12-31-2006

Interagency Science and Research: Quarterly Progress Report, Period Ending December 31, 2006

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Executive Summary

- Completed draft review and analysis of 6 interagency and 2 single-agency science strategies.
- Developed an outline for a Southern Nevada Agency Partnership Science Strategy based upon these reviews.
- Initiated a beta-test of a science proposal review process.

Summary of Attachments

- Team meeting agenda and notes.
- Copy of review and analysis of other science strategies.

Program Activities

Note: Due to serious illness, Dr. Debra Dandridge was not able to continue as full-time project manager during this quarter. In consultation with the NPS ATR and the SNAP Executive Director, the Public Lands Institute hired Dr. Craig Palmer from the UNLV Harry Reid Center for Environmental Studies to serve on a half-time basis as the Interim Project Manager, with Dr. Dandridge continuing to assist half-time. Dr. Palmer has extensive experience with the development of interagency research and monitoring programs, and his interim appointment was approved by the interagency Science & Research team lead, Kent Turner.

Interagency Team Meetings

Two meetings of the Interagency Science & Research Team (S & R) were held during this period, on October 10 and December 7, 2006. Due to Dr. Dandridge’s illness, Team Lead Kent Turner facilitated the October 10 meeting but was unable to provide minutes. Prior to the December meeting, Dr. Palmer met with Mr. Turner to develop an agenda and to identify reports that the team needed to review. These were copied and forwarded to the team members along with the agenda. Minutes of the December 2006 meeting are attached.

Beta Testing of Phase I Strategy

The S&R Team conducted a test management review of all seven eligible SNPLMA science nominations using criteria established in the Phase I strategy. Due to the shortfall of available funds for Round 7 proposals, the SNAP Board requested the S&R Team to attempt to also assess the potential of each proposal for phased funding.
Peer reviewers were identified to evaluate the scientific merit of four proposals selected by the S&R Team as a beta-test of the science proposal review process. These reviewers have also been asked to provide comments on the review questionnaire and the proposal templates. This work is ongoing.

Creation of Steering Committee

The Science and Research Team will continue to address the mission and goals of a proposed Science and Research Steering Committee in the next quarter. Over the first two years of this task agreement, the S & R Team has variously debated the desirability, timing, and charter of this proposed committee and, to date, has chosen to delay implementation. However, the “Science Advisors to the Glen Canyon Dam Adaptive Management Technical Work Group” was recently identified as a possible model to follow. Further discussions with team lead Kent Turner have determined that the potential formation of a steering committee should be a topic discussed in the upcoming science strategy.

Review of Multi-agency Initiatives

A draft review of six interagency science strategies was completed this quarter, as called for in the task agreement. The geographic scope of these strategies included the Colorado River from Glen Canyon Dam to Lake Mead; the lower Colorado River; northeastern forests of Maine, New Hampshire, Vermont and New York; northwest forests of Oregon, Washington and northern California; southern Florida ecosystems; and the Lake Tahoe watershed and air basin. In addition, two single-agency science strategies were reviewed.

An MS Access database was created to document detailed information regarding these science strategies. This preliminary information was summarized and presented to the Science and Research Team on December 7, 2006, along with a proposed outline for a SNAP science plan (see attached). The effort required to prepare each section of the SNAP science plan was also discussed with the team. The final report and analysis of interagency science strategies will be finalized for the team’s review during the next quarter.

Modification to Task Agreement

A draft modification (Mod #3) to the current cooperative agreement was prepared with new deliverables for the final year of the current agreement. These deliverables were reviewed by the Science and Research Team this quarter. Based on the team’s recommendations, a revised and more detailed list of Year 3 deliverables was prepared, approved by the team lead, and forwarded through NPS for processing.

Submitted by:

Margaret N. Rees, Principal Investigator

Date: December 31, 2006
Team Agenda & Minutes
Participants: S&R Team:
    Kent Turner, NPS, Team Lead
    Randy Sharp, USFS
    Cristi Baldino, FWS and National Refuges
    Carrie Ronning, BLM
    Debra Dandridge, PLI
    Craig Palmer, HRC/PLI, Acting Project Manager

Guests:
    Paul Buck, Judith Lancaster and David Mouat (DRI)

Upcoming Meetings: Feb. 1, 2007, 10:00 a.m.   Feb. 15, 2007, 10:00 a.m.

S&R Team Action Items

1. All Team members, send DRI all comments on their report by 12/15/06.
2. Kent and DRI will meet with the SNAP board in March or April.
3. PLI will distribute Round 7 science proposal for ad hoc peer review within one week. PLI will also
   interview writers of original proposals for their suggestions.
4. The team suggested PLI include a review of the Chesapeake Bay project science strategy.
5. PLI will address any information about the success of any science strategies reviewed.
6. Suggestions for addressing continuous funding for implementation of a SNAP science strategy:
   a. Add a marketing component to the proposed Science Strategy outline.
   b. Address potential outreach activities in the proposed Science Strategy outline.
   c. Identify how many analyzed plans get direct federal funding or long-term funding and describe the
      benefits of long-term guarantees of funding.
7. To complete a science strategy it is essential to have SNAP strategic goals for Southern Nevada Public
   Lands:
       a. The Team will meet and review land management plans and look for commonalities to develop
          recommendations.
       b. The S&R Team will present the problem to the SNAP board with recommendations for common
          goals.
8. The S&R Team will evaluate the proposed Science Strategy outline and PLI’s proposed cooperative
    agreement (Mod 3) update (the team will have a teleconference for discussion of these topics on Dec. 13)
9. PLI will include in Chapter 8 potential coordination with other arid land groups.
10. PLI will contact other SNAP teams that are already working on any information that would help inform the
    proposed outline, particularly Chapter 4.

Summary:

1. Review of DRI draft report of Mohave Desert Ecosystem Health Assessment Workshops

Prior to the meeting, a copy of the report entitled “Ecosystem Health Assessment: Research Needs for the 21st
Century” was sent to each team member. Judith Lancaster presented an overview of the report through a
PowerPoint presentation. At the conclusion of her presentation, team members discussed the report with Judith
and her coauthors-David Mouat and Paul Buck.

The following action items for DRI resulted from the discussions:
1. Supply electronic version of final report along with paper copies.
2. The term “alternative futures” needs additional explanation.
3. Clarify “retrospective analysis” and the contribution of cultural resources.
   a. Highlight the disparity between the archaeologists priorities and other specialists priorities.
   b. Work with the cultural resources participants to clarify their intent.
   c. Integrate cultural resources more into topic areas and address CR inventory within “Indicator and Rare Species” category.
4. Add a section or include a letter expressing DRI's personal recommendations.
5. Specifically address gaps in knowledge in a succinct manner; where necessary acknowledge the groups that did not address the topic.
6. Specifically address stressors (see #5 above).
7. Add an appendix with the original questions posed to group leaders.
8. Add an appendix for the May workshop.
9. Report needs to include:
   a. the May workshop (how it informs the August workshop),
   b. address the strategic initiatives (polling), and
   c. breakout leader reports plus
   d. a synthesis of all.
10. Compile the reasons that groups did not comply with instructions.
11. Add verbiage to the bottom of page 1 of the first draft about cultural resources and the skewed results.
12. Include points of convergence between science and managers.
13. Be more specific about May workshop data (see 9a above)

DRI requested that any additional comments from team members be provided to them by Dec. 15.

2. SAR request to SNPLMA office

Randy Sharp presented a spreadsheet with information provided by team members regarding a request to the SNPLMA office for funding from the Special Account Reserve. The justification for the request is that funding for staff time and expenses to participate on the SNAP Teams was not allowed at the time of the original Round 4 nomination, but is now allowed.

Budget figures were reviewed and updated to reflect current needs of the Science Team. As no budget figures had been received from BLM, Carrie promised to provide them to Randy by Dec. 11. Randy will work with Tammy at the SNPLMA office to finalize the request.

3. Round 7 updates

Kent reported that funding available from Round 7 land sales for Conservation Initiatives was very limited (approx. $6 Million) - when compared to earlier rounds. The chances that one of the science proposals will be funded is therefore very low.

PLI was asked to continue with the pilot test of the external review process for the four selected proposals. In addition to asking reviewers to answer the review questions developed by the team, the reviewers should also be asked for their comments on the review criteria as well as the proposal templates. The external reviewers should be selected and contacted within the next week.

PLI was also asked to interview the 4 original proponents for any suggestions they might have for improving the process for soliciting future science proposals.
4. Development of a Phase II Science Delivery Strategy

Craig Palmer presented the results of an ongoing survey of science delivery strategies. An MS Access database has been developed to collate that information (see Appendix A). Craig provided an overview of that effort that includes 6 interagency strategies and 2 agency strategies (see Appendix B) and a suggested outline for a SNAP science strategy (see Appendix C for updated outline).

Randy suggested that PLI include a review of the Chesapeake Bay Science Plan as this was suggested as a model for research planning at a recent research conference on the Great Basin. Randy also suggested that the science plan will need to address long-term funding for the implementation of a SNAP science strategy. The team agreed that a marketing component should be added to the proposed Science Strategy outline and this should address potential outreach activities. Another suggestion was to identify how many of the analyzed science strategies were based on direct federal funding or other long-term funding and describe the benefits of long-term guarantees of funding.

Several of the science strategies had been developed within an adaptive management framework. For this approach to work, it is necessary to have well-defined management goals that can be addressed by the Science Strategy. To complete our science strategy within an adaptive management framework, it is therefore essential to have SNAP strategic goals developed for Southern Nevada public lands.

The Team decided that their next meeting would be devoted to the identification of possible strategic goals for consideration by the SNAP Board. The Team will meet and review their respective land management plans and look for commonalities as a process to develop recommendations. Once completed, the S&R Team will present these recommendations to the SNAP board for its consideration and selection.

PLI was asked to include in Chapter 8 potential coordination with other arid land groups. They were also asked to contact other SNAP teams that are already conducting science activities for information that would help inform the proposed outline, particularly Chapter 4.

5. Mod 3 Deliverables for PLI Cooperative Agreement

PLI is currently submitting a modification to their cooperative agreement to obtain funding for the final year of their task. A draft list of their deliverables was presented to the team. The Team decided that they needed to review the deliverable list and discuss it on a future conference call. A date of December 13 was decided on for the conference call. Kent will provide PLI with an update from the conference call so that PLI can finalize their proposal and sent it forward for processing.

6. Future Meetings

The dates of Feb. 1 and Feb. 15 were selected for future S&R Team meetings.
Draft Review & Analysis of Interagency Science Strategies
Appendix A:
Access Database of Interagency Science Strategies
# Survey of Science Delivery Strategies

**Title:** Glen Canyon Dam Adaptive Management Program

**Geographic Scope:** Resources of Colorado River downstream of Glen Canyon Dam including water, sediment, fish, vegetation, wildlife and habitat, endangered and other special status species, cultural resources, air quality, recreation, hydropower, and non-use value. (Apparently goes to where Colorado River enters Lake Mead National Recreation Area)

**Agencies involved in research effort:**

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<tr>
<th>Agency Name</th>
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<tbody>
<tr>
<td>Bureau of Reclamation</td>
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<tr>
<td>Department of Energy</td>
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<tr>
<td>Bureau of Indian Affairs</td>
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<tr>
<td>Arizona Game &amp; Fish Department</td>
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<tr>
<td>Navajo Nation</td>
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<tr>
<td>San Jan Southern Paiute tribe</td>
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<td>U.S. Fish and Wildlife Service</td>
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<td>Hopi Trib</td>
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<tr>
<td>National Park Service</td>
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<tr>
<td>Hualapai Trib</td>
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<tr>
<td>Southern Paiute Consortium</td>
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<td>Pueblo of Zuni</td>
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<tr>
<td>Grand Canyon Wildlands Council</td>
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<tr>
<td>Grand Canyon Trust</td>
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<tr>
<td>Grand Canyon River Guides</td>
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<tr>
<td>Federation of Fly Fishers</td>
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<tr>
<td>State of Arizona</td>
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<td>State of Colorado</td>
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<td>State of New Mexico</td>
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<tr>
<td>State of Utah</td>
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<tr>
<td>State of California</td>
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</table>
Name of Science Group: Technical Work Group of the Adaptive Management Work Group

Has a science delivery strategy been prepared? ☑

Plan Title: Monitoring and Research Plan to Support Glen Canyon Dam Adaptive Management Program, Fiscal Years 2007-11

Plan Web Link: http://www.usbr.gov/uc/rm/amp/twg/mtgs/06nov08/Draft_MRP.pdf

Goals:

Goal 1: Protect or improve the aquatic food base so that it will support viable populations of desired species at higher trophic levels.
Goal 2: Maintain or attain viable populations of existing native fish, remove jeopardy from humpback chub and razorback sucker, and prevent adverse modification to their critical habitat.
Goal 3: Restore populations of extirpated species, as feasible and advisable.
Goal 4: Maintain a naturally reproducing population of rainbow trout above the Paria River, to the extent practicable and consistent with the maintenance of viable populations of native fish.
Goal 5: Maintain or attain viable populations of Kanab amber snail.
Goal 6: Protect or improve the biotic riparian and spring communities, including threatened and endangered species and their critical habitat.
Goal 7: Establish water temperature, quality, and flow dynamics to achieve AMP ecosystem goals.
Goal 8: Maintain or attain levels of sediment storage within the main channel and along shorelines to achieve Adaptive Management ecosystem goals.
Goal 9: Maintain or improve the quality of recreational experiences for users of the Colorado River ecosystem, within the framework of the GCDAMP ecosystems goals.
Goal 10: Maintain power production capacity and energy generation, and increase where feasible and advisable within the framework of the Adaptive Management ecosystem goals.
Goal 11: Preserve, protect, manage, and treat cultural resources for the inspiration and benefit of past, present, and future generations.
Goal 12: Maintain a high-quality monitoring, research, and adaptive management program.

Objectives:

Adaptive Management  ID Science Needs  ID Science Gaps  Coordination  Sharing Info

Wednesday, December 06, 2006
What major research themes have been identified?

For each GCDAMP goal (see above), strategic science questions and core monitoring information needs have been identified. Monitoring, research, and integration activities have been identified to addresses these science questions and information needs.

How were these identified?

Strategic science questions were developed by Knowledge Assessment Workshops in 2005.

How were science needs identified and prioritized?

An ad hoc Science Planning group identified core monitoring information needs and developed the science plan during the past year. A group of Science Advisors (consisting of 8 academic experts in fields germane to the studies within the scope of the GCDAMP) provided additional research questions upon review of plans and workshop reports.

How were science gaps identified and prioritized?

The Science Planning group (made up of members of the Technical Work Group), worked together to identify research gaps and to prioritize them.

What was the process used for science coordination?

The Technical Work Group meets quarterly and includes participants from all members of the Adaptive Management Work Group as well as the USGS and representatives from each National Park (Glen Canyon NRA and Grand Canyon NP).

What was the process used for sharing information between agencies?

Prior to each meeting, all reports and presentations are posted for review by the Technical Work Group members.

What was the process used for the communication of science information to stakeholders?

After each meeting of the Technical Work Group, a report is submitted to the Adaptive Management Work Group. In this report, key information items and issues are identified.

What was the process used to ensure the quality of the science information?

<table>
<thead>
<tr>
<th>Communication</th>
<th>Quality</th>
<th>Measure Success</th>
<th>Update plan</th>
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Other objectives: Provide recommendations to Adaptive Management Work Group regarding potential adaptive management activities.

Science topics of interest to group

<table>
<thead>
<tr>
<th>Research</th>
<th>Modeling</th>
<th>Monitoring</th>
<th>Science Applications</th>
<th>Synthesis</th>
<th>Funding</th>
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Other topics: Provide guidance to USGS Grand Canyon Monitoring and Research Center regarding...
The Science Advisors provide a review of all reports and plans. They are funded ($185K for FY07). In addition, they also use other outside reviewers as part of their peer review process. The USGS also requires project reviews every five years.

**What was the process used to measure the success of the science delivery strategy?**

The extensive monitoring program allows for an evaluation of success in meeting GCDAMP goals.

**How do they plan to update their science delivery strategy over time - such as identification of emerging needs?**

Every five years they develop an new monitoring and research plan.

**How do they plan to address their other objectives:**

The Technical Working Group provides options to the Adaptive Management Work Group related to management activities. For example, they are currently providing 4 options regarding flows from Glen Canyon Dam and how each of these might impact resources below the dam.

**Do they have any unique ideas for us to consider in the development of our science delivery program?**

The scientists recognized that they needed additional input from managers as they developed their science strategies. Their strategic planning activity for science over the past year provided the following recommendations we might want to consider:

1. Develop improved methods and/or procedures for managers to establish and articulate priorities for specific 3-5 year time intervals.
2. Develop improved methods for managers and scientists that permit more effective tradeoff assessments
3. Develop more effective scientists/managers collaborative working procedures
4. Implement methods to monitor and improve the adaptive management process
5. Implement methods to define future conditions for the Colorado river Ecosystem resources of concern.

**What do we consider as the strengths of their science delivery strategy?**

Their science activities are tied very closely to their adaptive management goals and processes. They seems to be able to respond to opportunities for research (floods in October provided sediment needed to improve beaches along the river - if they can get the approvals in place for a beach habitat building flow before the sediment is washed away).

**What are the weaknesses?**

None apparent.

**Recommendations**

The organization seems appropriate.

1) Adaptive management work group - managers providing input and oversight
2) Technical working group - includes scientists from all stakeholders of the adaptive management work group and USGS to provide detailed guidance on issues and objectives
3) Adequate funding is provided to do the needed research and monitoring (in this case through the Canyon Monitoring and Research Center)
4) Science Advisors provides an independent review panel for credible science.
Title: Lower Colorado River Multi-Species Conservation Program - Bureau of Reclamation

Geographic Scope: Lower Colorado River (including Lake Mead) extending south from Lake Mead to the US/Mexico border. Includes the states of Nevada, Arizona, and California.

Agencies involved in research effort:

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<tr>
<th>Agency Name</th>
<th>Description</th>
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<tr>
<td>Bureau of Reclamation</td>
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<td>Federal Participation Group (5 other agencies)</td>
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<td>Arizona Participation Group (26 entities)</td>
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<td>California Participant Group (12 entities)</td>
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<td>Nevada Participant Group (5 entities)</td>
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<td>Native American Participant Group (3 tribes)</td>
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<td>Conservation Participant Group (2)</td>
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<td>Other Interested Parties Participant Group (2)</td>
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Name of Science Group: None

Has a science delivery strategy been prepared? ☑

Plan Title: Lower Colorado River Multi-species Conservation Program - Draft Final Science Strategy

Plan Web Link: http://www.usbr.gov/lc/lcrmscp

Goals:
1. Identify monitoring and research needs

Objectives:

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<thead>
<tr>
<th>Adaptive Management</th>
<th>ID Science Needs</th>
<th>ID Science Gaps</th>
<th>Coordination</th>
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Other objectives:
a. Processes that can be used to identify knowledge gaps
b. Develop monitoring and research priorities
c. Incorporate new knowledge into decision making process

Science topics of interest to group:

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</table>
Other topics:

What major research themes have been identified?

a. Species research
b. System Monitoring
c. Post-development Monitoring

How were these identified?
Taken from HCP agreement

How were science needs identified and prioritized?
HCP agreement

How were science gaps identified and prioritized?
Review by BOR of existing information as well as results from monitoring and research conducted prior to Science Strategy adoption. Research needs were prioritized by BOR staff based on the information review and ranked in order of importance relative to HCP.

What was the process used for science coordination?
Unknown

What was the process used for sharing information between agencies?
Ideally through a common database maintained by BOR, publications, presentations

What was the process used for the communication of science information to stakeholders?
Annual reports are directed to the 54 member steering committee.

What was the process used to ensure the quality of the science information?
Unknown

What was the process used to measure the success of the science delivery strategy?
NA

How do they plan to update their science delivery strategy over time - such as identification of emerging needs?
5 year planning process that incorporates monitoring and research into an HCP adaptive management cycle.

How do they plan to address their other objectives:
Unknown

Do they have any unique ideas for us to consider in the development of our science delivery program?
Roles of steering committee and BOR are defined. Knowledge sharing is ensured through membership in the Steering Committee and a defined process of how information will flow to and from the Steering Committee (figures 2a. And 2b. Pages 8 & 9. This group also makes use of ad hoc
Task Work Groups.

**What do we consider as the strengths of their science delivery strategy?**

Knowledge sharing is ensured through membership in the Steering Committee and a defined process of how information will flow to and from the Steering Committee (figures 2a. And 2b. Pages 8 & 9.

**What are the weaknesses?**

This Science Strategy directly addresses issues relative to F&WS HCP for the Lower Colorado River. Social issues and cultural resources issues are not addressed. It appears that all the review of research is conducted by in-house BOR personnel. There seems to be little room for objective review of research methodology or results. No clear methodology for including academic research interests.

**Recommendations**
Title: Northeastern States Research Cooperative


Agencies involved in research effort:

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>USDA NE Research Station</th>
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<tr>
<td>Agency Name</td>
<td>New Hampshire Hubbard Brook Research Foundation</td>
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<tr>
<td>Agency Name</td>
<td>University of Vermont</td>
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<td>Agency Name</td>
<td>University of Maine</td>
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<tr>
<td>Agency Name</td>
<td>SUNY College of Environmental Science and Forestry</td>
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Name of Science Group: Northeastern States Research Cooperative

Has a science delivery strategy been prepared? ☐

Plan Title: Northeastern States Research Cooperative: Structure, Governance and Operating Guidelines.

Plan Web Link: http://www.uvm.edu/envnr/nsrc/

Goals:
- Collaborative regional-scale research projects
- Shared data and results
- Support for long-term monitoring
- Analysis of regional environmental issues
- Enhanced communication among researchers, managers and policy-makers

Objectives:

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Communication Quality Measure Success Update plan

☐ ☐ ☐ ☐

Other objectives: These objectives are found primarily in the detailed descriptions of the overall research themes.

Science topics of interest to group

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Other topics:

What major research themes have been identified?
How were these identified?
Northern Forest Lands Council 1990 report, Finding Common Ground: Conserving the Northern Forest

How were science needs identified and prioritized?
unknown

How were science gaps identified and prioritized?
NA

What was the process used for science coordination?
The NSRC membership is open to any regional researcher interested in ecosystem research or management. The NSRC forms workgroups of similar interests who share information.

What was the process used for sharing information between agencies?
Proposal symposium.

What was the process used for the communication of science information to stakeholders?
NA

What was the process used to ensure the quality of the science information?
Peer review, symposium, journal articles, etc.

What was the process used to measure the success of the science delivery strategy?
NA

How do they plan to update their science delivery strategy over time - such as identification of emerging needs?
NA

How do they plan to address their other objectives:
Broad thematic categories allow for research of many areas as the need/interest arises.

Do they have any unique ideas for us to consider in the development of our science delivery program?
Membership on a steering committee is elected. Very broad themes of ecosystem research were defined allowing for future (and unknown) research objectives to be included. There are set dates for proposal application, specific formats for proposal contents, a peer review process for proposal funding award, reviewers cannot participate in an proposal.

What do we consider as the strengths of their science delivery strategy?
Funding is primarily from Congressional direct line item appropriation. Participation in research workgroups is not exclusive or restricted to a chosen few. The Steering Committee is elected by science and research peers.

**What are the weaknesses?**

Should Congressional funding not be available, will research continue to be funded through other mechanisms? There is no clear interface between Forest Management and research results. Is the science application practical?

**Recommendations**
Title: Northwest Forest Plan (NWFP)

Geographic Scope: 24.5 million acres in Oregon, Washington, and northern California.

Agencies involved in research effort:

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<tr>
<th>Agency Name</th>
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<tbody>
<tr>
<td>USDA Pacific Northwest Research Station</td>
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<tr>
<td>USDA Pacific Southwest Research Station</td>
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<tr>
<td>USGS Forest and Rangeland Ecosystem Science Center</td>
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<tr>
<td>EPA Pacific NW Ecosystem Mgmt Research Program</td>
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<tr>
<td>Nat'l Marine Fisheries Srvc NW Fisheries Science Ct</td>
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Name of Science Group: Research and Monitoring Group (Research Agency Executives)

Has a science delivery strategy been prepared? ❏

Plan Title: Strategic Research Plan to Support Ecosystem Management Research in the Northwest Forest Plan Area

Plan Web Link: http://www.reo.gov/general/aboutNWFP.htm

Goals:
- Scientific research on fundamental questions underlying basic assumptions of the NWFP
- Development of research and monitoring plans
- Communication of scientific findings, technical transfer, and opportunities to facilitate adaptive management
- Independent scientific review, evaluation, and analysis

Objectives:

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Communication Quality Measure Success Update plan

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Other objectives:

Science topics of interest to group

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<tr>
<th>Research</th>
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Other topics:

What major research themes have been identified?

1. Understand ecological systems
2. Individual species research
3. Develop and evaluate alternative management systems
4. Resource restoration and enhancement
5. Economic and social dimensions of cultural and natural resources
6. Research to support monitoring and inventory systems
7. Decision support systems

**How were these identified?**
The research themes were identified through ecosystem management research planning and research survey effort conducted 1993 and 1995.

**How were science needs identified and prioritized?**
Not prioritized

**How were science gaps identified and prioritized?**
NA

**What was the process used for science coordination?**
NA

**What was the process used for sharing information between agencies?**
Conferences; other?

**What was the process used for the communication of science information to stakeholders?**
NA

**What was the process used to ensure the quality of the science information?**
NA

**What was the process used to measure the success of the science delivery strategy?**
NA

**How do they plan to update their science delivery strategy over time - such as identification of emerging needs?**
NA

**How do they plan to address their other objectives:**
NA

**Do they have any unique ideas for us to consider in the development of our science delivery program?**
The Group meets as needed and convenes workgroups and other committees to help address the research mission. The current Research Executive agencies include: USDA Pacific NW Research Station, USDA Pacific SW Research Station, USDI BLM, USDI Geological Survey-Western Regional Office, NOAA-National Marine Fisheries Science Center, and EPA-Western Ecology Division. The Group membership is assigned by the Research Agency Executives comprised of scientists or designated representatives. This group has helped organize research needs for over 24.5
million acres which includes a multitude of federal, state, and private interests.

**What do we consider as the strengths of their science delivery strategy?**

The Group is designed to "present an independent science perspective in intergovernmental forums." Initially, the Research Group visualized linking research agency databases to keep informed about completed and ongoing research work pertinent to ecosystem management in the NWFP area. This was to be accomplished, at least in part, by using the U.S.G.S. Biological Resources division database - Science Information System on the internet.

**What are the weaknesses?**

Little or no evident use of modeling. Unclear how research information is distributed to management or stakeholders. No clear evidence of how research is funded or how decisions are made regarding which research projects are selected or how research funds are awarded. Most importantly, where do research funds come from?

**Recommendations**
**Title:** South Florida Ecosystem Restoration Task Force

**Geographic Scope:** South Florida Ecosystem - defined as the area consisting of the lands and waters within the boundary of the South Florida Water Management district, including the Everglades, the Florida Keys, and the contiguous near-shore coastal waters of South Florida. This 18,000 square-mile region extends from Kissimmee Chain of Lakes south of Orlando through Florida Bay and the reefs southwest of the Florida Keys.

**Agencies involved in research effort:**

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<td>NOAA</td>
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<td>Office of Policy and Budget</td>
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<td>Bureau of Indian Affairs</td>
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<td>Florida Department of Community Affairs</td>
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<td>Florida Department of Agriculture and Consumer Ser</td>
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<td>South Florida Water Management District</td>
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<td>Florida fish and Wildlife Conservation Commission</td>
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<tr>
<td>Miami-Dad County</td>
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<tr>
<td>Lee County</td>
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<tr>
<td>Palm Beach County</td>
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<tr>
<td>Broward County</td>
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<tr>
<td>City of South Bay</td>
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<tr>
<td>Miccosukee Tribe of Indians of Florida</td>
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Name of Science Group: Science Coordination Group - SCG (19 members)

Has a science delivery strategy been prepared? ✓


Goals: Science Coordination Goal: Ensure sound, timely, and relevant scientific information is available to support decisions at all points in the restoration process through coordinating efforts, sharing information, and identifying and filling information gaps.

Objectives:

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Other objectives:

Science topics of interest to group

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Other topics:

What major research themes have been identified?

Water management, land use management/development, nutrients, spatial extent, exotic and invasive species, and contaminants.

How were these identified?

To identify research, modeling and monitoring needs and gaps, conceptual ecological models were developed based on the current understanding of the cause and effect relationships in the ecosystem. Drivers, stressors, ecological effects and attributes (endpoints) were identified.

How were science needs identified and prioritized?

The SCG convened scientific panels to identify those relationships described in the models that were the most critical to restoration success. The panels also identified prospective science needs from the evaluation of potential future impacts that are not described in the relationships in the models.

How were science gaps identified and prioritized?
A gap analysis was conducted through interviews and surveys of organizations to evaluate their science initiatives with respect to each science need. Research themes were developed through the use of SCG member experience and expertise.

**What was the process used for science coordination?**

Several actions were identified to fill science gaps. These actions were primarily led by the SCG with specific milestones and target dates. Seven specific coordination actions have also been identified with target dates.

**What was the process used for sharing information between agencies?**

Plans are being developed for regional workshops and meetings, regional newsletters, internet-available data sharing, conference and symposia, web-based forums, internet newsgroups.

**What was the process used for the communication of science information to stakeholders?**

No current mechanism exists to assure timely sharing of provision data or prepublication scientific findings. They are considering methods for rapid information sharing and are developing information-sharing process plan.

**What was the process used to ensure the quality of the science information?**

A system-wide organizational level protocol for assuring quality science programs is being developed.

**What was the process used to measure the success of the science delivery strategy?**

Feedback will be provided from the monitoring programs on the success of the overall management strategy, including the science strategy.

**How do they plan to update their science delivery strategy over time - such as identification of emerging needs?**

The SCG briefs the Task Force (agency exec’s) once a year on progress made in addressing science gaps. On a biennial basis, the SCG will prepare an updated science delivery plan.

**How do they plan to address their other objectives?**

n/a

**Do they have any unique ideas for us to consider in the development of our science delivery program?**

The use of the conceptual ecological models could be useful to identify research needs.

**What do we consider as the strengths of their science delivery strategy?**

Specific actions with milestones and target dates were specified in the science delivery plan. Regular reporting of results encourages progress towards meeting science needs.

**What are the weaknesses?**

It does not appear that the SCG has any resources allocated to it to conduct activities to foster communication such as the development of information portals or to hold workshops.

**Recommendations**
The development of the "Plan for Coordinating Science" appears to have been a very useful tool.

It appears that the SCG has used working groups to address specific topics such as identifying science application needs and gaps.
Title: Tahoe Science Consortium

Geographic Scope: Lake Tahoe watershed and air basin.

Agencies involved in research effort:

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<td>Desert Research Institute</td>
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<td>Sierra Nevada College</td>
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<td>University of California, Davis</td>
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<td>University of Nevada, Reno</td>
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<td>USGS</td>
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<td>USFS Pacific Southwest Research Station</td>
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<td>California EPA</td>
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<td>California Resources Agency</td>
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<td>Nevada Dept. of Conservation and Natural Resources</td>
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<td>Tahoe Regional Planning Agency</td>
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<td>U.S. Army Corps of Engineers</td>
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<td>U.S. EPA</td>
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<td>U.S. Fish and Wildlife Service</td>
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<tr>
<td>USFS Lake Tahoe Basin Management Unit</td>
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<td>Natural Resources Conservation Service</td>
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Name of Science Group: Committee of Scientists

Has a science delivery strategy been prepared? ☑

Plan Title: Tahoe Science consortium Purpose/functions Statement

Plan Web Link: http://terc.ucdavis.edu/tsc.html

Goals: 1. Provide resources to support research and related activities for environmental restoration within the Lake Tahoe Basin.

Objectives:

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**Other objectives:**
1. Develop and update a long-term comprehensive research plan that focuses on the restoration needs of Lake Tahoe, the Lake Tahoe Basin Science Plan.
2. Provide independent scientific review of research proposals and products.
3. Provide scientific input, as requested by planning, regulatory and implementing agencies in the Lake Tahoe Basin.

**Science topics of interest to group**

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<tr>
<th>Research</th>
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**Other topics:** Adaptive Management development and integration; Scientific consultation.

**What major research themes have been identified?**
Not yet formulated.

**How were these identified?**
Will be identified through a workshop sponsored by DRI in October 2006.

**How were science needs identified and prioritized?**
TBA

**How were science gaps identified and prioritized?**
TBA

**What was the process used for science coordination?**
Ideally through technical workshops and symposia with the intent to produce "state of the basin's scientific knowledge" reports.

**What was the process used for sharing information between agencies?**
Information archive to include reports and scientific publications linked to the existing Tahoe Integrated Information Management System (TIMS).

**What was the process used for the communication of science information to stakeholders?**
Ideally, workshops and symposia.

**What was the process used to ensure the quality of the science information?**
Independent scientific reviews.

**What was the process used to measure the success of the science delivery strategy?**
NA

**How do they plan to update their science delivery strategy over time - such as identification of emerging needs?**
As needed

**How do they plan to address their other objectives:**
Research Plan (similar to annual work planning process) with management and scientific review of the Plan and updated as needed.

_Do they have any unique ideas for us to consider in the development of our science delivery program?_

The Lake Tahoe Planning unit developed the Science Consortium as an independent 501 tax exempt entity. Start-up funds for this consulting group initially came from SNPLMA funding in 2005 (apex. $750,000) with future funding to come from other sources such as grants, etc. The Science Consortium will draft a comprehensive Science Strategy for the Tahoe Basin. USGS is independently drafting an Integrated Science Plan. Pathway 2007 Planning Process and USGS drafted a 20-year desired future environmental and economic model for the basin. USGS developed a population-growth and land use-change model to aid in the decision support process (usgs.gov/science/impact/summaries2005.html)

_What do we consider as the strengths of their science delivery strategy?_

_What are the weaknesses?_

_Recommendations_
Title: US EPA 10-year Research Strategy for the Landscape Sciences Program

Geographic Scope: Nation-wide and regional

Agencies involved in research effort:

| Agency Name | Environmental Protection Agency (EPA) |

Name of Science Group: EPA Science Advisory Board (SAB)

Has a science delivery strategy been prepared? ✓

Plan Title: A National Assessment of Landscape change and Impacts to Aquatic Resources: A 10-year Research Strategy for the Landscape Sciences Program


Goals:

1. Develop new remote sensing data collection and processing techniques that measure watershed-level stressors
2. Quantify relationships between measures of landscape attributes and determine how these relationships vary within and among regions
3. Compile a national comprehensive landscape-change database from the decades 1970's to early 2000's
4. Develop methods to analyze changes in landscape indicators between the early 1970's and early 2000's and make it available on internet
5. Demonstrate how landscape sciences can contribute to the assessment of the condition of the Nation's resources
6. Provide the tools and guidance to Federal, State managers so they may confidently apply landscape science techniques to ecological assessments

Objectives:

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Other objectives:

a. Spatial data acquisition, assembly, and accuracy assessment
b. New remote sensing methods development
c. Change detection
d. Quantification of landscape indicators relative to condition of aquatic resources
e. Assessment methods and research and development

Science topics of interest to group

Wednesday, December 06, 2006
What major research themes have been identified?

see goals

How were these identified?

Tiering off EPA Office of Research and Development strategic plan and EPA national strategic plan

How were science needs identified and prioritized?

unknown

How were science gaps identified and prioritized?

unknown

What was the process used for science coordination?

unknown

What was the process used for sharing information between agencies?

internet website and publishing articles

What was the process used for the communication of science information to stakeholders?

internet

What was the process used to ensure the quality of the science information?

Peer review by Science Advisory Board and overall review by independent scientists comprising the Board of Scientific Counselors (as well as publishing in peer reviewed journals)

What was the process used to measure the success of the science delivery strategy?

not articulated

How do they plan to update their science delivery strategy over time - such as identification of emerging needs?

Scientific review of plan in 2001 and at least a review in 2010

How do they plan to address their other objectives:

unknown

Do they have any unique ideas for us to consider in the development of our science delivery program?

Internal science review board and an external review group

What do we consider as the strengths of their science delivery strategy?

Ability to advance and conduct large scale (state-wide and region-wide) research with state-of-the-
art technology

**What are the weaknesses?**

National legislative mandates may limit local interface for research purposes. Knowledge about product availability to multiple users outside of topic specific research communities seems to be lacking.

**Recommendations**

EPA has technology and knowledge that can be leveraged to enhance research projects.
Title: US Geological Survey

Geographic Scope: Regional

Agencies involved in research effort:

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<th>Agency Name</th>
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<td>Agency Name</td>
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Name of Science Group: none per se

Has a science delivery strategy been prepared? ☐

Plan Title:

Plan Web Link:

Goals:

Objectives:

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Other objectives:

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Other topics:

What major research themes have been identified?

How were these identified?

How were science needs identified and prioritized?

How were science gaps identified and prioritized?
What was the process used for science coordination?

What was the process used for sharing information between agencies?

What was the process used for the communication of science information to stakeholders?

What was the process used to ensure the quality of the science information?

What was the process used to measure the success of the science delivery strategy?

How do they plan to update their science delivery strategy over time - such as identification of emerging needs?

How do they plan to address their other objectives:

Do they have any unique ideas for us to consider in the development of our science delivery program?

What do we consider as the strengths of their science delivery strategy?

What are the weaknesses?

Recommendations
Goals:
Mission statement: Increase understanding of the effects of both long-term climate change processes and more recent natural and anthropogenic disturbances on Great basin ecosystems and watersheds, and use this understanding to devise meaningful scenarios for their restoration and management.

Objectives:

Science topics of interest to group

What major research themes have been identified?
Ecology, Paleoecology, and Restoration of Great Basin Watersheds

How were these identified?
unknown

How were science needs identified and prioritized?
unknown

How were science gaps identified and prioritized?
What was the process used for science coordination?
unknown

What was the process used for sharing information between agencies?
unknown

What was the process used for the communication of science information to stakeholders?
unknown

What was the process used to ensure the quality of the science information?
unknown

What was the process used to measure the success of the science delivery strategy?
not applicable

How do they plan to update their science delivery strategy over time - such as identification of emerging needs?
NA

How do they plan to address their other objectives:
unknown

Do they have any unique ideas for us to consider in the development of our science delivery program?
not at this time

What do we consider as the strengths of their science delivery strategy?
The RMS-Reno does not have a science delivery strategy per se. This office operates under the umbrella of the RMRS-Ft.Collins and is a satellite office. Any agency (except the U.S. Forest Service) or private entity can approach the RMS-Reno and propose a research project provided some funding accompanies the proposal; and the proposal fits within the broad categories of RMS research foci. RMS's can accept direct funding transfers from Department of Interior agencies or other entities for research proposals.

What are the weaknesses?
The USDA Research Stations can not accept direct transfer of funds for research from the U.S. Forest Service, even though the research would directly benefit the management of USFS managed lands. However, Forest units can provide a management code that can be charged to. Research results tend to be published in in-house publications such as the General Technical series or RMR Science which summarizes current research results directed generally towards research station employees.

Recommendations
In general, the Rocky Mountain Research Station, as the umbrella entity, has a Strategic Framework (http://www.fs.fed.us/rm/main/strategic_plan/2003_strat_plan_final.pdf) that guides research
objectives. This document defines focus areas and provides strategic guidelines. Regionally, the RMS-Reno has the capability to organize comprehensive ecosystem studies when funding is provided. Research Stations have a history of collaborating with university scientists, typically those universities designated as Land Grant Universities. They freely partner with other federal, state, and local governments, industry, non-government organizations (NGOs), and tribal governments; and seek international cooperation where appropriate. Research stations, in general, stress application of results on managed lands.

There has been an effort to base a scientist in Las Vegas with support from the U.S. Forest Service. Among other services, this individual could serve as a scientific consultant. However, directed budget cuts for FY2007 have forced filling this position to be placed on hold.
Appendix B:
Summary of Science Delivery Strategies

Database status: 6 interagency strategies, 2 agency strategies

Geographic scope of interagency strategies:

GC – Colorado River from Glen Canyon Dam to Lake Mead NRA
LC – Lower Colorado River
NE – Northeastern forests of Maine, New Hampshire, Vermont and New York (26 million acres)
NW - Northwest forests of Oregon, Washington and northern California (24.5 million acres)
SF – Southern Florida ecosystems (11.5 million acres)
TB – Lake Tahoe watershed and air basin

Number of agencies involved:

GC – 25; LC – 56; NE – 5; NW – 4; SF – 24; TB – 15

Completed Science Plans: GC, LC, NW, SF (4 of 6)

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Organization:

Science team reports to a management team – all
Outside Science Advisory group – only GC
Use Ad Hoc teams – GC, NE, SF, TB (4 of 6)
Unique Ideas / Strengths

GC – Adaptive management framework, Science Advisory Group
LC – Defined roles and processes
NE – Process for soliciting, reviewing, and selecting science proposals
NW – Research executives involvement
SF – Use of conceptual models to identify science needs, routine update of science plan
TB – Planning a comprehensive strategy (SNPLMA funded)

Lessons

- Value of developing a comprehensive science plan
- Linking science to management actions
- Broader scope of science plans (objectives, topics)
Draft Outline:
Southern Nevada Science Strategy
1. Introduction
   a. Overview of the Southern Nevada Agency Partnership (SNAP)
   b. Vision, purpose and objectives of the science strategy
   c. Scope – monitoring, research, modeling, science applications, assessments

2. Organization & Responsibilities
   b. Responsibilities of each component in science strategy

3. Adaptive Management Strategy
   a. Role of science in adaptive management
   b. Process for the synthesis of science findings
   c. Process for incorporating new knowledge in planning and decision-making

4. SNAP Science Needs & Priorities
   a. Review of existing SNAP agency management documents and strategies to identify common goals, objectives and related science and monitoring questions
   b. Science needs and priorities from the DRI “Ecosystem Health Assessment – Research Needs for the 21st Century” workshops and other similar efforts
   c. SNAP strategic goals (as developed in conjunction with SNAP Board)
   d. Identification of management questions best answered by monitoring or research
   e. Science gaps and science needs
   f. Prioritization of science needs

5. Solicitation, Review and Selection of Science Proposals
   a. Process for requesting proposals in future SNPLMA rounds
   b. Process of independent review of science projects
   c. Process for prioritization and selection of science projects for funding

6. Agency Science Delivery Capabilities
   a. Assessment of agency science delivery capabilities
   b. Assessment of interagency science delivery capabilities (include existing team capabilities such as the Southern Nevada Restoration Team or other SNAP teams)
   c. Identification of potential agency focus areas for science contributions

7. Quality Assurance
   a. SNAP quality assurance program plan (develop as an appendix)
   b. Standardization of data collection protocols
   c. Review of final products

8. Science coordination and information sharing
   a. Purposes
      i. Exchange of data and information
      ii. Reduce duplication of efforts
      iii. Encourage coordination of monitoring and research efforts
b. Approaches to science coordination and information sharing within SNAP
c. Approaches to science coordination and information sharing with other groups in the Mojave desert region (e.g. Desert Managers Group, NPS Inventory and Monitoring program, Colorado Plateau Federal Managers Group)
d. Dissemination of science findings (e.g. reports, conferences, websites)
e. Facilitating science through data and information management

9. Funding and Timelines
   a. Past funding of proposals with science components
   b. Projected funding needs
   c. Review of potential sources of funding for SNAP science projects – current & future
   d. Approaches to marketing the science strategy

10. Continual improvement
    a. Identification of emerging science needs
    b. Periodic synthesis of science findings
    c. Frequency of revision of strategy