MIDDLE RIO GRANDE ENDANGERED SPECIES COLLABORATIVE PROGRAM

October 2022 Newsletter

THE VEGETATED ISLANDS WORKSHOP:

FINDING THE RIGHT PROBLEM

Provided by Michelle Tuineau, Program Support Team (PST)

On October 4-5, 2022, forty-two (42) participants from seventeen (17) different organizations braved the rainy weather and Balloon Fiesta traffic to join us in person for the Management of Vegetated Islands and Bank-Attached Bars Workshop. We thank all attendees for joining us in the spirit of collaboration, and offer a special thanks to Pueblo of Santa Ana for the generous offer to host the event at the Tamaya Wellness Center. Many thanks to the Workshop Small Group members (listed on pg 3) and workshop facilitators (listed on pg 4) for designing, facilitating, and summarizing the workshop with the help of the PST.

The goal of the workshop was to **identify planning and research needs for managing vegetated islands and bank-attached bars**. The workshop used three main activities to reach this goal: **a series of presentations** that set the stage for discussing vegetated islands/bars, a **poll exercise to assess issues** related to vegetated islands/bars, and three consecutive **breakout sessions that guided participants through a structured decision making (SDM) process to develop problem statements, objectives, and strategies** that address planning and research needs for vegetated islands/bars.

Day One opened with a **word cloud** exercise using Poll Everywhere. Respondents described their feelings about vegetated islands in one word (shown above). The more a word was used, the larger it was depicted. **"Dynamic"** was by far the most used word, which hinted at the complexity of the topic and the many conversations to come.

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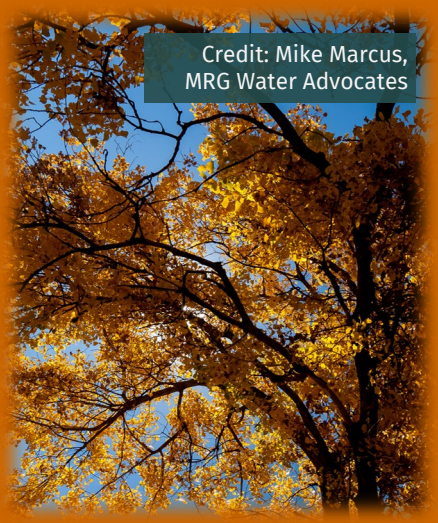
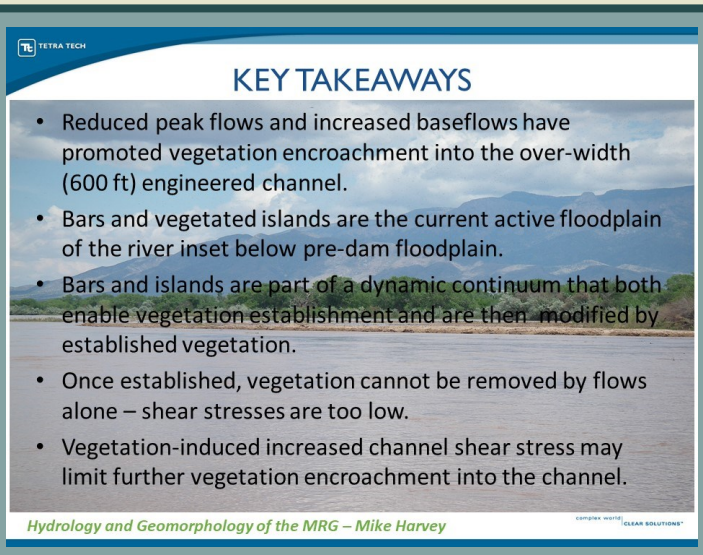
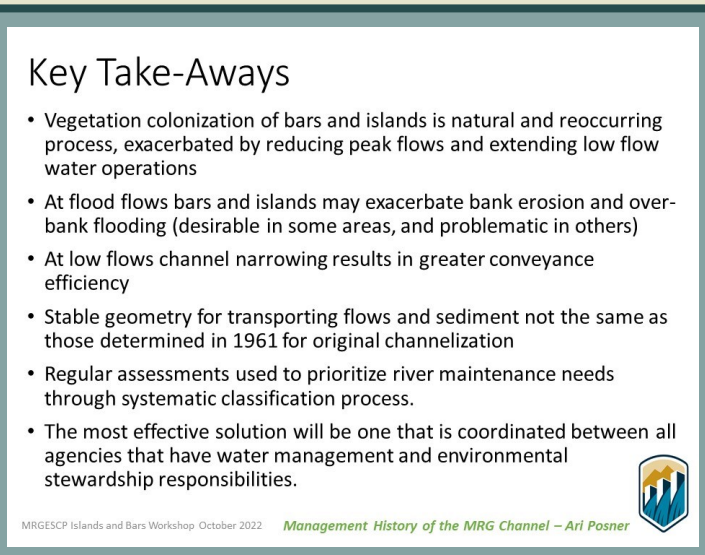
FEATURED THIS ISSUE:

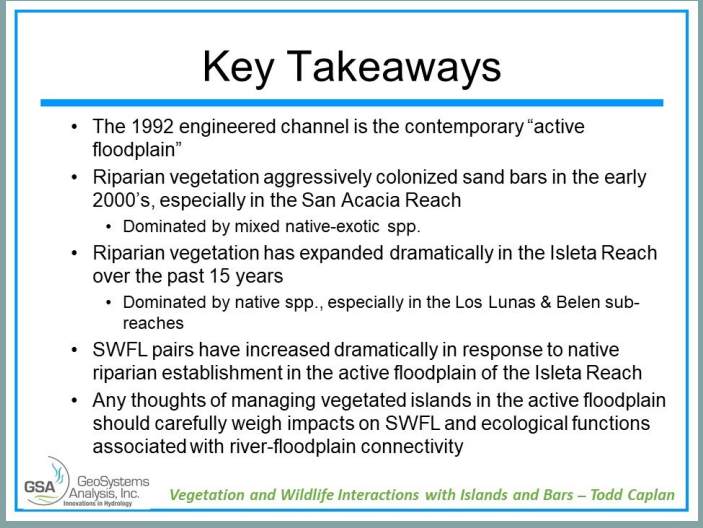

Credit: Mike Marcus, MRG Water Advocates

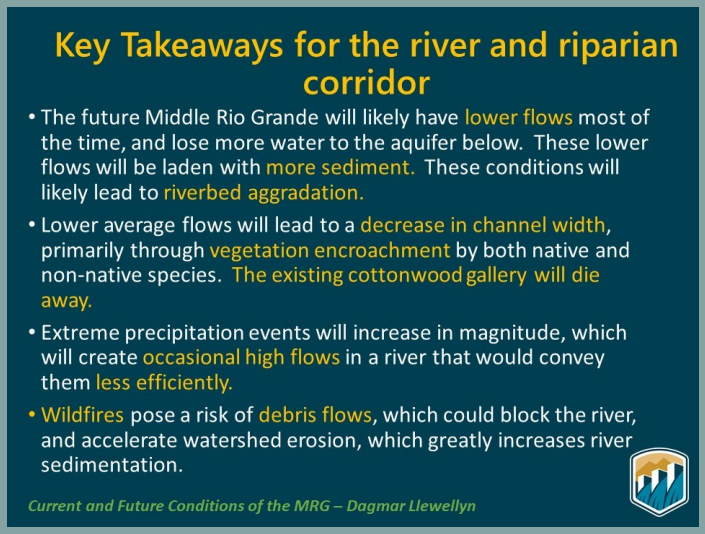
VEGETATED ISLANDS WORKSHOP CONT.

Next on Day One, four presenters set the stage with talks on different aspects of vegetated islands/bars. **Mike Harvey**, Tetra Tech, Inc., presented on **hydrology and geomorphology of the Middle Rio Grande (MRG)**. **Ari Posner**, U.S. Bureau of Reclamation (Reclamation), presented on **river channel management and maintenance activities in the MRG**. **Todd Caplan**, GeoSystems Analysis, presented on **riparian vegetation establishment in the channel and the impact on southwestern willow flycatchers**. Dagmar Llewellyn, Reclamation, presented on the **current and future condition of the MRG**. Key takeaways from the presentations are shown below. Workshop participants engaged with a panel of the four presenters during the follow up Q&A session (photo on page 3). Recordings of all presentations and the Q&A session are available on the Program Portal (**https://webapps.usgs.gov/MRGESCP/**).









Figures: Key takeaways from the workshop presenters. [upper left] Mike Harvey, Hydrology and Geomorphology of the MRG; [upper right] Ari Posner, River Channel Management and Maintenance in the MRG; [bottom left] Todd Caplan, Riparian Vegetation Establishment in the Channel; and [bottom right] Dagmar Llewellyn, Current and Future Conditions of the MRG.

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VEGETATED ISLANDS WORKSHOP CONT.

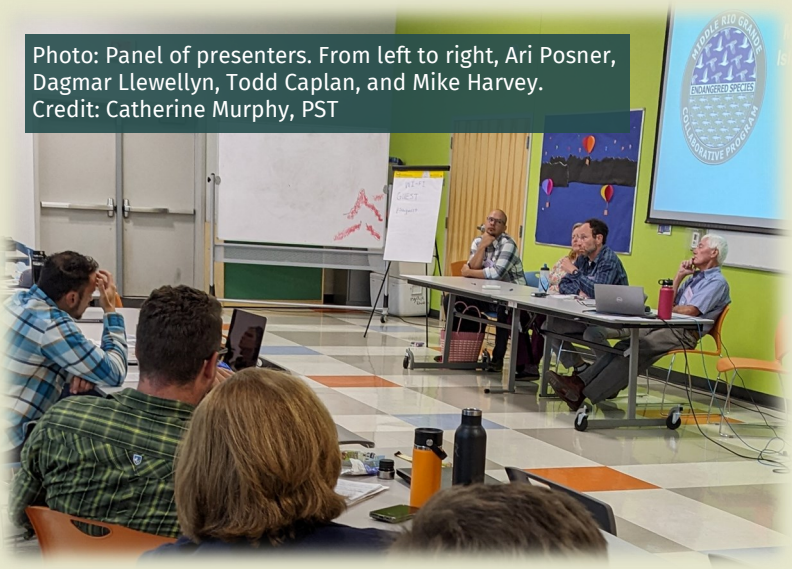


Photo: Panel of presenters. From left to right, Ari Posner, Dagmar Llewellyn, Todd Caplan, and Mike Harvey. Credit: Catherine Murphy, PST

WORKSHOP SMALL GROUP MEMBERS

Ara Winter, Bosque Ecosystem Monitoring Program

Ari Posner, U.S. Bureau of Reclamation

Colleen Langan-McRoberts, City of Albuquerque, Open Space Division

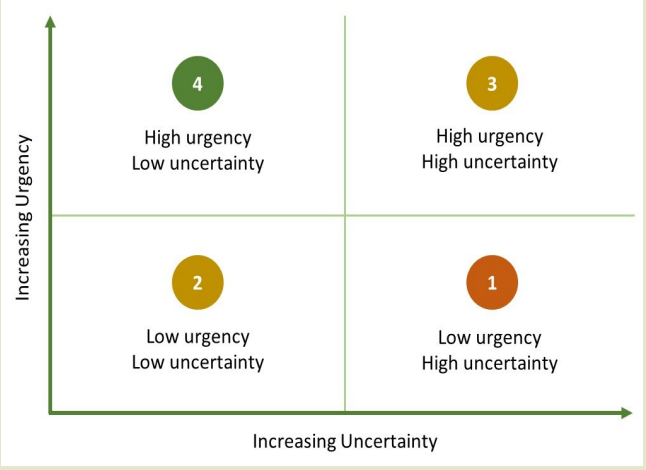
Grace Haggerty, New Mexico Interstate Stream Commission

Kyle Faig, City of Albuquerque, Open Space Division

Michael Scialdone, Pueblo of Sandia

Yasmeen Najmi, Middle Rio Grande Conservancy District

Following the four presentations, Q&A session, and a lunch break, the workshop participants took part in a Poll Everywhere exercise to assess the **urgency and uncertainty** (matrix shown below) of issues related to vegetated islands/bars. The activity was designed to give attendees the chance to step away from their individual organizations' priorities and collectively assess issues using indicators of research and planning needs. Participants assigned a number (1-4; see matrix below for categories) to each issue indicating its urgency and uncertainty. The group discussion that followed highlighted the differences in how participants perceive the listed issues, as well as how they define urgency and uncertainty. Some participants expressed their surprise at the results (shown below), which prompted others to explain their reasoning. The exercise and follow-up discussion brought to light the **range of perspectives** on vegetated islands/bars in the room, and presented a **list of issues** to use during the next workshop activity: developing problem statements, objectives, and strategies.



Figures: [left] Urgency versus uncertainty matrix and [right] issues related to vegetated islands/bars.

Issue	% Respondents			
	High urg Low uncert	High urg High uncert	Low urg Low uncert	Low urg High uncert
Floodplain inundation on/near islands/bars	29%	19%	33%	15%
Aquatic habitat value adjacent to islands/bars	33%	21%	29%	17%
Management of wetlands on/near islands/bars	32%	36%	12%	20%
Control of invasive species on islands/bars	42%	12%	19%	27%
Flows and sediment transport around islands/bars	13%	38%	38%	13%
Stability/persistence of vegetated islands/bars	42%	15%	23%	19%
Water conveyance around islands/bars	36%	16%	32%	16%
Surface-groundwater exchange on/near islands/bars	28%	32%	20%	20%
Evapotransipration rate associated with islands/bars	4%	17%	43%	35%
Fire fuels reduction on islands/bar	26%	13%	58%	0%
Bosque habitat being 'replaced' by islands/bars	12%	20%	40%	28%
Vegetation encroachment on islands/bars	26%	7%	67%	0%
Effect of islands/bar on channel width, depth, and incision	20%	52%	12%	16%
Impact of islands/bars on depletions and channel efficiency	12%	40%	32%	16%
Habitat value of islands/bars	38%	42%	12%	8%
Determining who is responsible for managing islands/bars	12%	58%	19%	12%

Continued on pg 4

Vegetated Islands Workshop Cont.

During the second half of Day One and all of Day Two, workshop participants split into four breakout groups to work through a **structured decision making (SDM) process to develop strategies addressing planning and research needs** related to vegetated islands/bars. SDM is an organized approach to analyzing a decision by breaking it into component parts. Each of the four breakout groups carried out this process with the help of a facilitator. The **Red Breakout Group** was facilitated by **Ari Posner**, Reclamation; the **Green Breakout Group** was facilitated by **Megan Friggens**, U.S. Forest Service; the **Blue Breakout Group** was facilitated by **Yasmeen Najmi**, Middle Rio Grande Conservancy District; and the **Yellow Breakout Group** was facilitated by **Colleen McRoberts**, City of Albuquerque Open Space Division, on Day One and **Lynette Giesen**, Reclamation, on Day Two.

Problem Statements: The "Why"

A Problem Statement frames and defines a decision problem. You will be defining a decision problem that addresses an issue related to management of vegetated islands and bars.

Focus questions:
- What **issue(s)** are you addressing with this Problem Statement?
- What **triggered** the issue and why?
  - What is the connection between the trigger and the issue?
- Who or what (e.g., stakeholders, species, etc.) is **affected** by the issue, either positively or negatively?
- What are the **potential concerns** to consider around the issue?

Objectives: The "What"

An Objective defines specific and measurable targets for effectively addressing a decision problem. You will be forming Objectives from the Problem Statements identified during Breakout Session I.

Focus questions:
- What **Problem Statement** are you addressing with this Objective?
- Which **concerns** are the most important?
- What will **success** look like and how will you **measure** it?
- What is the **time frame** and/or **spatial scale**?

Strategies: The "How"

A Strategy describes the methods and resources needed to accomplish an Objective. You will be developing Strategies to address the Objectives defined during Breakout Session II.

Focus questions:
- What **Objective** are you addressing with this Strategy?
- What **steps** are needed to reach the Objective?
- What **resources** are needed to carry out the steps?
- Is the strategy **feasible**?

Figures: Descriptions and focus questions used to aid in the development of problem statements [top], objectives [middle], and strategies [bottom].

For Breakout Session I, each group first **agreed upon 1-3 issues related to vegetated islands/bars** to focus on and **wrote one or more problem statements to address them**. For Breakout Session II, the groups **developed one or more objectives from their problem statements**. For Breakout Session III, the groups **developed one or more strategies to address their objectives**. For each of these processes, the breakout groups used the **focus questions** shown to the left to consider the important components involved. Once these questions were answered, the groups were able to pull all the components into final problem statements, objectives, and strategies. The outcomes of all breakout groups are compiled on page 5.

To close the workshop, participants gathered as a group to review the final strategies, discuss overarching messages, and share any individual insights. The group acknowledged a common thread from the breakout sessions, which was a switch of focus from vegetated islands/bars to a greater issue in the MRG. **The group identified three main management priorities in the MRG—water delivery, flood control, and ecosystem management—and voiced the shared problem of how to balance these priorities through collaboration and partnerships in the face of a dynamic river system under climate change.**

The Workshop Small Group was tasked with summarizing and organizing outcomes for the Science and Adaptive Management Committee to **determine next steps**. If you have any questions about the workshop, please send them to **mtuineau@west-inc.com**. We hope to see you at the next one!

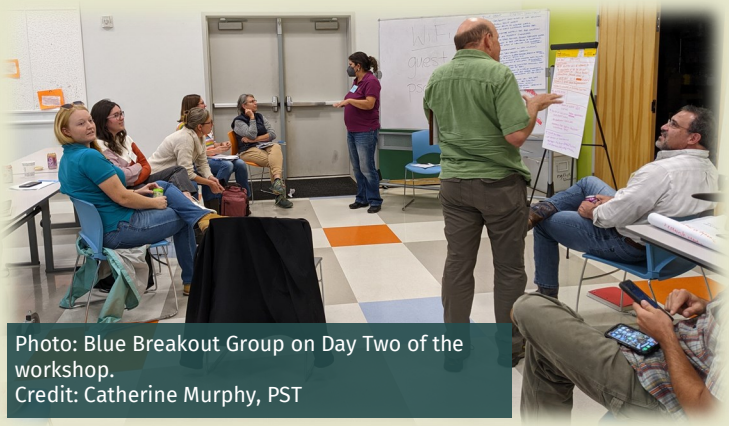


Photo: Blue Breakout Group on Day Two of the workshop.
Credit: Catherine Murphy, PST

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VEGETATED ISLANDS WORKSHOP CONT.

RED BREAKOUT GROUP - OUTCOMES

Problem Statement: The challenge to trying to develop one solution for all vegetated islands/bars is there are many functions. How do we effectively measure each of those functions in order to make decisions to address specific management needs?

Objective: Develop a model that correlates flows with ecological functions by reach.

Strategy: 1) Determine the inputs to develop the model(s) with a capacity assessment of existing models and data, identifying the ecological functions of interest, and identifying data gaps, 2) use existing model outputs as inputs to test hypotheses (what questions do we need to ask?), and 3) validate outputs of integrated model(s) with experiments to test assumptions.

GREEN BREAKOUT GROUP - OUTCOMES

Problem Statement: We have managed for less variability in flow, which has decreased channel dynamics and impaired function. We need to integrate management action to improve channel dynamics.

Objective: Develop an experimental framework to determine whether we can improve channel dynamics at the reach scale to balance diversity of habitats and water conveyance.

Strategy: Assemble teams, one for each reach, to define relationships and terms (& success?) associated with channel dynamics and water conveyance.

BLUE BREAKOUT GROUP - OUTCOMES

Problem Statement: Given reduced flows, how do we cost-effectively manage vegetated islands and bars to create a dynamic habitat mosaic for species of concern while maintaining sustainable water and sediment conveyance?

Objectives:

a) Qualify indicators of ecosystem function that will be provided by vegetated bars.

b) Increase acreage of emergent (Class 1) bars through vegetation management on bars/islands with recurring maintenance on a cycle to be determined.

c) Create a map of existing vegetated bar habitats to include: elevation, vegetation type and age class, and sediment transport, as well as additional layers.

d) Evaluate main channel bankfull capacity to carry 2-year return flows.

BLUE BREAKOUT GROUP - OUTCOMES

Strategies:

1) The proposed map will help to identify "good" habitat as well as stabilized areas requiring management action. Layers will need to be updated regularly (as frequently as possible) in order to remain relevant for dynamic management of bars and for identifying research needs.

2) Determine the appropriate/sufficient amount of increased acreage (per river mile?) of emergent bars. Determine suitable locations for increased acreage of emergent bars. Q: How do we implement "dynamic management?"

3) Habitat valuation will be informed by the development of the bar class map (as indicator of physical processes), as well as by existing habitat suitability maps. This effort builds on active research in species-specific habitat quality and quantity to define indicators of ecosystem function. Acknowledgement of the ephemeral nature of "habitat value" is key to the idea of "dynamic management."

4) Geomorphic monitoring – decadal and annual field reconnaissance during runoff and post monsoons

YELLOW BREAKOUT GROUP - OUTCOMES #1

Problem Statement: There is increased vegetation due to more islands/bars, including invasives. We need to develop tools for classifying vegetation by type and age in order to inform decision making.

Objectives: 1) Develop metrics and priorities for assessing vegetation and 2) Develop cooperative agreements between state, local, and federal agencies for managing vegetation.

Revised Objective: Develop a plan to prioritize actions taken on islands and bars based on balanced management goals (balanced meaning meeting management goals, flood control, ecosystem goals, and water delivery).

YELLOW BREAKOUT GROUP - OUTCOMES #1

Strategies:

1) Develop a report and map on condition of vegetated islands/bars using available resources

2) Develop consensus among stakeholders on condition of vegetated islands/bars

3) Develop consensus on balanced management goals

4) Develop consensus on metrics

5) Develop a plan to prioritize any action taken on islands and bars

Figures: Problem statements, objectives, and strategies from the workshop breakout groups. [upper left] Red Breakout Group outcomes, [upper right] Green Breakout Group outcomes, [middle left and right] Blue Breakout Group outcomes, and [bottom left and right] Yellow Breakout Group outcomes.

WHAT'S HAPPENING IN THE MRG?

Find out what's happening in MRG, including an update for the 2022 southwest monsoon season, recent conferences, recent publications, and upcoming events and funding opportunities.

2022 SOUTHWEST MONSOON SEASON

From June 15 to September 30 of this year, around 60% of Arizona and New Mexico experienced rainfall of 125% of average or greater (see map). In the aggregate, this year's Southwest Monsoon seems remarkable, but localized experiences always vary substantially. Indeed, comparison of monsoon seasons among different years depends very heavily upon the specific metrics with which you characterize a season, such as total precipitation, intensity, frequency of precipitation events, and/or spatiotemporal distribution of rainfall. If we expect to receive a greater proportion of our precipitation as rain in the future (with direct impacts on the shape of our hydrograph), this begs the question of whether resources should be allocated to developing better criteria for quantifying monsoons, and possibly tools for forecasting them. Regardless, the region is, no doubt, enjoying the benefits of the precipitation that fell during the official season, as well as the subsequent moisture and precipitation we have tacked on to the season in October.

To view additional informative maps and plots of this year's Southwest Monsoon data metrics, check out this page provided by Dr. Michael Crimmins with the University of Arizona: **https://cals.arizona.edu/climate/misc/SWMonsoonMaps/current/swus_monsoon.html**. And for more in-depth analysis of the season, check out the latest installment in the Southwest Climate Podcast series, "Sending the Monsoon Away in Style" at **https://www.climas.arizona.edu/podcast/oct-2022-sw-climate-podcast-sending-monsoon-away-style**.

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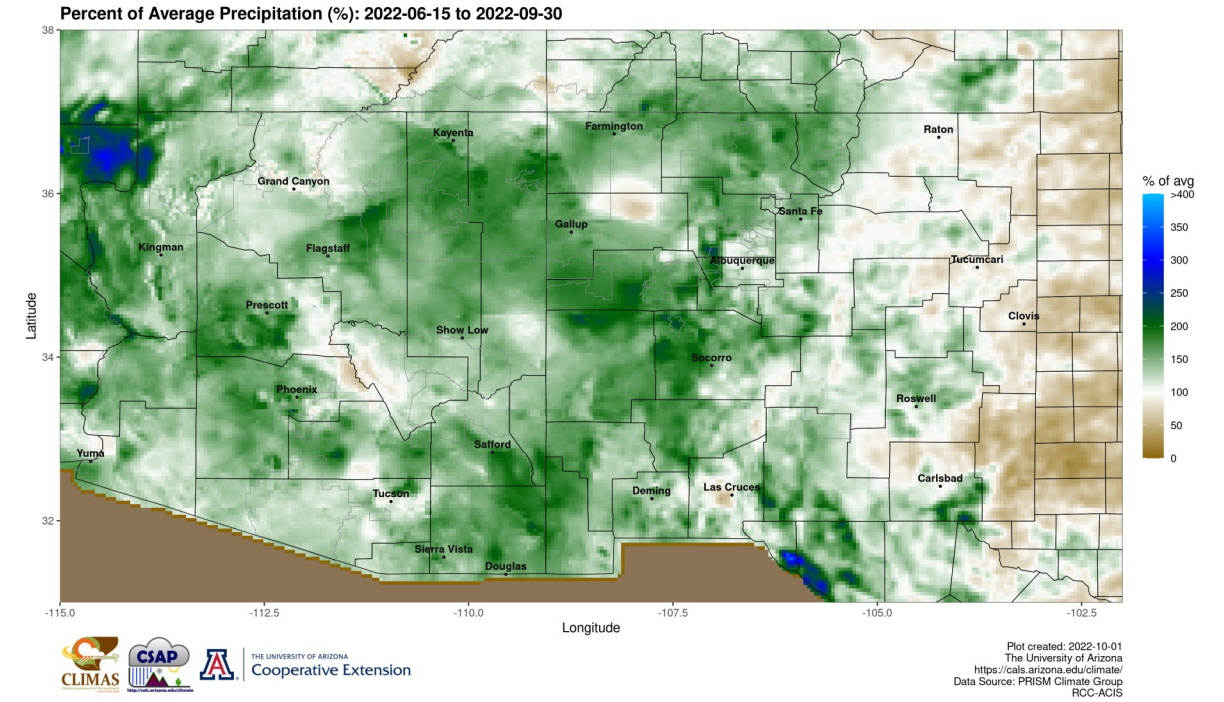

Figure: CLIMAS map of percent of average precipitation (%) from June 15 to September 30, 2022.

RECENT CONFERENCES

2022 Southwest Adaptation Forum — October 10-12, 2022

The **2022 Southwest Adaptation Forum (SWAF)** was held **October 10-12, 2022** at the Indian Pueblo Cultural Center in Albuquerque, New Mexico. SWAF was co-hosted by the **Southwest Climate Adaptation Science Center (CASC), the South Central CASC, U.S. Department of Agriculture Southwest Climate Hub, and Southwest Decision Resources**. At SWAF, participants learned about approaches to climate change mitigation and adaptation, tools to support climate change work, and relevant programs around the Southwest. The participants discussed the impacts being realized today from climate change, especially those being felt by indigenous communities, and developed potential solutions (short- and longer-term) related to climate change adaptation. One of the foci of the 2022 SWAF was re-centering the conversation on climate change adaptation to the local level, particularly indigenous and tribal communities, and developing strategies that incorporate place-based and traditional ecological knowledge and are scaled to address the impact rather than constrained by political boundaries. More information about the 2022 SWAF can be found at **https://www.swcasc.arizona.edu/2022-southwest-adaptation-forum**.

Southwest Tribal Climate Adaptation Menu Workshop — October 13, 2022

The **New Mexico Tribal Resilience Action Network** hosted a **Southwest Tribal Climate Adaptation Menu Workshop** at the University of New Mexico on **October 13, 2022**. Workshop participants provided feedback and input onto the content and delivery of a Southwest Tribal Climate Adaptation Menu. The Menu will integrate indigenous and traditional knowledge, culture, and values into climate adaptation planning by laying out ideas for adaptation actions with considerations for working with tribal communities. For more information about Southwest Tribal Climate Adaptation Menu effort, contact Atherton Phelger at **aphleger@law.unm.edu**.

EnviroData-NM Webinar — October 13, 2022

Natural Heritage New Mexico (NHNM), a member of the NatureServe Network of conservation science data centers in North and South America, presented a **webinar on the recently released EnviroData-NM database** on **October 13, 2022**. **Dr. Esteban Muldavin, Richard Norwood, and Rayo McCollough** with NHNM covered the different types of information available in the database, provided tips on how to access the data layers via a versatile interactive mapping tool, and demonstrated how to run reports for a geographic area of interest.

The EnviroData-NM is a centralized, searchable portal housing New Mexico's environmental data, including information about sensitive species, public health, natural resources, and energy development activity. The database is a publicly available application that was made possible through the New Mexico State Legislature's approval of HB 51 (aka Environmental Database Act) in 2021. This resource allows agencies, the public, private industry, and conservation practitioners to view what's happening on New Mexico's landscapes to enable data-driven decisions and minimize negative impacts to human health, plants, animals, land, air, and water.

Data are generally updated on annual cycle, but as live feeds become available, some layers will update more frequently. The current emphasis is on state data, but there is interest in incorporating additional data sources, such as Federal and non-governmental organizations. Data and technical support for EnviroData-NM is provided by the New Mexico State Land Office and the New Mexico Departments of Health, Game and Fish, Environment, and Energy, Minerals and Natural Resources. Please contact Natural Heritage New Mexico at **nhnm@unm.edu** for any questions or further information.

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RECENT CONFERENCES CONT.

67th Annual New Mexico Water Conference — October 26-27, 2022

The **67th Annual New Mexico Water Conference**, hosted by the **New Mexico Water Resources Research Institute (NM WRRI)**, was held both in person and virtually on **October 26-27, 2022** at New Mexico State University's Las Cruces Convention Center. The conference highlighted a diverse pool of presenters, including the New Mexico State Engineer; hydrologists and researchers from institutions from New Mexico, California, and Mexico; as well as representatives from the diverse communities across New Mexico. The presentation topics were equally diverse: groundwater sources and their management, watershed health, aquifer management, and best management practices. The implementation of agro-ecological practices, data collection systems and accessibility, new technologies, modernization of infrastructure, and traditional knowledge will be key to build resilience in order to face the water challenges that New Mexico will continue to have in the years to come. This resilience can only be achieved by the creation of highly collaborative networks (including bi-national collaborations) that include local water and land managers, and researchers. Such collaborative networks will be more effective at benefiting from the unprecedented federal funding that New Mexico will be receiving in the near future. For more information on the conference, please visit **https://web.cvent.com/event/8df4a3fa-9910-485f-9779-1b700a410d3e/summary**.

Credit: Mike Marcus, MRG Water Advocates

MRG ANNOUNCEMENTS

— EVENTS —

- The **Yellow-billed Cuckoo (YBCU) Working Group** is hosting its **annual fall meeting** on **November 9, 2022**. In the morning, they will be discussing Working Group business and planning. In the afternoon, they will be holding the science sessions. The primary topic of the meeting is rangewide and regional characteristics of yellow-billed cuckoo breeding habitat. For more information, contact Hira Walker at **coordinator@yellowbilledcuckoo.org**.

— FUNDING —

- The **Neotropical Migratory Bird Conservation Act** established an annual, competitive grants program to support projects that **promote the conservation of Neotropical migratory birds and their habitats**. Proposals are due no later than **November 3, 2022** at **11:59PM ET**. All applications must be submitted through **GrantSolutions.gov**. Learn more about this funding opportunity at **https://tinyurl.com/yckjydte**.
- Check out the WaterSMART funding opportunity update at **https://tinyurl.com/kctvn9c8**.

RECENT PUBLICATIONS

Evolution of Methods for Monitoring Herbaceous Vegetation

Herman B.D. (2022). Prepared by U.S. Army Engineer Research and Development Center (ERDC) Environmental Laboratory (EL). Prepared for Ecosystem Management and Restoration Research Program Environmental Laboratory (EL). **https://tinyurl.com/ywkth7ty**

Abstract:
This special report seeks to advance the field of ecological restoration by reviewing selected reports on the processes, procedures, and protocols associated with monitoring of ecological restoration projects. Specifically, this report identifies selected published herbaceous vegetation monitoring protocols at the national, regional, and local levels and then evaluates the recommended sampling design and methods from these identified protocols. Finally, the report analyzes the sampling designs and methods in the context of monitoring restored herbaceous vegetation at US Army Corps of Engineers (USACE) ecosystem restoration sites. By providing this information and the accompanying analyses in one document, this special report aids the current effort to standardize data collection methods in monitoring ecosystem restoration projects.

Quantifying flow and nonflow management impacts on an endangered fish by integrating data, research, and expert opinion

Yackulic, C.B., Archdeacon, T.P., Valdez, R.A., Hobbs, M., Porter, M.D., Lusk, J., Tanner, A., Gonzales, E.J., Lee, D.Y., Haggerty, G.M. (2022). *Ecosphere 13*(19). **https://doi.org/10.1002/ecs2.4240**

Abstract:
Managers charged with recovering endangered species in regulated river segments often have limited flexibility to alter flow regimes and want estimates of the expected population benefits associated with both flow and nonflow management actions. Disentangling impacts on different life stages from concurrently applied actions is essential for determining the effectiveness of each action, but difficult without models that integrate multiple information sources. Here, we develop and fit an integrated population model for endangered Rio Grande Silvery Minnow (*Hybognathus amarus*) in the Middle Rio Grande, New Mexico. We integrate catch per unit effort monitoring data collected during 2002–2018 with population estimates, data collected during rescue of minnow from drying pools, habitat availability estimates, laboratory results, releases of hatchery reared minnow, and expert opinion. We use expert elicitation to develop a larval carrying capacity index as an informed proxy for the complex interactions among flow, habitat, and life history in this species. We evaluate the model using out-of-sample forecasts of 2019 and 2020, develop an algorithm to identify supplemental water releases that maximize benefits to the minnow, and quantify the effectiveness of various actions. Experts generally agreed on the duration and timing of flow requirements and disagreed regarding the importance of different magnitudes. The integrated model with the larval carrying capacity index outperformed two alternative models in forecasting catch in 2019 and 2020. The model estimates that minnow abundance varied by more than three orders of magnitude between 2002 and 2018 and that in a few years recruitment was limited by spawner abundance. Evaluation of the expected benefits of flow and nonflow management actions to fall population abundance across different years suggests that efficient addition of water to the base hydrograph is the most effective action in most, but not all years. Many actions are effective only under certain hydrologic and population conditions and the effectiveness of different actions varies in different sections of the study area. Widespread water extraction and river regulation combined with periodic drought and ongoing climate change may necessitate creative management of federally listed fish species in arid systems informed by thorough analyses of management effectiveness.

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What's Happening in the MRG? Cont.

RECENT PUBLICATIONS CONT.

Rio Grande Silvery Minnow October Monitoring: 2020

Best E., Bullard M. (2022). Prepared by Bureau of Reclamation, Technical Service Center, Denver, Colorado. Prepared for Bureau of Reclamation Albuquerque Area Office. https://tinyurl.com/2u3b2yxj

Abstract:

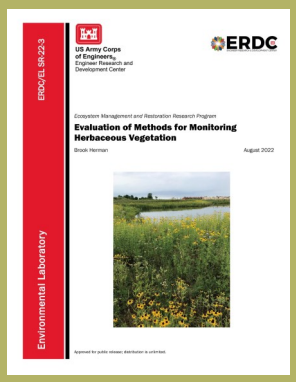
In late October 2020, the Bureau of Reclamation (Reclamation) conducted surveys for the federally endangered Rio Grande silvery minnow (Hybognathus amarus) at select sites along the Rio Grande below the San Acacia Diversion Dam to the South Monticello boat ramp in Elephant Butte Reservoir. Reclamation and U.S. Fish and Wildlife Service biologists sampled 10 sites using seine nets. Surveys were conducted to maintain compliance with the Endangered Species Act requirements for Reclamation's river maintenance and water management activities and to evaluate potential habitat restoration projects. During the fall seining efforts, 17 Rio Grande silvery minnows were captured: 9 at the South Monticello site, 3 at the Upper Escondida site, 2 at the Lower Escondida site, 2 at the San Acacia site, and 1 at the Nogal Canyon site. The length-frequency histograms indicated that roughly half of the silvery minnows captured in 2020 were young-of-year, which suggests a lack of recruitment associated with the low flows that attributed to the lower numbers of age-0 silvery minnows observed in 2020, and it also informs us that there was some recruitment experienced.

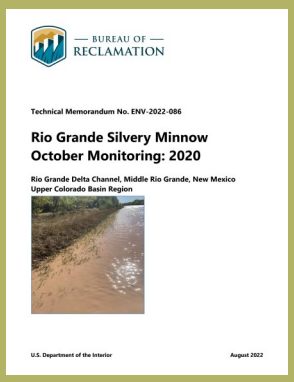
Rio Grande Silvery Minnow Population Monitoring During July 2022

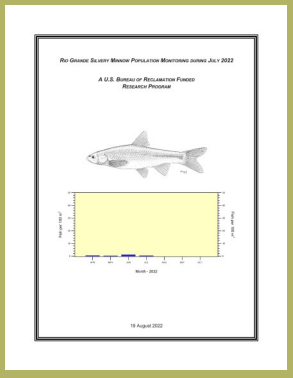
Dudley R.K., Platania S.P., White G.C. (2022). Prepared for U.S. Bureau of Reclamation. https://tinyurl.com/4y5h7zbu

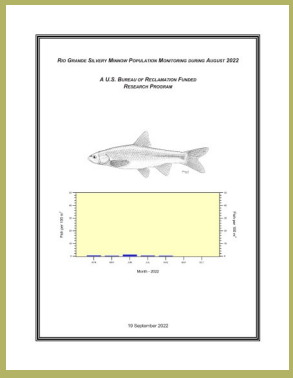
Rio Grande Silvery Minnow Population Monitoring During August 2022

Dudley R.K., Platania S.P., White G.C. (2022). Prepared for U.S. Bureau of Reclamation. https://tinyurl.com/mr2x4p2m









Figures: Click the report covers to read the linked publications.

— UPCOMING DATES —

- The **2022 Collaboratory** will be held in person on **December 6-7, 2022** at **9:00 AM to 4:30 PM MT** at **UNM Continuing Education Conference Center**. Please RSVP for the event at **https://www.eventbrite.com/e/427582610097** by **November 11, 2022**. Registration is free. Those who RSVP will receive the agenda and Collaboratory materials.
- The **Annual Rick Billings Award** is sponsored by the Bureau of Reclamation's Albuquerque Area Office to recognize an individual's **contributions to the success of the Collaborative Program**. Please fill out the form at **https://s.surveyplanet.com/jt8ppz7v** to submit your nominee for the 2022 Rick Billings Award by **November 11, 2022**. The winner will be announced at the December Executive Committee meeting.

— COLLABORATIVE SEMINAR —

GENETIC MONITORING OF THE RGSM

Megan Osborne, University of New Mexico (UNM), Department of Biology and Museum of Southwestern Biology — October 19, 2022

Recording Link: **https://youtu.be/XpKsmfhceNg**

Dr. Megan Osborne, research professor and evolutionary biologist at the UNM Department of Biology and Museum of Southwestern Biology, presented her findings from an ongoing, long-term genetic monitoring effort on the Rio Grande silvery minnow (*Hybognathus amarus*; RGSM). The presentation was focused on a comparative analysis of the results from microsatellite and SNP-based microhaplotype markers. Even with smaller sample sizes, the results associated with microhaplotype analyses compared favorably to those from microsatellites, and provided more rapid evaluation and, in some cases, more precise estimates. Microhaplotype markers also offered measures of inbreeding that, although not traditionally used in genetic monitoring programs, contribute valuable insights about this managed population.

Dr. Osborne summarized her presentation with the following key takeaways. Despite population declines, genetic diversity of RGSM has been maintained, albeit with an apparent increase in inbreeding. Comparison of pre-augmentation and post-bottleneck (particularly 2015 forward) populations revealed a shift in allelic composition of the population. Effective population size was positively associated with estimated abundance of river fish. Genetic estimates of gene flow were positively associated with the fraction of the population derived from the hatchery. Finally, when the riverine population of RGSM was dominated by augmented fish, genetic effective size (N_e) was reduced, suggesting that increases in RGSM abundance through augmentation will not likely increase N_e. Thus, the likelihood of genetic drift is expected to increase over time with the RGSM augmentation program.

These findings and trends across a 20-year time series may have important implications for RGSM conservation actions within an adaptive management framework of the Collaborative Program. For more details on this analysis, be sure to check out Dr. Osborne's paper (with coauthors Guilherme Caeiro-Dias and Tom Turner) entitled, "Transitioning from microsatellites to SNP-based microhaplotypes in genetic monitoring programs: lessons from paired data spanning 20 years," to be published in *Molecular Ecology* very soon.

New Member and Upcoming Dates

UPCOMING MEETINGS

Fiscal Planning Committee Meeting
November 1, 2022
9:00 AM—11:00 AM MT

Science and Adaptive Management Committee Meeting
November 8, 2022
8:00 AM—12:00 PM MT

2022 Collaboratory
December 6–7, 2022
9:00 AM—4:30 PM MT

Executive Committee Meeting
December 22, 2022
9:00 AM—12:00 PM MT

MRG EVENTS

YBCU Working Group Annual Fall Meeting
November 9, 2022

WELCOME DUSTIN CHAVEZ-DAVIS!

Dustin Chavez-Davis, Project Coordinator for the City of Albuquerque Open Space Division, joined the Executive Committee as an alternate representative for City of Albuquerque.

The information in this newsletter should not be attributed to the Collaborative Program or its Executive Committee, but to the organization from which it was submitted.

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