Science and Adaptive Management Committee Meeting

March 3, 2021

Meeting Materials:

Agenda

Minutes

Review of the MRG Fish Monitoring Plan Status Report of the PMWG to the EC [read-ahead, not included]

MRGESCP 2021 Objectives Workshop Summary [read-ahead]

MRGESCP 2021 Objectives Workshop SAMC Revision Summary [follow-up]

Draft MRGESCP S&T Ad Hoc Group Charge RGSM Genetics Ad Hoc [follow-up, draft]

Review of the MRG Fish Monitoring Plan Status Report of the PMWG to the EC [presentation, not included]

Middle Rio Grande Endangered Species Collaborative Program

Est. 2000

Science and Adaptive Management Committee (SAMC) Meeting
March 3, 2021
1:00 PM–4:00 PM

Meeting Location: *Zoom*
https://west-inc.zoom.us/j/8983593120?pwd=bU54V3NGeG93bXVlSlJFcEIzcE9wZz09
Meeting ID: 898-359-3120; Passcode: 1251
Call-In: +1-669-900-6833

Meeting Agenda

1:00 – 1:10	**Welcome, Introductions and Agenda Review** ✓ **Decision**: Approve March 3, 2021 meeting agenda ✓ **Decision**: Approve January 13, 2021 meeting minutes	*Catherine Murphy, Program Support Team (PST)*
1:10 – 2:10	**Invited guest discussions** • Alyssa O'Brien and Colleen McRoberts – City of Albuquerque Open Space Division: CABQ habitat restoration site • Wade Wilson – U.S. Fish and Wildlife Service Southwestern Native Aquatic Resources and Recovery Center: Ad hoc group to add Rio Grande silvery minnow (RGSM) genetics elements to conceptual ecological model (CEM) • Rich Valdez - SWCA Environmental Consultants: RGSM Population Monitoring Ad Hoc Group Summary Report	*Group discussion*
2:10 – 2:40	**Science & Technical Ad Hoc Groups** • Discuss recommendation of RGSM Population Monitoring summary report • Update on RGSM Population Modeling Ad Hoc Group – lead Charles Yackulic, U.S. Geological Survey • Propose and discuss additional ad hoc group(s) o Adding level of uncertainty to avian CEMs o Others? Read-ahead: ☐ RGSM Population Monitoring Summary Report – Executive Summary ✓ **Decision:** Approve RGSM Population Monitoring summary report findings and recommendations for EC presentation	*Facilitated discussion*

- ➢ **Action:** C. Murphy will prepare SAMC recommendations for RGSM Pop. Mon. summary report

2:40 – 2:50 **Break**

2:50 – 3:50 **2021 Objectives Revisions from Workshop** *Facilitated discussion*

- Discuss utilization of objectives in AM relational database and development of Long-Term Plan
- Review, modify and approve revisions for MRGESCP Objectives
- Choose a strategy proposed during the workshops for potential development into an S&T Ad Hoc charge

Read-ahead:

- ☐ Compiled MRGESCP Objectives Workshop results

- ✓ **Decision**: Approve revisions for MRGESCP Objectives
- ➢ **Action**: C. Murphy will finalize list of objectives to present for EC approval
- ➢ **Action**: C. Murphy will draft an ad hoc charge for the strategy chosen from the Objectives Workshops

3:50 –4:00 **Meeting Summary and Action Items Review** *PST*

- ✓ **Decision:** Set SAMC meeting dates through 2021

4:00 **Adjourn**

Middle Rio Grande Endangered Species Collaborative Program

Est. 2000

Science and Adaptive Management Committee (SAMC)
Meeting Minutes

March 3, 2021; 1:00 PM–4:00 PM
Location: Zoom Meeting

Decisions:

- ✓ Approval of March 3, 2021 SAMC meeting agenda
- ✓ Approval of January 13, 2021 SAMC meeting minutes

Action Items:

WHO	ACTION ITEM	BY WHEN
Program Support Team (PST)	Send Rich Valdez's Population Monitoring Work Group (PMWG) presentation to the SAMC	3/3/2021
SAMC	Submit comments on the PMWG presentation to Catherine Murphy	3/8/2021
PST	Send out the revised MRGESCP objectives	3/4/2021
SAMC	Submit revisions for the remaining MRGESCP objectives to Catherine M.	3/10/2021
PST	Send out a draft Science & Technical (S&T) Ad Hoc Group charge for incorporating genetics/augmentation into the Rio Grande silvery minnow conceptual ecological model	3/4/2021
SAMC	Review the charge and submit comments to Catherine M.	3/15/ 2021
PST	Send out a Doodle Poll to schedule a monthly SAMC meeting date	3/4/2021
SAMC	Fill out the Doodle Poll and notify the PST of any recurring obligations	3/8/2021

Next Meeting: April 2021

Meeting Summary

Welcome, Introductions, and Agenda Review

Catherine M., PST Science Coordinator and SAMC Facilitator, opened the meeting and led introductions. Catherine M. reviewed the March 3, 2021 meeting agenda and January 13, 2021 meeting minutes.

- ✓ **Decision**: The SAMC approved the January 13, 2021 SAMC meeting minutes
- ✓ **Decision**: The SAMC approved the March 3, 2021 SAMC meeting agenda

Invited Guest Discussions

Alyssa O'Brien and Colleen McRoberts, City of Albuquerque (CoA) Open Space Division, presented on several CoA projects. Main points are below:

- The CoA owns the Candelaria Nature Preserve and is in the process of getting a resource management plan approved by the City Council for the 170-acre parcel of land.
    - This land has implications for the wildlife along the Rio Grande, as 70-80 acres of farm fields will be turned into restored wildlife habitat.
    - The CoA is working with the Department of Transportation to widen existing wetlands to about 22 acres in the area.
- The CoA will purchase the Poole property in the San Antonio Oxbow (Oxbow) for a major public open space. There is a bluff area overlooking the Oxbow covered in fourwing saltbush, but it has important implications for the transitional zone for wildlife.
    - It will add an additional buffer for Oxbow, which is one of the only connected wetlands in the area.
    - The CoA has a FEMA grant of 1 million dollars from the Department of Homeland Security to treat 470 acres.
    - The CoA is currently taking requests for proposals for a project plan and prescription for the area.*
    - The CoA will work with the Ciudad Soil & Water Conservation District to employ a youth corps on ancestral lands (ex. Rocky Mountain Youth Corps) to implement the prescription, which will include targeting invasive species, mulching, planting, and reestablishing trails.
- The CoA will also look at creating new interpretive signage, improving river access, and developing informational kiosks.
- This summer, the CoA will work with University of New Mexico (UNM) students to do targeted monitoring, specifically around identifying invasive species.
    - This will help with the reassessment and reorganization of the Bosque Action Plan, a management plan developed in 1993. The new plan will last 5 years.
- The Bosque Montaño swale project will take place on the west side of the river, near the Bosque School, and will incorporate the Bosque Ecosystem Monitoring Program (BEMP). The CoA will work with UNM and BEMP to plant poles (e.g., cottonwood) and create a swale closer to the water table. The swale will be two-thirds acre.
    - There will be 93,000 cubic feet of soil available for distribution from this project.

Comments:

- Are cottonwoods primarily what will be planted? Cottonwoods are not good habitat for southwestern willow flycatchers (SWFL) and yellow-billed cuckoos. Willows are preferable.
    - There is no planting plan yet. The CoA is seeking input on which species to plant.*
    - The CoA has willow swales in other areas, particularly near outfalls.

        - Willow swales near outfalls attract SWFL because there is water.
- When swales are disconnected from the river, such as at the Rhodes property, there is a lot of salt accumulation and plants do not do well.
    - The planned CoA swale is fairly close to the river.
- How can the MRGESCP help?
    - Providing input and best management practices/recommendations.*
    - Suggestions for plants that would be beneficial to key species.*
    - Possibly use the Candelaria Nature Preserve for Pecos sunflower planting.*
- If a geodatabase is created, it can be incorporated into the geospatial mapper on the Program Portal.

Wade Wilson, U.S. Fish and Wildlife Service Southwestern Native Aquatic Resources and Recovery Center, presented on the genetics elements added to the RGSM CEM (see slides). Comments are below:

- Wade W. will share the presentation with Thomas Archdeacon, aquatic ecology expert on the SAMC, who was not present at the meeting.
- The RGSM CEM needs to be more complicated to capture everything going on.
- Each arrow on the graphical model is a relationship between a factor and a biotic response or another factor. Relationships are either known or uncertainties. Uncertainties need to be studied more if they are reducible.
- Each arrow will be a row in a table in the Adaptive Management Relational Database (AMRDB).
- The genetics components/relationships added can be linked to different projects.
- What is the next step?
    - To create a S&T Ad Hoc Group, led by Wade W., charged with further development on the RGSM CEM.
    - Catherine M. is working on the group's charge.
- Who picks the members of the ad hoc group?
    - The SAMC can send an initial list to Wade W., and Wade W. can recommend adding/removing members.

Rich Valdez, SWCA Environmental Consultants and former chair of the Population Monitoring Work Group (PMWG), presented on the RGSM Population Monitoring Ad Hoc Group Summary Report (see slides). Main points are below:

- The PMWG put together a summary report on its activities before being disbanded at the December Executive Committee (EC) meeting. Rich V. presented the findings and recommendations from this report to the SAMC.
- The report is being finalized and Rich V. is addressing the comments received. The final version will be provided to the SAMC for review before submitting to the EC.
- The PMWG was charged with three tasks: 1) conduct a workshop on catch-per-unit methodology, 2) review the Middle Rio Grande (MRG) fish monitoring plan (FMP), and 3) update the MRG FMP.
    - Task 2 is the focus of the summary report.
- Rich V. briefly showed the list of preliminary findings from the summary report (see slides).
- The long-term and consistent nature of the data from the FMP, starting in 1993, is its inherent value.
- There have been four science panels dealing with the RGSM. Recommendations from those science panels have been incorporated into the summary report.

- Rich V. listed the preliminary recommendations (see slides). The 15 recommendations will be narrowed down based on all comments received. Recommendations were split into three categories: modifications to sampling design or methodology, modeling and analyses to resolve uncertainty, additional evaluations for future monitoring.
    - Comments on modifications to sampling design or methodology recommendations:
        - #2 Comment - In terms of the 60 sites recommended, the value added diminishes relative to cost after 60 sites.
            - Monitoring over 20 sites improves precision, but returns start to diminish between 50-60 sites. This will need to be looked at further before sites are added.
            - When presenting this to the EC, phrase it so the value added is clear. Hone in on which things are important as far as next steps, so there is a translation from science to management.
        - At U.S. Bureau of Reclamation (Reclamation), there is a perception that a lot of money is already being spent on monitoring. Getting additional funding could be difficult.
            - There is another recommendation to evaluate the sampling design to look at trade-offs (e.g., doing more sampling in October versus other months).
        - Reclamation is also looking into bed material sampling and considering how to capture coarsening over time. In sampling, there may be opportunities to consider geomorphology.
    - Comments on modeling and analyses to resolve uncertainty recommendations:
        - Given how much work has been done to optimize sampling design (in terms of workshops, science panels, etc.), it may be difficult to make any changes.
            - No science panels set up mock sampling designs to address this.
    - Comments on additional evaluations for future monitoring recommendations:
        - #12 Comment – More 2D models are being developed with available data, which can represent in-channel features. Getting data to calibrate those models is important.

Closing comments:

- Suggestion to begin the presentation to the EC with the last slide, which summarizes the PMWG's determinations.
- Suggestion to reword the last bullet to specify uncertainties that cannot be resolved through monitoring.
- The SAMC will come up with a list of ad hoc groups that can get at the issues presented by the PWMG. Rich V. can advise on that list.*
- The SAMC will review the final report and prepare a list of recommendations, which includes potential ad hoc groups, for presentation to the EC.
- The SAMC will review Rich V's slides and send comments to Catherine M.
- The presentation could include more about what was learned and what was done right.
- As a reminder, the MRGESCP does not make management decisions, but can provide recommendations to those who do.

➢ **Action Item**: The PST will send Rich Valdez's PMWG presentation to the SAMC
➢ **Action Item**: The SAMC will submit comments on the PMWG presentation to Catherine Murphy

Science & Technical Ad Hoc Groups

Catherine M. briefly reviewed the S&T Ad Hoc Groups to be created. Main points below:

- The PST will send out the draft S&T Ad Hoc Group charge for incorporating genetics/augmentation into the RGSM CEM for review.
- Catherine M. contacted Charles Yackulic, U.S. Geological Survey, about the RGSM Population Modeling Ad Hoc Group. Catherine M. read his response email to the SAMC.
    - Charles Y. is making suggested changes to the model, including adding age class and salvage data, and incorporating results from expert elicitation results. He will report to the small group in the near future.
- Proposal for a group to add the level of uncertainty in relationships between drivers/stressors and biotic responses in the avian CEMs. The original group can be reconvened to flesh out the CEMs, with the purpose of putting them in a format that can be incorporated into the AMRDB.

➢ **Action Item**: The PST will send out a draft S&T Ad Hoc Group charge for incorporating genetics/augmentation into the RGSM CEM

➢ **Action Item**: The SAMC will review the charge and submit comments to Catherine Murphy

2021 Objectives Revisions from Workshop

The SAMC reviewed the revised objectives and made changes. Main points are below:

- The SAMC were mindful that objectives were on the same level in terms of hierarchy and detail, and that they were not strategies.
- Objective A-1 comments:
    - Response to the question of whether this sub-objective should be its own objective: Understand the limits of the long-term monitoring data. If there is high uncertainty in the analysis and results, then the next step is to find out how to resolve that uncertainty, and identify research that can help reduce that uncertainty.
        - It is specific about reducing uncertainty, so it should be an objective.
        - It is not only related to the RGSM. There is avian data as well.
        - It is more of a scientific consideration for all data, and could be part of a checklist of whether data is appropriate for the question being asked.
        - This issue may be addressed by an S&T Ad Hoc Group.
    - For some there is a huge distinction between CPUE and abundance.
        - Can ‘population’ be used as a catchall for abundance and CPUE?
            - Ultimately, abundance is what you want to know, whether you get there or not.
    - Should it be standard to specify reaches in objectives by reach?
        - RGSM objective groups were adamant about specifying reaches, as management and hydraulics change across reach. This is less important for birds.
    - Projects in the Project Bank will be prioritized based on links to MRGESCP objectives and other elements.
- Objective A-2 comments:
    - Change ‘research’ to ‘increase understanding of.’
    - Take out ‘seven’, in case there are additional life history traits.
        - Each of the seven life history traits could be part of a strategy.

    - The qualifier 'increase the probability of recovery' may not need to be included if it is inherent in the Science & Adaptive Management Plan.
    - Cut out 'scientific tools' as it is vague.
- Objective A-3 comments:
    - Add in 'of RGSM.'
    - There was some debate about using 'self-sustaining' during the Objectives Workshop. The group decided everything the MRGESCP does should be under the umbrella of recovery and opted not to use the term.
    - Revise to "Determine the relationship between base flow and the survival and recruitment…"
        - Flow needs can vary, so it is better to add in 'relationship.'
- Objective A-4 comments:
    - Catherine M.'s suggestion's
        - Replace 'support' with 'evaluate.'
        - Remove 'at least one research/modeling effort per year' and 'on an annual basis' to be consistent with other objectives.
            - Groups decided to make objectives broader and strategies S.M.A.R.T.er.
    - Replace 'optimal' with 'suitable environmental flow (i.e., timing, duration and magnitude of spring hydrograph)' as suggested at the Objectives Workshop.
    - The Objective Workshop group wanted to acknowledge the lack of flexibility in the system and included 'constraints and opportunities.'
    - There was discussion about using 'evaluate' versus 'research/modeling.' The SAMC decided to use 'evaluate.'
- Objective A-5 comments:
    - There was a suggested way to combine both parts of the objective: Refine existing research and modeling efforts to develop a range of options for increasing available habitat quality and quantity at life-stage limiting flow regimes.
        - This implies we already understand the quantity and quality of available habitat.
        - A-5.1 deals with trying to understand the quantity and quality of habitat available at different flow regimes.
            - One of the strategies could focus on better understanding this.
    - A-5.2 is dependent on A-5.1.
    - It is better to keep the objective broad and not limited to low flows. This objective deals with a physical manifestation of flows on the ground versus the spring hydrograph.
    - If objective statements are combined, we could add a strategy for dealing with refugia at life-stage limiting flow.
    - The second objective was developed from discussion about the first, so separating them may result in something being lost.
    - The SAMC decided to approve the original statements.
- Objective B-1 comments:
    - Remove 'designated critical habitat' as suggested at the Objective Workshop. Monitoring should occur wherever SWFL are present.
    - Specifics about monitoring will be in the strategies.
- Objective B-2 comments:
    - The objective should not overlap with the monitoring objective. Instead, it should focus on determining habitat availability within the MRG.
- Objective B-3 comments:

    - Southwestern willow flycatcher do not move around much. As a result, foraging and nesting habitat is nearly identical.
        - For the most part, the goal is to provide breeding habitat.
        - Suggestion to change to 'optimal breeding habitat' and take out '(i.e., migratory, foraging and nesting).'
- Objective C-1 comments:
    - Leave in qualifiers '(i.e., migratory, foraging and nesting)' for the yellow-billed cuckoo (YBCU) because they move around a lot over a large area. Emphasis should be on the importance of foraging habitat.
        - 'Migratory' can be taken out.
    - Add 'on landscape and microhabitat levels' as they have such a large range.
    - During the Objective Workshop, someone asked whether there should be an additional YBCU objective on improving understanding of its life history.
        - This might be captured in the third statement.
- Objective G-1 comments:
    - Suggestion to delete this objective as there is not anything specific the MRGESCP can do to support the conservation pool at the Abiquiu Reservoir.
    - Instead, the objective was broadened to support of all efforts that enhance operational flexibility for water managers in support of species.
- SAMC members will review the remaining objectives and send comments to Catherine M.

- **Action Item**: The PST will send out the revised MRGESCP objectives
- **Action Item**: The SAMC will submit revisions for the remaining MRGESCP objectives to Catherine Murphy

Odds, Ends, and Announcements

- The SAMC will schedule a monthly meeting date for the rest of the year, to make it easier for members to schedule ahead.

- **Action Item**: The PST will send out a Doodle Poll to schedule a monthly SAMC meeting date
- **Action Item**: The SAMC will fill out the Doodle Poll and notify the PST of any recurring obligations

*Requests for SAMC input are highlighted blue.

Meeting Participants

Alan Hatch	EC *Ex Officio* Member
Alyssa O'Brien	City of Albuquerque Open Space Division
Ari Posner	Geomorphology Expert
Catherine Murphy	Program Support Team, SAMC Facilitator
Colleen McRoberts	City of Albuquerque Open Space Division
David Moore	Terrestrial Ecology Expert
Debbie Lee	Program Support Team
Meaghan Conway	Ecosystem Function Expert
Melissa Welsch	Program Support Team
Michelle Tuineau	Program Support Team
Mo Hobbs	Aquatic Ecology Expert
Rich Valdez	SWCA Environmental Consultants
Ryan Gronewold	Hydrology Expert
Wade Wilson	Southwestern Native Aquatic Resources and Recovery Center

RGSM Objective A-1

Original statement: *Analyze available monitoring data for the RGSM from Cochiti Reservoir to Elephant Butte Reservoir to track population trends in the MRG.*

Revised statement:

Estimate the abundance of augmented and wild born RGSM populations in the Angostura, Isleta, and San Acacia reaches from year to year.

- Key questions/takeaways:
  - Relationship of CPUE and abundance?
  - How does mesohabitat availability change at different discharges?
  - Monitoring data may be too coarse to answer more specific analysis questions (i.e. drying and summer survival).
- Sub-objective: Understand the limits of the long-term monitoring data. If there is high uncertainty in the analysis and results, then the next step is to find out how to resolve that uncertainty, and identify research that can help reduce that uncertainty.

Breakout Group: Alison Hutson, Casey Ish, Stephen Zipper, Ryan Gronewold, Charles Yackulic, Debra Hill, Hector Garcia

A-1 Notes:

- The group questioned whether some analysis questions were in the bounds of what the data could answer.
- The original statement is relevant to the goal of having a self-sustaining RGSM population, but it could be more relevant to each reach.
- The monitoring data is year-to-year, but when doing an analysis, may want to look at specific years.
- There is a challenge in the relationship between CPUE and abundance. CPUE is 100 m^2, and amount of water in river can change.
- The group discussed analysis a lot. The other objectives better address impacts of habitat availability or flow variables on the RGSM population.
- This is a broad, coarse dataset. You can see how it's impacted each year based on big variables, but for different types of research, the data may be too coarse and need to be refined.
  - Need to understand limits of data.

A-1 Comments:

- Does abundance refer to relative abundance (CPUE) or total population estimate?
  - Ideally, abundance (CPUE) but relative abundance can be used if there are challenges.
- Looking at catchability of RGSM under different conditions may help address mesohabitat availability change at different discharges. How depth and velocity change catchability may help interpret data from different reaches.
  - This can apply to strategies at the reach level.
- Add uncertainty and looking at biases to capture noise in data.
  - The Sub-objective is related to this.

RGSM Objective A-2

Original statement: *Continue to support research into the life history of the RGSM to further inform management of the species.*

Revised statement:

Research how the seven life history traits of the RGSM change over time and space, and use the results to update the scientific tools to inform management of the species in a way that increases the probability of recovery.

- The 7 life history traits are links to the fitness of the species.
- Fitness: ability of an organism (or population) to survive and reproduce in the environment

Comments from Chat Window:

10:42:52 From Grace Haggerty New Mexico Interstate Stream Commission to Everyone: Can the 7 life history traits be listed in the statement? You need to communicate with non biologists.
10:43:42 From Ari Posner BOR to Everyone: could you talk about how those change over time and space
10:47:27 From Mick Porter - USACE to Everyone: nice framework for looking at the RGSM

Notes by Julie:

S: Contributing to research to understand the seven life history traits and how we can affect them so we can increase the probability of recovery. R: Life history traits are what will be used to inform the conceptual models/population viability analysis. We have to understand these to be able to know how we can affect them (good or bad). How and where can we affect them - management? Length of life – question: can we affect that positive? M: measure within each of the traits (e.g., measure what our practices are doing, what is/how are we affecting their growth pattern, offspring). R: to further inform management of the species

Fitting this into a SMART goal is tough because objectives seem to be meant to be broad, whereas SMART may fit strategies better.

Debated measurement criterion:

- M is hard – how do you measure success?
    - If you have a bad year, do you fail?
    - When we don't put any money to this goal, do we fail?
- Measure should be based on the science and not the administration: We need to know what happens during failure years – why is it failing in this trait? If we can pin down where – there is always something to learn.

Debated the word support – what does support mean?

- Financial – the Program doesn't have a budget, the signatories do, so we don't use this as a measure of support
- The Program is a science-based organization and sharing information – scientifically, and collaborating around resources to get work done
- Use the results of work completed to feed into the tools (conceptual models, PVA)
- If you had all the money in the world and all the power you needed, what would you do scientifically?

Breakout Group: Nathan Schroeder, Anne Marken, Liza Yazzie, Maya Pinon, Reynalden Delgarito, Julie Dickey

A-2 Notes:

- The objective could not hit every SMART letter, but strategies can.
- Decided to focus on research instead of supporting research. The Program is already supporting research and it is difficult to measure support.
- Made the objective specific to seven life history traits, which are measurable.
    - No traits are completely unknown.
- To be relevant for management, we need to know how traits are changing over space and time, and whether we can affect them.
- Life history traits are size at birth; growth pattern; age and size at maturity; number, size, and sex ratio of offspring; age- and size-specific reproductive investment; age- and size-specific mortality; and length of life.

A-2 Comments:

- Do growth rates change in different areas (e.g., Albuquerque and San Antonio)?
    - That needs to be answered with the strategies.
    - Traits are likely different in different reaches due to variability in water availability, food resources, temperature, etc.
- Many efforts are already addressing this objective; they may be included in the strategies.
- You need to focus temporal and spatial scale to fit the species you are working with.

RGSM Objective A-3

Original statement: *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.*

Revised statement:
Determine the base flow needed for survival and recruitment in the Middle Rio Grande.

Suggested Strategies:

- Review current research publications and develop hypotheses to determine the relationship between base flow (outside of spring runoff) and habitat quality (suitability) and availability. (1 year)
- Support development of models, such as integrated population models, habitat suitability models, and hydrologic models, to analyze seasonal and minimal habitat availability during base flow periods by reach, in consideration of variable annual water supply. (1-3 years, depending on model)
- Collect field measurements of habitat, flow, and population data to validate and refine modeling efforts, including routine monitoring and experimental manipulations. (ongoing with annual evaluation, following the AM cycle)

- Clearly define assumptions and uncertainties involving minimum base flow, habitat quality and availability, and a self-sustaining population (including survival rate, recruitment, etc.) as defined by the USFWS in the RGSM Recovery Plan. (ongoing with annual evaluation, following the AM cycle)

Breakout Group: Ara Winter, Ashlee Rudolph, Mark Kelly, Mike Marcus, Rich Valdez, Alyssa O'Brien, Guilherme Dias, Debbie Lee

A-3 Notes:

- The statement was too long, shortened to make it more SMART.
- Developed a basic objective and added detail to strategies.
- Expanded on what base flow means in strategies.
- The group discussed what a self-sustaining population is. Decided to defer to the USFWS definition.
- The objective does not split by reach, as self-sustaining population applies to all MRG, but analyses can split by reach.
- Four SMART strategies were developed, three from preliminary, one new.

A-3 Comments:

- Making objectives SMART can make them convoluted. Detail can be added to strategies instead.
- Self-sustaining is difficult to define. Need further discussion to make it consistent in all objectives.
    - Definition should be decided in collaboration with USFWS.
- The SAMC will pull from different approaches to revising objective statements to standardize the process.
- Base flow could be zero in portions of the Rio Grande at certain times of year. Is base flow equivalent to environmental flow or desired flow?
    - Base flow is tied to the hydrological objective in the 2016 BO that identifies two strategies: production and survival strategy. Base flow is part of survival strategy.

RGSM Objective A-4

Original statement: *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.*

Revised statement:

Evaluate at least one research/modeling effort per year to inform suitable environmental flow (i.e., timing, duration and magnitude of spring hydrograph), given system constraints and opportunities, needed to cue spawning and recruitment for the population.

Suggested Strategies:

- Determine thresholds for each component of the hydrograph based on river conditions (previous, current, forecast).
- Use spawning cues and recruitment conditions determined in Obj A-2, and quality/quantity of habitat determined by Obj A-5.
- Management options – identify policy constraints, volume, etc. based on river conditions (previous, current, forecast).
- Consider management and river conditions by reach to refine recommendations.
- Low flow years: specify magnitude threshold with decision point for recommending allocation of resources based on severity of river conditions.
- Opportunities for storing water from spring runoff as potential conservation tool.
- Jiggle (reach specific) –design study to assess the success of this management action; follow-up to compare/contrast.

Comments from Chat Window:
11:39:51 From Mick Porter - USACE to Everyone: "suitable environmental flow" is probably more useful than "optimal"

Breakout Group: Catherine Murphy, Ari Posner, Grace Haggerty, Dale Strickland, Eric Gonzalez, Carolyn Donnelly, Ryan Gronewald

A-4 Notes:

- Will likely drop “support” and go straight to verbs that are more active.
- Wanted to put a measurable target to hold the Program accountable. At least one effort per year will help us continue addressing the shape of the hydrograph.
- We can apply what we have learned to science the next year.
- The objective is focused on the spring hydrograph (timing, duration, magnitude) but info from other objectives (spawning cues, recruitment conditions) is needed.
    - This was captured in a strategy for incorporating information.
- Another strategy for determining thresholds for each component of the hydrograph (timing, duration, magnitude). We need to determine ideal peaks for each.
- The group included constraints and opportunities in the objective to tie in policy and river conditions.
- The group wanted a more measurable response for time scale, removed species recruitment rates.
- Reach specificity is in strategies versus objective.
- For other strategy, wanted to look at low flow years in particular to create decision point for resource allocation recommendations.
- Another strategy is a study to assess the success of the jiggle.
    - The jiggle is reach-specific, which makes for a good strategy.

A-4 Comments:

- A group is working to shape the hydrograph using Charles Yackulic’s model.

RGSM Objective A-5

Original statement: *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.*

Revised statements:

A-5a Refine existing research and modeling efforts to understand the quantity and quality of habitat available at different flow regimes by 2030.

A-5b Develop a range of options for increasing habitat availability and refugia at life stage limiting flow regimes for all life stages by 2030.

Suggested A5a Strategies:

- Support ongoing hydraulic modeling efforts to quantify available habitat.
- Obtain remote sensing data to add to modeling efforts (there is a need for this at low flows?), including coordinated ground truthing
- Include ground truthing of x sites to measure depth, velocity, river width, and transects to measure flow, (potentially adding to existing effort).

Suggested A5b Strategies:

- Investigate potential strategies for returning agricultural water to increase habitat refugia.
- Investigate strategies to create floodplain structures that increase habitat complexity.
- Support projects (ISARO) to combine low flow conveyance channels to maintain summer flows.

Notes by Melissa:

- Mick brought up the flow relationship with the Central gage and how BR does a LIDAR survey in winter but not at lower flow times. If LIDAR done at different times of the year could see the bottom of the river and compare flow rate when bank full and when single thread
- There was discussion about the depths, velocities, microflows, and what the underwater habitat is like in lower flow scenarios
- Quantina mentioned that minnows were found using outfalls. Megan said the outfalls she sampled recently just had 2 year olds, this led to acknowledgment that different reaches had different flow dynamics
- The discussion of the LIDAR possibilities and the outfall results led to the formation of strategies that were more detail-oriented than the strategies

Breakout Group: Meaghan Conway, Mick Porter, Megan Osborne, Quantina Martine, Andy Dean, Nathan Schroeder, Cynthia Naha

A-5 Notes:

- First thing group did was change “needed” to “available”.
- The group discussed existing efforts going on.
    - Utah State and Colorado State.

  - Instead of contributing to research, decided to acknowledge the research and modeling out there.
- There is a good understanding of recruitment but less of survival, especially for low flow modeling.
- Group discussed limitation of how fish use habitat versus how we catch them.
- We need to figure out how available habitat area changes as flow changes from bank flow to single threaded channel.
- Group discussed constraints of water availability, and how to manage within mandates.
- Most discussion was around modeling habitat availability at low flows, for survival rather than recruitment.

A-5 Comments:

- Is the 2nd bullet under A-5a “obtain remote sensing data" referencing physical habitat or occurrence of fish relative to habitat?
  - One of the challenges and points of interest is looking at habitat availability at low flows.
  - Reclamation flies the river during winter (flows at 400 to 800 cfs). Cannot use Lidar in winter because of turbidity, but if we wait until low flow (single thread), can use Lidar to look at topography that would be inundated at higher flow. Want to use Lidar topography and model as if inundated to determine habitat.
    - Suggestion to add fish sampling component.
    - That captures one element in time, but things change. Are you trying to get a percentage?
      - The Lidar can help with hydraulic model of habitat as flows go up and down. It would provide relative amounts.
    - Is it possible to do measurements from photos?
      - The aerial photo can give info on river width, but we need Lidar for Bathymetry. Could also use drones.
      - Lidar enables 2D models versus 1D models, more spatial representation of depth and velocity.
    - Need to be aware that the river changes year-to-year and under different flows.
    - Suggestion to use underwater vehicles, but need at least a foot of water. Vehicles measure water quality parameters as well.

Day 1 - Closing Discussion:

- Workshop attendees may be called on for feedback as the SAMC works on objectives.
- Suggestion for change to Objective A-3: use “survival and recruitment” instead of “self-sustaining population” (similar to A-4), as it ties more into an objective format. The Program goal already specifies a self-sustaining population of RGSM.
  - This appropriate change should affect other objectives.
- Can Objective A-1 address the question of what a self-sustaining population is?
  - Is that something the monitoring data can address?
    - The objective should help us achieve a self-sustaining population.
    - The data just gives you the numbers, but does not tell you why. So many parameters affect CPUE.

  - A statement on self-sustaining population would make it is easier to tailor objectives.
  - Self-sustaining is a recovery term. If there is an objective that aims to achieve that, it enters into recovery plan territory.
- There needs to be an objective that addresses the genetic effects of augmentation.
  - The objective could be to determine the effect of augmentation on the RGSM population.
  - Could possibly add other species management efforts, like fish rescue.
  - Suggestion to shift the focus of A-1 objective to general species management, which would include those aspects.

RGSM New Objective? Or add this under A-1?

Original statement: *NA*

Suggested statement:

Monitor/Evaluate the effects of species management (i.e., propagation, augmentation, rescue/salvage) on RGSM genetic diversity.

OR

Monitor/Evaluate the effects of species management (i.e., propagation, augmentation, rescue/salvage) on RGSM population viability.

SWFL Objective B-1

Original statement: *Continue monitoring for SWFL in designated critical habitat areas to track territories in the MRG management unit of the Rio Grande recovery unit.*

Revised statement:
Monitor for SWFL in designated critical habitat in the MRG management unit of the Rio Grande recovery unit.

Suggested Strategies:

- Conduct annual SWFL surveys in designated critical habitat areas to track territories in the MRG management unit.
- Conduct annual SWFL nest monitoring in designated critical habitat areas to track population dynamics in the MRG management unit.
- Develop a tiered strategy for surveys at varying levels of effort to account for years when the full effort cannot be implemented, to prioritize "core" populations and ensure that every site in the MRG is surveyed at least once every three years. (within a year)
- Analyze available survey data annually to ensure SWFL territories are not decreasing in the MRG management unit. If the number of territories are decreasing, review habitat areas where territories have decreased to make recommendations for improving habitat to increase SWFL territories.
- Analyze available nest monitoring data annually to determine limiting factors to SWFL population growth and sustainability.

Breakout Group: Dave Moore, Ari Posner, Eric Gonzales, Maya Pinon, Debbie Lee

B-1 Notes:

- The group broadened the objective and included additional strategies.
- Monitoring is not just tracking territories, but determining how birds are doing in nesting attempts relative to habitat.
- Revised statement changed to "monitor" instead of "continue monitoring," as funding is on-and-off. Surveys are not always done throughout the MRG.
- The group included strategies to conduct annual SWFL surveys and nest monitoring in designated territories.
- Another strategy included for taking surveys at different levels of effort to ensure core populations are still monitored when the full effort cannot be made.
    - Previous efforts have been able to monitor the entire MRG, but not recently.
    - We always want a general grasp on the population.
    - USFWS is shifting towards a full survey every three years when funding is not available.
- We need to analyze annual survey data to ensure SWFL territories are not decreasing, and make recommendations to improve habitat if they are.
- We need to analyze nest monitoring to determine limiting factors to SWFL population growth.
    - Limiting factor are mostly habitat-related, but there are sometimes other factors (e.g., cowbird parasitism)

B-1 Comments:

- The Program is not in the 2016 BO, and should not be as connected to what happens in the BO. Suggestion for the Program to return to looking at the species in the Program area versus just the MRG.
    - One of the Program strategies could be to figure out what other monitoring is occurring for the SWFL to determine how other units are doing. As climate changes, we may need to look outside the MRG to find habitat.
- We need to consider focusing habitat areas in more than one place, and think more strategically about spreading the birds out. It is not easy but beneficial.
    - It is better now that it was before, 90% of the population used to be in one area. Now, populations are growing in other areas.
    - SWFL do not like to travel far, they prefer hopping close by.
- The objective is too narrow. Science takes place outside of designated critical habitat. For example, there are SWFL at the Pueblos that should be monitored.
    - The Program's jurisdiction does not meet the Pueblos, but under the new Science & Adaptive Management Plan, the Program will focus on using science to inform management. The Program's science is not limited by jurisdictional lines.

SWFL Objective B-2

Original statement: *Continue monitoring critical SWFL habitat and contribute to research on the impacts from non-native and exotic species on SWFL recovery.*

Revised statements:

Monitor available SWFL habitat to determine habitat availability within the MRG.

- This objective informs Objective B-3.

Suggested Strategies:

- Every 3-4 years, determine the availability of suitable, moderately suitable, and unsuitable SWFL habitat patches in the MRG management unit.
- Every 3-4 years, ground truth vegetation remote sensing models and refine models.
- Maintain and update Hink & Ohmart maps on the Program Portal as new data is acquired.

Comments from Chat Window:

10:53:06 From Meaghan Conway to Everyone: https://nhnm.unm.edu/riparian/nmripmap
10:56:18 From Meaghan Conway to Everyone: The project summary should link to a document with and overview of the methods used to create the map

Breakout Group: Dave Moore, Ari Posner, Eric Gonzales, Maya Pinon, Debbie Lee

B-2 Notes:

- The group decided native and exotic species were an issue to all listed species and the health of the whole riparian system.
    - The group created a new objective to address this.

- Objective B-2 was revised to specify monitor for SWFL habitat availability to inform restoration activities in the MRG.

SWFL New Objective

Original statement: *NA*

Suggested statement:

Determine the impacts from non-native vegetation on listed species' habitat availability and population dynamics.

Suggested Strategies:

- Maintain and update Hink & Ohmart maps on the Program Portal as new data is acquired.
- Research the relationship of non-native vegetation on lited species' habitat availability.
- Research the relationship of non-native vegetation on listed species' population dynamics.
- Make management recommendations to minimize and mitigate negative impacts from non-native species to the listed species in the MRG.

New Objective Notes:

- The new objective was spawned from Objective B-2.
- A strategy was included to determine the distribution of non-native vegetation and overlap of vegetation with listed species' habitat.
- Another strategy included to investigate potential interactions between listed species and non-native vegetation.

New Objective Comments:

- Heritage New Mexico is developing a riparian habitat vegetation map that is available for download. The MRG area is done, and lists native, non-native, mixed.
    - There is overlap with the Hink and Ohmart map.
    - What was methodology for putting the map together?
        - Satellite data, Lidar, ground-truthing, classification modelling, vegetation height model.
    - The biggest gap in data was underneath the top of the canopy. That data is tough to get with aerial imagery.

SWFL Objective B-3

Original statement*: Support large-scale restoration efforts to protect and expand SWFL habitat in the MRG.*

Revised statements:

B-3a Characterize optimal habitat (i.e., migratory, foraging and nesting) conditions in currently occupied SWFL locations to inform restoration.

B-3b Manage successional processes that maintain existing SWFL habitat (i.e., migratory, foraging and nesting) in the Program Area.

Suggested Strategies:

- Determine factors that cause habitat loss, accounting for successional processes
- Maintenance and adaptive management…
- Develop record of past activities and findings for reference (success vs. failure) and planning (modeling)

B-3c Expand SWFL habitat (i.e., migratory, foraging and nesting) through restoration efforts in the Program Area.

Suggested Strategies:

- Investigate opportunities to expand spatial scale for study/recovery
- Invite San Juan Conservation District? and others to present brown bags seminars on SWFL conservation for information exchange.
- Identify water availability and resources for creating SWFL habitat.

Note: Look at how habitat overlaps with other species (e.g., YBCU, NMMJM, others).

Comments from Chat Window:

11:06:03 From Hector Garcia to Everyone: Through the years the birds have also selected what we humans would say is not good habitat. So statistics tells us preferred but the bird has the final say. Key is how many HR projects have we done, how many have the right veg structure, and how many have birds nested in? Success is NOT only bird is using, providing the appropriate veg structure is success to us HR builders.

Breakout Group: Mo Hobbs, Meaghan Conway, Grace Haggerty, Amy Erickson, Andy Dean, Catherine Murphy

B-3 Notes:

- The group had a similar conversation as others to determine whether to use “MRG” or “Program area.”
- The strategies developed for the first objective could look at specific habitat for specific life history needs.

- The first objective focused on locations SWFL occupy. Currently, some restoration occurs in areas SWFL do not occupy. We want to know the ideal environmental triggers for SWFL habitat restoration.
- The group also wanted to look at habitat overlap with other species.
- The objectives are focused on expanding habitat and knowing when habitat is successful.

B-3 Comments:

- How do the objectives overlap with the other SWFL objectives?
    - There is some overlap with habitat mapping, but the objectives need to be laid out and consolidated, if possible.
- Various studies have been done on characterizing optimal habitat; that data needs to be brought in.
    - Objective 1 should focus on incorporating that information into useful activities moving forward. The verb in the objective needs to change.
    - Past SWFL studies used various methods.
        - If we knew how we wanted to analyze data, could methods be standardized?
            - Making recommendations for what data should be collected and how would be a good thing.

YBCU Objective C-1

Original statement*: Contribute to research and understanding of habitat needs for the YBCU.*

Revised statements:

C-1a Characterize optimal habitat (i.e., migratory, foraging and nesting) conditions in currently occupied YBCU locations to inform restoration.

Suggested Strategies:

- Strengthen understanding of effects from stressors and drivers (e.g., anthropogenic activities, vegetation structure/species, patch size, and prey abundance) on all life stages?

C-1b Determine successional processes that maintain existing YBCU habitat (i.e., migratory, foraging and nesting) in the Program Area.

C-1c Intensify/expand monitoring program/effort for YBCU.

Suggested Strategies:

- Increase use of tracking technology, etc.
- Determine YBCU habitat use outside of areas used by SWFL?

Next Steps: Protect existing habitat; Outreach concerning seasonal foraging area use for YBCU (promote recommended land-use practices: no-till, organic, noise reduction).

Comments from Chat Window:
11:10:30 From Grace Haggerty New Mexico Interstate Stream Commission to Everyone: Vicky may have had some recommendations not considered here. Genetics and possibly modeling efforts.
11:12:15 From Ari Posner BOR to Everyone: Do we have a strong understanding of their life-history?
11:34:18 From David Moore - BOR to Everyone: Ari - cuckoo life history? Somewhat. Knowledge of habitat requirements is not great.
11:35:25 From Ari Posner BOR to Everyone: Yes, I was thinking we need an objective to improve understanding of the Cuckoo life-history/develop an ecological model.
11:36:03 From Debbie Lee to Everyone: The Program did develop a CEM for YBCU life history, but there are a lot of uncertainties embedded in there.

Breakout Group: Mo Hobbs, Meaghan Conway, Grace Haggerty, Amy Erickson, Andy Dean, Catherine Murphy

C-1 Notes:

- The group changed vague wording, and copied a lot from the previous objective.
- One strategy is to strengthen understanding of stressors and drivers identified in the YBCU conceptual ecological model.
- As less is known about this species, there is a focus on expanding monitoring.
- SWFL and YBCU habitat overlap but the YBCU has a much larger territory.

C-1 Comments:

- Birds have selected habitat that we would not deem good. The key is determining how many habitat restoration projects have been done, how many have the right vegetation structures, and how have nested birds.
    - That may be captured in the first YBCU objective.
- We know a lot less about YBCU, and we have been trying to figure out more about them for years.
    - We are starting from a lower knowledge base than the SWFL.
- We may want to look to things Vicky Ryan recommended. She advocated for a modeling effort and discussed genetics.
    - The genetics conversation was probably related to eastern versus western YBCU. The conversation has largely been put to rest.
    - The conversation came up again last year when the USFWS was considering whether to continue to list the Western YBCU.
- How many other entities are working with the YBCU like NM?
    - NM has been extremely proactive and are in the top tier of research related to the species.
    - We need comparable data from other locations.
    - We are only six years out from listing, and more information is still being discovered. YBCU are being found in unexpected places.

NMMJM Objective D-1

Original statement: *Contribute to efforts to expand habitat and preserve existing habitat in the MRG.*

Revised statements:

D-1a Initiate and support NMMJM monitoring efforts to identify relevant habitat features, potential additional habitat, and existing populations.

D-1b Contribute to efforts to expand habitat and preserve existing habitat in the MRG.

Suggested Strategies:

- Expand on existing vegetation/habitat monitoring efforts to include vegetation characteristics relevant to NMMJM (e.g. herbaceous vegetation).
- Analyze monitoring data to determine potential habitat.
- Identify and survey potential NMMJM habitat in the MRG.

Comments from Chat Window:

08:06:52 From Hector Garcia to Everyone: Hector: the key on the mouse and the sunflower is that it impacts mainly the reach below SADD, which is a key to the minnow and birds. So if you look at ecosystem as a whole it is good to have a combo of species.

11:29:19 From Debbie Lee to Everyone: NMMJM potential strategies - Evaluate efficacy of non-invasive survey methodologies. Develop potential strategies for reintroduction

11:32:42 From David Moore - BOR to Everyone: Hector, at one point there was talk about refining Frey's NMMJM habitat map for Reclamation lands. Did that ever happen?

Breakout Group: Megan Friggens, Hector Garcia, Alyssa O'Brien, Ondrea Hummel, Jenny Davis, Melissa Welsch

D-1 Notes:

- The NMMJM and PESU are not often spotlighted.
- The original objective is jumping ahead, and we may need to focus on monitoring efforts instead.
- We need to address the first objective and get basic data before contributing to efforts in Objective 2.

D-1 Comments:

- We need people to help create conceptual ecological models for the NMMJM and PESU.
- Is Strategy C related to identifying potential habitat that NMMJM can be transferred into, or are we still looking for where PESU are?
    - It could likely be both.
    - There have been recent discoveries in places we did not know before within the last few years.
    - There is still a lot unknown about where NMMJM occur.
    - The NMMJM and PESU inhabit areas that are not right on the riverbank. Surveys may not be capturing them well.

  - This issue came up during a 2016 workshop with Jennifer Frey. One potential strategy identified was to look at the NMMJM's historic range, and do some concentrated surveys.
  - NMMJM are very specific in habitat requirements. Previous efforts looked in areas with suitable habitat, and they were not found.
  - There have not yet been reintroduction efforts.
- Would any suitable habitat be considered for NMMJM reintroduction?
  - The process would likely be heavily scrutinized by the USFWS.
  - The habitat is so specific for the NMMJM, it is not repeatable.
  - Jennifer Frey previously did a study, and Reclamation were not comfortable with how far she went with habitat determination. We are back at step 1 with the NMMJM. No one is surveying for the mouse except USFWS.
  - This discussion could be encompassed in a Strategy D "explore potential options for NMMJM reintroduction if suitable habitat is found."
- Another potential strategy could be to evaluate the efficacy of non-invasive survey methodologies. This was discussed at the previous workshop.

PESU Objective E-1

Original statement: *Continue monitoring for PESU stands in the West-Central New Mexico Recovery Region and preserve habitat.*

Revised statements:

E-1a Continue and expand monitoring and surveying for PESU stands in the West-Central New Mexico Recovery Region.

E-1b Preserve and expand existing habitat stands in the West-Central New Mexico Recovery Region.

Suggested Strategies:

- Coordinate existing monitoring and surveying efforts through data sharing efforts
- Expand on existing monitoring efforts to determine PESU habitat indicators/requirements
- Collect seeds from appropriate existing populations to establish a seedbank

Comments from Chat Window:

08:06:52 From Hector Garcia to Everyone: Hector: the key on the mouse and the sunflower is that it impacts mainly the reach below SADD, which is a key to the minnow and birds. So if you look at ecosystem as a whole it is good to have a combo of species.

11:36:05 From Grace Haggerty New Mexico Interstate Stream Commission to Everyone: There was a great video of Pecos sunflower effort outside the Rio Grande. Can someone remind of that?

11:37:22 From Debbie Lee to Everyone: FWS mapping PESU: https://youtu.be/g2ewLn2tpZY

11:38:42 From Debra Hill to Everyone: Sarah_Yates@fws.gov Sunflower lead

11:39:21 From Grace Haggerty New Mexico Interstate Stream Commission to Everyone: Contact Gina Della Russo on the Rhodes Property work on the Pecos Sunflower. Save our Bosque Task Force.
11:42:09 From Meaghan Conway to Everyone : The film I saw was called Saving Beauty , the YouTube link no longer works so it may have only been temporarily available.
11:43:50 From Debbie Lee to Everyone: Found Saving Beauty: https://www.savingbeautyfilm.com/film#:~:text=The%20Pecos%20Sunflower%2C%20listed%20as,into%20a%20sea%20of%20gold
11:46:46 From Meaghan Conway to Everyone: Yes, that's it, thanks Debbie

Breakout Group: Megan Friggens, Hector Garcia, Alyssa O'Brien, Ondrea Hummel, Jenny Davis, Melissa Welsch

E-1 Notes:

- This objective was heavily informed by survey responses.
- We need more basic information to make informed decisions on the PESU.
- One strategy for seed collection; there was a lot of discussion on planting, and how it can be fairly easy to do.

E-1 Comments:

- There is a known population at La Joya and on the Rhodes' property. The La Joya population is naturally occurring and the Rhodes population was planted. Surveys were done at La Joya in 2018, and at the Rhodes' property in 2017.
- There is a lead person at USFWS who can coordinate PESU efforts, Sarah Yates (Sarah_Yates@fws.gov).
- Seed collection gives the Program an opportunity for hands-on participation.
- We could potentially meet recovery goals easily.
- There is a video on mapping the PESU at Bitter Lake on Youtube: https://youtu.be/g2ewLn2tpZY.
- Contact Gina Della Russo, Save our Bosque Task Force, on the PESU Rhodes' Property work.

OTHER Objective F-1

Original statement: *Monitor the status of other threatened species in the MRG.*

Revised statement:
Monitor core habitat trends in the MRG for general and specific indications of decline.

Suggested Strategies:

- Review the biennial assessment from the NMDGF for status of various species in the MRGESCP area. Consider including protection measures for applicable species in restoration efforts, where possible.
- Include other monitoring efforts of (i.e. monitoring migratory bird trends, habitat monitoring) in the MRGESCP database.
- Compile a database of habitat and biological surveys within the MRG and update annually

Breakout Group: Ryan Gronewold, Mark Kelly, Lawrence Abeita, Trevor Birt, Casey Ish, Debra Hill

F-1 Notes:

- Decided to look more at the overall ecosystem health, instead of focusing on specific species or type of habitat.
- There is overlap with other objectives, specifically the new objective.
- The first two strategies are remnants of the originals. Strategy C is new.
    - There is overlap with other objectives in terms of looking at the Hink and Ohmart surveys and updating the conceptual ecological models.
- This objective can likely be combined with the new objective.

F-1 Comments:

- Habitat is different for different species. We may want to identify the indicators for decline in the MRG (e.g., flow, tree coverage, sediment transfer). Or, are we just watching species that may be at risk of becoming listed.
    - We want to get to a point of watching at risk species.
    - The objective is considered the state of habitat in the MRG instead of habitat for specific species. MRG habitat could be addressed with vegetation surveys, for example. We want to see how things are changing over time, and establish the AM Relational Database to see trends.
    - Ecosystem may be a better word to use. That would open up the objective to broader future studies.
- There is an existing monitoring effort with bird surveys by Hawks Aloft. Unsure of entire area of coverage and there have been funding issues.
- Are trends referring to climate change or general trends?
    - General trends.

OTHER Objective G-1

Original statement: *Support the establishment and maintenance of a Conservation Storage pool in Abiquiu Reservoir status of other threatened species in the MRG.*

Revised statement:

Support the establishment and maintenance of a Conservation Storage pool in Abiquiu Reservoir that enhances the operational flexibility of water managers to support species.

Suggested Strategies:

- Provide monitoring data to support the environmental assessment process to establish the conservation storage pool.
- When possible, find available water to support the conservation storage pool to benefit species and habitat.
- Compile/present monitoring data for various species/habitat uses to advise on annual storage volumes.

Comments from Chat Window:
11:51:18 From Ari Posner BOR to Everyone: Investigate the potential benefit of...
11:54:18 From Hector Garcia to Everyone: Change environmental assessment to compliance
11:58:40 From Hector Garcia to Everyone: To add to Grace's comments of other water there can be "support to changes/updates to the Compact"

Breakout Group: Ryan Gronewold, Mark Kelly, Lawrence Abeita, Trevor Birt, Casey Ish, Debra Hill

G-1 Notes:

- The objective is specific to the effort by the ABCWUA, in coordination with USACE, to establish and maintain a conservation storage pool in Abiquiu Reservoir.
- Abiquiu Reservoir is authorized for 200,000 acre-feet of water storage.
    - That storage space is mostly owned by ABCWUA.
    - Previously, the reservoir was only authorized for San Juan Chama water. The only place you could store native runoff was at El Vado.
- Legislation passed in September 2020 that allows for native Rio Grande storage at Abiquiu Reservoir.
    - That storage could potentially be useful to for water management in the MRG, including for listed species.
- There are several hurdles to get through before storing native water.
    - Needs a storage permit.
    - NEPA compliance.
    - Needs approval from Rio Grande Compact Commission.
- The group struggled with how the Program can help the objective.

G-1 Comments:

- The Program can provide the scientific justification for the storage pool. That way, there will not be a need to do additional studies to show that.
- Suggestion to change the objective to “Investigate the potential impacts and benefits of…”
- What monitoring data is the strategy referring to?
    - Any data that can be used to show the benefit of the action.
    - Suggestion to use “data” instead of “monitoring.”
- There are a ton of data, models, and reports that show the potential benefit of storing water at Abiquiu. For example, you could have one longer peak instead of two small peaks in the spring.
    - We could make a strong case for having continuous high flows versus spotty high flows for the RGSM.
    - This objective could be linked back to the RGSM objective on the hydrograph.
- This is the only objective related to water management. We need to go back to other water issues (e.g., Cochiti deviation, El Vado modification, working with Colorado to distribute flows differently) to address adaptive management.
    - The group talked about ways to acquire or mange water in the system, but unsure what Program role should be. It is good to get people thinking about it.
    - As the Program shows success and informs adaptive management, people may be less rigid.
- We may want to be less specific to Abiquiu. It may be better to concentrate on smaller things to do for water management, rather than a big agency-centric effort.

MRGESCP Objectives Workshop, Feb. 10-11, 2021
SAMC Revision Summary

Below is a list of the draft MRGESCP planning objective statements revised first during the 2021 Objectives Workshops and subsequently by the Science and Adaptive Management Committee (SAMC). Once revisions are complete, the objectives will be recommended to the Executive Committee for use in updating the Science and Adaptive Management Plan, Adaptive Management Relational Database, and Long-Term Plan for the MRGESCP.

Workshop Attendees (Day 1 - RGSM)	**Workshop Attendees (Day 2 – Avian/Other)**
Alison Hutson, NMISC	Alyssa O'Brien, City of ABQ Open Space
Alyssa O'Brien, City of ABQ Open Space	Amy Erickson, Audubon Southwest
Andy Dean, USFWS ES Office	Andy Dean, USFWS ES Office
Anne Marken, MRGCD	Ari Posner, USBR
Ara Winter, BEMP	Casey Ish, MRGCD Conservation Program
Ari Posner, USBR	Dave Moore, USBR Technical Service Center
Ashlee Rudolph, USBR	Debra Hill, USFWS
Carolyn Donnelly, USBR	Eric Gonzales, USBR
Casey Ish, MRGCD Conservation Program	Grace Haggerty, NMISC
Charles Yackulic, USGS	Hector Garcia, USBR
Cynthia Naha, Santo Domingo Pueblo	Jenny Davis, USFWS
Dale Strickland, WEST, Inc.	Lawrence Abeita, BIA
Debra Hill, USFWS	Liza Yazzie, Realty Specialist, USBR
Eric Gonzales, USBR	Mark Kelly, ABCWUA
Grace Haggerty, NMISC	Maya Pinon, Rep. Deb Haaland--NM01
Guilherme Dias, UNM Department of Biology	Meaghan Conway, NMDGF
Hector Garcia, USBR	Megan Friggens, USFS Rocky Mountain Research Station
Liza Yazzie, Realty Specialist, USBR	Mo Hobbs, ABCWUA
Mark Kelly, ABCWUA	Ondrea Hummel, Tetra Tech
Maya Pinon, Rep. Deb Haaland--NM01	Ryan Gronewold, USACE
Meaghan Conway, NMDGF	Trevor Birt, NMISC
Megan Osborne, UNM	*Catherine Murphy, PST*
Mick Porter, USACE	*Debbie Lee, PST*
Mike Marcus, MRG Water Advocates Board	*Melissa Welsch, PST*
Mo Hobbs, ABCWUA	*Michelle Tuineau, PST*
Nate Caswell, USFWS New Mexico FWCO	
Nathan Schroeder, Pueblo of Santa Ana	
Quantina Martine, Audubon Southwest	
Reynalden Delgarito, USACE	
Rich Valdez, SWCA, representing NMISC	
Ryan Gronewold, USACE	
Steve Zipper, SWCA	
Thomas Archdeacon, USFWS-NMFWCO	
Catherine Murphy, PST	
Debbie Lee, PST	
Julie Dickey, PST	
Melissa Welsch, PST	
Michelle Tuineau, PST	

RGSM Objective A-1

Original statement: *Analyze available monitoring data for the RGSM from Cochiti Reservoir to Elephant Butte Reservoir to track population trends in the MRG.*

Revised statement: ***Estimate the abundance of augmented and wild born RGSM populations in the Angostura, Isleta, and San Acacia reaches from year to year.***

RGSM Objective A-2

Original statement: *Continue to support research into the life history of the RGSM to further inform management of the species.*

Revised statement: ***Increase understanding of how the life history traits of the RGSM change over time and space, to better inform management of the species and increase the probability of recovery.***

RGSM Objective A-3

Original statement: *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.*

Revised statement: ***Determine the relationships between base flow and survival and recruitment of RGSM in the Middle Rio Grande.***

RGSM Objective A-4

Original statement: *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.*

Revised statement: ***Evaluate suitable environmental flow (i.e., timing, duration and magnitude of spring hydrograph), given system constraints and opportunities, needed to cue spawning and recruitment for the RGSM population.***

RGSM Objective A-5

Original statement: *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.*

Revised statements:

A-5.1) Refine existing research and modeling efforts to understand the quantity and quality of habitat available at different flow regimes by 2030.

A-5.2) Develop a range of options for increasing habitat availability and refugia at life stage limiting flow regimes for all life stages by 2030.

RGSM Objective A-6

Original statement: *NA*

Suggested statement:
Monitor/Evaluate the effects of species management (i.e., propagation, augmentation, rescue/salvage) on RGSM genetic diversity.

OR

Monitor/Evaluate the effects of species management (i.e., propagation, augmentation, rescue/salvage) on RGSM population viability.

SWFL Objective B-1

Original statement: *Continue monitoring for SWFL in designated critical habitat areas to track territories in the MRG management unit of the Rio Grande recovery unit.*

Revised statement: ***Monitor for SWFL in the MRG management unit of the Rio Grande recovery unit.***

SWFL Objective B-2

Original statement: *Continue monitoring critical SWFL habitat and contribute to research on the impacts from non-native and exotic species on SWFL recovery.*

Revised statement: ***Determine SWFL habitat availability within the MRG.***

SWFL Objective B-3

Original statement*: Support large-scale restoration efforts to protect and expand SWFL habitat in the MRG.*

Revised statements:
B-3.1) Characterize optimal breeding habitat conditions in currently occupied SWFL locations to inform restoration.

B-3.2) Manage successional processes that maintain existing SWFL breeding habitat in the Program Area.

B-3.3) Expand SWFL breeding habitat through restoration efforts in the Program Area.

Other Objective H-1

Original statement: *NA*

Suggested statement:

Determine the impacts from non-native vegetation on listed species' habitat availability and population dynamics.

YBCU Objective C-1

Original statement*: Contribute to research and understanding of habitat needs for the YBCU.*

Revised statements:

C-1.1) Characterize optimal habitat (i.e., foraging and nesting) conditions on landscape and microhabitat levels in currently occupied YBCU locations to inform restoration.

C-1.2) Determine successional processes that maintain existing YBCU habitat (i.e., foraging and nesting) in the Program Area.

C-1.3) Intensify/expand monitoring program/effort for YBCU.

NMMJM Objective D-1

Original statement: *Contribute to efforts to expand habitat and preserve existing habitat in the MRG.*

Revised statements:

D-1.1) Initiate and support NMMJM monitoring efforts to identify relevant habitat features, potential additional habitat, and existing populations.

D-1.2) Contribute to efforts to expand habitat and preserve existing habitat in the MRG.

PESU Objective E-1

Original statement: *Continue monitoring for PESU stands in the West-Central New Mexico Recovery Region and preserve habitat.*

Revised statements:

E-1.1) Continue and expand monitoring and surveying for PESU stands in the West-Central New Mexico Recovery Region.

E-1.2) Preserve and expand existing habitat stands in the West-Central New Mexico Recovery Region.

OTHER Objective F-1

Original statement: *Monitor the status of other threatened species in the MRG.*

Revised statement: ***Monitor ecosystem trends in the MRG for general and specific indications of decline.***

OTHER Objective G-1

Original statement: *Support the establishment and maintenance of a Conservation Storage pool in Abiquiu Reservoir status of other threatened species in the MRG.*

Revised statement: ***Support efforts to enhance the operational flexibility of water managers to support species.***

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

Approved by Science and Adaptive Management Committee (SAMC) on _____, *2021*.

Parent Committee
Science and Adaptive Management Committee.

Ad Hoc Group Charge
Identify a series of genetic components that inform, and are informed by, the life history characteristics of the Rio Grande silvery minnow (RGSM) and its 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,
Alison Hutson, New Mexico Interstate Stream Commission,
Kathy Lang, City of Albuquerque BioPark,
Dana Price (?), U.S. Army Corps of Engineers,
Michael Porter (?), U.S. Army Corps of Engineers,
Megan Osborne (?), University of New Mexico
Others?

Iterative Task Development

Background
Work being conducted on RGSM genetics guides and informs the propagation and augmentation plans. Thus, this work is also integral to our understanding of population dynamics. Any representation of RGSM population-level responses to environmental influences, therefore, should also include factors that affect the augmented species' genetic integrity and diversity. As such a representation, the conceptual ecological model for RGSM currently fails to capture the full suite of threats to 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)."

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

Tasks and Deliverables

Task 1: Add genetics components to RGSM CEM

Identify a series of genetic components 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:
Incorporation of genetic components into the RGSM CEM will facilitate additional linkages to Collaborative Program Objectives and RGSM recovery criteria.

Deliverable:
1) Schematic of RGSM CEM (provided by PST) modified to include genetic components and relationships with other components and life stages.
2) Presentation of modified schematic to SAMC, followed by discussion.

Task 2: Characterize relationships among RGSM CEM components

Indicate the level of influence and level of uncertainty for each relationship between pairs of components in the RGSM CEM.

Objective of Task 2:
Characterization of relationships with the added genetic components in the RGSM CEM will help to identify critical uncertainties for further study.

Deliverable:
Table of individual relationships between pairs of components in the RGSM CEM (provided by PST) with levels of influence and uncertainty characterized as High, Medium or Low.

Timeline and Reporting Scheduling

Task	Subtask	Deliverable	To Be Completed By
Task1: Add components to RGSM CEM	NA	Modified schematic of RGSM CEM	TBD
		Presentation to SAMC	TBD
Task 2: Characterize relationships	NA	Modified table of relationships in RGSM CEM	TBD

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.