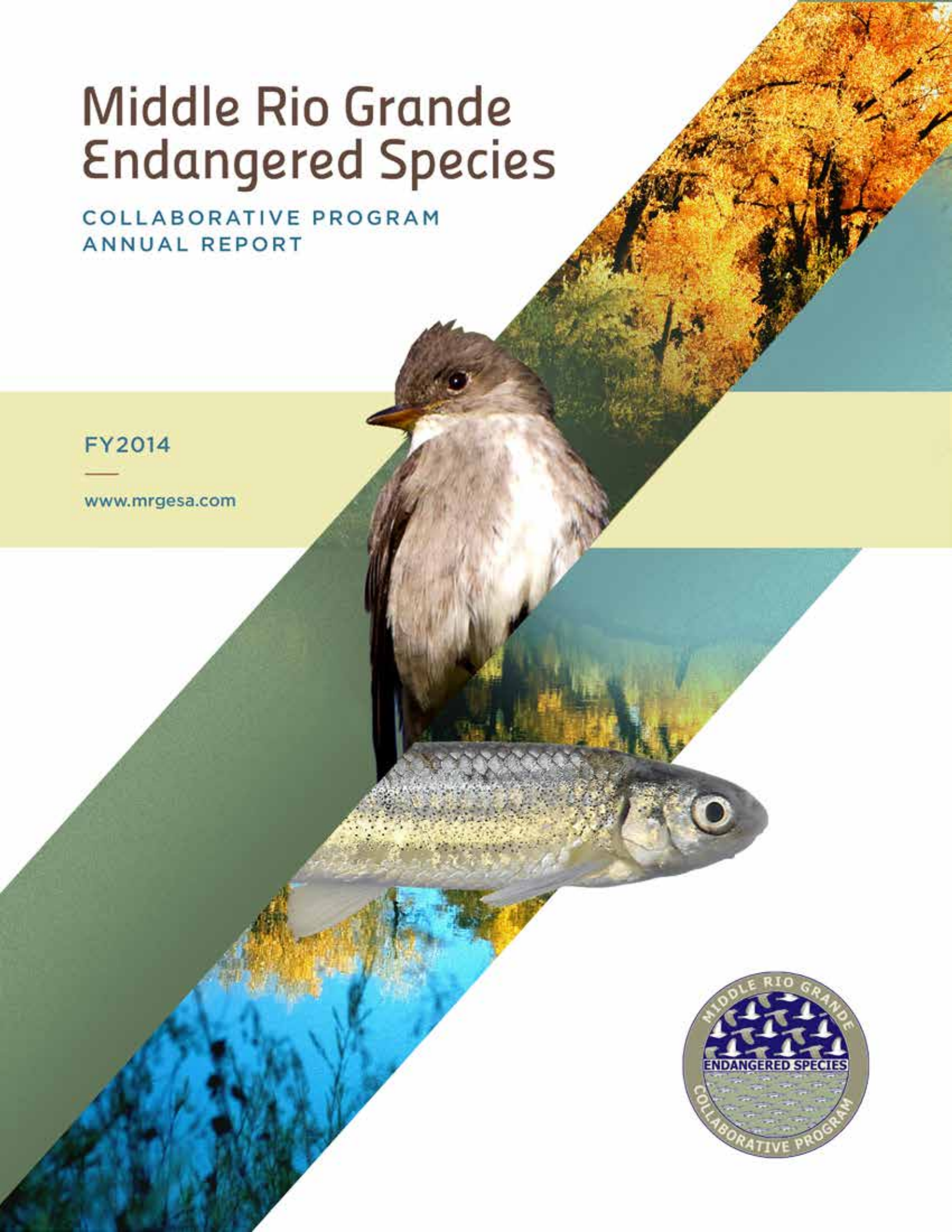
# Middle Rio Grande Endangered Species

## COLLABORATIVE PROGRAM ANNUAL REPORT

FY2014

www.mrgesa.com



# MIDDLE RIO GRANDE ENDANGERED SPECIES COLLABORATIVE PROGRAM (MRGESCP)

## FY 2014 Annual Report

Prepared by

GenQuest, Inc.
www.genquestinc.com
Bureau of Reclamation Contract #R15PD01032

# TABLE OF CONTENTS

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| **ABCWUA** | Albuquerque Bernalillo County Water Utility Authority |
| **AF** | Acre-Feet |
| **APA** | Assessment Payers Association |
| **BA** | Biological Assessment |
| **BiOp** | 2003 Biological Opinion |
| **BEMP** | Bosque Ecosystem Monitoring Program |
| **CC** | Coordination Committee |
| **COA** | City of Albuquerque |
| **Collaborative Program (also Program, or MRGESCP)** | Middle Rio Grande Endangered Species Collaborative Program |
| **CPUE** | Catch Per Unit Effort |
| **EC** | Executive Committee |
| **ESA** | Endangered Species Act |
| **FY** | Fiscal Year |
| **HR** | Habitat Restoration |
| **HRW** | Habitat Restoration Work Group |
| **IDD** | Isleta Diversion Dam |
| **LFCC** | Low-Flow Conveyance Channel (Reclamation) |
| **LLSMR** | Los Lunas Silvery Minnow Refugium |
| **LTP** | Long Term Plan |
| **MAT** | Minnow Action Team |
| **MOA** | Memorandum of Agreement for the Middle Rio Grande Endangered Species Collaborative Program |
| **MRG** | Middle Rio Grande |
| **MRGCD** | Middle Rio Grande Conservancy District |
| **mtDNA** | Mitochondrial DNA |
| **NMAGO** | New Mexico Attorney General's Office |
| **NMDA** | New Mexico Department of Agriculture |
| **NMFWCO** | New Mexico Fish and Wildlife Conservation Office |
| **NMGF** | New Mexico Department of Game and Fish |
| **NMISC (also ISC)** | New Mexico Interstate Stream Commission |
| **PIO** | Public Information Outreach Work Group |

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| **PMT** | Program Management Team |
| **PVA** | Population Viability Analysis |
| **Reclamation (also BOR)** | Bureau of Reclamation |
| **RGSM** | Rio Grande Silvery Minnow *(Hybognathus amarus)* |
| **RIP** | Recovery Implementation Program |
| **RPA** | Reasonable and Prudent Alternative |
| **RPM** | Reasonable and Prudent Measure |
| **SADD** | San Acacia Diversion Dam |
| **ScW** | Science Work Group |
| **USFWS (also Service)** | U.S. Fish and Wildlife Service |
| **SNARRC** | Southwestern Native Aquatic Resources and Recovery Center (U.S. Fish and Wildlife Service; formerly Dexter) |
| **SWFL** | Southwestern Willow Flycatcher *(Empidonax traillii extimus)* |
| **SWM** | Species Water Management Work Group |
| **UNM** | University of New Mexico |
| **USACE** | U.S. Army Corps of Engineers |
| **USGS** | U.S. Geological Survey |

# DEFINITIONS

**Coordination Committee:** A committee established by the Executive Committee (EC) to identify concerns associated with Collaborative Program activities, work to resolve those concerns, and develop consensus recommendations to the EC.

**Executive Committee:** The Collaborative Program's governing body which is made up of signatory representatives. The EC provides policy, budget approval, and decision-making on all issues, unless specifically delegated to the Program Management Team (PMT), Coordination Committee (CC), or work groups.

**Lead Agency:** The agency responsible for ensuring that the project work is completed.

**Listed Species:** Federally listed species under the Endangered Species Act (ESA) with special emphasis on the Rio Grande silvery minnow (RGSM) and Southwestern willow flycatcher (SWFL).

**Middle Rio Grande:** An area from the headwaters of the Rio Chama watershed and the Rio Grande, including all tributaries from the Colorado/New Mexico state line downstream to the headwaters of Elephant Butte Reservoir.

**Program Management Team:** A team that provides management technical support to the EC, CC, and work groups, and consists of a Program Manager and management staff employed by Reclamation, U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), and New Mexico Interstate Stream Commission (NMISC), administrative and clerical staff, federal employees and contractors, and signatory representatives.

**Recovery Implementation Program:** A planned collaborative, multi-stakeholder initiative that seeks to balance water use and development with the recovery of federally listed endangered species.

**Work Group:** Established by the EC, as needed, to provide assistance and expertise to address specific Collaborative Program tasks. Members of a work group may consist of professionals, signatories, contractors, and other parties who have expertise related to the assignment given to the work group.

# COLLABORATIVE PROGRAM COMMITTEE AND WORK GROUP CO-CHAIRS

**Program Assistant:** Alighieri Saenz
asaenz@usbr.gov
505-462-3600

### EC - EXECUTIVE COMMITTEE

**Federal Co-chair:** Brent Rhees
brhees@usbr.gov

**Non-federal Co-chair:** Estevan López
estevan.lopez@state.nm.us

**Non-federal Co-chair Alternate:** Rick Billings
rbillings@abcwua.org

### CC - COORDINATION COMMITTEE

**Federal Co-Chair:** James Wilber
jmwilber@usbr.gov

**Non-federal Co-chair:** Rick Billings
rbillings@abcwua.org

### SCW - SCIENCE WORK GROUP

**Federal Co-chair:** Dana Price
dana.m.price@usace.army.mil
505-342-3378

**Non-federal Co-chair:** Brooke Wyman
brooke@mrgcd.us
505-247-0234

### HRW - HABITAT RESTORATION WORK GROUP

**Federal Co-chair:** Danielle Galloway
Danielle.a.galloway@usace.army.mil
505-342-3661

**Non-federal Co-chair:** Rick Billings
rbillings@abcwua.org
505-768-2755

### MAT - MINNOW ACTION TEAM

**Non-federal Co-chair:** David Gensler
dgensler@mrgcd.us
505-247-0234

**Non-federal Co-chair:** Grace Haggerty
grace.haggerty@state.nm.us

### PVA/BIOLOGY - POPULATION VIABILITY ANALYSIS WORK GROUP

**Federal Co-chair:** Dave Campbell
david_campbell@fws.gov
505-761-4745

**Non-federal Co-chair:** Dave Gensler
dgensler@mrgcd.us
505-247-0234

### PIO - PUBLIC INFORMATION & OUTREACH WORK GROUP

**Federal Co-chair:** Mary Carlson
mcarlson@usbr.gov
505-462-3576

**Non-federal Co-chair:** Julie Maas
julie.maas@state.nm.us
505-383-4095

# EXECUTIVE SUMMARY

In 2009, the Executive Committee (EC) of the Middle Rio Grande Endangered Species Collaborative Program (Collaborative Program, Program, or MRGESCP) directed efforts to pursue advancement of the Collaborative Program through a recovery implementation program (RIP). This effort will enhance the Collaborative Program's focus on recovery activities, and serve as an Endangered Species Act (ESA) compliance vehicle using a new Long Term Plan (LTP) as a mechanism for advancing the Collaborative Program based on the framework of the Rio Grande silvery minnow and Southwestern willow flycatcher recovery plans.

The general purpose of the RIP is:

> To protect and improve the status of species listed pursuant to the ESA within the Middle Rio Grande (MRG) by implementing certain recovery activities to benefit and work toward recovery of those species and their designated critical habitats, with special emphasis on the Rio Grande silvery minnow (Hybognathus amarus; silvery minnow) and the Southwestern willow flycatcher (Empidonax traillii extimus; flycatcher);
>
> and, simultaneously,
>
> To protect existing and future water uses while complying with applicable state and federal laws, rules and regulations, and to serve as the ESA coverage vehicle for entities that rely on the RIP as the ESA conservation measure for the effects of water uses and management actions in the Program area (Figure 1.1).

As of July 7, 2010, the signatories to the Collaborative Program MOA include:

- Bureau of Reclamation (Reclamation)
- U.S. Fish and Wildlife Service (Service)
- U.S. Army Corps of Engineers (USACE)
- New Mexico Interstate Stream Commission (NMISC)
- New Mexico Department of Game and Fish (NMGF)
- New Mexico Attorney General's Office (NMAGO)
- Santo Domingo Tribe
- Pueblo of Sandia
- Pueblo of Isleta
- Pueblo of Santa Ana
- Middle Rio Grande Conservancy District (MRGCD)
- City of Albuquerque (COA)
- Albuquerque Bernalillo County Water Utility Authority (ABCWUA)
- Assessment Payers Association of the Middle Rio Grande Conservancy District (APA)
- New Mexico Department of Agriculture (NMDA)
- University of New Mexico (UNM)

This report describes the Collaborative Program, summarizes expenditures by the Collaborative Program and its signatories in Fiscal Year (FY) 2014, and highlights accomplishments using funds allocated during FY 2014.

# 1 INTRODUCTION

Our goal is to alleviate jeopardy to the endangered species, conserve and contribute to their recovery, protect existing and future water uses, and provide public outreach and education.

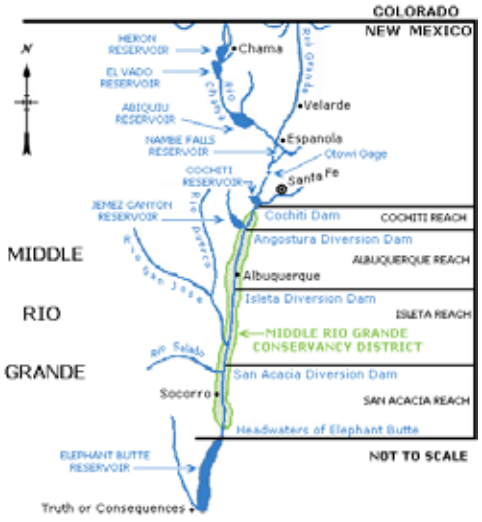


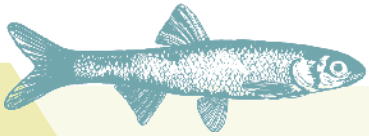

Figure 1.1
Collaborative Program Area: New Mexico - Colorado Border to Headwaters of Elephant Butte

**The Collaborative Program consists of governmental entities, Indian Tribes and Pueblos, and non-governmental organizations that are focused on improving the status of the listed endangered species in the Middle Rio Grande (MRG) region. These species include the Rio Grande silvery minnow (Hybognathus amarus) (RGSM) and the Southwestern willow flycatcher (Empidonax traillii extimus) (SWFL). The MRG encompasses an area that includes the headwaters of the Rio Chama watershed, and the Rio Grande and all of its tributaries from the Colorado/New Mexico state line downstream to the headwaters of Elephant Butte Reservoir (Figure 1.1).**

The Collaborative Program receives funding through U.S. Congressional appropriations to implement projects designed to benefit the federally listed endangered RGSM and SWFL. The Collaborative Program implements activities required by the 2003 Biological Opinion (BiOp) issued by the U.S. Fish and Wildlife Service (Service or USFWS) titled, "Biological and Conference Opinions on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande, Albuquerque, New Mexico" (Service, 2003). The BiOp, as amended, provides requirements for alleviating jeopardy to listed species and adverse modification of designated critical habitat. The BiOp is a product of Endangered Species Act (ESA) Section 7 consultation. Compliance with the 2003 BiOp provides ESA coverage for the two action agencies, the Bureau of Reclamation (Reclamation) and the U.S. Army Corps of Engineers (Corps or USACE), to carry out specific actions as described, and broad coverage for participating non-federal entities.

To help identify and guide species' recovery needs, Section 4(f) of the ESA directs the Secretary of the Interior to develop and implement recovery plans for listed species or populations.

# INTRODUCTION 1



Recovery plans developed by the Service for the RGSM (Service, 2010) and SWFL (Service, 2002) include: 1) a description of management actions necessary to conserve the species or population; 2) objective, measurable criteria that, when met, will allow the species or population to be removed from the List of Endangered and Threatened Wildlife; and, 3) estimates of the time and funding needed to achieve the plan's goals and intermediate steps. Recovery recommendations identified in these plans are advisories aimed at lessening or alleviating the threats to the species and ensuring self-sustaining populations in the wild.

The general Collaborative Program goals consistent with these recovery plan recommendations are to:

- Alleviate jeopardy to the listed species within the scope of the Collaborative Program;
- Conserve and contribute to the recovery of the listed species by:
    - Stabilizing existing populations; and,
    - Developing self-sustaining populations.
- Protect existing and future water uses; and,
- Provide public outreach and education to communities within the scope of the Collaborative Program.

In November 2006, the Collaborative Program adopted a Long Term Plan (LTP) (MRGESCP, 2006) with the following objectives:

- To serve as a road map for implementing activities within the scope of the Collaborative Program;
- To provide accountability through measurable objectives and an annual Collaborative Program assessment process; and,
- To help integrate federal and non-federal budget processes for providing funding for future activities.

In August 2009, the Executive Committee (EC) of the Collaborative Program decided to try to move beyond "alleviating jeopardy" and transition into a recovery program. One of the first tasks was to begin drafting a new LTP containing an inventory of possible beneficial activities based in the framework of the RGSM and SWFL recovery plans and that are within the scope of the Collaborative Program. In the new draft LTP, the Collaborative Program's activities and projects will be organized by LTP elements linking specific efforts to recommended recovery activities.

The following sections describe the Collaborative Program associated responsibilities for species recovery.

## 1.1 COLLABORATIVE PROGRAM GOVERNANCE

Reclamation is the lead agency for ensuring that Collaborative Program activities comply with federal and state environmental laws, improve the status of the species, and attain and maintain ESA compliance. This responsibility includes compliance for existing, ongoing, and future activities associated with the Collaborative Program.

The Collaborative Program's By-Laws, adopted in October 2006, describe the governance structure, decision-making processes, and roles and responsibilities of its participants. The Collaborative Program By-Laws were amended three times (July 2008, January 2009, and September 2009) to update or clarify roles, responsibilities, and/or protocol. Documents related to governance, by-laws, authorities, charters, and code-of-conduct are maintained on the Collaborative Program's website.

## 1.2 COLLABORATIVE PROGRAM ORGANIZATION

The organizational structure of the Collaborative Program consists of: the EC, the Coordination Committee (CC), technical work groups, and the Program Management Team (PMT). This section provides general information about these groups. More specific information, including work group documentation, is available on the Collaborative Program website.

### Executive Committee

The EC is the governing body of the Collaborative Program.

The EC is comprised of representatives of the signatories listed in the Executive Summary of this report. The EC provides policy direction, budget oversight, and decision-making on all issues, unless specifically delegated to the PMT, CC, or work groups.

The EC is responsible for:

- Setting Collaborative Program priorities;
- Providing direction, assigning tasks to, and overseeing the work of the PMT, CC, and work groups;
- Ensuring development and implementation of the LTP to achieve the purposes of the Collaborative Program;
- Coordinating Collaborative Program activities with other federal and non-federal activities in the Collaborative Program area to achieve the greatest effect and limit unnecessary duplication of other efforts;
- Authorizing work groups;

- Developing multi-year budget recommendations to the Corps, Reclamation, the Service, other federal agencies, Tribes and Pueblos, and non-federal entities;
- Reviewing and approving annual reports and work plans, budgets, and policy or position papers on behalf of the Collaborative Program;
- Establishing operating procedures for the Collaborative Program;
- Representing the Collaborative Program to executive agencies, legislative bodies and other third parties;
- Monitoring progress in achieving Collaborative Program goals;
- Ensuring implementation of a quality assurance/ control program;
- Coordinating requests for funding and resources to Congress, the New Mexico State Legislature, and other sources;
- Ensuring sound financial management of Collaborative Program resources and timely reporting of the financial status of the Collaborative Program;
- Ensuring coordination among participants in carrying out Collaborative Program actions and policies;
- Providing periodic reports to Congress, the New Mexico State Legislature, interest groups, and the public regarding the Collaborative Program; and,
- Conducting other activities necessary or advisable to achieving the goals of the Collaborative Program.

### Coordination Committee

Each member of the EC appoints one member to the CC and may appoint one or more alternate members. The CC was established for the purpose of identifying concerns associated with Collaborative Program activities, working to resolve those concerns, and developing consensus recommendations to and information for the EC. More specifically, the CC is responsible for:

- Carrying out the directives of the EC;
- Reviewing and providing comments and recommendations on work group formation, the LTP, annual reports, work plans, budgets, operating procedures, congressional reports, work group deliverables, and other documents prior to submittal to the EC by the PMT;
- Working to achieve consensus recommendations for the EC on unresolved issues;
- Consulting regularly with EC representatives on issues of concern to ensure that recommendations reflect the viewpoints of organizations participating in the EC and of EC members; and,
- Ensuring that EC members are informed on matters coming before the EC.

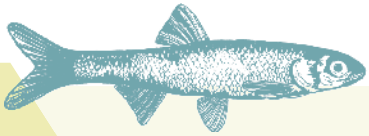
## WORK GROUPS

The EC establishes work groups, as needed, to provide assistance and expertise that address specific Collaborative Program tasks. Members of a work group may consist of professionals, signatories, contractors, and other parties who have expertise related to the assignment given to the work group. Work groups provide technical assistance, expertise, leadership, technical review, and coordination to address specific tasks to accomplish the goals of the Collaborative Program, primarily for implementation of the LTP. Work groups meet regularly, providing a forum for discussing Collaborative Program-related topics and contributing to consistency in technical planning efforts over the duration of the Collaborative Program.

### Habitat Restoration Work Group

The Habitat Restoration Work Group (HRW) helps to restore habitat in the MRG to contribute to accomplishing BiOp Reasonable and Prudent Alternative (RPA) elements R and S for the benefit of the listed species. The HRW provides:

- Coordination of long-term, MRG-wide, habitat restoration (HR) plans that actively integrate hydrology, river function, and riparian communities resulting in improved ecological conditions and habitats for endangered species that support the BiOp;
- Integration of HRW activities with other MRG projects, including other Collaborative Program work groups and restoration efforts outside of the Collaborative Program;
- A regular forum for meeting and discussing Collaborative Program-related HR topics;
- Consistency in technical planning efforts, based on sound science, over the duration of the Collaborative Program;
- Technical assistance to others wanting to implement HR projects in the MRG; and,
- A scientific framework for monitoring and assessing restoration projects



### Public Information Outreach Work Group

The Public Information Outreach Work Group (PIO) assists the EC in educating and informing the general public, stakeholders, and state and federal legislators about Collaborative Program activities and accomplishments. These information and outreach efforts supported: 1) Requests for long-term non-federal cost share funding; 2) Understanding by the general public regarding the potential role of the Collaborative Program in MRG water management and endangered species recovery issues; and, 3) Increased awareness by the general public and decision-makers regarding the collaborative problem-solving approach and funding requirements of the Collaborative Program. Some of the key PIO objectives include:

- Streamline the process to successfully get the word out about the Collaborative Program;
- Ensure that entities affected by the actions of the Collaborative Program fully understand the issues and participate in a meaningful way with the Collaborative Program and other decision-makers. These entities include land owners, water rights holders, and water users;
- Ensure that the Governor, Congressional Delegation, Pueblo and Tribal Leaders, advocacy groups, and New Mexico State Legislators, along with city and county leaders directly affected by the water management and/or associated endangered species compliance issues on the MRG, are aware of the role of the Collaborative Program regarding these issues and the need for funding from both the federal side and the non-federal cost share;
- Establish an effective communication strategy for all leaders within the Collaborative Program; and,
- Evaluate the role of the Collaborative Program in informing stakeholders and the general public about plans for future water operations, ESA compliance, and Collaborative Program activities.

### Science Work Group

The Science Work Group (ScW) provides scientific recommendations, technical assistance, and expertise to the Collaborative Program for the benefit of listed species in the MRG. The ScW provides:

- Recommendations for research and monitoring priorities;
- Technical review and coordination of science projects;
- Coordination and integration of long-term research and monitoring activities, including other Collaborative Program work groups and activities outside of the Collaborative Program;
- A regular forum for meeting and discussing Collaborative Program-related research and monitoring;
- Consistency in technical planning efforts over the duration of the Collaborative Program;
- Technical assistance to others wanting to implement research and monitoring projects; and,
- A framework for exchanging scientific information.

### Ad Hoc Work Groups

Temporary ad hoc work groups may be formed from existing primary Collaborative Program work groups. Ad hoc work groups consist of individuals with expertise and/or interest in the specialized subject necessary to implement LTP tasks. The primary work group oversees each formed ad hoc work group and is responsible for ensuring that ad hoc work groups meet objectives and schedules. The primary work group disbands the ad hoc work group upon completion of the pre-determined objectives. The EC may appoint additional members to the ad hoc work groups.

### Population Viability Assessment Work Group

The PVA ad hoc work group identifies and articulates ideas and input into two different Population Viability Assessment (PVA) models, and provides biological information needed for the Biological Assessment (BA) and BiOp. Work group members formulate biological and ecological relationships and define them for analysis in the PVAs.

### Signatories

Signatories (listed in the Executive Summary) are entities who have signed the Collaborative Program Memorandum of Agreement (MOA), agreeing to participate in and support the Collaborative Program. Any organization having a demonstrated interest in the success of the Collaborative Program may apply to become a signatory. To qualify for consideration, the applicant organization submits a letter of interest to the EC supporting the goals and success of the Collaborative Program and expressing its intent to sign the MOA if the application is accepted. The number of signatories to the Collaborative Program is limited to twenty.

# 2 FINANCIAL SUMMARY

As the fiscal agent for the Collaborative Program, Reclamation manages the federal funding allocated by Congress to the Collaborative Program. As the contracting agency, Reclamation administers interagency agreements, financial assistance, and contracts for Collaborative Program projects. Federal appropriations are supplemented by non-federal Collaborative Program signatories in the form of financial contributions and in-kind services (e.g., personnel time, equipment, land access). Fiscal Year (FY) 2014 Congressional appropriations and signatories provided funding for the categories depicted in Figure 2.1 and Table 2.1.

In addition, the U.S. Army Corps of Engineers (USACE), through its congressional authority, began receiving appropriations in the fourth quarter of 2009. In FY 2014, USACE provided $1,581,023 to the efforts of the Collaborative Program through work group participation and projects. The breakout of this funding is available through USACE's report for FY 2014.

**FIGURE 2.1: FISCAL YEAR 2014**

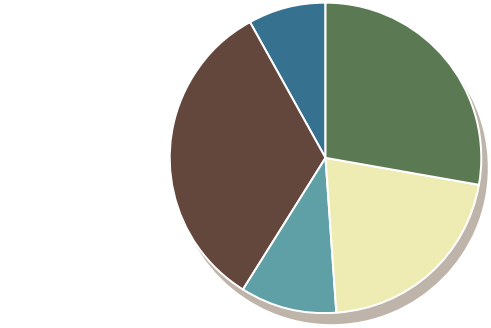



**TABLE 2.1 | Breakdown for Fiscal Year 2014**

| MAIN FUNDING CATEGORIES | AMOUNT APPROPRIATED |
|---|---|
| Physical Habitat Restoration and Management | $1,727,132 |
| Water Management | $1,280,250 |
| Population Augmentation/Propagation (Silvery Minnow Only) | $606,740 |
| Monitoring and Rescue/Salvage | $2,066,617 |
| Program Management | $525,470 |
| **TOTAL** | **$6,206,209** |

# 3 PROGRAM ACCOMPLISHMENTS

Throughout Fiscal Year (FY) 2014, the Collaborative Program continued to restore RGSM and SWFL habitat, acquire and manage supplemental water, augment and propagate RGSM, support scientific analysis and adaptive management, improve public outreach and program management, and promote recovery of the listed species.

Noteworthy Collaborative Program accomplishments include:

- 1,592 acres of habitat restoration to date (through Collaborative Program and non-Collaborative Program efforts) to date, or 99% of the 1,600 acre 2003 Biological Opinion (BiOp) requirement;
- Acquiring and releasing a total of 15,635 acre-feet (AF) of supplemental water during 2014; and,
- Augmenting and propagating RGSM in the Middle Rio Grande (MRG). Since 2002, over 2,280,000 RGSM have been released into the MRG through augmentation activities. Since 2000 approximately 769,500 RGSM have been salvaged and relocated to wet reaches of the Rio Grande.

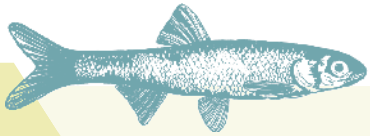
Several activities in 2014 were conducted in an effort to improve the status of the RGSM:

- The Southwest Native Aquatic Resources and Recovery Center (SNARRC) continued to contribute directly to the enhancement and stabilization of existing and re-introduced RGSM populations within its historic range. In 2014, SNARRC produced over 303,000 age-0 fish, and released 233,00 RGSM into the MRG and approximately 70,000 RGSM into the Big Bend Reach of the Rio Grande, Texas.
- A total of 29,092 RGSM eggs were collected in 2014 by Albuquerque BioPark and contracted staff. Approximately 15,000 juvenile RGSM were hatched from these eggs and provided to SNARRC to maintain their broodstock. The RGSM Sanctuary continued to function as an education and outreach facility;
- In 2014, the Los Lunas Silvery Minnow Refugium (LLSMR) continued to raise RGSM for augmentation, house broodstock and an additional population in case of river disaster or disease affecting other propagation facilities, and conduct studies of the species that will assist in its recovery; and,
- In 2014, RGSM tissue samples and specimens were provided to the University of New Mexico (UNM) for genetic analysis and monitoring of the MRG captive propagation program and the repatriated population at Big Bend.

In FY 2014, USACE funded the continued maintenance of the Database Management System (DBMS). The DBMS is web-accessible and GIS-based, enabling Collaborative Program participants and the general public to readily access data associated with Collaborative Program activities regarding HR, water management, and other scientific investigations that support MRG Basin management.

The Collaborative Program has continued to restructure and transition from activities focused on avoiding jeopardy towards objectives of a Recovery Implementation Program (RIP) with the endorsement of the RIP Document and Action Plan.

Numerous projects were conducted in 2014 that contributed to meeting the goals specified in this report and they are summarized in the following sections.



## 3.1 PHYSICAL HABITAT RESTORATION AND MANAGEMENT

Habitat restoration (HR) and improvement activities include physical manipulations of the Rio Grande channel (riverine restoration) and adjacent bosque (riparian restoration) to benefit the listed species. HR priorities in 2014 included planning, designing, constructing, and monitoring of projects to benefit the RGSM and SWFL in various locations throughout the Middle Rio Grande (MRG). Table 3.1 summarizes the status of physical habitat restoration and management activities, and the activities are described in the following sections.

**TABLE 3.1 | FY 2014 Funded Projects: Physical Habitat Restoration and Management**

| | Funded Projects – Funded Entity | Funding Entity | Entity Performing Work | Continuing Activity or Distinct Project | BiOp Requirement | Grant/ Contract # | Amount Appropriated |
|---|---|---|---|---|---|---|---|
| 3.1.1 | Pueblo of Santa Ana Habitat Restoration | Reclamation<br>Pueblo of Santa Ana | Pueblo of Santa Ana | FY11-FY14 | yes | R11AP40096 | $147,980<br>$29,152 |
| 3.1.2 | Island Removal Project – Pueblo of Isleta | NM Water Trust Board<br>Pueblo of Isleta | Pueblo of Isleta | FY14 | yes | N/A | $1,000,000<br>$250,000 |
| 3.1.3 | San Juan-Chama Drinking Water Environmental Mitigation Project – ABCWUA | ABCWUA | ABCWUA | FY13-FY15 | N/A | N/A | $300,000 |

### 3.1.1 PUEBLO OF SANTA ANA HABITAT RESTORATION

This project involved the creation of a network of ephemeral channels within ten acres of existing lowered river bar. Areas adjacent to the ephemeral channels were planted with more than 836 poles of woody riparian species, and woody debris piles were placed on the upper portions of the bar. The water level will be monitored to assess changes in inundation.

**Benefits to Species:** When completed, RGSM and SWFL will potentially benefit from increased wetted habitat when flows are low, diversified habitat types, multi-structured vegetation cover, and re-connection between known used habitats and previously used habitats.

### 3.1.2 ISLAND REMOVAL PROJECT – PUEBLO OF ISLETA

This project involved the removal of approximately nine acres of islands below the Isleta Diversion Dam (IDD). It restored the connection between the shallow groundwater and surface-water flow, and resulted in a wet water gain in this reach of the river. The input from the shallow groundwater may result in a longer reach below the IDD remaining wet during low flow conditions.

**Benefits to Species:** This project created approximately eighteen acres of habitat for the RGSM via the removal of islands and extension of the wetted area of the river.

### 3.1.3 SAN JUAN-CHAMA DRINKING WATER ENVIRONMENTAL MITIGATION PROJECT – ABCWUA

This project consisted of HR treatments to promote inundation of river features to provide habitat for all life stages of RGSM, including low-velocity, shallow floodplain waters at lower discharges along the main channel margins (e.g., creation of embayments) and alongside channels within the bosque (e.g., ephemeral channels). A secondary goal of the project was to improve riparian habitat for SWFL, including the flooding of bosque lands to promote willow-dominated habitat. The project has the advantage of combining the three treatment sites into a single project approximately twenty acres, thus enabling Albuquerque Bernalillo County Water Utility Authority (ABCWUA) to attain some efficiencies of scale while providing maximum potential benefit for RGSM and SWFL.

**Benefits to Species:** When fully implemented, RGSM and SWFL will potentially benefit from increased wetted habitat when flows are low, diversified habitat types, multi-structured vegetation cover, and re-connection between known used habitats and previously used habitats.

## 3.2 WATER MANAGEMENT

The Collaborative Program seeks to develop and implement creative water use and development alternatives that will satisfy water needs for threatened and endangered species while protecting existing uses. Language in the Fiscal Year (FY) 2006 Energy and Water Appropriations Act (Public Law 109-275) assigned responsibility for water acquisition, administration, and management to Reclamation, to be conducted at full federal expense.

Water management includes acquisition of water and/or manipulation of flows, reservoirs, and Low-Flow Conveyance Channel (LFCC) pumping to meet compliance requirements and activity objectives on the ground. Reclamation works to secure potential supplies of water and storage space and implement management strategies to meet Biological Opinion (BiOp) requirements and Collaborative Program goals. Table 3.2 summarizes the status of water management projects. The projects are described in the following sections.

**TABLE 3.2 | FY 2014 Funded Projects: Water Management**

| | Funded Projects – Funded Entity | Funding Entity | Entity Performing Work | Continuing Activity or Distinct Project | BiOp Requirement | Grant/ Contract # | Amount Appropriated |
|---|---|---|---|---|---|---|---|
| 3.2.1 | Supplemental Water Program – Bureau of Reclamation | Reclamation | Reclamation | FY01-ongoing | no | various | $1,280,250 |
| 3.2.2 | Minnow Action Team | N/A | MRGESCP | FY12-ongoing | no | N/A | N/A |

### 3.2.1 SUPPLEMENTAL WATER PROGRAM – BUREAU OF RECLAMATION

Water acquisition funding in 2014 made possible releases of supplemental water to meet the flow requirements of the 2003 BiOp and benefited RGSM and SWFL. Funds in the amount of $1,280,250 were used to secure leases of San Juan-Chama Project water from willing lessors to provide for releases of supplemental water into the Rio Grande. Water leases for 2014 are summarized in Table 3.2.1.

**TABLE 3.2.1 | FY 2014 Funding for the San Juan-Chama Project Supplemental Water Lease Agreements**

| SJCP Contractor | 2014 Leased Acre-Feet | 2014 Funding |
|---|---|---|
| ABCWUA | 3,321 | $332,100 |
| City of Belen | 354 | $17,700 |
| City of Española | 500 | $25,000 |
| City of Santa Fe | 900 | $45,000 |
| County of Los Alamos | 1,067 | $53,350 |
| El Prado W&S District | 36 | $1,800 |
| Jicarilla Apache Nation | 4,679 | $467,900 |
| Ohkay Owingeh | 1,779 | $88,950 |
| Taos Pueblo | 1,970 | $197,000 |
| Town of Bernalillo | 199 | $9,950 |
| Town of Red River | 54 | $2,700 |
| Town of Taos (original + settlement allocations) | 651 | $32,550 |
| Village of Los Lunas | 125 | $6,250 |
| **Total** | **15,635** | **$1,280,250** |

### 3.2.2 MINNOW ACTION TEAM

The Minnow Action Team (MAT) began in 2012 as a transitional and informal work group to provide an adaptive management focus to Middle Rio Grande (MRG) water and species activities. Due to reports of low RGSM numbers in the MRG resulting from the prolonged drought in that year, the MAT was formed to determine if any management actions could be proposed to the Executive Committee (EC).

The work group is now one of several teams that are considered a key element of the proposed Recovery Implementation Program (RIP) organization (MRGESCP, 2012). In particular, the focus of the MAT is to assimilate information (hydrologic, biological, and ecological) on an annual basis, and provide recommendations that could be used to reduce threats to endangered species and to enhance spawning, recruitment, and survival conditions for RGSM. The MAT is anticipated to work together with an Adaptive Management committee, once established, to address species recovery over the long-term planning horizon.

In 2014, the MAT continued to perform an annual assessment of hydrologic conditions in the context of addressing species needs. The MAT provided its technical recommendations to the EC on potential operational and monitoring actions that could be considered for the upcoming irrigation season. The recommendations for 2014 were similar to those of 2013, with the exception of suggesting that the flow targets in the 2003 BiOp be followed to the extent possible. While the irrigation season was predicted to be curtailed in 2014, sufficient monsoonal precipitation allowed the Middle Rio Grande Conservation District (MRGCD) to continue its operations in the fall.

### 3.3 POPULATION AUGMENTATION/PROPAGATION (SILVERY MINNOW ONLY)

The Collaborative Program has partially funded the construction, operation, and maintenance of three rearing and breeding facilities for RGSM in the Middle Rio Grande (MRG): the City of Albuquerque's (COA) Aquatic Conservation Facility (formerly the Rio Grande Silvery Minnow Rearing and Breeding Facility), the New Mexico Interstate Stream Commission's (NMISC) Los Lunas Silvery Minnow Refugium (LLSMR), and the U.S. Fish and Wildlife Service's (USFWS) Southwestern Native Aquatic Resources and Recovery Center (SNARRC; formerly Dexter National Fish Hatchery and Technology Center). SNARRC is also utilized to conduct research for fish health assessments and to assist in preservation of genetic diversity. These facilities provide sufficient populations for reestablishing and augmenting RGSM within its historic range of the Rio Grande Basin. Table 3.3 summarizes the captive propagation and population augmentation projects funded by the Collaborative Program and its signatories in Fiscal Year (FY) 2014. The projects are described in the following sections.

**TABLE 3.3** | FY 2014 Funded Projects: Population Augmentation/Propagation (Silvery Minnow Only)

| | Funded Projects – Funded Entity | Funding Entity | Entity Performing Work | Continuing Activity or Distinct Project | BiOp Requirement | Grant/ Contract # | Amount Appropriated |
|---|---|---|---|---|---|---|---|
| 3.3.1 | SNARRC Rearing/Breeding Operation and Maintenance – USFWS | Reclamation | USFWS | FY03-ongoing | yes | R13PG40023 | $300,000 |
| 3.3.2 | City of Albuquerque Rearing/ Breeding Operation and Maintenance | Reclamation | City of Albuquerque | FY03-ongoing | yes | R14AP00136 | $140,000 |
| 3.3.3 | Operations and Maintenance of the Los Lunas Silvery Minnow Refugium – NMISC | Reclamation | NMISC | FY07-ongoing | yes | R14AP00124 | $166,740 |

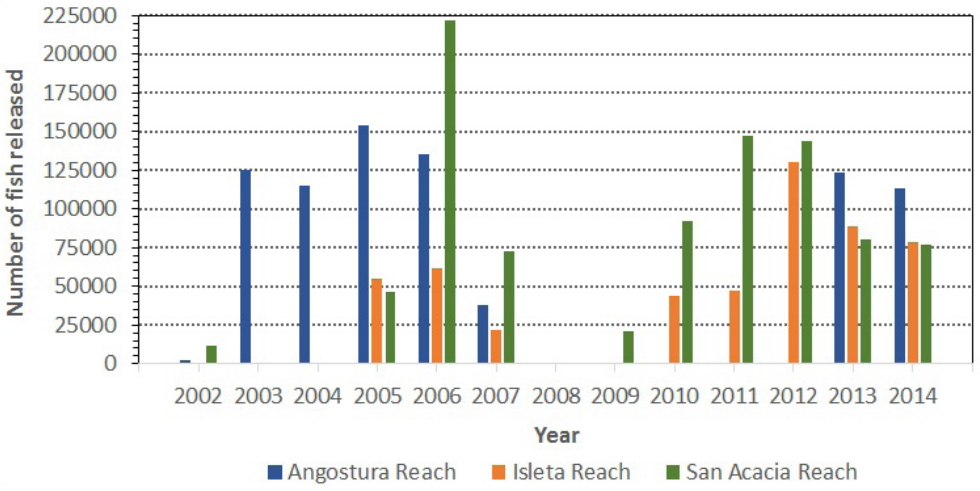



Figure 3.3

Rio Grande silvery minnow augmentation releases by reach (2002–2014): Bars represent yearly totals of all seasonal releases in the Angostura, Isleta, and San Acacia Reaches from the Southwestern Native Aquatic Resources and Recovery Center (SNARRC), Los Lunas Silvery Minnow Refugium (LLSMR) and Aquatic Conservation Facility. Data are from annual reports by the U.S. Fish and Wildlife Service New Mexico Fish and Wildlife Conservation Office (formerly the Fishery Resources Office). These reports, titled "Rio Grande silvery minnow augmentation in the Middle Rio Grande, New Mexico," are available on the New Mexico Fishery Resources Office website: http://www.fws.gov/southwest/fisheries/nmfwco/reports.html

### 3.3.1 SNARRC REARING/BREEDING OPERATION AND MAINTENANCE – USFWS

This cooperative project at USFWS's Southwestern Native Aquatic Resources and Recovery Center (SNARRC) in Dexter, NM utilizes the joint expertise of federal and state agencies, and educational institutions to significantly aid in reestablishing, stabilizing, and enhancing populations of RGSM within its historic range of the Rio Grande Basin. The two facilities contributing to the effort are the USFWS's SNARRC and New Mexico Fish and Wildlife Conservation Office (NMFWCO). SNARRC produces 250,000-300,000 RGSM annually for river augmentation. The facility holds an additional 80,000-100,000 RGSM over winter and 16,000-20,000 captive broodstock year-round. The primary purpose of this activity is to propagate RGSM for augmentation efforts.

In 2014, SNARRC maintained a captive broodstock of 25,000 wild-caught adult fish and 5,000 larvae from egg salvage operations. SNARRC produced approximately 303,000 RGSM in the calendar year, providing 233,000 for augmentation in the MRG and 70,000 for reintroduction at the Big Bend Reach, TX.

SNARRC provided 1,000 adult fish and 37,362 eggs to the Los Lunas Refugium and 180 adult fish and 20,000 eggs to the COA BioPark to supplement the stocks at those facilities.

**Benefits to Species:** The facility is utilized to conduct research for fish health assessments, maintain captive broodstocks, assist in preservation of genetic makeup, and rear and maintain larvae and adults. The propagation program began in 2001, and has made significant advances in developing appropriate and consistent propagation and culture methods.

### 3.3.2 CITY OF ALBUQUERQUE REARING/ BREEDING OPERATION AND MAINTENANCE

RGSM are tagged before being released from the SNARRC facility.

*Credit: U.S. Fish and Wildlife Service*

This project provides funding for the operation and maintenance of the COA Aquatic Conservation Facility (formerly the Rio Grande Silvery Minnow Rearing and Breeding Facility) located at the Albuquerque BioPark. The continued operation of the facility promotes the recovery of RGSM and increases RGSM numbers in the wild through captive propagation and augmentation. The Aquatic Conservation Facility is designed as a practical breeding and rearing center, as well as a research center. The facility includes indoor culture systems, outdoor culture systems, and a naturalized refugium. The indoor systems are used for quarantine, breeding, egg hatching, and rearing larvae. The outdoor systems are used for raising larvae to sub-adult age as well as holding large numbers of broodstock. The naturalized refugium is an outdoor system that creates a river-like environment with controllable flow, variable depth, variable habitat, and natural substrate.

Between April 17, and June 11, 2014, staff from the Aquatic Conservation Facility conducted over 200 man-hours monitoring and collecting of RGSM eggs in the MRG. A total of 21,112 eggs were collected by Aquatic Conservation Facility staff and an additional 7,980 eggs were collected by contracted staff and transferred to the Aquatic Conservation Facility for hatching and rearing. On May 28, 2014, approximately 5,000 juvenile RGSM that had been hatched from wild-collected eggs were transferred to SNARRC to be used as future broodstock.

A total of 25,467 RGSM were tagged and later released into the Angostura reach of the MRG in October 2014. An additional 24,245 tagged RGSM were released in cooperation with USFWS in the Isleta Reach, near Jarales, NM.

**Benefits to Species:** The continued operation of this facility will help promote recovery of the RGSM and increase its numbers in the wild through captive propagation and augmentation. The propagation techniques used by the facility staff have produced fish, eggs, and substantive information for other fish culturists. The COA's facility significantly aids reestablishing, stabilizing, and enhancing populations of the RGSM within its historic range of the Rio Grande Basin.

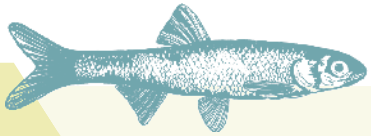
### 3.3.3 OPERATIONS AND MAINTENANCE OF THE LOS LUNAS SILVERY MINNOW REFUGIUM – NMISC

The Los Lunas Silvery Minnow Refugium (LLSMR), built and managed by NMISC with federal financial assistance, was designed for the propagation and culture of RGSM within a more natural environment. The facility, which began operation in 2009, is located on State of New Mexico property in the Village of Los Lunas, about twenty miles south of Albuquerque. The facility includes an outdoor refugium that has a stream, ponds, islands, and overbank areas to mimic the Rio Grande's habitats. The LLSMR also has an indoor hatchery, a quarantine building, outdoor tanks, and an office building. The LLSMR has a
permanent staff of two aquaculturists and one technician. The LLSMR is permitted by USFWS, and NMISC and USFWS work closely with the Collaborative Program's Captive Propagation Work Group to accomplish its goals and objectives. The facility and its operation are described in:

> Tave, D., G. Haggerty, C.N. Medley, A.M. Hutson, and K.P. Ferjancic. 2011. Los Lunas silvery minnow refugium: a conservation hatchery. World Aquaculture 42(2):28-34, 67.

**Benefits to Species:** The LLSMR benefits RGSM through protection against extinction and assisting in recovery by:

- Raising RGSM for augmentation of wild populations in the MRG;
- Housing a broodstock population for species protection against extinction in the case of river disasters;
- Housing an additional captive population in case of a disease affecting the other two RGSM breeding and propagation facilities; and,
- Conducting studies that provide insight to the species, as well as improving hatchery management of the species.



## 3.4 MONITORING

The Collaborative Program pursues scientifically based solutions to address the needs of the listed species, and the ecosystems upon which they depend. Monitoring and rescue/salvage are used to ensure that Collaborative Program activities achieve the desired objectives. In FY 2014, science and monitoring priorities included: 1) assessing key habitat requirements of the RGSM and SWFL that are essential to alleviating jeopardy and promoting recovery; 2) assessing hydrologic and geomorphic impacts on habitat qualities; and, 3) monitoring and assessing the population status of RGSM and SWFL. Table 3.4 summarizes the projects funded by the Collaborative Program and its signatories for Fiscal Year (FY) 2014. The projects are described in the following sections.

**TABLE 3.4 | FY 2014 Funded Projects: Monitoring**

| | Funded Projects – Funded Entity | Funding Entity | Entity Performing Work | Continuing Activity or Distinct Project | BiOp Requirement | Grant/ Contract # | Amount Appropriated |
|---|---|---|---|---|---|---|---|
| 3.4.1 | Wasteway/Drain Outfalls Fish Sampling – MRGCD | MRGCD | MRGCD; SWCA; NMISC; USACE; Pueblo of Isleta | FY14 | no | various | $20,000 |
| 3.4.2 | Rio Grande Silvery Minnow Population Monitoring | Reclamation | ASIR, LLC | FY02-ongoing | yes | R13PD43013 | $214,636 |
| 3.4.3 | Rio Grande Silvery Minnow Spawning Monitoring/ Egg Monitoring in Canals | Reclamation | GenQuest, Inc. | Annual | yes | R14PD00153 | $131,501 |
| 3.4.4 | Assessment and Monitoring of Rio Grande Silvery Minnow Genetics | Reclamation | University of New Mexico | FY14-ongoing | yes | R14PC00035 | $166,450 |
| 3.4.5 | Rio Grande Silvery Minnow Propagation, Augmentation, and Rescue/Salvage | Reclamation | USFWS | FY01-ongoing | yes | R13PG40023 | $315,767 |
| 3.4.6 | Southwestern Willow Flycatcher Surveys | Reclamation<br>USACE | Reclamation; USACE | FY13-ongoing<br>FY95-ongoing | N/A | N/A | $363,000<br>$10,000 |
| 3.4.7 | Bosque School BEMP Site Monitoring | USACE<br>Reclamation | Bosque School; USACE | FY00-ongoing<br>FY14-FY16 | N/A | W81G69319-28877<br>R12AP40022 | $200,000<br>$25,000 |
| 3.4.8 | Rio Grande Silvery Minnow Monitoring – USACE | USACE | USACE; SWCA | FY14-FY15 | N/A | W912PP-14-F-0005 | $270,385 |
| 3.4.9 | Tamarisk Leaf Beetle Monitoring – USACE | USACE | USACE; Ecoplateau Research | FY 2014 | N/A | W912PP-14-P-0041 | $52,742 |
| 3.4.10 | Alameda Gage Temperature Probe – USACE | USACE | USACE; USGS | Annual | N/A | W81G6900 912997 | $6,080 |
| 3.4.11 | Southwestern Willow Flycatcher Surveys in the Albuquerque Metro Area – USACE | USACE | USACE; Hawks Aloft, Inc. | FY04-ongoing | N/A | W912PP-11-F-0061 | $183,426 |
| 3.4.12 | Rio Grande Sediment Gages: Rio Puerco, San Acacia, San Marcial – USACE | USACE | USACE; USGS | Annual | N/A | W81G6900 822607 | N/A |
| 3.4.13 | Rio Grande Nature Center High Flow Channel Gage Monitoring – USACE | USACE | USACE; USGS | FY10-ongoing | N/A | W81G6900 912997 | N/A |
| 3.4.14 | Rio Grande and Tributaries Geomorphic Characterization Study – USACE | USACE | USACE; Tetra Tech, Inc. | FY11-FY16 | N/A | W912PP-08-D-0009 | $470,602 |
| 3.4.15 | Los Lunas Habitat Restoration Project Monitoring – USACE | USACE | USACE; Reclamation; MRGCD | FY00-ongoing | N/A | W81G6931 928877 | $25,028 |

### 3.4.1 WASTEWAY/DRAIN OUTFALLS FISH SAMPLING – MRGCD

The purposes of this study were to assess the habitat suitability of drain outfalls as refugia for RGSM and other fish species, and to evaluate fish utilization of these areas during summer drying events.

This study monitored and documented the following: drain outfall utilization by fish; fish health and size, water quality, and aquatic food supply as indicators of habitat suitability; and, drain outfall utilization by fish, including the habitat type(s) being used. RGSM collected within the wasteway/drain outfalls were found where debris was present and sites were classified as having a complex habitat component. Overall, average water quality was similar between the wasteway/drain outfalls and the associated main channel. Fish were found occupying the wasteway/drain outfalls during all three surveys conducted between July and September, indicating that they are likely used when the adjacent main channel is dry. However, drying did not occur in 2014 in the adjacent main channel, so the study could not determine whether use of the wasteway/drain outfall sites increases or decreases during drying.

**Benefits to Species:** RGSM may use wasteway/drain outfalls as refugia during times of drought and river drying. By directing small quantities of water to outfall locations, water management actions have the potential to contribute to RGSM survival.

### 3.4.2 RIO GRANDE SILVERY MINNOW POPULATION MONITORING

Population monitoring of RGSM and the associated Middle Rio Grande (MRG) fish community has been systematically conducted at multiple sites from Algodones, NM to Elephant Butte Reservoir since 1993, and has been continuously funded by the Collaborative Program from 2002 to present. This long-term sampling program allows for documentation of RGSM population trends.

Monitoring occurs nine months of the year at twenty locations in the MRG. The metric used as a measure of species status is the number of RGSM individuals per unit area sampled, or catch per unit effort (CPUE). The consistent monitoring protocol implemented for this project has yielded a nearly seamless long-term ecological data set to:

- Determine long-term (multiple years) and short-term (seasonal) trends in fish populations of the MRG using statistical approaches that discern spatiotemporal differences in the abundance of native and non-native fish, with a focus on RGSM;
- Evaluate the influence of discharge timing, magnitude, and duration on population fluctuations of both native and non-native fish species in the MRG over time and space, with a focus on RGSM;
- Compare changes in RGSM absolute and rank abundance to that of other native and non-native fish species;
- Determine site-specific sampling variation; and,
- Examine spatial correlation of RGSM population dynamics over time.

The estimated densities of RGSM were notably lower 2010–2014 as compared with 2007–2009. During standard

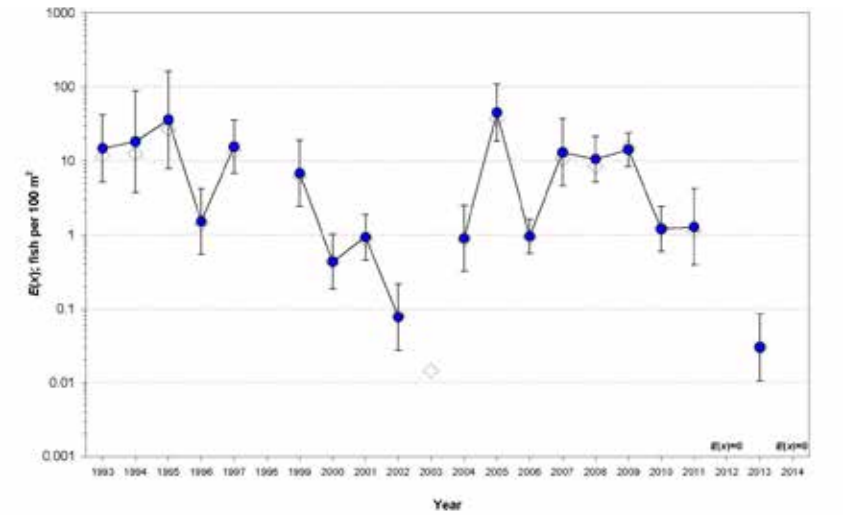
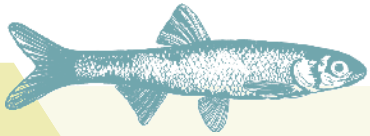



Figure 3.4.2

**Rio Grande silvery minnow estimates of density (E(x)), using October sampling-site density data (1993–2014):** Solid circles indicate modeled estimates and bars represent 95% confidence intervals. Dotted horizontal lines represent orders of magnitude. From "Rio Grande Silvery Minnow Population Monitoring Program Results From February To December 2014," by R. K. Dudley, S. P. Platania, and G. C. White, 2015.



monitoring conducted in October 2014, no RGSM were detected at any of the twenty population monitoring sites.

**Benefits to Species:** The overarching purpose of the monitoring effort is to provide the foundation necessary to assess long-term changes in the MRG ichthyofaunal community, including RGSM. Specifically, these data have been used to document temporal and spatial trends in native and non-native fish populations and to assess the influence of environmental variability (i.e., timing, magnitude, and duration of discharge) on species abundance and community structure. Monitoring fish communities at selected study sites provides information on RGSM and associated fish fauna, including population trends in response to water management practices.

### 3.4.3 RIO GRANDE SILVERY MINNOW SPAWNING MONITORING/EGG MONITORING IN CANALS

Spawning monitoring acquires important (daily) information on the reproductive output of RGSM in the MRG at multiple sites in the Isleta and San Acacia Reaches. The sampling survey protocol is designed to estimate the number of in-river RGSM eggs produced during major spawning events and over the duration of the principal spawning season (April–June). The protocol is also designed to analyze egg passage rates, make correlations with water quality data, identify detailed spatial spawning patterns, and make comparisons with prior years' data. Systematic monitoring of the reproductive output of RGSM at several sites in the MRG was first conducted in 1999 and has continued annually (except 2005) since 2001.

Canal monitoring has been performed each year since 2003 in order to document RGSM entrainment in main canals associated with diversion dams during the RGSM spawning period from May 1st to May 31st. Catch rates in irrigation canals are used to determine the extent of entrainment of eggs into the irrigation system at both the Isleta (IDD) and San Acacia Diversion Dams (SADD) in order to minimize take due to diversions. Daily reports and updates to management entities are provided as well, to assist in resource management and river management decisions during the spring peak.

A total of 9,727 eggs were detected during 2014 monitoring from May 6th to June 11th. The estimated number of eggs transported downstream was 41,127 at the Isleta Reach site, 142,369 at the San Acacia site, and 9,758,496 at San Marcial.

**Benefits to Species:** Selected samples of wild eggs are provided to research personnel for ongoing population viability and genetic studies. Long-term monitoring of the reproductive effort of RGSM is necessary for recovery efforts and to facilitate effective management decisions. Catch rates of drifting eggs during the spring peak flows are used to determine the magnitude and timing of the spring spawn for RGSM. Each yearly effort is also designed, in part, to provide insight to the success of recent stocking efforts. The future conservation status of RGSM appears dependent on ensuring adequate flow conditions during the spawning and early recruitment phases of this species.

### 3.4.4 ASSESSMENT AND MONITORING OF RIO GRANDE SILVERY MINNOW GENETICS

Genetic sampling and analyses are being conducted on wild and artificially propagated stocks of RGSM. This project examines changes in levels of genetic variability in the wild population, impacts to viability, and impacts of captive propagation and augmentation on wild stocks. The RGSM genetics database is being used to develop, parameterize, and verify models aimed at predicting genetic effects of captive propagation on wild stocks of RGSM (under various scenarios) to inform captive propagation and augmentation strategies aimed at species recovery. Genetic monitoring of RGSM using nuclear microsatellites and mitochondrial DNA (mtDNA) commenced in 1999 and has continued annually since that time, with the exception of 2013.

**Benefits to Species:** This project has provided long-term, annual genetic information on wild and captively reared stocks of RGSM. It is critical to characterize the genetic diversity of the wild population of RGSM, both spatially and temporally, so that broodstock may be selected to mirror the pattern of wild variation in hatchery-propagated individuals. Knowledge of the genetic diversity of captively spawned RGSM is required to ensure that artificial selection in hatcheries or variance in reproductive success among brooding individuals have not significantly altered (i.e., reduced) gene frequencies of individuals released into the wild population.

### 3.4.5 RIO GRANDE SILVERY MINNOW PROPAGATION, AUGMENTATION, AND RESCUE/SALVAGE

The RGSM is restricted to a variably perennial reach of the Rio Grande in New Mexico, from the vicinity of Bernalillo downstream to the headwaters of Elephant Butte Reservoir. This distance, which fluctuates as the level of water in Elephant Butte Reservoir changes, is approximately 150 river miles. The intent of this project by the U.S. Fish and Wildlife Service (USFWS) is to reduce mortality of post-larval RGSM when flow in the MRG becomes intermittent. The project also determines the amount of incidental take as defined in the 2003 Biological Opinion (BiOp) due to water operations and drying.

Between June 20, and September 27, 2014, monitoring observed 630 RGSM in isolated pools. Of these, 559 were found alive and transported to a location within the same reach with flowing water. Monitoring found seventy-one dead RGSM, of which seventy were associated with the first river drying and considered incidental take to water operations in the MRG during the 2014 irrigation season. One dead RGSM was assigned to the USFWS take permit. The level of approved incidental take was 12,952 RGSM for 2014.

This project also evaluates the effectiveness of RGSM population augmentation in the MRG and monitors the temporal and spatial movements of released RGSM. In 2014, USFWS's New Mexico Fish and Wildlife Conservation Office (NMFWCO) monitored stocked fish during surveys, at approximately one-month intervals, to determine survival, growth, and movement of hatchery-reared RGSM. From December 2013 to November 2014, 1,722 hatchery-released RGSM were documented. The majority of recaptured fish were attributed the RGSM rescue/salvage program of rescuing stranded fish from isolated pools. About 268,000 RGSM were stocked at eighteen out of twenty monitoring sites located within the MRG. All released fish were supplied by hatchery operations with guidance from the RGSM Genetics Management and Propagation Plan.

**Benefits to Species:** The MRG rescue and salvage program seeks to salvage RGSM from intermittent reaches of the Rio Grande between IDD and Elephant Butte Reservoir that, without management intervention, would likely result in substantial RGSM mortality. The RGSM are rescued from isolated pools, transported, and released alive at locations that are perennially wet.

Over 2,000,000 hatchery-raised RGSM have been released in the MRG since 2002. The quantitative contribution of this augmentation in currently occupied reaches is under additional study.

### 3.4.6 SOUTHWESTERN WILLOW FLYCATCHER SURVEYS

Surveys and studies of SWFL have been conducted at sites from Velarde to Elephant Butte by Collaborative Program agency biologists since 1995. These studies were originally designed to provide further insight into potential threats to SWFL populations and their habitat requirements. The studies are now focused on completing presence/absence surveys and nest monitoring.

Reclamation conducted and completed surveys and nest monitoring at selected project sites within the Middle Rio Grande Basin of New Mexico. Survey results will be used to determine the distribution, abundance, and productivity

SWFL surveys provide a census of the population present, population trends, and the current distribution of SWFL (shown above) in the Middle Rio Grande.

of breeding SWFLs within the defined study area. These surveys are required to achieve compliance with the ESA and to meet project obligations.

In 2014, SWFL surveys were also conducted in the Albuquerque bosque as part of the U.S. Army Corps of Engineers's (USACE) Middle Rio Grande Restoration Project using USACE-permitted staff. Surveys were performed at the San Antonio Oxbow, Tingley Bar, South Diversion Channel, a site south of the South Diversion Channel, and two sites on the west side of the Rio Grande near I-25. A Collaborative Program restoration project site, near the Central Wasteway, was also surveyed. SWFL were only detected at all of the sites during the first survey period in 2014, but none were detected after that. Surveys used the monitoring protocol described in Sogge et al. (1997). All sites will continue to be monitored each year as part of the post-construction monitoring for the Middle Rio Grande Restoration Project.

**Benefits to Species:** This project is an essential component of tracking the status of the species. It provides a census of the population present, population trends, and the current distribution of SWFL in the region. These data enable managers to determine impacts to the species from specific actions and to adapt as necessary.

### 3.4.7 BOSQUE SCHOOL BEMP SITE MONITORING

BEMP uses volunteers and students to conduct regular and systematic monitoring of habitats on the historical Rio Grande floodplain while promoting education and awareness of the bosque's overall condition.

*Credit: Bosque School*

The Bosque Ecosystem Monitoring Program (BEMP) is a collaborative ecological monitoring program between the University of New Mexico (UNM) and the Bosque School, which is funded in part by USACE and Reclamation. BEMP uses volunteers and students to conduct regular and systematic monitoring of habitats on the historical floodplain while promoting education and awareness of the bosque's overall condition. BEMP collects long-term data at 227 research sites along 350 miles of the Rio Grande, including weather data, shallow groundwater table depth, monthly precipitation, surface arthropod activity, and measurements of forest production (leaf litter biomass, tree diameter, growth rates, and plant distribution). The data are shared with Collaborative
Program signatory agencies and other land and natural resource managers.

Reclamation provided support for 220 one-hundred meter vegetation transactions at a total of 22 BEMP sites. Data collected from these activities were inputted to BEMP's database. Reclamation also provided administration and supervision for contracted work and coordination of vegetation surveys, landowner access issues, and other BEMP administrative overhead.

**Benefits to Species:** This program provides long-term data collection, promotes public outreach, and furthers preservation of endangered species habitat.

### 3.4.8 RIO GRANDE SILVERY MINNOW MONITORING

USACE and contractors use standard metrics during post-runoff monitoring to compare between restoration sites and assess the effectiveness of restoration treatment types.

*Credit: U.S. Army Corps of Engineers*

Bosque habitat restoration (HR) projects have been constructed to benefit both fish and terrestrial species in the MRG. Specifically, the endangered RGSM may use inundated riparian habitat for spawning and recruitment. Evaluating the effectiveness of HR projects requires monitoring for fish, including RGSM, during spring runoff and post-runoff. How the fish community responds in the vicinity of HR projects in the months following recruitment provides a broad measure of project utilization. The use of standard metrics during post-runoff monitoring allows for comparisons between restoration sites and assessment of the effectiveness of different restoration treatment types.

**Benefits to Species:** HR is needed to reduce risk of extinction and to increase recovery potentials for RGSM in the MRG.

### 3.4.9 TAMARISK LEAF BEETLE MONITORING – USACE

Surveys show that the tamarisk leaf beetle (Diorhabda carinulata) has spread into the Rio Grande watershed, resulting in defoliation of tamarisk.

In 2013, surveys first revealed that the tamarisk leaf beetle (Diorhabda carinulata) had spread into the Rio Grande watershed of New Mexico, resulting in defoliation of tamarisk. The spread of tamarisk leaf beetle from the north and potential spread of other species of tamarisk leaf beetle (e.g., Diorhabda elongate) from Texas will ultimately affect riparian forests in central and southern New Mexico. Impacts to tamarisk and native riparian communities are known. These areas are critical habitat for the endangered SWFL and important to many other riparian obligate breeding birds, amphibians, and reptiles. The survey methods for tamarisk leaf beetle are based on those established by the Tamarisk Coalition, with modification. Survey data shall be used to coordinate and compile beetle monitoring datasets with the Tamarisk Coalition.

**Benefits to Species:** The spread of the tamarisk leaf beetle will ultimately affect critical habitat for SWFL. The goals of the project are to: provide resource managers with information about beetle advancement along the Rio Grande and its tributaries; identify defoliation within these riparian ecosystems; and, provide recommendations for approaches that may be used to mitigate the effects of defoliation by the beetle.

### 3.4.10 ALAMEDA GAGE TEMPERATURE PROBE – USACE

A temperature probe has been installed at the Alameda Bridge to provide continuous data on water temperature. The temperature data is uploaded with other gage information to the U.S. Geological Survey (USGS) website.

**Benefits to Species:** Water temperature monitoring in the Rio Grande helps identify suitable environmental conditions for RGSM spawning.

### 3.4.11 SOUTHWESTERN WILLOW FLYCATCHER SURVEYS IN THE ALBUQUERQUE METRO AREA – USACE

Detection of SWFL at sites in the Albuquerque metro area provide evidence that these sites could serve as important stopover areas for migrating willow flycatchers.

*Credit: Hawks Aloft, Inc.*

The USACE conducts HR in the Rio Grande bosque in the Albuquerque, New Mexico metropolitan area. Hawks Aloft conducts SWFL surveys at five bosque sites: Brown Burn, Durand Outfall, Montaño Southwest, Rio Bravo Northeast, and South Corrales. At Montaño Southwest, annual SWFL surveys have been conducted since 2004. The SWFL surveys were initiated at Brown Burn and Rio Bravo Northeast in 2010 and at Durand Outfall and South Corrales in 2011.

In 2014, seven SWFL were detected across the five sites. Historical detections provide evidence that these sites could serve as important stopover areas for migrating willow

flycatchers, including the federally endangered Southwestern subspecies. However, surveys have indicated that habitats at Durand Outfall and South Corrales are currently unsuitable for breeding SWFL. Bank-lowering and the establishment of extensive willow swales at these two sites, prior to the 2012 breeding season, enhances the possibility that suitable breeding habitat could develop in the future.

**Benefits to Species:** This study will aid in the understanding of how human activities impact the habitats of endangered species, and it will support operational and strategic decision-making.

### 3.4.12 RIO GRANDE SEDIMENT GAGES: RIO PUERCO, SAN ACACIA, SAN MARCIAL – USACE

The geomorphology of the Middle Rio Grande has been affected by flood control and irrigation projects, and secondary influences have altered the geomorphology of the channel.

The goal of this effort is to assess the relative contributions of dams and secondary influences (channel rectification measures and sediment delivery from contributing drainage areas) on the geomorphology of the Rio Grande. The geomorphology of the MRG has been affected by flood control and irrigation projects, and secondary influences have altered the geomorphology of the channel. Accurate sediment gage data are critical for understanding these effects, and this project supports data collection at three gages.

**Benefits to Species:** This effort will aid in understanding how USACE project activities affect the habitats of endangered species, and it will support operational and strategic decision-making.

### 3.4.13 RIO GRANDE NATURE CENTER HIGH FLOW CHANNEL GAGE MONITORING – USACE

The channel gage at the Rio Grande Nature Center collects data on streamflow through the channel during spring runoff.

*Credit: Mick Porter*

The Rio Grande Nature Center Habitat Restoration Project High Flow Channel was constructed to benefit RGSM and SWFL in the Albuquerque Reach through reestablishment of the hydrological connection between the river and channel. The objective of this monitoring study is to collect data on streamflow through the channel during spring runoff. This information helps biologists understand whether and for how long flow conditions in the channel are suitable for RGSM and recruitment. The magnitude and duration of flows also affect the growth of native shrub species that provide essential SWFL habitat.

**Benefits to Species:** The results of this study assist in adaptively managing habitat for RGSM and vegetation for SWFL.

### 3.4.14 RIO GRANDE AND TRIBUTARIES GEOMORPHIC CHARACTERIZATION STUDY – USACE

Federal and non-federal partners are monitoring the availability and effectiveness of the Los Lunas Habitat Restoration Project, including physical elements related to habitat characteristics (hydrology, geomorphology, and vegetation) and presence of endangered species.

The goal of this study is to assess the relative contributions of dams and secondary influences (channel rectification measures and sediment delivery from contributing drainage areas) on the geomorphology of the Rio Grande through a combination of quantifying the key influences and numerical sedimentation modeling. The objective of the current phase of the study is to characterize the impacts on Rio Grande mainstem geomorphology and sedimentation between IDD and SADD.

**Benefits to Species:** This study will aid in the understanding of how human activities impact the habitats of endangered species, and it will support operational and strategic decision-making.

### 3.4.15 LOS LUNAS HABITAT RESTORATION PROJECT MONITORING – USACE

Following a fire in April 2000, the Los Lunas Restoration Site was selected as the first BiOp restoration area. The Reclamation Albuquerque Area Office and the USACE Albuquerque District have acted as joint lead federal agencies on this project, and the Middle Rio Grande Conservancy District (MRGCD) is the primary non-federal cooperator. The primary objective of the HR project is to improve habitat conditions for the RGSM and SWFL. This ongoing activity will monitor the availability and effectiveness of restored habitat, including physical elements related to habitat characteristics (hydrology, geomorphology, and vegetation) and presence of RGSM and SWFL.


Vegetation transect, well, and photo station locations at the Los Lunas Restoration Project (2011 natural photography).

*Credit: Reclamation*

Following a fire in April 2000, the Los Lunas Restoration Site was selected as the first Biological Opinion restoration area.

*Credit: Reclamation*

**Benefits to Species:** HR may successfully create sustainable habitat features for RGSM and SWFL. Consistent monitoring will ensure that constructed projects are functioning as designed and assist in determining the effectiveness and life spans of various restoration techniques and treatments. This will also help with design of future restoration projects, which can be refined based upon monitoring results.

## 3.5 PROGRAM MANAGEMENT

The Collaborative Program requires management and administrative support to accomplish its goals and objectives. Collaborative Program By-Laws state that Reclamation will employ a Program Manager and management staff. Program management and support activities are required to assist in the implementation of the Biological Opinion (BiOp) Reasonable and Prudent Alternative (RPA) and Reasonable and Prudent Measures (RPM). Program management involves setting and reviewing objectives, coordinating activities across projects and work groups, and overseeing the integration of interim work products and results. Specific tasks include: contract administration; budget administration and financial management; reporting to the Executive Committee (EC), Coordination Committee (CC), and other groups or agencies as appropriate; supporting Collaborative Program activities, such as meeting coordination, website administration, and outreach; and, performing other Collaborative Program-related management functions. Table 3.5 summarizes the program management projects funded by the Collaborative Program and its signatories for Fiscal Year (FY) 2014, and these projects are described in the following sections.

**TABLE 3.5 | FY 2014 Funded Projects: Program Management**

| | Funded Projects – Funded Entity | Funding Entity | Entity Performing Work | Continuing Activity or Distinct Project | BiOp Requirement | Grant/ Contract # | Amount Appropriated |
|---|---|---|---|---|---|---|---|
| 3.5.1 | Collaborative Program Management and Support – All Signatories | All Collaborative Program signatory agencies | All Collaborative Program signatory agencies | FY01-ongoing | yes | various | N/A |
| 3.5.2 | Collaborative Program Management and Support – USFWS | Reclamation | USFWS | FY02-ongoing | no | N/A | $2,133 |
| 3.5.3 | Collaborative Program Facilitation Support – Contracted | Reclamation | GenQuest, Inc. | FY13-FY15 | no | R13PX43048 | $12,468 |
| 3.5.4 | Collaborative Program Note Taking Support – Contracted | Reclamation | Alliant Environmental, LLC | FY13-FY15 | no | R13PC43008 | $68,109 |
| 3.5.5 | MRGESCP Database Management System – USACE | USACE | USACE | FY07-ongoing | N/A | W912PP-08-D-0021 | $62,760 |

### 3.5.1 COLLABORATIVE PROGRAM MANAGEMENT AND SUPPORT – ALL SIGNATORIES

In 2014, Collaborative Program signatories provided management staff responsible for overall Collaborative Program administration, coordination, and dissemination of information about Collaborative Program activities. In addition, each signatory provided an EC member, CC member, representatives for the technical work groups, and contracting support. Collaborative Program management and support provided by one of the Collaborative Program signatories, U.S. Fish and Wildlife Service (USFWS), is described in detail in section 3.5.2.

**Benefits to Species:** Program management and support activities are required to implement all aspects of the 2003 BiOp RPA and RPMs. Signatories also provide technical support representatives to: assist with the evaluation of proposed projects; review project deliverables; develop scopes of work and independent government cost estimates; and, develop monitoring and program assessment plans.

### 3.5.2 COLLABORATIVE PROGRAM MANAGEMENT AND SUPPORT – USFWS

In 2014, the Collaborative Program provided funding to USFWS for personnel to support program management activities and to facilitate Endangered Species Act (ESA) compliance. Specific program management provided by USFWS included assisting in the coordination, planning, and management of work groups staffed by Collaborative Program participants, in order to fulfill Collaborative Program By-Laws and the Long Term Plan (LTP). Specific ESA compliance tasks included facilitating Section 7 consultations under the ESA for the Collaborative Program and managing Section 10 endangered species permits for Collaborative Program signatories. The Service also provided a Middle Rio Grande ESA Coordinator to serve on the CC.

**Benefits to Species:** Benefits to RGSM and SWFL include managerial and on-the-ground support for activities that advance the species' recovery, and the facilitation of ESA compliance to minimize adverse effects of actions in the Middle Rio Grande (MRG) on listed species and their critical habitat.

### 3.5.3 COLLABORATIVE PROGRAM FACILITATION SUPPORT – CONTRACTED

In 2014, facilitation was contracted in furtherance of the Collaborative Program's mission. Technical facilitation services fulfill requirements for planning, implementing, and tracking Collaborative Program meeting discussions and action items before, during, and after events.

### 3.5.4 COLLABORATIVE PROGRAM NOTE TAKING SUPPORT – CONTRACTED

In 2014, staffing was contracted to perform general and administrative tasks in furtherance of the Collaborative Program's mission. Contracted support duties included: (1) technical note-taking at various Collaborative Program meetings; (2) preparation and distribution of meeting summaries and time-sensitive action items; and (3) providing technical support for workshops and working meetings.

### 3.5.5 MRGESCP DATABASE MANAGEMENT SYSTEM – USACE

The U.S. Army Corps of Engineers (USACE) awarded an indefinite delivery contract in 2008 for development of a Database Management System (DBMS), which was completed in 2014. The Collaborative Program's DBMS (located at mrgesa.com) is a spatially-referenced relational database management system, which also functions as the Collaborative Program's website. The DBMS stores and facilitates access to all scientific data and reports relating to the MRG and the endangered species occurring there. The DBMS also tracks financial and programmatic data, stores documents and reports, and functions as an activity tracking system to Collaborative Program members and the public. The DBMS receives ongoing maintenance and updates.

**Benefits to Species:** The DBMS provides a user-friendly, comprehensive clearinghouse for data related to endangered species and critical habitat in the MRG to facilitate analysis, hypothesis testing, and management decisions. It also serves as a tracking system for Collaborative Program activities and projects.


The Middle Rio Grande Endangered Species Collaborative Program's website, at www.mrgesa.com, provides a user-friendly, comprehensive clearinghouse for data related to endangered species and critical habitat in the Middle Rio Grande.

# 4 REFERENCES


Dudley, R.K., Platania, S.P. & White, G.C. 2015. *Rio Grande Silvery Minnow Population Monitoring Program Results from February to December 2014.*

*MRGESCP. November 13, 2006. Middle Rio Grande Endangered Species Act Collaborative Program Long-Term Plan 2005 - 2014.* Albuquerque, NM (Document ID 2495). MRGESCP Website Link: http://www.mrgesa.com.

MRGESCP. May, 2008. *Memorandum of Agreement for the Middle Rio Grande Endangered Species Collaborative Program* (Document ID 2382). Albuquerque, NM. MRGESCP Website Link: http://www.mrgesa.com.

MRGESCP. September 17, 2009. *By-Laws Middle Rio Grande Endangered Species Collaborative Program* (Document ID 4176). Albuquerque, NM. MRGESCP Website Link: http://www.mrgesa.com.

MRGESCP. July 18, 2012. *Middle Rio Grande Endangered Species Act Collaborative Program Recovery Implementation Program Final Draft Program Document* (Document ID 6058). Albuquerque, NM. MRGESCP Website Link: http://www.mrgesa.com.

MRGESCP. March 3, 2014. *Collaborative Program WorkGroup Charters* (Document ID 6227). MRGESCP Website Link: http://www.mrgesa.com.

USFWS. 2002. *Southwestern Willow Flycatcher Recovery Plan.* Albuquerque, New Mexico. USFWS Website Link: https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/SWWF/Final%20Recovery%20Plan/ExecSummary_Contents.pdf.

USFWS. 2003. *Biological and Conference Opinions on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande, Albuquerque, New Mexico, as amended in 2005, 2006.* USFWS Website Link: http://www.fws.gov/southwest/es/newmexico/ES_bio_op.cfm.

USFWS. 2010. *Rio Grande Silvery Minnow (Hybognathus amarus) Recovery Plan, First Revision.* Albuquerque, NM. USFWS Website Link: http://www.fws.gov/southwest/es/Documents/R2ES/Rio_Grande_Silvery_Minnow_Recovery_Plan_First_Revision.pdf.

Sogge, M.K., T.J. Tibbitts, & J.R. Petterson. 1997. *Status and breeding ecology of the Southwestern willow flycatcher in the Grand Canyon.* Western Birds 28(3): 142-157.

Tave, D., G. Haggerty, C.N. Medley, A.M. Hutson, and K.P. Ferjancic. 2011. *Los Lunas silvery minnow refugium: a conservation hatchery.* World Aquaculture 42(2):28-34, 67. NMISC Website Link: http://www.ose.state.nm.us/sandbox/LLSMR/publications.php.

USACE. March, 2014. *USACE Collaborative Program Report of Activities Fiscal Years 2009-2013.* United States Army Corp of Engineers. Albuquerque, NM. USACE Website Link: http://www.usace.army.mil/Portals/2/docs/civilworks/pdg_ec/FY09_budget_ec_final.pdf.