fits into the planning process – implementation?

- Learning while managing

How does adaptive management work in areas already allocated/defined in the plan?

- Plan should identify priority questions to guide actions, create flexibility (not prescriptions)
- Consideration: Some programs? Areas? Lend themselves better to have adaptive management at a smaller scale implementation plan
- Talk about what resources/programs
- Accountability
- Cultural roadblocks

Dealing with uncertainty

- More explanation of uncertainty – define it better and more broadly, which provides more flexibility
- Including learning objectives as the purpose and need
- Describe the adaptive management process in the plan, so you have a process, not a decision (e.g., Lower Snake, Las Cienegas)
- Scientific peer-reviewed study plan as an appendix

Cultural roadblocks

- Leadership has to buy in to adaptive management: funding, training, flexibility, accountability, risk-taking – prioritize
- Tie adaptive management to BLM initiatives
- Demonstrate plan effectiveness
- Sell them the benefits of adaptive management (e.g., Las Cienegas)
- Two types of training – for field folks, for managers

PERMITTING

Oil and gas

Obstacles:

- Limited decision space – once you issue a lease, you have to follow through
- Lease terms
- Legal obligation to provide leases
- APD time frame requirements
- Lack of trust – public, NGOs, operators, state agencies, other federal agencies
- Giving priority use to a given area
- Internal/external resistance to change

Strategies/recommendations:

- Review regs/policies to make more amenable to adaptive management. Emphasie adaptive management policy within oil and gas development
- Leadership and accountability
- Relief from 30 day APD timeframes and quarterly lease offerings
- Need to be more transparent and inclusive in decision making
- Educate and increase understanding about parameters we have to work with
- Better planning
- Building adaptive management into planning

Grazing

Obstacles:

- Internal/external resistance to change
- Lack of trust
- Lack of understanding of decision space
- Fear of litigation

- Lack of willingness by some publics to participate
- Lack of understanding of appropriate grazing uses by publics
- Lack of *effective* monitoring
- Limited funding

Strategies/recommendations:

- Education/understanding by publics
- Monitoring – ask/answer the right questions, SMART monitoring
- Better planning
- Build AM into planning and permitting processes
- Prioritize funding

Recreation

Obstacles:

- Lack of willingness by some publics to participate
- Unknown future uses/demands
- Funding
- Conflicting uses
- Special designation areas

Strategies/recommendations:

- Establish framework for adaptive management at the RMP level (screening criteria)
- Prioritize funding
- Education

Other permitting processes

Realty – land use permits, utilities, filming, rights-of-way

Forestry – timber sales

If you want leadership buy-in to adaptive management, you have to connect it to an initiative that is already receiving a lot of attention (such as the Healthy Lands Initiative), but it has to be more than that

What is driving us at the national level is our performance assessment tool from OMB. OMB is saying show us that your plans are effective, show us how the decisions in your plans are achieving your objectives. Perhaps there is a way to hook adaptive management to that.

MONITORING

Challenges/Obstacles to Implementing AM in BLM Monitoring Processes & Recommendations for How to Address Them

Institutional Issues

- Lack of institutional support for long term AM monitoring program. There is no mechanism to ensure there is a steady flow of funding for monitoring.
    - Create an endowment for monitoring.
    - Use interest accrued on bonds to fund monitoring.
    - Longer term commitment requested and made for adaptive management projects
    - Build incentives to support AM approaches – need to be performance-based. Change what Field Offices are held accountable for related to monitoring (hold field offices accountable for effectiveness of monitoring and usefulness of monitoring to decisions, and for meeting resource condition objectives, rather than quantity of sites measured).
    - Changes to budget process to make the connection between funding for AM projects and funding for monitoring
    - Build in long-term monitoring (analogous to operations and management) costs into budget (get approval from Congress)

- Lack of feedback mechanisms for monitoring data to inform decisions and future planning. Example, lack of identified pathway for project monitoring
    - Identify the reason why the data is not incorporated into the planning process (could be simply a matter of communication).
    - Engage planners/decision makers in the identification of the questions and development of the monitoring program. If you are not successful at this, try to figure out why and address that issue.
    - Acknowledge and address differences in culture of scientists and planners/decision makers.
    - Ability to translate project level monitoring results to RMP scale.

- Bureaucratic lag time

- Existing agency culture and practices that may not accommodate monitoring for AM.
    - Update institutional processes and guidelines with new standards of practice from the field.
    - Training and outreach.

- Techniques for managing the risks for where field offices should put their monitoring dollar

- Federal Oil and Gas Royalty Management Act (FOGRMA) – lease inspections are very prescriptive, so do not have enough man hours to inspect all the leases

and the leases that are problematic tend to fall off the list. Tend to focus on high production leases. Problems with small leases are they tend to become orphan leases. Bonds were not sufficient to lay the well to rest. Objective is to identify wells that are no longer producing, so that it can be ensured that sufficient resources are available to close the well. Regulatory/policy

- Require lesees to keep logs or industry could hire a consultant to do inspections
- Idea to compensate an entity for plugging with royalty credits. This could be built into an AM strategy at the front end of a new process.
- Use volunteers. There are particular tasks that volunteers can do a lot. Sometimes retired agency folks volunteer. Appropriate tasks for volunteers include: photo monitoring. The institutional memory, analysis and housing of the data should be in the agency.
- Require increase in bond at purchase of wells
- May require changing the law to prioritize inspection of lower productivity wells
- At the point when multiple strategies for addressing this have been identified, you could use AM to test to determine which one works best
- You might also use a model to predict
- Identify data needed for decision making
- Third party peer review of this problem

Human and Funding Resource Issues

- Lack of human resources, funding and technical capacity to design and carry out adaptive management experiments and monitoring
  - Partnering, collaboration and consultation
    - Different types of partnerships to meet different needs
      universities,
      NGOs,
      industry,
      permitees,
      volunteers
  - Volunteers – match volunteers with tasks based on their skills and agency needs
  - Look at Uncompahgre Plateau Project for lessons about how to leverage funds from outside sources.

Technical Issues

- Data storage
  - Need databases for monitoring data
  - Ensure that existing databases can be accessed with current software programs

- Lag times in ecological system responses to management actions (e.g. sage grouse example, no impact first three years, in fourth year they did not return)

  - Ensure that the range of indicators identified includes both those that are sensitive to short term and long term response

- Factors outside the boundaries that may impact the hypothesis being tested, factors outside the implementing agency's control.
  - Develop a conceptual model to identify the factors impacting the problem, both those factors that are in and out of our control
  - Coordinate with other monitoring programs

- Reluctance to stop legacy monitoring
  - Assess how monitoring is used and determine which monitoring is used to answer AM questions and/or inform decisions or for data mining. If a monitoring program is not used, consider discontinuing it.
  - Establish criteria for monitoring.

- Lack of analysis or assessment of data

- Lack of baseline data

- Setting up monitoring appropriate for the need (RMP monitoring (implementation monitoring) vs. effectiveness monitoring (response of the natural resource to management action)

- Lack of monitoring methods to address management scale questions.