September 20, 2018

Documents:

Meeting Agenda

Meeting Minutes

Read-Aheads and Presentations

- *Endangered Species Act Formal Consultation With Active Biological Opinions in the MRGESCP Area*
- *MRGESCP AMWG Discussion Document*
- *MRGESCP AMWG [presentation]*

Middle Rio Grande Endangered Species Collaborative Program

Est. 2000

Science/Habitat Restoration Workgroup (ScW/HR)
Meeting Agenda

September 20, 2018 12:30 PM – 2:30 PM
Location: 8500 Menaul Blvd NE, Conference Room B-342

Conference Call Information:
Phone: (712) 451-0011 Passcode: 141544

12:30 – 12:35	Welcome, Introductions and Agenda Review ➢ **Decision**: Approve meeting agenda	*Ashley Tanner*
12:35 – 12:45	Review of August 2018 ScW/HR meeting • Action items update ➢ **Decision**: Approve August meeting minutes	*Ashley Tanner*
12:45 – 1:00	SOWs • Quick overview of modifications made to SOWs ➢ **Decision**: Approve SOWs to go to funding agencies for contracting	*Ashley Tanner*
1:00 – 2:00	Overview of Science Plan • Overview of the document • Overview of discussions that took place at the Adaptive Management Work Group meeting regarding the Science Plan	*Dave Wegner*

2:00 – 2:25	Direction for Fall 2018
	• Discuss ideas for November Workshop/Panel
	  ○ Peer review
	  ○ Project/SOW prioritization
	  ○ Science process
	➢ **Action Item**: Send ideas for November Workshop/Panel to WEST by Friday, October 5 (~2 weeks)
		Ashley Tanner (facilitator)

2:25 – 2:30	Additional items, follow-ups, and next meeting date • October brown bag: Megan Friggens • Next ScW/HR meeting date: Tuesday, October 23rd	*Ashley Tanner*
2:30	Adjourn	

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Location: 8500 Menaul Blvd NE, Conference Room B-342

Meeting Highlights

Decisions

- ✓ Pending comment incorporation (on corrections to the yellow-billed cuckoo [YBCU] listing), meeting minutes of August 16, 2018 were approved.
- ✓ Approved Scopes of Work (SOWs) to go to the Executive Committee (EC) for approval and funding agencies for contracting.

Action Items

WHO	NEW ACTION ITEMS	BY WHEN
WEST	Send revised SOW one-pagers, Dave Wegner's presentation, and other materials that were not supplied as read-aheads to the work group.	ASAP
Ashley Tanner, Debbie Lee	Modify SOW descriptions list to denote the specific Peer Review Panel and send to work group.	10/12/18
Ashley, Debbie	Update SOW descriptions list to include Peer Review Panels, including the MacDonald et al. and San Acacia peer reviews.	10/12/18
All	Update SOW description list with new SOW ideas.	Fall 2018
ONGOING ACTION ITEMS		
All	Test GIS map functionality and provide comments to WEST.	Ongoing
Michael Porter, Justin Reale, Joel Lusk, Alison Hutson, Wade Wilson, Eric Gonzales	Form a Genetics SOW small group on domestication.	Fall 2018
WEST	Develop SOW decision-making matrix (with help from Joel Lusk) for review by the group.	Fall 2018
All	Review 2017 literature compilation completed by WEST to brainstorm potential SOW ideas.	Ongoing
Debbie	Work with the By-laws Group to construct a strawman to illustrate the process by which the ScW/HR will advance SOWs to the EC.	Ongoing
Ashley Tanner	Put together a basic GIS map user manual.	Ongoing

Next Meeting

- The next ScW/HR meeting will be Tuesday, October 23, 2018 from 9 AM to 12 PM at U.S. Bureau of Reclamation (Reclamation).
    - Brown Bag presentation by Megan Friggens, of the U.S. Forest Service, Rocky Mountain Research Station, will follow from 12 PM to 1 PM.

Meeting Summary

Review of August 2018 ScW/HR Meeting

- Ashley Tanner, Western Ecosystems Technology, Inc. (WEST), updated the work group on the status of current Action Items with some items to be discussed later.
    - Mo Hobbs and Kate Mendoza, Albuquerque Bernalillo County Water Utility Authority (ABCWUA), were to provide a digital copy of summary statistics for geographic information system (GIS) layer to distribute to group. *Complete*
    - Ashley T. was to put together a basic GIS map user manual. The database management system (DBMS) site is undergoing updates and the functions will change, the map user manual will be completed when the DBMS map functions are fully established. *Ongoing*
    - WEST was to put together a one-page description of the Temperature Degree Day SOW, the Baselayers SOW, and with Vicky Ryan, U.S. Fish & Wildlife Service (USFWS) the YBCU SOW. *Complete*
    - Lynette was to compile a list of SOWs from U.S. Corps of Engineers (USACE) for further development. The list is with Debbie Lee, WEST. *Complete*

✓ Pending comment incorporation (on corrections to the YBCU listing), meeting minutes of August 16, 2018 were approved.

SOWs

- Prior to the meeting four SOWs were sent to the group. The decision to forward these to the contractor needs to be made. (Reminder: what is seen on the one page description will not necessarily be what is seen on the final contract.)
    - The group requested that the one-page descriptions be revised to include a section detailing relevance to the peer review recommendation(s).
    - The group requested that management implications are pulled out as a separate section.
    - The group voiced support for the current SOW template, and encouraged continued use of it if it meets the EC's needs.
    - Group decided it wasn't necessary to reconvene for edits but would rely on WEST to make edits requested at today's meeting.
    - ➢ WEST will send revised one-pager to group as a follow up. The description will be copy/pasted into the full SOW which includes language on relevance to peer review recommendation(s) (with citation).
- During the conversation, the point was made that if the EC does not approve a SOW, that does not preclude agencies from taking up the idea.
- Debbie L. is pulling together an interim long-term plan (LTP) that lists projects into one document. Currently, there are about 200 projects; some have been done, but eventually will tie in this work group's SOW descriptions with the Middle Rio Grande Endangered Species

Collaborative Program's (MRGESCPs or Program's) LT Plan cycle. The goal is a SOW process that is part of a good science process.

- Ashley T. will be sending out new SOWs. Debbie L. asks that the group review the list of projects to eliminate, completed projects, or to add new suggestions.
    - A participant suggested denoting the specific peer review ([N] for Noon, [H] for Hubert, etc.) in the table for easier tracking
    - There were also suggestions to add McDonald, San Acacia, and other peer review recommendations.
    - ➢ WEST will update the SOW descriptions list to include the MacDonald et al. and San Acacia peer review recommendations.
    - ➢ WEST will modify SOW descriptions list to denote the specific peer review panel and send to work group.
- Modifications were made to the Temperature Degree Days SOW to include language USACE includes in contracts. It listed options for finding some data that may prove useful. Comments on the background section did not get incorporated, but will be. For this round of revisions, the focus was on timeline and deliverables.
- The Habitat Restoration (HR) Projects Compilation received the least comments and has been forwarded to Grace Haggerty, New Mexico Interstate Stream Commission (NMISC), who has agreed to share her SOW once it is ready.
    - Grace provided an update to the group: the scope has come back from work orders with the various contractors and it mirrors what has been discussed in the work group. She is now awaiting an answer from Santa Fe. The response is expected soon and will be shared by the next ScW/HR meeting. This is one of the SOWs going to the EC as a one-pager.
- Ashley T. shared a comment she had received prior to the meeting on the Hink and Ohmart (H&O) Vegetation Mapping SOW (base layer map). This individual was concerned that H&O was not the best classification system, and wondered why H&O was chosen over other techniques that are considered better and more modern.
    - Several work group members voiced the opinion that while there are other techniques that provide data on a more granular level, H&O is widely used in the Middle Rio Grande, and it would be better to fill in a larger model rather than have a small map of something new and novel.
    - One participant noted that federal agencies are supposed to use the U.S. National Vegetation Classification (USNVC) which is different than H&O. The work Natural Heritage NM is undertaking can help "crosswalk" between H&O and USNVC.
    - The focus of the SOW will be to update the Albuquerque reach and then move on from there. The following additional observations for the future were made:
        - See that it crosswalks with USNVC. Those justifications can also be used to help crosswalk in future.
        - The aim is to expand the base map and not to replicate it. One participant thought that language should speak to its aim to expand the map.
    - Regarding the YBCU Genetics/Genomics SOW, it is expected the EC will ask about the duration of the project, as it is only a three month project. It was explained that there was no guarantee that adequate samples (both in number in collection range) can be secured to complete the genetics/genomics study. Anything past identifying samples and getting permission to use them would be an optional task.
        - This SOW could be an example of a grant. The full SOW identified four different individuals that could be contacted and expects the contractor or recipient to find samples within those three months. If enough samples are found, then an optional task to develop high-throughput markers would be initiated.

- The questions were: Is it doable? Is there a cache of tissue samples that could be used for this? Vicky R. is contacting people and asking that very question.

✓ ScW/HR approved the four SOWs to go to EC for approval and funding agencies for contracting.

Overview of Science Plan

- Dave Wegner, WEST, gave a presentation on creating a culture of science within the MRGESCP and how the ScW/HR SOWs fit in the EC Study Plan. He began with saying that in July, the EC wanted an outline of a proposed timeline to move the Program to Adaptive Management (AM) integrated, and to incorporate River Integrated Operations (RIO) and other agency AM processes into the Program's AM and science plan. The AM Work Group (AMWG) is developing the transition plan now with a goal to have formal recommendations to the EC by late December/early January. The AMWG won't have all the details but will have some structure which will need to be expanded on, reviewed, and revised before it can be implemented. Given the role of the ScW/HR, it is appropriate to think about how the SOW process will fit in the EC Study Plan.
- The ScW/HR helped identify Lynette G. and Kate M. as the two participants to interact with on that process.
- Comments, questions, and answers that came out of the discussion are captured below:
  - There are multiple biological opinions (BOs); Joel Lusk, USFWS, provided a BO list to inform the AM plan development, and to be shared with the work group.
  - When speaking to scientific review, a participant remarked there were a couple of challenges revolving around hypothesis testing. There have been a few actions the Program didn't like, but this was not documented. There have been project reports which do not include useful information. The Program should be included in the review process so we can look broadly for consistency and make sure everything is documented.
  - With the continued discussion on review of studies associated with science plans, participants raised a number of questions around peer review. They are captured below:
    - *How should the credentials of potential reviewers be vetted?*
      Usually, when a peer review is set up for a specific purpose, it is up to the contractor to do the vetting in order to maintain the panel's independence. As far as a process for this internal work group, that would have to be discussed. The idea is to have a defined technical work group as ad hoc temporary experts.
    - *Does one have to pay for expert review?*
      Some do but that is generally avoided because of the perception of pay to play. Some universities may request travel cost or honorarium. Some reviewers have an hourly rate. For others, its part of their job and don't get paid. Generally if it's no more than just sit and review you don't pay. If a paper is expected at the end, you pay. Others may also do it without pay because they want their name on the review panel.
  - *Has the AMWG thought of a process to address topics which, because of politics, no one wants to elevate?*
    A public process, through work groups would be the venue/vehicle to do this.
  - *What does disagreement look like? How does it play out?*

With a BO it has probably been called out already. If it still goes forward, there are different ways, but one is litigation. On other venues, for example Glen Canyon, Reclamation brought in the National Academies of Sciences to conduct a review. A third way is to hire somebody but then you get dueling science, which usually doesn't solve the problem. Most of the time, agencies are willing to work it out.

- The group also discussed work group size.
    - Having advocated in the past to form a big work group focused on a specific topic (e.g., habitat restoration), one participant did see the logic of breaking into smaller groups for other specialties, or forming targeted subgroups.
    - Small targeted groups are reasonable but it is also important to think about capacity. Some agencies may only have one person for the Program, so balancing can be difficult. The ScW/HR, for example, is mainly a water group; species other than RGSM are not often represented here.
    - The idea of ad hoc work groups forming and meeting as needed may be the way to address that people don't like attending meetings and that there are resource limitations.
- Discussion was prompted to consider "culture" and communication, and the linkages between the two. The discussion however formed around having "good" science and the AM science plan. The following are comments what resulted.
    - It's not clear whether we have clear science; we have to use the scientific approach to evaluate it.
    - It was thought by some that the Program does have good science and has done quite a bit of sharing. The plan to hold regular science symposia is going to improve that. The Program can always work to improve on our good science. Another participant stated there are areas where we don't know if we have good science and because there's no process for that, we're flailing.
- Another participant summed up some points to consider for the AM science plan:
    1. The best available science isn't always the best information standard. Although the phrase "best available scientific information" might sound like a high bar of scientific information, it is not. "Best available scientific information" allows an agency to provide an opinion when the available information has a lot of uncertainty. "Best available scientific information" does not equal "high quality scientific information" and is most often different from the best possible scientific information.
    2. A list of ten active BOs in the middle Rio Grande (MRG) was provided but there are more down south. The MRGESCP says its action area goes down to the New Mexico (NM)-Texas border, but the Program does not, really. In fact, over 30% of the action agencies (Federal Emergency Management Agency [FEMA], U.S. Environmental Protection Agency [USEPA], refuges, International Boundary and Water Commission [IBWC], and RioGrandeProject), with BOs in the action area of the MRGESCP are not often of interest to the EC.
    3. It can be very hard to work with. There are too many groups being contemplated in the science plan documents. You could change the group title and it's still just us (pointing to the people in the room) that are working together. This is a huge structure on a limited management body.
    4. What is the group and how is it going to function? The focus of the AM team should be more on management actions and not research/monitoring. Monitoring does not equal management. Many of the action agencies cannot wait for the AM team to conduct the research/monitoring protocol reviews that are contemplated in the science plan to make management decisions in the face of uncertainty. Every BO monitoring protocol would be reviewed by the AM team. The scope and complexity

of the AM Science Plan seems to exceed both the need and discretionary management activities available. We need an appropriate level or standard of review by scaling science to fill the need and the risk. Where do minnow spawn? What does it matter if I only have 20,000 acre feet (ac-ft)? We spend a lot of money and time on that and it doesn't change the fact there is only 20,000 ac-ft. That kind of language (scaling) would be helpful.

- There was also a discussion on requirements that could be built into studies because of conditions/circumstances indicated earlier. It was noted that as studies are designed, the physical conditions should be considered. Given the dynamics of the Rio Grande, and the long timeline for contracting, study designs need to take this into account.

Direction for Fall 2018

- Debbie L. brought up the concern of holding a science symposium in early spring when the Program still needed to decide what AM direction it would take. Rather than holding off until the fall, and losing a funding cycle, a smaller science forum had been proposed by the AMWG for late winter, a Minnow Action Team (MAT) "plus" meeting. In addition to the regular updates in a MAT meeting, there would be extended presentations from scientists related to RGSM and hydrology. This does not preclude a forum in the fall 2019, which would be a scaled-down version of a full science symposium. The forum could then transition to the annual symposium which could be held in the spring or fall depending on what works best for participants.
    - Several liked the February timeframe but still thought you might have to sacrifice the first year results. July monitoring results just came out and October monitoring data would be very important.
    - One participant suggested that the Program consider having a special issue in a journal or publication. This is something other programs do.
        - This was an interesting suggestion to consider in the future. At this point, the Program was probably not ready to undertake something like that.
- The upcoming November Science Workshop will be the space to discuss peer review, project and SOW prioritization, and the science process. To have a full discussion with good interaction, the work group should be prepared with questions on the process that have added to their programs. This should be both a high level and low level discussion. Dave W. and Ashley T. want to pull together some of these processes from groups that have gone through this before and formulate questions with the work group prior to the November workshop.
    - With the startup of new SOWs in the New Year, discussions on peer review, prioritization and science process will likely come up. A November workshop will help us by having some answers and ideas in place.
    - Ashley will work with the ScW/HR in the planning for the November workshop.

Present

Name	**Organization**
Ann Demint	U.S. Bureau of Reclamation
Lynette Giesen	U.S. Army Corps of Engineers
Grace Haggerty	New Mexico Interstate Stream Commission
Bryan Hobbs	U.S. Bureau of Reclamation
Mo Hobbs	Albuquerque Bernalillo County Water Utility Authority
Alison Hutson	New Mexico Interstate Stream Commission
Kathy Lang	City of Albuquerque BioPark
Debbie Lee	Western Ecosystems Technology, Inc.
Joel Lusk	U.S. Fish & Wildlife Service
Mike Marcus	Assessment Payers Association of the MRGCD
Kate Mendoza	Albuquerque Bernalillo County Water Utility Authority
Lana Mitchell	Western Ecosystems Technology, Inc.
Mickey Porter	U.S. Army Corps of Engineers
Dana Price	U.S. Army Corps of Engineers
Justin Reale	U.S. Army Corps of Engineers
Nathan Schroeder	Pueblo of Santa Ana
Ashley Tanner	Western Ecosystems Technology, Inc.
Dave Wegner	Western Ecosystems Technology, Inc.

Table 1. ESA formal consultation with active Biological Opinions in the MRGESCP area			
Cons No.	Federal Agency Lead	Title	Date Issued
2018-F-0614	USFWS	Bosque del Apache NWR wetland management	13-Sep-18
2014-F-0302	USACE	Bernalillo to Belen Levee Project	29-Aug-18
2018-F-0260	FEMA	Wildfire Hazard Mitigation Project, Socorro County, NM	31-Jul-18
2017-F-0331	USBR	Central Socorro BosqueTreatment Restoration Project	15-Mar-17
2013-F-0033	USBR/NMISC/MRGCD/BIA-Tribes	Water Management and River Maintenance Activities in the MRG	2-Dec-16
2014-F-0436	USACE/Ohkay Owingeh	Espanola Valley Habitat Restoration Study	7-Oct-16
2011-F-0024	USEPA/AMAFCA/Sandia Pueblo	Authorizing pollutants in stormwater by Municipal Separate Storm Sewer Systems in MRG	14-Aug-14
2012-F-0015	USACE	San Acacia Levee Project	28-Feb-13
2006-F-0045	USFS/City of Santa Fe	Construction and operation of the Buckman Diversion Project	25-Jun-07
2003-F-0146	USBR/ABCWUA	Construction and operation of the Albuquerque Drinking Water Project	13-Feb-04

MRGESCP Adaptive Management Work Group

***Discussion Document* for AMWG**

Science Review of Monitoring and Research Reports

September 2018

Information developed and data collected through the monitoring and research studies are important to effectively implement adaptive management and make better water and species management decisions and measure progress towards MRGESCP objectives. This requires a cultural shift in how science has historically been viewed and implemented. Traditionally each agency or group has identified a question (or hypotheses), developed a study plan (of various levels of detail) to address the question, allocated funding, implemented the study and managed completion of the project.

This approach, while following agency requirements, often resulted in a shot-gun pattern approach to science which did not always follow good protocol nor allowed it to be integrated into a strategic evaluation of the issues or the operational impact of the operation and management of the Middle Rio Grande.

It is recognized that the agencies have a definitive set of requirements that dictate process for the development of funding vehicles for specific studies. Those processes will continue to be embraced when it comes to actual funding and implementing specific studies. The proposed levels of review are to be implemented in addition to the efforts of the agencies. The intent of the proposed review process is to develop as part of the adaptive management program a science culture for the MRGESCP.

The Objective of this document is to discuss at a conceptual level the expectations of the Adaptive Management Work Group. We need to establish our expectations so that they can be folded into a more definitive plan to ultimately be presented as part of the AMWG proposal to the Executive Committee.

Coordination

It is suggested that a *Science Integrity Committee* (SIC) be established under the MRGESCP adaptive management program to identify, coordinate, and manage the scientific review process for the MRGESCP adaptive management program.

Levels of Scientific Review

In order to improve the culture for and of science in the MRGESCP it is important to build on existing agency requirements and, where appropriate, to expand the dialogue to support the professional publication of reports and analyses in order to improve scientific understanding and integrity. Ultimate implementing a more rigorous scientific process will lead to more definitive and useful information for scientists and managers. Improved science will provide a level of protection from legal and administrative reviews.

Two levels of scientific review are proposed as MRGESCP projects are developed and completed.

First Level of Review:

Monitoring and research reports will be reviewed internally initially by MRGESCP identified resource and science managers to ensure that the reports are complete and that the reported results, findings, and recommendations are valid and supported by the data and analytical methods. This will follow agency protocols and be accomplished in an open and transparent manner. Critiques will be coordinated with the individual researcher.

Second Level of Review:

If the prepared reports meet the initial study criteria and the data and analysis support the conclusions and recommendations made, then the second level of review will be initiated. If there is a question on the technical conclusions of the studies or if the results are potentially controversial, then a more refined review approach will be determined based on what the report is intended to support. Four categories of use for the scientific results:

1. **Recommendation to resource managers.** If the report is non-controversial and supports compliance monitoring, then scientific review can be done by an internal set of technical subject matter experts identified by the MRGESCP. These reviewers will be identified and managed to complete their reviews in a timely and reportable manner.
2. **Technical study based on new or evolving science.** If the study is to be used to support additional research, potential modification of a traditional compliance or implementation monitoring effort, or a new scientific approach, then a more definitive and independent review of the science program is warranted. The MRGESCP adaptive management program will identify for each of these types of studies a minimum of three outside reviewers who can commit to the review of the work product in a timely manner. Reviewers are encouraged to consult with other experts to conduct the reviews

3. **Part of a sequenced set of research studies or controversial in nature.** If results or findings are being used to support new studies or are controversial in respect to methodology, analyses or recommendations, then it a more definitive review is appropriate. This could include additional outside experts, either as individuals or as a structure panel, to conduct a detailed review of the studies and results.
4. **If as a result of these reviews the results or findings are not supported**, reviewers will identify the causes and recommend corrective actions as appropriate (e.g. correcting mathematical errors, revising protocols, changing assumptions, or utilize different analytical or statistical approaches).

If the reviewed studies pass the scientific review process, the Adaptive Management group will forward the recommendation to the MRGESCP for consideration. That consideration and recommendation to the EC could include: (1) revision of monitoring protocols or methodologies; (2) approval of recommendations and forwarding to technical managers for changes in management or operations; (3) support for additional sequenced or follow-on studies; and/or embracing as a new set of management directions. If actions are required, reviewers will be responsible for drafting appropriate recommendations for adopting changes in implementation, as appropriate, through the *Triennial Study Cycle*, annual work plan development, and adaptive management processes.

If the BiOp Partners determine that the studies or new information represents important new data, they can consult with the FWS as to the appropriate course of action to take.

Components of Science Plans and their Review

Monitoring and Research Plans – Objective

The processes for incorporating science and review into development of monitoring and research plans will guide the MRGESCP implementation of the adaptive management program. These processes are important foundational elements for successful implementation of the biological opinion(s) for the Middle Rio Grande. Results of monitoring and research provide the basis for adaptive implementation of research and studies to support better water and resource management, failure to incorporate valid scientific approaches into monitoring and research plans could jeopardize attainment of the MRG biological goals.

Development of Monitoring and Research Plans - Overview

The MRGESCP Adaptive Management group will develop monitoring and research plans for each monitoring and research activity that is approved through the Annual Work Plan process.

Initially this will be a small set of studies that have EC collaborative support for development, funding and implementation. It is the goal of the program that within 5 years or less a migration of additional studies necessary to support the Biological Opinion(s) will come under the MRGESCP Science and Adaptive Management group. Determination of the studies that will move will be a function of meeting several criteria to be established by the Coordination group.

Plans for system monitoring and research are anticipated to be standalone documents. It is anticipated that post-development (i.e. habitat restoration or construction) will be included where appropriate as a coordinated action between the Biological Opinion partners and the MRG ESCP adaptive management programs.

Protocols for each type of post-development monitoring (including survey protocols for detecting nesting birds, survey protocols for measuring vegetation patterns and growth, backwater creation, etc.) and methods used to analyze monitoring data (e.g. statistical tools) are expected to be consistent among the various management plans and any recovery plans for fish or riparian species.

The monitoring and research development process provides for review of draft plans to ensure they are based on scientific principles and best available information. All scientific programs conducted under the MRGESCP will embrace the DOI Code of Scientific and Scholarly Conduct (attached) and other referenced programs as appropriate to the MRGESCP.

Monitoring Plans

Existing monitoring plans will be used as a base from which to develop and support enhanced monitoring plans to address the biological and physical resource components of the MRG system. The existing plans may be (1) fully embraced as is, (2) fine-tuned to ensure capture of needed information, and/or (3) revised to reflect new knowledge and information for each system monitoring and the pre-and post-development monitoring activity undertaken by the MRGESCP or Biological Opinion partners. Standardized monitoring protocols and analytical methods may be provided in separate documents that may be incorporated by reference in specific system resource plans.

Monitoring plans should include, as appropriate, the following types of information:

- Description of monitoring purposes and objectives;
- Description of the monitoring protocols (may be incorporated by reference) and sampling design, including citations supporting the validity of the methods and sampling design;
- Procedures that will be used to analyze monitoring data (may be incorporated by reference), including citations supporting the validity of the methods;

- Procedures for validating monitoring data and methods;
- Monitoring schedule and duration, including citations supporting the validity of the monitoring schedule;
- Schedule for submitting monitoring report;
- Monitoring report content requirements;
- Monitoring data storage procedures;
- References, including printed references and personal communications;
- Date the monitoring plan was prepared and dates of subsequent revisions; and
- Other types of information as appropriate to specific monitoring plans.

All monitoring plans, including elements such as survey protocols that may be standardized, will undergo the review process described under Monitoring and Research Plan Review Process below. The MRGESCP Adaptive Management program will maintain a library of monitoring protocols. These protocols will be incorporated by reference into monitoring plans developed.

The MRGESCP Adaptive Management program will review, as appropriate, relevant existing science-reviewed monitoring procedures. These existing monitoring procedures may be adopted by MRGESCP Adaptive Management program without further review (e.g. USFWS monitoring protocols for Southwestern willow flycatcher and other listed species). The MRGESCP Adaptive Management program will develop, in cooperation with the stakeholders, procedures for monitoring for which science-reviewed procedures have not previously been developed. To accomplish this, the MRGESCP program will solicit information from the stakeholders and resource agency experts, independent scientists, and other experts as appropriate. Draft procedures may be field tested and revised as needed based on test results to ensure that they can be effectively implemented and yield the desired monitoring information.

MRGESCP Adaptive Management program will conduct, as necessary, reviews of its monitoring plans to ensure that the monitoring procedures are valid for achieving the stated monitoring objectives and that they provide all the information described above that are required for monitoring plans. The MRGESCP Adaptive Management program will revise or replace monitoring plans, as appropriate, if indicated through review.

The approved and agreed upon MRGESCP Adaptive Management program monitoring studies will be carried forward into the Triennial and Annual work plans.

Research Study Plans

It is anticipated that the MRGESCP will undertake research to collect information necessary to fill knowledge gaps and resolve uncertainties primarily related to:

- Life history and habitat requirements of covered species,
- Techniques for the creation of aquatic and riparian habitat,
- Techniques for the management of created habitats, and
- Handling and management of the Rio Grande silvery minnow.

The extent of uncertainties related to the topics identified is quite large. Research will be directed only towards applied research that is likely to yield tangible results for resolving the knowledge gaps and uncertainties that are critical for ensuring successful implementation of the MRGESCP Adaptive Management program and the Biological Opinion(s). Information collected through research will be used in the adaptive management recommendation and decision-making process to improve the management of the Rio Grande and its species.

Research will be identified, study plans developed, appropriate levels of review conducted, under the species research and created habitat research science strategy implementation elements are incorporated into the Triennial and annual work plans.

Research plans should include, as appropriate, the following information:

- Description of research purpose and objectives;
- Hypotheses and supporting information;
- Description of the research methods and design, including citations supporting the validity of the methods;
- Procedures that will be used to analyze and interpret research data (e.g. statistical tools), including citations supporting the validity of the methods;
- Procedures for validating research data and methods;
- Research schedule and duration;
- Research reporting schedule and content requirements;
- Research data storage procedures;
- References, including printed references and personal communications; and
- Other types of information as appropriate to specific research projects.

All research plans will undergo the review process described under Monitoring and Research Plan Review Process below.

Monitoring and Research Plan Review Process

Outcomes of activities addressed in the MRGESCCP monitoring and research science plans are critical to the success of the Adaptive Management program and meeting the needs of the Biological Opinion(s). Therefore it is important that they are based on the best available

scientific information and sound science principles. Flawed monitoring and research plans will likely result in decision-making that results in inefficient or unsuccessful implementation.

It is proposed that all draft monitoring and research plans, including standardized plan elements (e.g. species survey protocols) undergo a review process. The review process is intended to provide timely and efficient science review of monitoring and research plans. All monitoring and research plans are not created equal therefore the level of review will differ among plans, depending on the level of uncertainty associated with the guidance and its role in guiding implementation. As an example, a monitoring plan that implements protocols that are generally accepted by the resource management community will require less review than for a monitoring effort for which survey protocols currently does not exist.

The MRGESCP Adaptive Management steering committee will identify which monitoring and research plans will be reviewed by (1) internal review teams and/or which will (2) require additional review by non MRGESCP individuals.

Levels of Review

Internal Review Teams

Composition – will include appropriate MRGESCP stakeholder staff with relevant expertise in biological and physical sciences, scientific methodology, habitat restoration design and engineering, and resource management, as appropriate to the topic of monitoring or research.

Review Approach – the internal review teams will review draft monitoring and research plans to ensure that methods are valid and well documented and that they will achieve the intended objectives.

Plan Revisions – Draft monitoring and research plans will be revised through an iterative process (if necessary) and either (1) submitted for recommendation by the MRGESCP Adaptive Management Program and submittal to the EC for approval, or (2) submitted for additional review by stakeholders, resource management agency experts, or recommended for external expert review

External Expert Review

If additional review is appropriate as determined by the Internal Review Team, the MRGESCP Adaptive Management program will organize additional review through coordination with outside experts or groups of experts. This could include the establishment of technical review panels, technical work groups, or other venues that may be identified.

MRGESCP Adaptive Management Work Group

Creating a culture of and for science within the Middle Rio Grande Endangered Species Collaborative Program

9/20/2018

Why is Scientific Review Important?

- The obvious – it's the right thing to do
- Upholding principles of scientific integrity in scientific processes encourages public trust in decision-making

Encourages rigorous and transparent scientific processes

Characterized by transparent and open communication of scientific findings and conclusions

Implementation of scientific review processes will ensure accuracy, veracity, and objectivity of scientific findings and conclusions

Adaptive Management and Science

Professional Organizations and Institutions

- National Academy of Sciences
- American Association for the Advancement of Science
- Professional Organizations
  - American Fisheries Society
  - Ecological Society of America
  - American Geophysical Union
  - others

Other Science Programs

Federal and State Governments

- Presidential Memorandum of March 9, 2009
- OSTP Memorandum and Direction of December 17, 2010
- Agency direction (example DOI Code of Scientific Conduct)

Levels of Scientific Review – the High View

First Level of Review –

* Internal by agencies, science managers and work groups
* Follow agency protocols
* Transparent and open

Second Level of Review – Depends on the how the report is to be used

* Recommendations to resource managers
* Based on new or evolving science
* Part of a sequenced set of research studies or controversy

If as a result of the reviews, the results or findings are not supported, reviewers will identify the issues and recommend corrective actions as appropriate.

Review of Studies Associated with Science Plans

The MRGESCP Adaptive Management group will develop monitoring and research plans for each monitoring and research activity that is approved through the Annual and Triennial Study Plan process.

Monitoring – Existing monitoring plans will be used as a base from which to develop and support enhanced plans to address the biological and physical components of the MRG system.

Research – Fill knowledge or information gaps and to resolve uncertainties and focus on applied science to support management actions.

Levels of Scientific Review

- Internal Review Teams
  - MRGESCP stakeholder staff
  - Agency experts
- External Expert Review
  - Technical experts both within and external to agencies
  - Technical review panels
  - Technical work groups

Practices to Encourage a Culture of Scientific Integrity

- Promoting a culture of scientific integrity: Honesty and rigor to produce high quality scientific information…
- Avoidance of political interference: Both external and internal to the agency and strengthening the actual and perceived credibility of government research.
- Public communication: Communication of scientific and technical information to the media and the public and transparency of decision-making.
- Professional development of scientists and engineers: Continued learning, attendance at professional conferences, authorship of peer-reviewed journal articles and participation on professional and scholarly societies.

Next Steps

- Adaptive Management Work Group working to develop guidelines
- Seek review from various MRGESCP Work Groups – your input is important
- Then:

  Integrate into the overall Annual and Triennial Study Plan development recommendations

  Will provide to EC as a recommendation for action