Science and Adaptive Management Committee Meeting
November 30, 2023

Meeting Materials:

Agenda

Minutes

Information and Data Quality Standards Ad Hoc Charge [read-ahead]

Restoration Resources Compendium Ad Hoc Charge [read-ahead]

SER Recovery Wheel Ad Hoc Group Charge [read-ahead]

Strategic Plan for Potential Drying Ad Hoc Charge [read-ahead]

RGSM CEM Genetics Ad Hoc Charge [read-ahead]

RGSM Hypotheses Development Ad Hoc Charge [read-ahead]

RGSM Population Modeling Ad Hoc Charge [read-ahead]

Draft 2023 SAMC Summary Report [read-ahead, draft]

Draft 2024 MRGESCP Work Plan [read-ahead, spreadsheet, draft]

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

Agenda

Middle Rio Grande Endangered Species Collaborative Program
Est. 2000

Science and Adaptive Management Committee (SAMC)
Meeting Agenda

November 30, 2023; 10:00 AM – 12:00 PM

Location: Bureau of Reclamation Albuquerque Office, Rio Grande Conference Room
555 Broadway Blvd NE, Albuquerque, NM 87102

Microsoft Teams Log-In:
[Click here to join the meeting](#)
Meeting ID: 222 313 487 080
Passcode: W6t9Fo

Meeting Objectives:
- *Hear update on 2023 Science Symposium*
- *Hear update on Climate Futures Planning Workshop*
- *Discuss Ad Hoc group status*
- *Discuss 2024 Work Plan*
- *Discuss 2023 SAMC activities summary report*
- *Open discussion on future of SAMC*

10:00 – 10:10	**Welcome, Introductions, Agenda Review**	*Program Support Team (PST)*

    ✓ **Decision**: Approval of November 30, 2023 agenda

10:10 – 10:15	**August Meeting Minutes and Action Item Review**	*PST*

    ✓ **Decision**: Approval of August 21, 2023 SAMC meeting minutes

Read-Ahead:
☐ Draft August 21, 2023 SAMC Meeting Minutes

10:15 – 10:25	**SAMC Takeaways from the WEST Presentation**	*PST*

- Update on WEST SAMC support

10:25 – 10:35	**Update on Science Symposium**	*PST*

- Postponement update
- Location, keynote speaker, and student involvement

10:35 – 10:40	**Update on Climate Futures Planning Workshop**	*PST*

- Postponement update
- SAMC facilitation

    ➢ **Action Item**: PST will coordinate with interested members to facilitate the workshop

| 10:40 – 11:10 | **Ad Hoc Group Updates** | *SAMC Leads; PST* |

Ad Hoc Group Updates *SAMC Leads; PST*
- Compendium
  - Lead: Meaghan Conway
- SER Recovery Wheel
  - Lead: Ondrea Hummel
- RGSM Hypotheses Development
  - Leads: Mick Porter, Alison Hutson, Ara Winter
- River Drying in the MRG
- Information & Data Quality Standards
  - Leads: Ara Winter, Matt Wunder
- RGSM CEM/Genetics
  - Lead: Wade Wilson

- ➤ **Action Item**: RGSM Hypotheses Development leads will develop draft memo to EC to request floodplain monitoring data
- ➤ **Action Item**: Identify a SAMC lead to support the RGSM CEM/Genetics ad hoc group
- ➤ **Action Item**: PST will continue coordinating with group leads

Read-Aheads:
- ☐ Ad Hoc Group Charges

11:10-11:20   2023 SAMC Summary Report *PST; Group Discussion*
- Draft 2023 SAMC Summary Report

Read-Ahead:
- ☐ Draft 2023 SAMC Summary Report

11:20 – 11:30   2024 Work Plan *PST; Group Discussion*
- Draft 2024 Work Plan

Read-Ahead:
- ☐ Draft 2024 MRGESCP Work Plan

11:30 – 11:55   Open Discussion *Group Discussion*
- SAMC discussion on how the SAMC should function moving forward

11:55 – 12:00   Action Items, Next Steps, and Announcements *PST*
- ➤ **Upcoming Events:**
  - EC Meeting: January 18; 1-4 PM
  - Science Symposium: February 2024
- ➤ **Next SAMC Meeting**: February 2024

12:00   Adjourn

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

Minutes

Middle Rio Grande Endangered Species Collaborative Program
Est. 2000

Science and Adaptive Management Committee (SAMC)
Meeting Minutes

November 30, 2023; 10:00 AM – 12:00 PM
Location: Bureau of Reclamation Albuquerque Office, Rio Grande Conference Room
555 Broadway Blvd NE, Albuquerque, NM 87102

Decisions:

- ✓ Approval of the November 30, 2023 SAMC meeting agenda
- ✓ Approval of the August 21, 2023 SAMC meeting minutes

Action Items:

WHO	ACTION ITEM	BY WHEN
Program Support Team (PST)	Send final draft of River Drying in the Middle Rio Grande (MRG) report to Lynette Giesen, U.S. Bureau of Reclamation, for review	12/8/2023
PST	Provide WEST presentation slides and PST resumes to SAMC	12/8/2023
PST	Coordinate with Aubrey Harris, U.S. Army Corps of Engineers, to receive further input on the Multi-Year Plan prior to Executive Committee (EC) review	12/15/2023
PST	Revise the 2024 Work Plan to include additional details and better reflect the summary report, and send to the SAMC for review	12/15/2023
PST	Follow up with Mick Porter and Megan Friggens on potentially serving as SAMC leads to support the Rio Grande Silvery Minnow (RGSM) Conceptual Ecological Model/Genetics Ad Hoc Group	12/15/2023
RGSM Hypotheses Development Ad Hoc Group leads (Mick Porter, Alison Hutson, Ara Winter)	Develop a draft memo to the EC to request floodplain monitoring data	12/22/2023
PST and Ara Winter	Coordinate with Ara Winter to provide the SAMC summary report update at the January 2024 EC meeting	1/5/2023
SAMC	Review the revised 2024 Work Plan prior to EC review	1/5/2024
SAMC	Review the draft memo from the RGSM Hypotheses Development Ad Hoc Group leads requesting floodplain monitoring data prior to EC review	1/5/2024

PST	Coordinate EC discussion on integrating the Multi-Year Plan into existing Middle Rio Grande Endangered Species Collaborative Program (MRGESCP) structure	1/18/2024
PST	Coordinate a meeting with Ara Winter, Ari Posner, and Dave Moore to discuss organizing an ad hoc group to review and develop vegetated islands and bars work products	February 2024
RGSM Hypotheses Development Ad Hoc Group leads	Discuss working with an Engineer Research and Development Center (ERDC) student interested in completing a research project on population models	February 2024
PST	Coordinate with interested SAMC members to facilitate the Climate Futures Planning Workshop in March 2024	March 2024
PST and SAMC	Continue coordinating with SAMC leads	Ongoing

Next Meeting: January-March 2024

Meeting Minutes

Welcome, Guest Introductions, Agenda Review

The November 30, 2023 SAMC Meeting Agenda was approved by attending SAMC members.

- ✓ **Decision**: Approval of the November 30, 2023 SAMC meeting agenda

August Meeting Minutes and Action Item Review

The draft August 21, 2023 SAMC Meeting Minutes were approved by attending SAMC members. Summary updates for action items are below:

- The PST sent out a call for abstracts for the Science Symposium.
- SAMC members volunteered for the small planning group, which convened multiple times.
- SAMC suggestions regarding the Climate Futures Planning Workshop materials were incorporated.
- The PST and Aubrey Harris will follow up with potential speakers regarding a seminar on the Sustainable Rivers Program and eFlows.
- SAMC members volunteered to help facilitate the Climate Futures Planning Workshop.
- A call for membership for the Restoration Compendium and Society for Ecological Restoration (SER) Recovery Wheel Ad Hoc Groups went out and volunteers have been compiled.
- Matt Wunder has been updated on the Information and Data Quality Standards Ad Hoc Group tasks.
- The Whitfield field trip occurred on September 26, 2023, with 27 attendees.
- The EC will discuss how to integrate the Multi-Year Plan into existing MRGESCP structure before the SAMC continues its science review of the plan.
- Ari Posner shared some resources related to vegetated islands and bank-attached bars. The PST will reach out to coordinate on this effort after the meeting.
  - Ara Winter noted that Bosque Ecosystem Monitoring Program (BEMP) students have been doing work on islands and bars and offered to send the data to Ari P. and the PST.
  - Dave Moore would like to contribute to SAMC efforts related to vegetated islands and bars and asked to be kept in the loop.
- The PST met with SAMC ad hoc group leads to coordinate and prepare updates ahead of today's meeting.
- Aubrey Harris brought up the topic of the request for proposals (RFP) approach, which she had been discussing with the PST. The approach offers a way to select projects and find the best people to carry out projects.
  - Aubrey H. likes the Multi-Year Plan and wants to use it as a resource for developing the RFP approach.
    - Aubrey H. stated the Multi-Year Plan is well-organized, sets objectives, and integrates literature reviews.
    - Hira Walker, U.S. Army Corps of Engineers, is very interested in this effort and would like to see it developed.
    - The PST will meet with Aubrey H. to discuss the Multi-Year Plan prior to the next EC meeting.

- ➤ **Action Item**: PST will coordinate with Aubrey Harris to receive further input on the Multi-Year Plan prior to EC review
- ➤ **Action Item**: PST will coordinate EC discussion on integrating the Multi-Year Plan into existing MRGESCP structure
- ➤ **Action Item**: PST will coordinate a meeting with Ara Winter, Ari Posner, and Dave Moore to discuss organizing an ad hoc group to review and develop vegetated islands and bars work products

- ✓ **Decision**: Approval of the August 21, 2023 SAMC meeting minutes

SAMC Takeaways from the WEST Presentation

The PST reviewed the slides from the WEST Staffing Presentation to the EC on November 29th, which include PST roles and points-of-contact. The PST will provide the presentation slides to the SAMC in the meeting follow-up. The PST encouraged transparency and offered the space to discuss the presentation further. The following topics were discussed:
- Aubrey H. discussed the need for USACE investment (e.g., time, money) in MRGESCP and return on that investment. USACE requested a list of completed MRGESCP activities that link to USACE. USACE is spending $40K to allow Mick Porter and Aubrey H. to participate in the SAMC and needs to know what they are getting in return.
    - o The PST stated the 2023 SAMC Summary Report to the EC would help provide a list of activities.
- The PST noted that progression of the SAMC has included a shift in format and leadership roles, with members taking more ownership.
- Ari P. discussed the staffing change on the PST and noted that Reclamation is hopeful about new leadership. Ari P. is confident progress we will not be lost.
- Ari P. next noted there was a big disconnect between the draft 2024 MRGESCP Work Plan and the 2023 SAMC Summary Report. He discussed how to best lay out each project, including adding status of project and grouping them by ad hoc group or species to make them easier to see.
    - o Ari P. suggested layouts should be more directed at work getting done and ensuring deliverable needs are clear. He suggested group chairs should be included and interim deliverables should be tracked. He reiterated that details need to match between the work plan and summary report.
    - o Ara W. suggested a TLDR (i.e., short abstract) section would be helpful to summarize the work plan.
- Alison Hutson discussed developing a more useful Long-Term Plan that includes a list of projects with funding sources, Endangered Species Act (ESA) information, due dates, funding sources, and links to the Science and Adaptive Management Information System (SAMIS).
    - o Ara W. noted that he has used SAMIS, but it is problematic and there are pushes to improve the interface.

- ➤ **Action Item**: PST will provide WEST presentation slides and PST resumes to SAMC

Update on Science Symposium

Construction was delayed at the Southwestern Indian Polytechnic Institute (SIPI) and now overlaps with the selected dates for the symposium, which were December 6-7, 2023. The small planning group decided to postpone the event in order to keep the symposium at the SIPI. The proposed dates are

during the week of February 12ᵗʰ 2024. Dr. Muskett, SIPI staff member and the MRGESCP's event sponsor, will let the PST know by the end of the week if the week of February 12ᵗʰ is available. The PST will then begin to heavily advertise the postponed event.

The MRGESCP can take advantage of the postponement by extending the abstract submission deadline to accommodate those who were not able to submit abstracts by the original deadline. The planning group is also working to bolster student involvement and engagement at the symposium.

Update on Climate Futures Planning Workshop

Due to personnel shifts and to ensure adequate staffing and support, the workshop has been postponed to March 2024. The PST will be working with the small planning group, those who signed up to facilitate, the EC, and the SAMC to set a date.

The following SAMC members previously volunteered to facilitate: Ara W., Aubrey H., Megan Friggens, and Ondrea Hummel. Ara W. will need to confirm he is able to facilitate. Additional SAMC members who would like to facilitate the event are encouraged to contact the PST.

➢ **Action Item**: PST will coordinate with interested SAMC members to facilitate the Climate Futures Planning Workshop in March 2024

Ad Hoc Group Updates

Ad Hoc Group leads and the PST gave updates:

Restoration Compendium Ad Hoc Group
Lead: Meaghan Conway
- There are only federal members currently. Ondrea H., who is non-federal, can review group work products and the PST is seeking additional non-federal members.

Society for Ecological Restoration (SER) Recovery Wheel Ad Hoc Group
Lead: Ondrea Hummel
- There is a list of volunteers, and the group needs to get together. Ondrea H. is in touch with the SER. Her goal is to get in touch with recovery wheel authors in January. They may be able to join a meeting and do a Q&A session.

Rio Grande Silvery Minnow (RGSM) Hypotheses Development Ad Hoc Group
Leads: Mick Porter, Alison H., Ara W.
- Mick P. stated the group met two months ago with the PST and prioritized 4 projects related to RGSM physiology and population modeling. Mick P. stated the need to do some exploratory analyses to refine how we use monitoring data to plug into models.
  - Ara W. noted the need to first quantify uncertainties and the cost to reduce them in a cost benefit analysis.
- Aubrey H. related that an ERDC student is looking to do a research project on population models and how to bridge the gap of getting them into practice. Aubrey H. suggested the ad hoc group work with the student to develop a project. The ad hoc group leads agreed to discuss the option further.

River Drying in the MRG Ad Hoc Group
Lead: None
- The PST stated the drying report had been revised to incorporate the SAMC's edits.
- The report also went through WEST technical editing and is undergoing a senior review by Dale Strickland, WEST.
- The PST will send the draft to Lynette, Reclamation, for final review before it is finalized. The group will be kept on hold while the report is in draft.

Information & Data Quality Standards Ad Hoc Group
Leads: Ara W. and Matt Wunder, NM Department of Game & Fish
- Ara W. stated deliverables were being drafted and no additional meetings with the group were necessary.

RGSM Conceptual Ecological Model (CEM)/Genetics Ad Hoc Group
Lead: Wade Wilson, U.S. Fish & Wildlife Service
- The PST stated a conversation is warranted to discuss the group's status, as well as to re-articulate its purpose and define a discrete ending point.
- The PST asked for a volunteer SAMC lead to support this effort, and to coordinate with Wade W. to facilitate additional conversations.
  - SAMC members suggested asking Mick P. or Megan Friggens, who were not in attendance.

- ➢ **Action Item**: RGSM Hypotheses Development leads will develop draft memo to EC to request floodplain monitoring data
- ➢ **Action Item**: SAMC will review the draft memo from the RGSM Hypotheses Development Ad Hoc Group leads requesting floodplain monitoring data prior to EC review
- ➢ **Action Item**: RGSM Hypotheses Development leads will discuss working with a student at ERDC interested in a completing a research project on population models
- ➢ **Action Item**: PST will follow up with Mick Porter and Megan Friggens on potentially serving as SAMC leads to support the RGSM CEM/Genetics Ad Hoc Group
- ➢ **Action Item**: PST will send final draft of River Drying in the MRG report to Lynette Giesen, U.S. Bureau of Reclamation, for review
- ➢ **Action Item**: PST will continue coordinating with group leads

2023 SAMC Summary Report

The PST reviewed the draft 2023 SAMC Summary Report for the EC. The following summary points were discussed:
- All Science & Adaptive Management administrative tasks have been completed except for the 2024 Work Plan, which the SAMC will discuss next and will be reviewed by the EC at the January 2024 meeting.
- Ongoing Science & Technical (S&T) Ad Hoc Groups will continue into 2024, with the exception of the Information and Data Quality Standards Ad Hoc Group, which the PST hopes to sunset by the end of 2023.
- SAMIS efforts will continue in 2024, with a focus on populating the Project Bank.
- Ongoing development of resources and tools include the vegetated islands and bars glossary and conceptual models for the New Mexico meadow jumping mouse and the Pecos sunflower.

- HR Coordination Group meetings successfully transitioned into meetings alternating with field trips.
- The Science Symposium and Climate Futures Planning Workshop will be held in early 2024.
- The SAMC supported including additional quantitative information on coordination meetings and deliverables to the summary report to help with SAMC members reporting back to their organizations.
- Ara W. volunteered to present the 2023 SAMC Summary Report to the EC at the January 2024 meeting.

- ➢ **Action Item**: PST coordinate with Ara Winter to provide the SAMC summary report update at the January 2024 EC meeting

2024 MRGESCP Work Plan

The PST reviewed the draft 2024 MRGESCP Work Plan. As previously discussed, the SAMC supported including additional details in the 2024 Work Plan and better reflecting the 2023 SAMC Summary Report. The revision will be reviewed by the SAMC.

- ➢ **Action Item**: PST will revise the 2024 Work Plan to include additional details and better reflect the summary report, and send to the SAMC for review
- ➢ **Action Item**: SAMC Review the revised 2024 Work Plan prior to EC review

Open Discussion

The SAMC had an open discussion on how the group should function moving forward. The PST noted the meeting marked the first 2-hour business meeting and there will be a transition period while the new format is adopted. The SAMC appears to have an interest in having more agency over MRGESCP science efforts, including deciding formats and expertise for tasks, as well as continuing to take on lead roles based on expertise and interest. The SAMC was asked how they'd like the SAMC to function in the next year. The following summary points were discussed:

- Ari P. noted the draft work plan needed the most revision and the summary report was a good start for making revisions.
  - o Ari P. noted the ad hoc group sections should be broken into tasks.
  - o Ari P. noted the vegetated islands and bars glossary and conceptual ecological model should be developed by a group. Ari P. volunteered to be SAMC lead for the group. Dave M. and Ara W. will continue to be involved.
  - o Aubrey H. voiced the need for more consistency in formatting for all documents. She noted that charges should include who's writing, who's reviewing, etc. The goals are to develop an overarching standardized structure for ad hoc documents and refine the process to request ad hoc support.
  - o The SAMC's role is to provide interdisciplinary review. More targeted review is needed for specific efforts.
  - o Ari P. noted that WEST drafted the first vegetated islands and bars glossary. His first reaction was there were textbook/classical definitions with obscure citations. There are more appropriate definitions to use.
    - ▪ Zoë Rossman, PST, noted that she developed the glossary with Angela Medina-Garcia, PST. Neither of them are experts on the subject. Ari's comment highlights the importance of handing off tasks to folks with expertise and/or the

resources compiled. This helps ensure we use time and resources wisely. An ad hoc group would help compile the right experts.

Announcements
- ➤ **Upcoming Events:**
  - o <u>EC Meeting</u>: January 18; 1-4 PM
  - o <u>Science Symposium</u>: February 2024
- ➤ **Next SAMC Meeting**: January-March 2024

Meeting Participants

SAMC Member	Role
Alison Hutson	Aquatic Ecology Expert
Ara Winter	Statistics/Modeling Expert
Ari Posner	Geomorphology Expert
Aubrey Harris	Hydrology Expert
Meaghan Conway	Ecosystem Function Expert
Michael (Mick) Porter	Aquatic Ecology Expert
Ondrea Hummel	Watershed Resource Planning/Regulatory Expert
S. Dave Moore	Terrestrial Ecology Expert
Ryan Gronewold	EC *ex-officio*/Hydrology Expert

Program Support Team	Role
Zoë Rossman	SAMC Facilitator
Kevin Shelley	Support
Michelle Tuineau	Support

Guests	Organization
Lynette Giesen	U.S. Bureau of Reclamation

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

Information and Data Quality Standards Ad Hoc Charge [read-ahead]

Middle Rio Grande Endangered Species Collaborative Program

Middle Rio Grande Endangered Species Collaborative Program (MRGESCP)
Information and Data Quality Standards Hybrid Ad Hoc Group
Revised Charge

Note: Due to this charge's relationship to both MRGESCP administrative and science practices, this group will be a hybrid Administrative/Science and Technical Ad Hoc Group. Therefore, the charge and final deliverables must be approved by both the Executive Committee (EC) and the Science and Adaptive Management Committee (SAMC).

Approved by the SAMC on *August 26, 2022.*
Approved by the EC on *September 8, 2022.*
Approved by the Information and Data Quality Standards Hybrid Ad Hoc Group on *February 9, 2023.*
Revised for the SAMC on *June 8, 2023.*

Ad Hoc Group Charge
The Information and Data Quality Standards Hybrid Ad Hoc Group will develop a form template that summarizes data QA/QC and management practices for each signatory project entered into the Science and Adaptive Management Information System (SAMIS), and will develop language for a data disclaimer for the Program Portal.

Membership
   A. *Criteria for membership*
   - An understanding of the Information Quality Act (IQA) and other federal and state regulations/policies regarding data management and information quality assurance/quality control (QA/QC).
   - An understanding of good data management practices.
   - Experience with, or future interest in, providing scientific information to the MRGESCP in order to inform recommendations to natural resource management agencies.
   - Experience with, or future interest in, posting scientific data and reports onto the Program Portal.

   B. *Member List*
   - **Matt Wunder, N.M. Department of Game and Fish - Co-Lead**
   - **Ara Winter, Bosque Ecosystem Monitoring Program - Co-Lead**
   - Mick, U.S. Army Corps of Engineers
   - Kenneth Richard, U.S. Bureau of Reclamation
   - Shannon Weld, N.M. Interstate Stream Commission

Background
The initial charge of the Information and Data Quality Standards Hybrid Ad Hoc Group was to investigate the feasibility, utility, and necessity of applying Information Quality Act (IQA)[1] standards to the MRGESCP. On March 27, 2023, the Ad Hoc Group determined that developing IQA-compliant standards to the MRGESCP was not a feasible task since IQA standards vary by

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[1] The Information Quality Act (IQA) or Data Quality Act (DQA) (Section 515 of Public Law 106-554) directs the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies."

organization and signatories must comply with their own agency standards, or the standards of relevant funding agencies.

However, the Ad Hoc Group saw value in documenting data management practices for each project uploaded to the SAMIS. This documentation would give SAMIS users additional information about how data are collected, stored, and managed for individual projects, and could provide a snapshot of IQA standards that are being met by a project.

Tasks and Deliverables

Task One Description
Create a form template for information on data management for projects uploaded into the SAMIS.

Objective of Task One
To document data management practices for individual projects within the SAMIS to support external data use.

Deliverable(s):
1. Form template compatible with the SAMIS for users to fill out when uploading data.
2. Document with definitions and justifications for each field included in the template.

Task Two Description
Develop a data disclaimer for the Program Portal.

Objective of Task Two
To develop a data disclaimer to protect the MRGESCP, signatories, agencies that fund project contracts, and project contractors, from liability relating to decisions supported by data and other information served on the Program Portal.

Deliverable(s):
Draft disclaimer language for SAMC and EC review to put on the Program Portal.

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	To Be Completed By
Create a form template for information on data management for projects uploaded into the SAMIS.	Identify appropriate fields to include in the template in order to provide a snapshot of data management practices for a project.	Template with fields and associated document with definitions and justifications for each field.	July 2023
	Revise the template to ensure usability within the SAMIS.	Revised template.	July 2023

Draft a data disclaimer for the Program Portal.		Draft disclaimer language for SAMC and EC review to put on the Program Portal.	August 2023 SAMC

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

Restoration Resources Compendium Ad Hoc Charge [read-ahead]

Middle Rio Grande Endangered Species Collaborative Program (MRGESCP)
Restoration Resources Compendium Science & Technical (S&T) Ad Hoc Group
Approved Charge

Approved by the SAMC in *August 2023*.
Approved by the Restoration Resources Compendium S&T Ad Hoc Group on *.*

Parent Committee
Science and Adaptive Management Committee

Ad Hoc Group Charge
Create a compendium of habitat/ecosystem restoration projects and resources within the Middle Rio Grande (MRG) Basin. The compendium should include project metadata (e.g., project location, lead agency, date range), as well as objectives, target species, monitoring plans, adaptive management plans, and reports associated with each project, when available. In addition, the compendium should also contain a list of resources that can inform restoration planning, adaptive management, and monitoring in the MRG.

Membership
  A. *Criteria for membership*
  - Experience with planning, designing, implementing, monitoring and/or adaptively managing restoration projects in the MRG.
  - Knowledge about habitat restoration goals, monitoring protocols and metrics, and maintenance and adaptive management needs in the MRG.

  B. *Member List (nominees)*
  - **Meaghan Conway, U.S. Fish and Wildlife Service – Lead**
  - Ashlee Rudolph, U.S. Bureau of Reclamation
  - Dana Price, U.S. Army Corps of Engineers
  - Betsy Bainbridge, U.S. Fish & Wildlife Service
  - Hira Walker, U.S. Army Corps of Engineers
  - Michael Scialdone, Pueblo of Sandia
  - Shannon Weld, N.M. Interstate Stream Commission

Background
In February 2023, the SAMC requested a compilation of information about restoration efforts in the MRG to help inform future and ongoing restoration projects within the basin. The purpose of this "compendium" is to provide restoration practitioners with a set of resources to aid in the design and monitoring of restoration projects in the MRG, as well as details about current and past MRG restoration projects. This compendium, combined with 1) the development of a tool to track restoration success at the ecosystem level (the Society for Ecological Restoration recovery wheel), and 2) clear ecosystem-level driving questions, will guide the formation of a standardized monitoring approach for the MRG (Figure 1).

The Program Support Team (PST) began drafting the compendium in March 2023, and included current and past restoration projects in the MRG, as well as a list of resources relevant to restoration planning and monitoring in the MRG. Using the list of projects, the PST identified common restoration goals (i.e., habitat restoration, fire fuel reduction, management of hydrology/geomorphology) and restoration targets (e.g., listed species, native and non-native

vegetation) for the MRG. Restoration targets were cross-referenced with projects and resources so that restoration practitioners can easily locate guidance and resources that relate to their desired target.

The primary objectives of this ad hoc group are to refine and further develop the draft compendium and to ensure that it is useful and relevant for restoration practitioners in the MRG. The final deliverable, the revised compendium, will support restoration throughout the MRG, and will also be used to inform the creation of standardized monitoring guidance for the MRG.
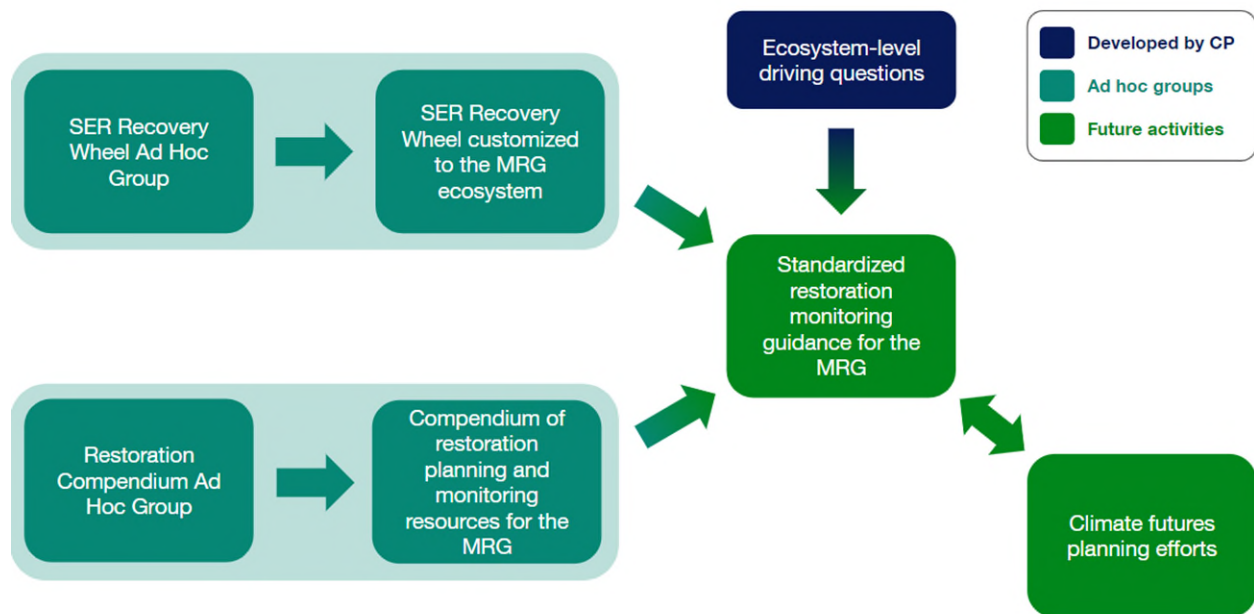

Figure 1. Outcomes of this ad hoc group will be combined with a Recovery Wheel customized to the MRG and ecosystem-level driving questions to inform the creation of standardized restoration monitoring guidance and other efforts within the MRG.

Tasks and Deliverables

Step	Objective	Task	Deliverable
PST presentation to ad hoc group – Overview of draft compendium			
1.	Become familiar with the draft compendium, the process documentation, and the decision tree	• Review the draft compendium created by the PST, as well as the documentation about its development. • Review the associated decision tree and determine if the structure of the compendium is appropriate for use by restoration practitioners.	Provide suggestions for improving the structure of the compendium, if needed.
2.	Edit project list	• Edit the list of past and current restoration projects in the MRG. • Add additional projects, any follow-up monitoring or reports,	A revised list of completed and active restoration projects in the MRG.

		and identify the goals and targets for each project.	
3.	Review list of goals and targets	• Review and refine the list of restoration goals and targets identified from the project list.	A revised list of goals and targets for restoration practices in the MRG.
4.	Edit resources list	• Using the list of targets from Step 3, identify additional resources for restoration planning and monitoring and relate to one or more restoration targets within the MRG.	A revised list of restoration resources customized to the MRG.
Check-in with SAMC – Summarize progress, issues and findings			
5.	Recommend next steps	• Using the lessons learned from Steps 2-4, provide recommendations for using the compendium to inform the creation of standardized monitoring guidance for the MRG.	A brief outline containing lessons learned and any recommendations for future use of the compendium.

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	To Be Completed By
Step 1	Review compendium	Suggestions for improving the structure of the compendium, if necessary.	Time to complete: 1 meeting + 1 week
Step 2	Complete project list	A complete list of completed and active restoration projects in the MRG.	Time to complete: ~4 weeks
Step 3	Review list of goals and targets	A complete list of goals and targets for common restoration practices in the MRG.	Time to complete: 1 meeting + 1 week
Step 4	Complete resource list	A list of restoration resources customized to the MRG.	Time to complete: ~4 weeks
Step 5	Recommendations and lessons learned; presentation to SAMC	An outline documenting the process used to complete the compendium, lessons learned, and any recommendations for future groups.	Time to complete: ~2 weeks
		Collaborative Program seminar	TBD

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

SER Recovery Wheel Ad Hoc Group Charge [read-ahead]

Middle Rio Grande Endangered Species Collaborative Program (MRGESCP)
Society for Ecological Restoration (SER) Recovery Wheel Science & Technical (S&T) Ad Hoc
GroupA
Approved Charge

Approved by the SAMC in *August 2023*.
Approved by the SER Recovery Wheel &T Ad Hoc Group on *.*

Parent Committee
Science and Adaptive Management Committee

Ad Hoc Group Charge
Develop an ecosystem-level restoration assessment tool based on the Society for Ecological Restoration's (SER) Ecological Recovery Wheel, which visually represents recovery of a target ecosystem compared to a selected reference ecosystem using a 5-star rating scale across a set of attributes. The Recovery Wheel should be customized to the Middle Rio Grande (MRG) river-floodplain ecosystem. The process used to develop this tool should be fully documented to facilitate use and future updates to the wheel.

Membership
   A. *Criteria for membership*
   - Knowledge of the structure, function, and spatio-temporal dynamics of the MRG river-floodplain ecosystem.
   - Understanding of planning, design, implementation, monitoring, and maintenance practices for ecological restoration in the MRG.

   B. *Member List (nominees)*
   - **Ondrea Hummel, Tetra Tech, Inc. – Lead**
   - Cetan Christensen, Albuquerque Bernalillo County Water Utility Authority
   - Chris Lippitt, University of New Mexico, ASPIRE
   - Hira Walker, U.S. Army Corps of Engineers
   - Jack Marchetti, N.M. Department of Game & Fish
   - Jennifer Davis, U.S. Fish & Wildlife Service
   - Stephanie Jentsch, U.S. Army Corps of Engineers

Background
In February 2023 the SAMC identified the Society for Ecological Restoration's (SER) Ecological Recovery Wheel (Figure 1) as an appropriate and useful tool to assess the success of restoration efforts at the *ecosystem level* in the MRG. The development of this tool, combined with additional restoration monitoring resources and ecosystem-level driving questions, will support an end goal of developing standardized monitoring guidance for the MRG (Figure 2). The Recovery Wheel is part of a set of ecological restoration standards launched in 2016 by SER (McDonald et al. 2016). These standards have been vetted by the international restoration community and applied to a wide variety of restoration work since their inception. While restoration efforts in the MRG are often implemented at the species-specific habitat level, use of the Recovery Wheel tool can place habitat-level projects within the context of ecosystem-scale recovery. This context will help to identify additional benefits that potentially result from restoration projects. The Recovery Wheel is a customizable tool, in which sub-attributes can be modified to suit the MRG ecosystem, and ratings (1-5 stars) represent a scale of progress towards full recovery for each sub-attribute. Over the life

of a project, the Recovery Wheel serves as a valuable visual aid for demonstrating progress toward the restoration goals (along individual sub-attributes), as well as helping practitioners determine whether (and when) intervention/maintenance is warranted.

The primary objective of this ad hoc group is to customize the SER Recovery Wheel tool to the MRG ecosystem by: 1) selecting an appropriate reference ecosystem; 2) reviewing attributes (see Table 1) and identifying desired sub-attributes for the MRG; and 3) assigning appropriate levels (see Table 2) to each sub-attribute. Sub-attributes within each attribute should reflect aspects of the MRG ecosystem that are relevant to management of listed species and associated ecological structure and function. Selection of metrics used to quantify sub-attributes should take into account not only the responsiveness of the variable to both management actions and climate change, but also the cost, effort, and feasibility of collecting the data.

The final deliverable (i.e., customized wheel) of this ad hoc group can be subsequently modified through adaptive management and informed by climate futures planning.
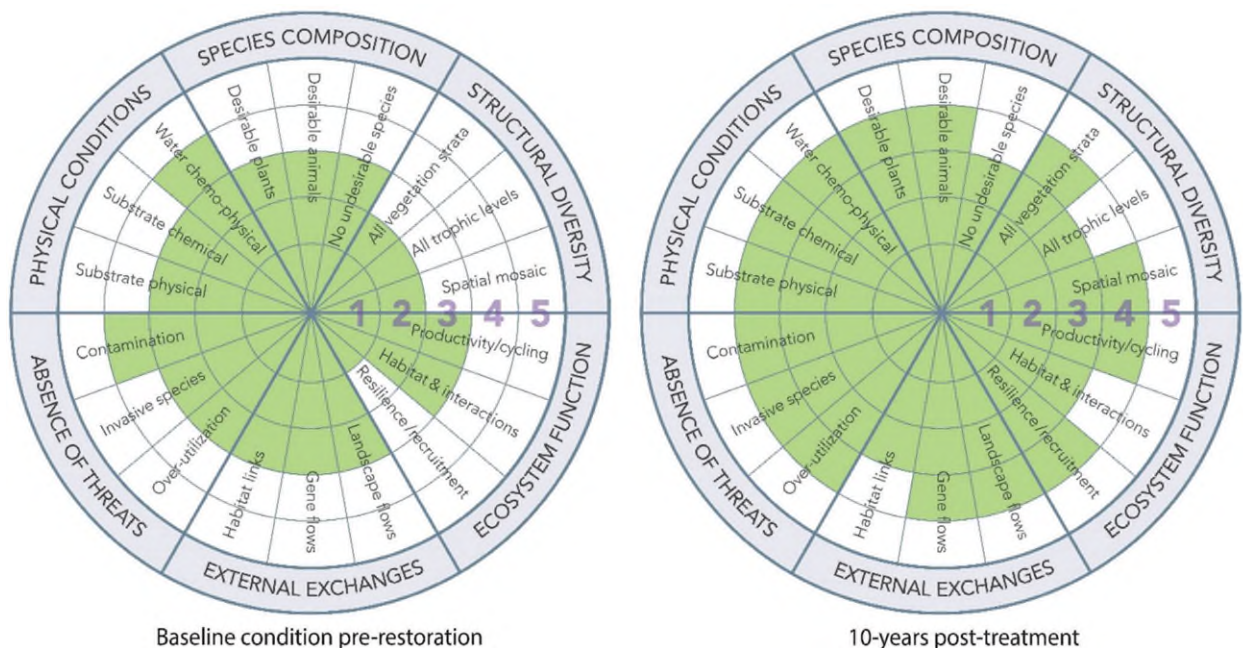

Baseline condition pre-restoration   10-years post-treatment

Figure 1. "The ecological recovery wheel is a tool for conveying progress of recovery of ecosystem attributes compared to those of a reference model. In this example, the first wheel represents the condition of each attribute assessed during the baseline inventory stage of the project. The second wheel depicts a 10-year-old restoration project, where over half its attributes have attained a four-star condition. Practitioners familiar with the project goals, objectives, site-specific indicators, and recovery levels achieved to date can shade the segments for each sub-attribute after formal or informal evaluation. Sub-attribute labels can be added or modified to best represent a particular project. For symmetry of design, three sub-attributes are used in this example, but there may be more, or fewer, needed depending on the project." (Gann et al. 2019)
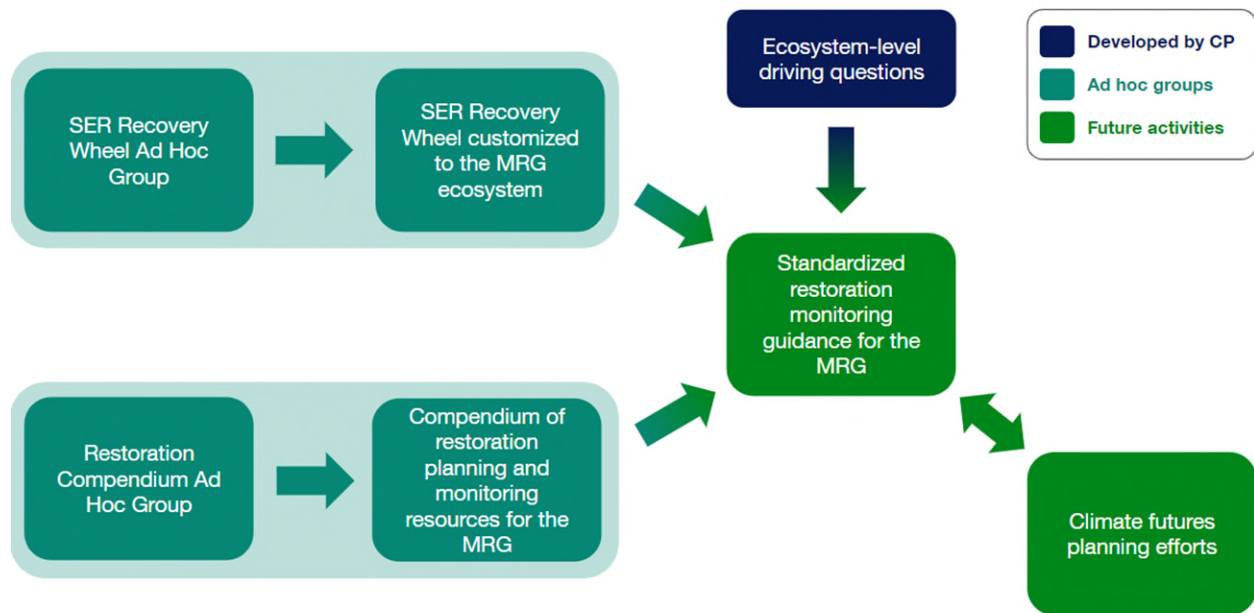
Figure 2. Outcomes of this ad hoc group will be combined with restoration monitoring resources and ecosystem-level driving questions to inform the creation of standardized restoration monitoring guidance and other efforts within the MRG.

Table 1. "Description of the key ecosystem attributes used to characterize the reference ecosystem, as well as to evaluate baseline condition, set project goals, and monitor degree of recovery at a restoration site." (Gann et al. 2019)

Attribute	Description
Absence of threats	Direct threats to the ecosystem such as overutilization, contamination, or invasive species are absent
Physical conditions	Environmental conditions (including the physical and chemical conditions of soil and water, and topography) required to sustain the target ecosystem are present
Species composition	Native species characteristic of the appropriate reference ecosystem are present, whereas undesirable species are absent
Structural diversity	Appropriate diversity of key structural components, including demographic stages, trophic levels, vegetation strata and spatial habitat diversity are present
Ecosystem function	Appropriate levels of growth and productivity, nutrient cycling, decomposition, species interactions, and rates of disturbance
External exchanges	The ecosystem is appropriately integrated into its larger landscape or aquatic context through abiotic and biotic flows and exchanges

Table 2. "Sample one- to five-star recovery scale interpreted in the context of the six key ecosystem attributes used to measure progress along a trajectory of recovery. This five-star scale represents a gradient from very low to very high similarity to the reference model. As a generic framework, users must develop indicators and monitoring metrics specific to the ecosystem and sub-attributes they identify." (Gann et al. 2019)

Attribute	★	★★	★★★	★★★★	★★★★★
Absence of threats	Further deterioration discontinued, and site has tenure and management secured	Threats from adjacent areas beginning to be managed or mitigated	All adjacent threats managed or mitigated to a low extent	All adjacent threats managed or mitigated to an intermediate extent	All threats managed or mitigated to high extent
Physical conditions	Gross physical and chemical problems remediated (e.g. excess nitrogen, altered pH, high salinity, contamination or other damage to soil or water)	Substrate chemical and physical properties on track to stabilize within range of reference ecosystem	Substrate stabilized within range of reference ecosystem and supporting growth of characteristic native biota	Substrate securely maintaining conditions suitable for ongoing growth and recruitment of characteristic native biota	Substrate exhibiting physical and chemical characteristics highly similar to that of the reference ecosystem with evidence they can indefinitely sustain species and processes
Species composition	Some colonizing native species present (e.g. ~2% of species in the reference ecosystem). Moderate onsite threat from nonnative invasive or undesirable species. Regeneration niches available	A small subset of characteristic native species establishing (e.g. ~10% of reference). Low to moderate onsite threat from nonnative invasive or undesirable species	A subset of key native species (e.g. ~25% of reference) establishing over substantial proportions of the site. Very low onsite threat from nonnative invasive or undesirable species	Substantial diversity of characteristic native biota (e.g. ~60% of reference) present across the site and representing a wide diversity of species groups. Very low onsite threat from nonnative invasive or undesirable species	High diversity of characteristic native species present (e.g. >80% of reference), with high similarity to the reference ecosystem; improved potential for colonization of more native species over time. No known onsite threat from undesirable species
Structural diversity	One or fewer biological strata present and no spatial patterning or community trophic complexity relative to reference ecosystem	More strata present but low spatial patterning and trophic complexity, relative to reference ecosystem	Most strata present and some spatial patterning and trophic complexity relative to reference site	All strata present. Spatial patterning evident and substantial trophic complexity developing relative to the reference ecosystem	All strata present and spatial patterning and trophic complexity high. Further complexity and spatial patterning able to self-organize to highly resemble reference ecosystem
Ecosystem function	Substrates and hydrology are at a foundational stage only, capable of future development of functions similar to the reference	Substrates and hydrology show increased potential for a wider range of functions including nutrient cycling, and provision of habitats and resources for other species	Evidence of functions commencing (e.g. nutrient cycling, water filtration, and provision of habitat and resources for a range of species)	Substantial evidence of key functions and processes commencing including reproduction, dispersal, and recruitment of native species	Considerable evidence of functions and processes on a secure trajectory toward that of the reference and evidence of ecosystem resilience, tested by reinstatement of appropriate disturbance regimes
External exchanges	Potential for exchanges (e.g. of species, genes, water, fire) with surrounding landscape or aquatic environment identified	Connectivity for enhanced positive (and minimized negative) exchanges arranged through cooperation with stakeholders. Linkages being reinstated	Positive exchanges between site and external environment becoming evident (e.g. more species, gene flows, etc.)	High level of positive exchanges with other native ecosystems established; control of undesirable species and disturbances	Evidence that external exchanges are highly similar to reference, and long-term integrated management arrangements with broader landscape in place and operative

Tasks and Deliverables

Step	Objective	Task	Deliverable
1.	Become familiar with SER 5-Star Recovery Wheel tool	Review literature on SER Recovery Wheel (Figure 1) • Primary Attributes • Sub-attributes • 5-star Recovery Levels • Customization process	N/A
2.	Designate a reference ecosystem	Determine an appropriate reference state for comparison based on desired restoration goals for the MRG, including the scale at which this should take place.	A description of the designated reference ecosystem with a justification of choices based either on scientific literature or expert opinion when appropriate. Please cite sources.
3.	Customize sub-attributes for the MRG	Define relevant sub-attributes for the MRG ecosystem. See Table 1 and Figure 3 for descriptions and examples.	A recovery wheel customized to the structure and function of the MRG ecosystem. Please cite sources, where appropriate, and provide rationale.
Interim Peer Review 1: attributes and sub-attributes			
4.	Customize the sub-attribute recovery levels for the MRG	Using the customized wheel from Task 3, determine the appropriate recovery levels for each sub-attribute. Consider the question of when/if to maintain or intervene at a restoration site. See Table 2 for an example of how to define levels.	A recovery wheel for the MRG, including sub-attribute levels that inform decisions about site condition and maintenance/ intervention. Please cite sources, where appropriate, and provide rationale.
Interim Peer Review 2: levels and thresholds			
Check-in with SAMC – Summarize progress, issues and findings			
5.	Recommend next steps	Using the lessons learned from Steps 2-4, provide recommendations regarding application of the Recovery Wheel to different habitat types within the MRG ecosystem.	An outline documenting the process used to develop a Recovery Wheel customized to the MRG and identifying any lessons learned during the task with recommendations for application and improvement of this tool.

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	To Be Completed By
Step 1	Familiarize with tool	N/A	TBD
Step 2	Design reference ecosystem	A summary of the reference ecosystem constructed with a justification of choices based either on	Time to complete: ~4 weeks

Task	Subtask	Deliverable	To Be Completed By
		scientific literature or expert opinion when appropriate. Please cite sources.	
Step 3	Select sub-attributes; Peer Review 1	A recovery wheel customized to the structure and function of the MRG. Please cite sources, where appropriate, and provide rationale.	Time to complete: ~4 weeks (additional 2 weeks for Peer Review)
Step 4	Define sub-attribute recovery levels; Peer Review 2; Check-in with SAMC	A recovery wheel for the MRG, including sub-attribute levels that inform decisions about site condition and maintenance/intervention. Please cite sources, where appropriate, and provide rationale.	Time to complete: ~4 weeks (additional 2 weeks for Peer Review)
Step 5	Recommendations and lessons learned; Presentation to SAMC	An outline documenting the process used to develop a Recovery Wheel customized to the MRG and identifying any lessons learned during the task with recommendations for application and improvement of this tool.	Time to complete: ~2 weeks
		Collaborative Program seminar	TBD

Footnotes

1. "*While every restoration practitioner strives to place his/her site on a secure trajectory to full ecosystem recovery relative to an appropriate reference system, full recovery can often be slow or unrealistic in the short-term. In these cases, and for all restoration projects, practitioners are encouraged to aim and monitor for continuous improvement toward ecosystem recovery… The 5-Star Recovery System tool utilizes a 5-star scale that represents a cumulative gradient from very low to very high similarity to a reference ecosystem. A restoration site can be assigned to one of the five recovery levels (1 to 5 stars) in an overall assessment; or, different ecosystem attributes can be individually assigned recovery levels based on available monitoring data, which provides a more detailed overview of recovery progress, and accounts for the fact that different attributes may have varying rates of recovery. The Recovery Wheel (Figure 1) provides a visual way in which to communicate ecological recovery progress using the 5-star system, and can be shaded in as various sub-attributes of the site achieve greater recovery over time.*" (https://www.ser.org/page/SERNews3113)

2. The SER Recovery Wheel was modified and applied to Flatlick Stream (Department of Public Works and Environmental Services, Fairfax County, Virginia), where they created pre-restoration and post-restoration Recovery Wheels for a stream ecosystem (Figure 3). The attributes, sub-attributes, and levels may be applicable to some MRG ecosystems. More information can be found at the following links:
https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/fairfax_county_restoration_recovery_wheel.pdf
https://www.fairfaxcounty.gov/publicworks/stormwater/plans-projects/fairfax-recovery-wheel
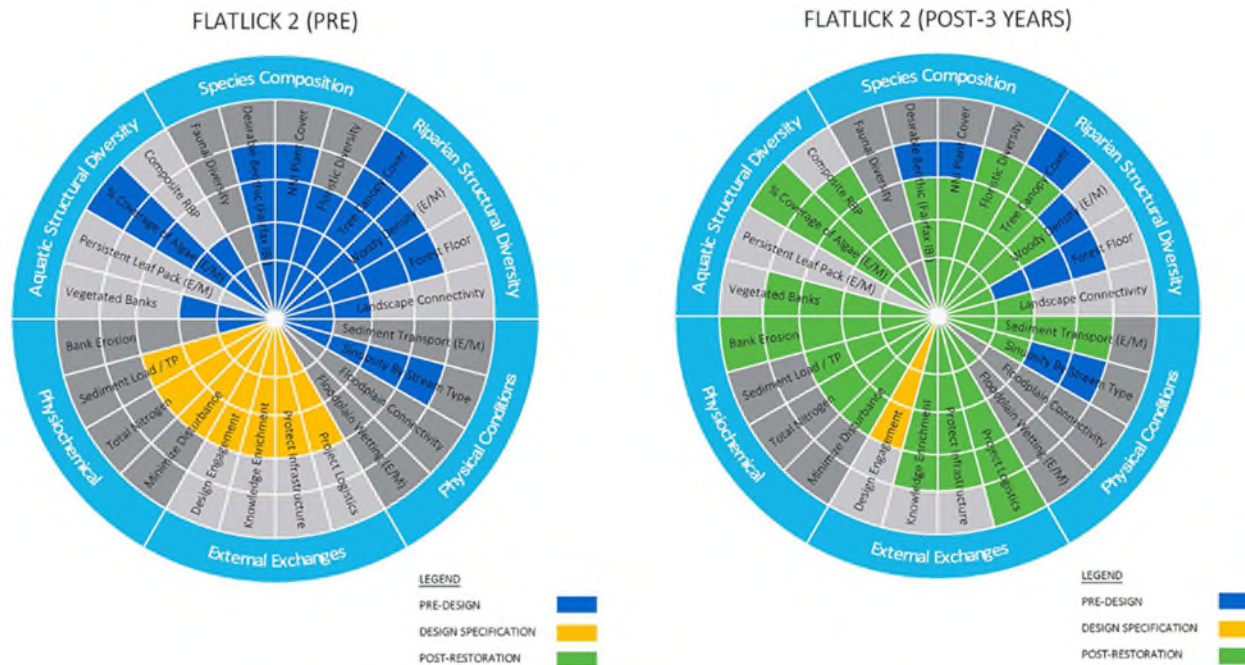
Figure 3. "Recovery Wheels for the Flatlick II stream restoration, with both a pre-restoration condition and the condition as assessed 3-years post restoration."
https://www.fairfaxcounty.gov/publicworks/stormwater/plans-projects/fairfax-recovery-wheel

References

"Fairfax Recovery Wheel." Fairfax County,
https://www.fairfaxcounty.gov/publicworks/stormwater/plans-projects/fairfax-recovery-wheel.
Accessed 14 March 2023.

Gann, G.D., T. McDonald, B. Walder, J. Aronson, C.R. Nelson, J. Jonson, J.G. Hallett, C. Eisenberg, M.R. Guariguata, J. Liu, F. Hua, C. Echeverría, E. Gonzales, N. Shaw, K. Decleer and K.W. Dixon. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology, 27: S1-S46. https://doi.org/10.1111/rec.13035

McDonald, T., G.D. Gann, J. Jonson, and K.W. Dixon. 2016. International standards for the practice of ecological restoration – including principles and key concepts. First Edition. Society for Ecological Restoration, Washington, D.C.

McDonald, T., J. Jonson and K.W. Dixon. 2016. National standards for the practice of ecological restoration in Australia. Restoration Ecology, 24: S4-S32. https://doi.org/10.1111/rec.12359

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

Strategic Plan for Potential Drying Ad Hoc Charge [read-ahead]

**Middle Rio Grande Endangered Species Collaborative Program (MRGESCP)
Strategic Plan for Potential Drying in the Middle Rio Grande Science & Technical (S&T) Ad
Hoc Group Charge**
Revised Charge

Approved by the Science and Adaptive Management Committee (SAMC) on *November 8, 2022*.
Approved by the Strategic Plan for Potential Drying in Angostura Reach Ad Hoc Group on
December 16, 2022.
Revised in *March 2023*

Parent Committee
The Strategic Plan for Potential Drying in the MRG S&T Ad Hoc Group is formed by and reports to
the SAMC, and operates at the will of the SAMC. The SAMC may, at any time, request updates from
the S&T Ad Hoc Group, revise its charge, alter membership, or sunset the group.

Ad Hoc Group Charge
Develop recommendations for management actions to deploy in preparation for, or in response to,
a potential drying event in the Angostura Reach near Albuquerque, New Mexico. Recommendations
should include descriptions of each management action, scientific justification, anticipated
responses, and considerations for deployment, including the consequences and tradeoffs for each
alternative. Each alternative for the Angostura Reach should be considered in the context of other
reach drying response actions or strategies (if in existence), and include recommendations for
related data collection efforts, use of water infrastructure, and endangered species management
actions for the Rio Grande silvery minnow (*Hybognathus amarus*; RGSM).

Membership
   A. *Criteria for membership (at least one of the following is required for each member)*
      - Knowledge of the operational scheme for water management within the Angostura,
        Isleta and San Acacia Reaches of the Middle Rio Grande;
      - Experience with the RiverEyes Monitoring Program protocols and action thresholds
      - Knowledge of endangered species management and recovery actions for RGSM

   B. *Member List*
      Lead TBD
      Alison Hutson, New Mexico Interstate Stream Commission
      Anne Marken, Middle Rio Grande Conservancy District
      Carolyn Donnelly, U.S. Bureau of Reclamation
      Casey Ish, Middle Rio Grande Conservancy District
      Debra Hill, U.S. Fish & Wildlife Service
      Diane Agnew, Albuquerque Bernalillo County Water Utility Authority
      Eric Gonzales, U.S. Bureau of Reclamation
      Justin Reale, U.S. Army Corps of Engineers
      Kenneth Richard, U.S. Bureau of Reclamation
      Lucas Barrett, U.S. Bureau of Reclamation
      Lynette Giesen, U.S. Bureau of Reclamation
      Nabil Shafike, U.S. Bureau of Reclamation
      Reynalden Delgarito, U.S. Army Corps of Engineers

Background

Portions of the Middle Rio Grande basin can experience channel drying during the summer months for up to 80 km (Archdeacon, 2016). While the Isleta and San Acacia reaches tend to experience drying events every summer, the Angostura Reach flows has not dried since the 1980's. Angostura instream flows are typically managed at low levels through complex combination of interacting factors and can vary greatly as a function of inputs from upstream tributaries, irrigation demands, irrigation return flows, municipal demands and wastewater returns, water releases to supplement natural flows, downstream water delivery requirements, and precipitation. However, should drought conditions and low snowpack in the Upper Rio Grande basin and in Colorado continue in the future, maintaining flows in the Angostura Reach is likely to become even more challenging.

A higher frequency of drying in the Angostura Reach would not only negatively impact the RGSM and other listed species, but it would also adversely affect the agricultural, recreational, and municipal use of the river. Public safety and the overall perceptions of river conditions would also likely become unfavorable within the Albuquerque and surrounding metropolitan areas.

Concerns over Angostura Reach drying have been raised at multiple Executive Committee (EC) meetings since 2020. Accordingly, the MRGESCP now recognizes the urgency and importance of developing a strategic plan to address concerns associated with potential drying in the Angostura Reach. The proposed strategic plan will be developed beginning with the tasks in this charge.

Tasks and Deliverables

Task 1: Expert review and opinion of past management actions deployed in the Isleta and San Acacia Reaches.

Objective of Task 1.
Become sufficiently familiar with the historic actions of agencies in response to drying in the Isleta and San Acacia Reaches of the MRG in order to formulate an opinion on the efficacy of past management actions. Task 1 will focus on describing RGSM-specific objectives, scientific justification, validity of methods, and realized conservation benefits.

Deliverable(s): Opinion on efficacy (with respect to RGSM) of past management actions in response to drying in Isleta and San Acacia Reaches.

Task 2: Design and prioritize a suite of management objectives and associated actions regarding drying in the Angostura Reach. Base objectives and actions on the strength of scientific support and anticipated conservation benefit for the RGSM.

Objective of Task 2
The objective is to design new RGSM conservation objectives and actions (as needed) from insights gained in Task 1 that have a high likelihood of achieving measurable and meaningful benefits.

Deliverable(s): Prioritized list of management objectives and associated actions for conservation of RGSM in anticipation of drying in the Angostura Reach.

Task 3: Develop an innovative and achievable strategy to address the conservation needs of the RGSM in response to drying events in the Angostura Reach.

Objective of Task 3
The objective is to have a proactive, scientifically vetted and operationally sensitive suite of prioritized RGSM conservation actions to deploy in the Angostura Reach in response to the stressors associated with drying/dewatering events.

Deliverable(s): A strategic framework identifying consequences, tradeoffs, and associated risk and uncertainty to avoid or mitigate the adverse impacts of dewatering events on the RGSM.

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	To Be Completed By
Task 1	Subtask 1A: Review	None	November 2022
	Subtask 1B: Expert Evaluation	Expert opinion on past actions	November 2022
Task 2	Subtask 2A: Design management objectives & actions	Comparison of management actions, consequences, & tradeoffs	November 2022
	Subtask 2B: Prioritize management actions	Prioritized list of management actions based on benefit & scientific defensibility	November 2022
	Subtask 2C: Describe metrics and methods	Monitoring plan	November 2022
Task 3	Subtask 3B: Design a deployment strategy for RGSM conservation actions	Draft strategic framework	January 2023

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

RGSM CEM Genetics Ad Hoc Charge [read-ahead]

Middle Rio Grande Endangered Species Collaborative Program (MRGESCP)
Science & Technical (S&T) Ad Hoc Group Charge
Rio Grande Silvery Minnow Conceptual Ecological Model/Genetics Ad Hoc Group

Approved by Science and Adaptive Management Committee (SAMC) on April 22, 2021.

Parent Committee
Science and Adaptive Management Committee.

Ad Hoc Group Charge
Identify a series of genetics-related components that inform, and are informed by, the life history characteristics of the Rio Grande silvery minnow (RGSM), propagation and augmentation of the species, and environmental influences in the Middle Rio Grande (MRG). Incorporate these components into the conceptual ecological model (CEM) for the RGSM, found in Appendix B of the MRGESCP 2020 Science and Adaptive Management Plan (WEST 2020).

Membership
   A. *Criteria for membership*
      - Knowledge of RGSM genetics, life history and ecology within the Middle Rio Grande;
      - Familiarity with MRGESCP Science and Adaptive Management Plan (WEST 2020), RGSM Genetics and Propagation Plan (CABQ et al. 2018a), and RGSM Augmentation Plan (CABQ et al. 2018b).

   B. *Member List*
      Wade Wilson (Lead), U.S. Fish and Wildlife Service
      Jane Rogosch, Cooperative Fish & Wildlife Research Unit, Texas Tech University
      Megan Osborne, University of New Mexico
      Eric Gonzales, Bureau of Reclamation

Iterative Task Development

Background
RGSM genetic data guides and informs the propagation and augmentation plans. Thus, this work is also integral to our understanding of population dynamics. Any representation of the relationship of RGSM abundance to environmental influences, therefore, should also include factors that affect the genetic integrity and diversity of augmented populations. The current CEM for RGSM fails to capture the full suite of threats to the recovery of the species. The task described below will remedy these omissions and help to inform adaptive management strategies for RGSM recovery.

Specifically, this task addresses Recommendation 5 from the Fraser et al. Independent Science Panel on RGSM Genetics (AFWE&I 2016):
> *"The Science Workgroup (led by the Program) and the Genetics Workgroup (led by the USFWS) should integrate the genetics data and the decision-making more carefully. Specifically, there should be more translation of the genetics research into the adaptive management process, hatchery broodstock practices, and the integration of the past 15 years of research (genetics and ecology combined)."*

Tasks and Deliverables

Task 1: Add genetics-related components to RGSM CEM

Identify a series of genetics-related components (e.g., genetic diversity of broodstock, captive demographic parameters) that inform, and are informed by, the life history characteristics of the RGSM and its environmental influences in the Middle Rio Grande. Incorporate these components into the conceptual ecological model (CEM) for the RGSM, found in Appendix B of the MRGESCP 2020 Science and Adaptive Management Plan (WEST 2020).

Objective of Task 1:
Incorporate genetics-related components into the RGSM CEM to improve utility of the model and facilitate additional linkages to Collaborative Program Objectives and RGSM recovery criteria.

Deliverable:
1) Schematic of RGSM CEM (provided by PST) modified to include genetics-related components and their relationships to life stages and other components in the model.
2) Presentation of modified schematic to SAMC, followed by discussion.

Task 2: Characterize relationships among RGSM CEM components

Indicate the level of importance (on RGSM population dynamics), level of understanding and ability to manage for each new relationship between a parent-child component pair in the RGSM CEM.

Objective of Task 2:
Characterize the added parent-child component relationships in the RGSM CEM to identify critical uncertainties for further study.

Deliverable:
3) Modified spreadsheet (provided by PST) of individual relationships between parent-child component pairs in the RGSM CEM with level of importance, level of understanding and ability to manage characterized as High, Medium or Low.

Task 3: Define genetics-related components added to RGSM CEM

Define the genetics-related components and any new component categories added to the RGSM CEM by expanding Tables B2 and B3 found in Appendix B of the MRGESCP 2020 Science and Adaptive Management Plan (WEST 2020).

Objective of Task 3:
Provide reference definitions for any new genetics-related components and component categories added to the RGSM CEM.

Deliverable:
4) Modified "Table B3_descriptions" and "Table B2_categories" included in spreadsheet (provided by PST).

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	Completed By
Task 1: Add genetics-related components to RGSM CEM	NA	1. Modified schematic of RGSM CEM	September 15, 2021
		2. Presentation to SAMC	November SAMC meeting
Task 2: Characterize relationships among RGSM CEM components	NA	3. Modified table "RGSM_CEM_relationships" in provided spreadsheet	Progress to be reported to SAMC at November meeting
Task 3: Define genetics-related components added to RGSM CEM	NA	4. Modified tables "Table B3_descriptions" and "Table B2_categories" in provided spreadsheet	September 15, 2021

References:

Amec Foster Wheeler Environment & Infrastructure, Inc. 2016. Final Summary Report: Expert Peer Review of the Middle Rio Grande Endangered Species Collaborative Program's Rio Grande Silvery Minnow Genetics Project. Prepared for the U.S. Bureau of Reclamation, Albuquerque, NM.

City of Albuquerque, New Mexico Interstate Stream Commission, US Fish and Wildlife Service, and University of New Mexico. 2018. Rio Grande Silvery Minnow Genetics Management and Propagation Plan 2018-2022. City of Albuquerque BioPark, Albuquerque, NM.

City of Albuquerque, New Mexico Interstate Stream Commission, University of New Mexico, US Bureau of Reclamation, and US Fish and Wildlife Service. 2018. Rio Grande Silvery Minnow Annual Augmentation Plan 2018-2022. City of Albuquerque BioPark, Albuquerque, NM.

Western EcoSystems Technology, Inc. 2020. Middle Rio Grande Endangered Species Collaborative Program Science and Adaptive Management Plan. Prepared for the Executive Committee of the Middle Rio Grande Endangered Species Collaborative Program, Albuquerque, NM. 98 pp.

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

RGSM Hypotheses Development Ad Hoc Charge [read-ahead]

Middle Rio Grande Endangered Species Collaborative Program (MRGESCP)
Rio Grande Silvery Minnow Hypotheses Development Science & Technical (S&T) Ad Hoc Group
Revised Charge

Approved by the Science and Adaptive Management Committee (SAMC) on *August 26, 2021*.
Approved by the Rio Grande Silvery Minnow (RGSM) Hypotheses Development Ad Hoc on *August 16, 2022*.
Revised for the SAMC in *September 2023*

Parent Committee
Science and Adaptive Management Committee*.*

Ad Hoc Group Charge
Review, translate and refine recommendations from the RGSM Population Monitoring Work Group (PMWG) status report (Valdez 2021) into specific questions with clear and testable hypotheses. If a hypothesis cannot be generated, provide an explanation and cite relevant literature.

Membership
   A. Criteria for membership
- Knowledge of RGSM life history and ecology within the Middle Rio Grande (MRG);
- Familiarity with MRG Fish Monitoring Program (FMP);
- Group should include a diverse range of perspectives, beyond those of the original Population Monitoring Workgroup.

   B. Member List (confirmed)
      Alison Hutson, N.M. Interstate Stream Commission – Lead
      Ara Winter, Bosque Ecosystem Monitoring Program – Lead
      Michael Porter, U.S. Army Corps of Engineers – Lead
      Andy Dean, U.S. Fish & Wildlife Service
      Eric Gonzales, U.S. Bureau of Reclamation
      Matthew Wunder, N.M. Department of Game & Fish
      Nathan Schroeder, Pueblo of Santa Ana
      Stephen Zipper, SWCA Environmental Consultants
      Kim Eichhorst, Bosque Ecosystem Monitoring Program

Background
The recent report entitled, "Review of the Middle Rio Grande Fish Monitoring Program" (Valdez 2021) summarizes the findings that resulted from activities of the RGSM PMWG from 2012-2020 and provides eight recommendations. The report concludes that the MRG Fish Monitoring Program, in its current form, fulfills its intended purposes, but that use of the data outside of those purposes should be assessed separately. To that end, in July 2021 the MRGESCP Executive Committee (EC) approved additional scientific review and, where justified, further refinement of the report's recommendation statements, listed here:

1. *Continue to implement FMP, as conducted during 2017-2020 that includes the recommendations of the Hubert et al. (2016) science panel.*
2. *Evaluate the use of other fish sampling gears, in addition to beach seines, to inform and possibly supplement the current FMP.*
3. *Re-evaluate the relationship of CPUE to total abundance of RGSM.*

4. *Characterize the physical parameters of principal mesohabitat types to inform fish population models and hydraulic habitat models.*
5. *Refine the current monitoring plan to optimize precision and representation of the October CPUE at acceptable program costs.*
6. *Evaluate and compare other analytical methods against the mixture model and determine if other methods are more suitable for computing RGSM CPUE.*
7. *Develop and regularly evaluate integrated population models to help identify and reconcile complex influences on monitoring.*
8. *Draft a clear and concise MRG Fish Monitoring Plan for review and approval by the SAMC and the EC.*

The Valdez (2021) summary report serves as a starting place for the tasks detailed below. Additional resources and support will be provided by the MRGESCP Program Support Team, as needed, to expedite this work.

The SAMC requests that you review the draft tasks, deliverables and schedule below and provide feedback and questions to begin the iterative process of task development.

Tasks and Deliverables

Task 1: Translate recommendation statements into specific questions with clear and testable hypotheses.
Translate each recommendation statement into a clearly articulated research hypothesis. Clarify and refine the language used, if needed. Some statements may warrant multiple hypotheses. If a hypothesis cannot be generated, provide a brief explanation and cite relevant literature.

Objective of Task 1:
Clearly articulated research hypotheses will help to identify important influences, as well as key response metrics and steps needed to design studies and communicate findings effectively.

Deliverable:
List of research hypotheses generated from each recommendation statement, or brief justification for no hypothesis. Provide all relevant citations of literature, where applicable.

Task 2: Review each hypothesis from Task 1 for scientific validity, technical accuracy, and management relevance.
Review of each statement should include an updated literature review (i.e., beyond that provided in the summary report, if applicable). Cite any relevant evidence supporting or refuting the need for additional investigation of the topic. As part of this review, include any study considerations required to scope a project to address the hypothesis.

Objective of Task 2:
A thorough and current review of each recommendation ensures that the best available science will be applied at all decision points. This supports adaptive management as outlined in the MRGESCP Long-Term Plan for Science and Adaptive Management (WEST 2022).

Deliverable:
Completed review comment matrix for the hypotheses generated from report recommendation statements selected in Task 1 (form provided by PST).

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	To Be Completed By
Task 1: Translate recommendation statements into specific questions with clear and testable hypotheses	Progress updates to SAMC	List of research hypotheses generated from the recommendation statements	TBD
Task 2: Review each hypothesis from Task 1 for scientific validity, technical accuracy, and management relevance	NA	Completed review comment matrix	TBD
		Presentation to SAMC	TBD

References

Valdez, R. A. 2021. Review of the Middle Rio Grande Fish Monitoring Program: Status Report of The Population Monitoring Workgroup, Richard A. Valdez, Ph.D. Workgroup Chair (2019-2020). Prepared for the Executive Committee of The Middle Rio Grande Endangered Species Collaborative Program, Albuquerque, New Mexico. Final. July 20, 2021. 63pp.

Western EcoSystems Technology, Inc. 2022. Middle Rio Grande Endangered Species Collaborative Program Long-Term Plan for Science and Adaptive Management, v. 2.0. Approved by the Executive Committee of the Middle Rio Grande Endangered Species Collaborative Program, March 23, 2022, Albuquerque, NM. 88 pp.

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

RGSM Population Modeling Ad Hoc Charge [read-ahead]

Middle Rio Grande Endangered Species Collaborative Program (MRGESCP)
Science & Technical (S&T) Ad Hoc Group Charge
Rio Grande Silvery Minnow Population Modeling Ad Hoc Group

Approved by Science and Adaptive Management Committee (SAMC) on March 3, 2021.

Parent Committee
Science and Adaptive Management Committee

Ad Hoc Group Charge
Develop an integrated population model for the Rio Grande silvery minnow (RGSM) using population monitoring data to predict RGSM responses to different factors, including stocking, salvage, spring flows, low summer flows and intermittency.

Membership
   A. *Criteria for membership*
      Familiarity with river conditions and habitat needs of RGSM in the MRG, knowledge of fisheries science and/or population dynamics.

   B. *Member List*
      Charles Yackulic (Lead), U.S. Geological Survey
      Rich Valdez, SWCA Environmental Consultants
      Mo Hobbs, Albuquerque Bernalillo County Water Utility Authority
      Thomas Archdeacon, U.S. Fish and Wildlife Service
      Joel Lusk, U.S. Bureau of Reclamation
      Eric Gonzales, U.S. Bureau of Reclamation
      Mick Porter, U.S. Army Corps of Engineers

Iterative Task Development
   1. This modeling effort will directly or indirectly inform three RGSM Objectives:
      ➤ **Objective A-3**: Support research and modeling efforts to determine how much base flow is needed to produce sufficient habitat to support species survival rates necessary to achieve a self-sustaining population in each reach.
      ➤ **Objective A-4**: Support research and modeling efforts to determine timing, duration, and magnitude of flows needed to produce sufficient habitat in support of species recruitment rates for a self-sustaining population in each reach.
      ➤ **Objective A-5**: Contribute to research and modeling efforts to better understand the quantity and quality of habitat needed at different flow regimes to support recruitment and survival of RGSM.
   2. To better define linkages to these objectives, please describe in greater detail the specific RGSM responses and factors being modeled.
   3. To ensure appropriate application of the model, please describe the methods of development, as well as associated model assumptions and estimation error and/or bias.
   4. Describe the knowledge gaps and critical uncertainties that reduce the accuracy or precision of the parameter estimates.

Tasks and Deliverables

1. ***Expert Elicitation***
   Refine model parameters using a process of subject matter expert elicitation. Document methodologies, assumptions and supporting evidence.

   Objective of Task One
   Improve model performance and applicability by harnessing the institutional knowledge of subject matter experts, where data may not exist.

   Deliverable(s): Report on expert elicitation process and findings in a presentation to SAMC (or Collaborative Program seminar).

2. ***Application of Integrated Population Model for RGSM in the MRG***
   Describe decision support using the integrated population model (IPM). What questions does the model help to answer? How much error is associated with an estimate? Do the model outputs inform other decision support tools? What critical information is needed to improve the model estimates?

   Objective of Task Two
   Demonstrate the utility of the IPM and bridge the gap between the abstract modeling exercise and practical management application.

   Deliverable(s): Presentation of the IPM framework, model outputs and decision support scenarios as a presentation to SAMC (or Collaborative Program seminar) and accompanying one to two page fact sheet.

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	To Be Completed By
Expert Elicitation		Report methods and findings in a presentation	Progress to be reported to SAMC at November meeting
Application of IPM		Decision support presentation and fact sheet	Progress to be reported to SAMC at November meeting

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

Draft 2023 SAMC Summary Report [read-ahead, draft]

MIDDLE RIO GRAND ENDANGERED SPECIES COLLABORATIVE PROGRAM
2023 SAMC Summary Report

The following are status updates and notes for 2023 Science and Adaptive Management Committee (SAMC) activities, prepared for the November 30, 2023 SAMC meeting.

	Item	Status	Notes
Administrative Tasks			
✓	Module one of signatory SAMIS trainings	COMPLETE	Module one of SAMIS trainings completed December 2022 - January 2023.
	2024 Work Plan	ONGOING	To be reviewed and approved by the EC at the January 2024 meeting.
✓	2023 SAMC appointments	COMPLETE	Four new SAMC members were appointed from applicant pool and joined the SAMC in May 2023.
✓	2023 Science Evaluation	COMPLETE	The 2023 Science Evaluation was completed November 2022 - February 2023.
✓	2021-2022 Program Bibliography	COMPLETE	The 2021-2022 Program Bibliography was completed in May 2023 and posted to the Program Portal.
Science & Technical (S&T) Ad Hoc Groups and Administrative Ad Hoc Groups			
	Information and Data Quality Standards Hybrid Ad Hoc Group	ONGOING	Draft template completed and USGS disclaimer language adopted. Products will be reviewed and group completed by the end of 2023.
	RGSM Hypothesis Development S&T Ad Hoc Group	ONGOING	Group leads are currently discussing RGSM population model parameter validation and population model comparison.
	SER Recovery Wheel S&T Ad Hoc Group	ONGOING	SAMC approved charge in August 2023. Group member list has been compiled, and group will convene in the first half of 2024.
	Restoration Resources Compendium S&T Ad Hoc Group	ONGOING	SAMC approved charge in August 2023. Group member list has been compiled, and group will convene in the first half of 2024.
	Drying in Angostura Reach S&T Ad Hoc Group	ONGOING	Drying report is complete and will be reviewed and finalized by the end of 2023.

	Item	Status	Notes
	RGSM CEM/Genetics S&T Ad Hoc Group	ONGOING	The RGSM CEM was revised with genetics elements in 2022. The revised RGSM CEM will be reviewed and finalized in 2024.
Building the Science and Adaptive Management Information System (SAMIS)			
	Populate Project Bank with past, current, and potential projects	ONGOING	Current 2023 projects are being collected for inclusion, and potential projects are being developed and included on an ongoing basis.
	Identify uncertainties in the CEMs, assess their status, and link to the appropriate elements in SAMIS	ONGOING	SAMIS development is in process to support this activity.
Science Decision Support Planning and Tools Development			
	Vegetated Islands and Bars glossary	ONGOING	Glossary has been drafted, SAMC leads are currently reviewing.
	NMMJM Conceptual Model	ONGOING	Model has been drafted and will be completed, revised, and reviewed in 2024.
	PESU Conceptual Model	ONGOING	Model has been drafted and will be completed, revised, and reviewed in 2024.
Information Sharing and Coordination			
✓	MRGESCP Newsletters	COMPLETE	Newsletters were published in February, April, June, August, and November.
✓	Habitat Restoration (HR) Coordination Meetings	COMPLETE	Quarterly HR Coordination meetings were held in February (field trip), April, August (field trip), and November (field trip).
✓	Climate Futures Planning Workshop	ONGOING	The workshop planning is complete and the workshop will take place in Spring 2024.
✓	Science Symposium	ONGOING	The Symposium will take place in February 2024.

Science and Adaptive Management Committee Meeting
November 30, 2023

See the following meeting material on the page below:

Draft 2024 MRGESCP Work Plan [read-ahead, spreadsheet, draft]

Middle Rio Grande Endangered Species Collaborative Program
DRAFT 2024 Work Plan

TASK	SUBTASK	EC	AAH	SAMC	S&T	FPC	Sigs	PST	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
	Executive Committee (EC) meeting	X									X			X			X			X
	Science and Adaptive Management Committee (SAMC) meeting			X					Q1			Q2			Q3			Q4		
	Fiscal Planning Committee (FPC) meeting					X			Q1			Q2			Q3			Q4		
1.1	**Program Portal Administration**																			
1.1a	Maintain and update documents and content on the Program Portal							X	X	X	X	X	X	X	X	X	X	X	X	X
1.1b	Update the existing datasets on the Program Portal						X	X				X	X	X	X	X	X			
1.1c	Develop a plan for continued Program Portal funding	X				X			X	X	X	X	X	X	X					
1.2	**Science and Adaptive Management Information System (SAMIS)**																			
1.2a	Maintain and update activities in SAMIS						X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.2b	Hold signatory SAMIS trainings						X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.3	**SAMC Membership**																			
1.3a	Collect and review applications for new SAMC members		X					X						X	X	X				
1.3b	Appoint new SAMC members	X														X			
1.4	**Science Evaluation**																			
1.4a	Carry out the Science Evaluation	X		X				X	X	X	X									
1.5	**Annual Program Evaluation**																			
1.5a	Carry out the Annual Program Evaluation	X		X		X		X	X	X	X									
1.5b	If needed, draft and adopt updates to the Long-Term Plan for Science & Adaptive Management to reflect recommendations from the Science Evaluation and Program Evaluation	X	X					X				X	X	X						
1.5c	If needed, draft and adopt updates to committee charters and the By-Laws to reflect recommendations from the Program Evaluation	X	X					X				X	X	X						
1.6	**Work Plan**																			
1.6a	Check in and revise the 2024 Work Plan if needed	X						X			X			X			X			
1.6b	Develop and approve the 2025 Work Plan	X						X										X	X	X
1.7	**Reporting**																			
1.7a	Continue drafting and approve the 2023 Annual Report	X						X	X	X	X									
1.7b	Collect and finalize 2023 signatory contributions reports						X	X	X	X	X	X	X	X	X	X	X			
1.7c	Develop and finalize the 2023 cost share report						X	X	X	X	X	X	X	X	X	X	X			
1.7d	Begin drafting the 2024 Annual Report						X	X										X	X	X
1.7e	Develop the SAMC annual summary report to the EC			X				X											X	X
2.1	**Send out regular MRGESCP newsletters**							X		X		X		X		X		X		X
2.2	**Host collaborative seminars**			X				X	X	X	X	X	X	X	X	X	X	X	X	X
2.3	**Science Symposium**																			
2.3a	Plan for and host the 2024 Science Symposium	X				X		X	X	X										
2.4	**Collaboratory**																			
2.4a	Plan for the 2025 Collaboratory	X				X		X										X	X	X
2.5	**Workshop**																			
2.5a	Plan for and host the Climate Futures Planning Workshop	X				X		X	X	X	X									
3.1	**Conceptual Ecological Models**																			
3.1a	Complete, revise, and review the Rio Grande silvery minnow conceptual ecological model			X	X				X	X	X	X	X							
3.1b	Complete, revise, and review the New Mexico meadow jumping mouse conceptual model			X	X				X	X	X	X	X							
3.1c	Complete, revise, and review the Pecos sunflower conceptual model			X	X				X	X	X	X	X							

General Administration

Communication

Category	No.	Task																		
Science Support	3.2	**Continue RGSM Hypothesis Development S&T Ad Hoc Group**			X				X	X	X	X	X							
	3.3	**Restoration Guidance S&T Ad Hoc Groups**																		
	3.3a	Evaluate use of the Society of Ecological Restoration (SER) Recovery Wheel's applicability and usefulness to plan and evaluate ecosystem restoration in the MRG			X	X			X	X	X	X	X	X	X	X	X			
	3.3b	Compile and review a compendium of restoration resources for the MRG			X	X			X	X	X	X	X	X	X	X	X			
	3.4	**Vegetated Islands and Bank-Attached Bars in the MRG**																		
	3.4a	Develop a glossary of technical terms related to management of vegetated islands/bars			X	X			X	X	X									
	3.4b	Develop conceptual model representing the vegetated islands/bars phenomenon			X	X			X	X	X	X	X	X	X	X	X			X
Signatory Coordination	4.1	**Host quarterly HR coordination meetings**					X		X	X		X			X			X		
	4.2	**Identify coordination opportunities related to the spring/summer hydrology**	X					X		X										
	4.3	**Provide updates on coordination activities related to the spring/summer hydrology, and lessons learned**	X					X												X
	4.4	**Provide updates on the implementation of signatory activities from the Long-Term Plan**					X	X		X		X			X			X		