

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

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