Middle Rio Grande Endangered Species

COLLABORATIVE PROGRAM

Report for 2008 and 2009 | The Program Management Team | www.mrgesa.com

TABLE OF CONTENTS

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

APA	Assessment Payers Association
BA	Biological Assessment
BiOp	2003 Biological Opinion
Collaborative Program (also MRGESCP)	Middle Rio Grande Endangered Species Collaborative Program
CBSG	Conservation Breeding Specialist Group
CC	Coordination Committee
COA	City of Albuquerque
CPE	Carp Pituitary Gland Extract
DEC	Design, Engineering, and Construction
Dexter	National Fish Hatchery and Technology Center
EC	Executive Committee
ESA	Endangered Species Act
HR	Habitat Restoration
HRW	Habitat Restoration Work Group
NMISC (also ISC)	New Mexico Interstate Stream Commission
LFCC	Low-Flow Conveyance Channel
LTP	Long Term Plan
MOA	Memorandum of Agreement for the Middle Rio Grande Endangered Species Collaborative Program
MOU	Memorandum of Understanding
MRG	Middle Rio Grande
MRGCD	Middle Rio Grande Conservancy District
mtDNA	Mitochondrial DNA
NMESFO	New Mexico Ecological Services Field Office
NMGF	New Mexico Department of Game and Fish
NMAGO	New Mexico Attorney General's Office
PIO	Public Information Outreach Work Group
PIT	Passive Implantable Transmitter
PMT	Program Management Team
PHVA	Population and Habitat Viability Assessment
PVA	Population Viability Analysis
RGSM	Rio Grande Silvery Minnow
RPA	Reasonable and Prudent Alternative
RPM	Reasonable and Prudent Measure
SADD	San Acacia Diversion Dam

ACRONYMS AND ABBREVIATIONS

ScW	Science Work Group
Service (also USFWS or FWS)	U.S. Fish and Wildlife Service
SWFL	Southwestern Willow Flycatcher
SWM	Species Water Management Work Group
UNM	University of New Mexico
USACE	U.S. Army Corps of Engineers

EXECUTIVE SUMMARY

The Middle Rio Grande Endangered Species Collaborative Program (Collaborative Program) brings diverse groups together to address serious environmental issues along the Middle Rio Grande (MRG). These groups include federal, state, and local governmental entities, Indian Tribes and Pueblos, and non-governmental organizations. Through this collaborative effort, these entities simultaneously protect and improve the status of listed endangered species along the MRG, protect existing and future regional water uses, and comply with state and federal laws, including Rio Grande Compact delivery obligations.

The Collaborative Program was established in April 2002 under a Memorandum of Understanding (MOU), and continued through a Memorandum of Agreement (MOA) signed May 15, 2008. The intent of Collaborative Program participants is two-fold:

- First, to prevent extinction, preserve reproductive integrity, improve habitat, support scientific analysis, and promote recovery of the listed species within the Collaborative Program area in a manner that benefits the ecological integrity, where feasible, of the MRG riverine and riparian ecosystem; and
- Second, to exercise creative and flexible options so that existing water uses continue and future water development proceeds in compliance with applicable federal and state laws.

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)
- Pueblo of 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 the Collaborative Program's expenditures in Fiscal Year (FY) 2008 and FY 2009, and highlights accomplishments using funds allocated during FY 2008 and 2009.

COLLABORATIVE PROGRAM CONTACTS

Program Management Team

Yvette McKenna
U.S. Bureau of Reclamation
yrmckenna@usbr.gov
(505) 462-3640

Yvette McKenna is the Program Manager for the Middle Rio Grande Endangered Species Collaborative Program (Program), managed by the Bureau of Reclamation, Albuquerque Area Office, a position she's held since August 2009. Yvette has 16 years of federal government experience including positions with the U.S. Environmental Protection Agency, the Department of Defense, the International Boundary and Water Commission, and Western Area Power Administration. Her focus has been on enforcement of, and compliance with, environmental regulations as an environmental scientist, environmental protection specialist and biologist. Yvette has a Bachelor of Science degree in Microbiology from New Mexico State University, and is a co-inventor of MI Agar used for the simultaneous detection of E. coli and total coliforms in drinking water.

Stacey Kopitsch
U.S. Fish and Wildlife Service
stacey_kopitsch@fws.gov
(505) 761-4737

Stacey Kopitsch is a Biologist with the U.S. Fish & Wildlife Service's (Service) New Mexico Ecological Services Field Office (NMESFO) and has served as a Program Management Team (PMT) member since 2010. She began her career with the Service over 6 years as a Wildlife Inspector (Law Enforcement) at the port of New York, and she has been in her current position with the NMESFO since February, 2010. Prior to her employment with the Service, Stacey worked for the National Park Service as a Biological Science Technician at the Fire Island National Seashore. Stacey has a Bachelor's degree in Biology from the University of Richmond and a Master's degree in Ecology from Fordham University.

Amy Louise
NM Interstate Stream Commission
amy.louise@state.nm.us
(505) 383-4057

Amy Louise is a Project Manager with the U.S. Army Corps of Engineers (USACE), and previously served as a hydrologist with the NM Interstate Stream Commission (NMISC) and PMT members since 2006. She started working at the Office of the State Engineer in June 1997 after she obtainer her Bachelor of Science degree in Civil Engineering. Amy obtained her Master's degree in Water Resources in December 2004.

Collaborative Program Contacts

Program Manager
Yvette McKenna
U.S. Bureau of Reclamation
yrmckenna@usbr.gov
(505) 462-3640

Public Affairs
Mary P. Carlson
U.S. Bureau of Reclamation
mperea@usbr.gov
(505) 462-3576

Program Specialist
Diana Herrera
U.S. Bureau of Reclamation
dherrera@usbr.gov
(505) 462-3554

Coordination Committee Chairs
Susan Bittick
U.S. Army Corps of Engineers
susan.m.bittick@usace.army.mil
(505) 342-3397

Brooke Wyman
Middle Rio Grande
Conservancy District
brooke@mrgcd.us
(505) 247-0234

Program Management Assistant
Alighieri Saenz
U.S. Bureau of Reclamation
sasaenz@usbr.gov
(505) 462-3600

COLLABORATIVE PROGRAM CONTACTS

Monika Mann
U.S. Army Corps of Engineers
monika.mann@usace.army.mil
(505) 342-3250

Monika Mann is an environmental planner with the USACE and has been involved with the PMT since 2009. Monika started working with USACE in 2005 as a Stay-in-School for Civil Project Management. In 2007, she moved to General Engineering for a year, and received a position in Plan Formulation in 2008. In the spring of 2010 she was promoted as an Environmental Planner. Monika received her Bachelor's degree in Environmental Planning and Design through the School of Architecture and Planning at the University of New Mexico (UNM) in December 2009.

Diana Herrera
U.S. Bureau of Reclamation
dherrera@usbr.gov
(505) 462-3554

Diana Herrera is a Program Specialist with the Bureau of Reclamation (Reclamation). She began her career with Reclamation in 1984, and started working with the Collaborative Program in 2003. Her work with the Program consists of budget and contract administration. Diana started her federal career at the Veteran's Administration Regional Office in Albuquerque and then worked for the Atomic Energy Commission (now known as the Department of Energy). She has over 33 years of federal service.

Terina Perez
U.S. Bureau of Reclamation
tlperez@usbr.gov
(505) 462-3614

Terina Perez is a biologist with Reclamation, and became involved with the PMT in 2010. From 1998 until July 2010 she served as a Hatchery Manager at the City of Albuquerque's Native Species Rearing and Breeding Facility. Terina received her Bachelor's degree in Biology from the University of Missouri at St. Louis and is currently working towards a Master's degree in Water Resources at UNM.

Jenae Maestas
GenQuest, Inc.

Jenae Maestas worked with the Bureau of Reclamation as the Program Administrative Assistant contracted through GenQuest from October 2009 to December 2010. Jenae began her career at Los Alamos National Laboratory where she worked for four years before completing her Bachelor's degree in Communications at UNM in 2009.

Alighieri Saenz
U.S. Bureau of Reclamation
asaenz@usbr.gov
(505) 462-3600

Alighieri (Ali) Saenz is the new Program Administrative Assistant and joined the Bureau of Reclamation in March 2011 from the City of Albuquerque's Economic Development Department. Ali is a former United States Army Reservist where she served for 8 years as a specialist during Operation Enduring Freedom, including a tour in Kandahar, Afghanistan. Ali is working on completing her Bachelor's degree in Business Administration and Management.

1 INTRODUCTION

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

The Middle Rio Grande Endangered Species Collaborative Program (Collaborative Program), consisting of governmental entities, Indian Tribes and Pueblos, and non-governmental organizations, focuses 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 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 (Figure 1).

The Collaborative Program receives funding through congressional appropriations to implement projects designed to benefit the federally listed endangered RGSM and the SWFL. The Collaborative Program implements activities required by the 2003 Biological Opinion (BiOp) issued by the U.S. Fish and Wildlife Service (Service) 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, 2005, 2006). 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. When its requirements are implemented, it serves as a tool to conserve listed species, assist with species recovery, and help protect critical habitat. 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

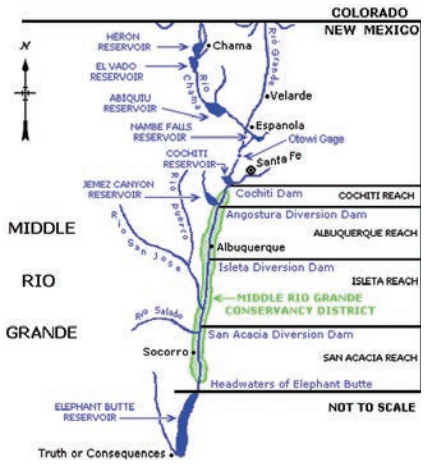


Figure 1
Program Area: *New Mexico - Colorado Border to Headwaters of Elephant Butte*

1 INTRODUCTION

(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. Recovery plans developed by the Service for the RGSM and SWFL 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.

As defined in recovery plans for the RGSM and SWFL (Service 2010 and 2002, respectively), species recovery criteria aim to support the goals of the ESA and provide a measurable, supportable basis for determination of ESA compliance by the Service. The general Collaborative Program goals consistent with these recovery plan recommendations are:

1. Alleviate jeopardy to the listed species within the scope of the Collaborative Program
2. Conserve and contribute to the recovery of the listed species
    - Stabilize existing populations
    - Develop self-sustaining populations
3. Protect existing and future water uses
4. 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
- to help integrate federal and non-federal budget processes for providing funding for future activities.

In August of 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 revising the 2006 LTP to include activities that are linked to the RGSM and SWFL recovery plans and are within the scope of the Collaborative Program. The revised LTP is planned to be ready for Collaborative Program review in October 2011.

The Collaborative Program 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 includes compliance for existing, ongoing, and future activities associated with the Collaborative Program, including the 2003 BiOp and future BiOp(s).

The Collaborative Program's By-Laws, adopted in October 2006, describe the governance structure, decision making processes, and roles and responsibilities. The Collaborative Program By-Laws were amended three times (July 2008, January 2009, 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 at http://www.middleriogrande.com.

1.2 Collaborative Program Organization

The organizational structure of the Collaborative Program consists of: the Executive Committee (EC), the Coordination Committee (CC), technical work groups (there is currently a combination of 9 standing and ad hoc work groups), and the Program Management Team (PMT). This section provides general information about these groups; more specific information, including workgroup documents, 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

1 INTRODUCTION

in the Executive Summary of this report. The EC provides policy, 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 USACE, Reclamation, 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/quality 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.
- 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 formation of work groups, 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 their EC representatives on issues of concern to ensure that recommendations reflect the viewpoints of organizations participating in the EC and EC members.
- 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 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. Work groups provide technical assistance, expertise, leadership, technical review, and coordination to address specific tasks to accomplish the goals of the Collaborative Program, primarily 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. Some of the key HRW objectives include:

1 INTRODUCTION

1. Coordination of long-term, MRG-wide, habitat restoration (HR) plans that actively integrate river function, riparian community, and hydrology, resulting in improved habitats for endangered species that support the BiOp RPA.
2. Integration of HR activities with other Collaborative Program-related activities, including other work groups and restoration efforts outside of the Collaborative Program.
3. Technical assistance to others wanting to implement HR projects.
4. Providing a scientific framework for monitoring and assessing restoration projects.
5. Support for conferences and publications that facilitate the exchange of information derived from HRW efforts.

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 will support: 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:

1. Ensure that entities affected by the actions of the Collaborative Program (e.g., land owners, water rights holders, and water users) fully understand the issues and participate in a meaningful way with the Collaborative Program and other decision-makers.
2. Ensure that the Governor, Congressional Delegation, Pueblo and Tribal Leaders, advocacy groups, New Mexico State legislators, and 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.
3. Establish an effective communication strategy for all leaders within the Collaborative Program.
4. 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. Some of the key ScW objectives include:

1. Develop recommendations for research and monitoring priorities.
2. Provide support for an adaptive management process.
3. Coordinate and integrate long-term research and monitoring activities, including other Collaborative Program work groups and activities outside of the Collaborative Program.
4. Serve as a forum for regular meetings and discussion on Program-related research and monitoring.
5. Provide consistency in technical planning efforts.
6. Provide technical assistance to others wanting to implement research and monitoring projects.
7. Provide a framework for exchanging scientific information.

Species Water Management Work Group

The Species Water Management Work Group (SWM) provides assistance and expertise to the Collaborative Program and Reclamation to secure potential supplies of water and storage space and implement management strategies to meet Collaborative Program goals. SWM seeks to identify and analyze the relative merits of potential water management alternatives to meet water supply and acquisition goals and assists with implementation of selected alternatives, including facilitating stakeholder interaction and supporting regulatory compliance activities.

Ad-Hoc Work Groups

Temporary ad-hoc work groups may be formed by 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 work group oversees each formed ad-hoc work group and is responsible for ensuring that ad hoc work groups meet objectives and schedules. The 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.

PHVA

The PHVA/Hydrology ad hoc work group articulates ideas and input into the Population Viability Assessment (PVA), and provides hydrologic information needed by Reclamation and the USACE to write BAs for use in consultation with the Fish and Wildlife Service. This information is necessary in order to obtain a new Biological Opinion. Workgroup members develop hydrologic analysis, water management scenarios, and define such for analysis in the PVA and BAs.

PVA

The PVA ad hoc work group identifies and articulates ideas and input into both Population Viability Assessment (PVA) models, and provides biological information needed for the BAs and BiOp. Workgroup members develop biological and ecological relationships and define such for analysis in the PVAs.

SAR

The San Acacia Reach ad hoc work group facilitates the development of sustainable, holistic long term solutions for the San Acacia reach of the Middle Rio Grande by increasing public outreach and involvement, identifying resource management issues and establishing forums that seek to resolve those issues, and developing recommendations to implement San Acacia Reach resource management issues.

MPT

The Monitoring Plan Team ad hoc work group was established to lead the development of a 2-year pilot monitoring plan to measure the effectiveness of completed habitat restoration projects funded by the Collaborative Program. The purpose of the 2-year monitoring plan is to contribute to meeting the 2003 Biological Opinion RPA element "S", which requires 10 years of annual monitoring for each habitat restoration project.

DBMS

The DBMS ad hoc work group ensures successful implementation of the Program's Database Management System (DBMS) with full involvement and participation of Program signatories and workgroups.

PROGRAM MANAGEMENT TEAM

The Program Manager and PMT provide management and technical support to the EC, CC, and work groups. The PMT consists of a Program Manager and management staff employed by Reclamation, the Service, USACE, and NMISC; and contracting, administrative and clerical staff (federal employees or contractors). The Program Manager provides direction for PMT activities and reports to the EC regularly on Collaborative Program activities. The Program Manager is responsible for determining the most expeditious and reasonable manner to carry out assignments as directed by the EC, whether through a work group, assignment to the PMT, or outsourcing. The PMT is also responsible for overall administration, coordination, and dissemination of information about Collaborative Program activities.

SIGNATORIES

Signatories (listed in the Executive Summary) are entities who have signed the Collaborative Program 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 20.

2 FINANCIAL SUMMARY

Congress appropriated $16.0 million in FY 2008 and $12.8 million in FY 2009 for Collaborative Program activities.

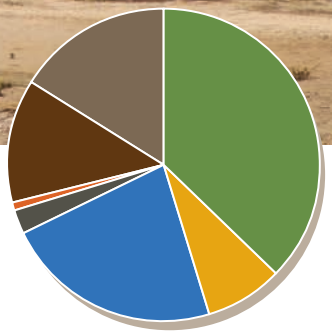
As the fiscal agent for the Collaborative Program, Reclamation manages the Federal funding allocated by Congress to the Collaborative Program. As the contracting agency, Reclamation administers interagency agreements, financial assistance, and contracts for Collaborative Program projects.

Congress appropriated $16.0 million in FY 2008 and $12.8 million in FY 2009 for Collaborative Program activities.

- During FY2008 on behalf of the Collaborative Program, Reclamation awarded $16.0 million to acquire and manage water; to plan, construct, and monitor HR projects; to monitor the status of the RGSM and SWFL, to conduct biological and hydrological studies; and to rescue RGSM during river drying.
- During FY2009 on behalf of the Collaborative Program, Reclamation awarded approximately $12.8 million to: acquire and manage water; captively propagate and rear RGSM; plan, construct, and monitor HR projects; monitor the status of the RGSM and SWFL; conduct biological and hydrological studies; and rescue RGSM during river drying.

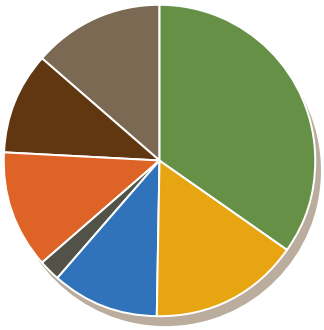
These Federal appropriations were supplemented by non-federal Collaborative Program signatories in the form of financial contributions and in-kind services (e.g., personnel time, equipment, land access). FY 2008 and FY 2009 Congressional appropriations provided funding for the categories depicted in Figures 2.1 and 2.2. Funded activities meet BiOp requirements or address long-term recovery needs.

Fiscal Year 2008



- Water Operations and Management
- Captive Propagation
- Habitat Improvement (Construction, Planning and Fish Passage)
- Water Quality
- RGSM Salvage
- Other Monitoring and Research
- Program Management, Assessment, and Outreach

Fiscal Year 2009



- Water Operations and Management
- Captive Propagation
- Habitat Improvement (Construction, Planning and Fish Passage)
- Water Quality
- Activities Supporting Development of New Biological Assessment (BA)/BiOp
- Other Monitoring and Research
- Program Management, Assessment, and Outreach

3 PROGRAM ACCOMPLISHMENTS

...the Collaborative Program continued to improve habitat, support scientific analysis, and promote recovery of the listed species...

Throughout FY 2008 and FY 2009, the Collaborative Program continued to improve habitat, support scientific analysis, and promote recovery of the listed species, specifically, the RGSM and SWFL. The CC formed an ad-hoc group to review the Collaborative Program MOU and recommended a MOA to the EC. In support of Collaborative Program efforts, Signatories signed the MOA in May 2008.

Noteworthy Collaborative Program accomplishments include:

- Dewatering of the river channel within the RGSM's habitat had been identified as a key threat to the continued existence of the species. A sizeable portion of the RGSM habitat is located within the mainstream of the Rio Grande between Cochiti Dam and San Marcial, which is a section of the river prone to critically low flows during the irrigation season. In 2008 and 2009, the Supplemental Water Program assisted in achieving the targeted flows described in the BiOp. Representatives from Reclamation, USACE, the Service, ISC, and Middle Rio Grande Conservancy District (MRGCD) participated in conference calls throughout the irrigation season to exchange information and discuss actions. These conference calls provided an efficient means to coordinate water operations, low-flow conveyance channel (LFCC) pumping operations, and related RGSM rescue operations.
- The Conservation Breeding Specialist Group (CBSG) designed and conducted a series of workshops for the Collaborative Program that produced a population viability analysis (PVA), and a set of conservation strategies for the RGSM in New Mexico. The population and habitat viability assessment (PHVA), the product of this effort,

3 PROGRAM ACCOMPLISHMENTS

will be a detailed action plan for future management of the RGSM within New Mexico and throughout its range.

- The PIO developed a new Collaborative Program logo and letterhead and the Collaborative Program website which serves as a single point of access to public and draft documents. The web site, www.mrgesa.com or www.middleriogrande.com, became operational in early 2008 and provides updated information about the Collaborative Program such as the calendar of events and press releases. It also provides links to Collaborative Program documents and to signatory web sites.
- HRW was the lead work group on USACE HR projects at the Rio Grande Nature Center and for perennial refugia for RGSM at drain outfalls. HRW coordinated with contractors regarding progress on analysis and recommendations (A&Rs) for the Isleta reach, Sandia Pueblo sub-reach of the Albuquerque reach, Velarde reach, and the San Marcial to Elephant Butte reach.
- The EC approved the formation of a Program Database ad-hoc work group to provide guidance on development of the Collaborative Program Database Management System (DBMS), a comprehensive web-accessible, GIS- based database management system that will enable Program participants to readily access data associated with Collaborative program activities regarding habitat restoration, water management, and other scientific investigations that support Rio Grande basin management.
- The FY 2008 priorities agreed upon by the EC focused on information needs for the preparation of a new biological assessment (BA) that takes into account severe drought conditions or sequential years of drought. The CC worked with the PMT and work groups to address these priorities, ensure that activities continued to meet the 2003 BiOp, and to move forward on assisting in recovery efforts.
- The PIO designed and drafted a Collaborative Program handout and met with members of the EC to discuss methods for increasing awareness of Collaborative Program accomplishments among Federal and State legislators.
- In order to standardize monitoring of HR projects, the EC approved development of a 2-year pilot HR effectiveness monitoring plan (EMP) on September 26, 2008. The scope of the EMP was designed to collect standardized data to determine whether Collaborative Program projects are supporting the RGSM and SWFL and to provide input to the Collaborative Program's Adaptive Management Plan. The Monitoring Plan Team (MPT) consultant presented alternatives for the 2-year pilot HR EMP. The EMP will monitor the effectiveness of completed HR projects in the Albuquerque and Isleta Reaches and will serve as a pilot for a 10-year HR EMP.
- Approximately 22,000 acre-feet of supplemental water was released during the 2009 irrigation season to meet flow targets required by the 2003 BiOp and manage river recession to minimize incidental take of RGSM. Approximately 26,000 acre-feet of supplemental water remained in storage to enhance in-stream flows during 2010.
- In August 2009, the EC made a landmark decision to restructure the Collaborative Program goals and outcomes. This restructuring will facilitate transition from current activities focused on avoiding jeopardy, to working towards those of a Recovery Program (RP) based on the LTP. A future RP would be linked to species recovery plans, with an ESA Section 7 consultation providing Federal and non-Federal coverage to Collaborative Program Signatories.
- Representatives from the Collaborative Program participated in an open house on September 25 and 26, 2009. The open house showcased Collaborative Program accomplishments and was attended by more than 300 members of the public. Activities included a walking tour of a HR site, a poster session highlighting accomplishments of each work group and their projects, the rolling river water trailer, the water jeopardy game, and many children's activities.
- The EC approved the formation of the San Acacia Reach (SAR) ad-hoc work group, with objectives to facilitate the development of sustainable, holistic, long-term solutions for the San Acacia Reach through: increased public outreach, providing venues to the public and other stakeholders to discuss issues and opportunities, communicating the status of planned and ongoing agency actions, facilitating discussions among all stakeholders about long-term goals for the SAR, and developing recommendations to address SAR resource management issues.

Since 2000, over 1,126,000 RGSM have been released into the MRG through augmentation activities. Since 1996,

3 PROGRAM ACCOMPLISHMENTS

approximately 777,000 RGSM have been salvaged and relocated to wet reaches of the Rio Grande. Several activities in 2008 and 2009 were successful in improving the status of the RGSM including the following:

- RGSM were present at all 20 of the October 2008 sampling sites and at 19 of the 20 October 2009 sampling sites.
- In December of 2008, RGSM were introduced into the Rio Grande near Big Bend, Texas as a nonessential, experimental population under section 10(j) of the ESA.
- Survival of RGSM spawned and reared at Dexter has incrementally improved from 10% in 2001 to 85% in 2009. No RGSM were needed for augmentation in 2008 for the MRG so all of the production from Dexter National Fish Hatchery was sent to Big Bend. In 2009, Dexter National Fish Hatchery and Technology Center maximized its production of the RGSM by producing over 500,000 age-0 fish.
- In 2008 and 2009, RGSM egg concentrations in the river were not sufficient to warrant collection; however, larval fish were collected later in the summer each year and taken to propagation facilities in order to augment broodstock. In 2008, 205,500 and 2009, 119,520 RGSM eggs were produced from captive spawning at the Albuquerque Biopark propagation facility. In 2009, the Albuquerque Biopark contributed 36,646 RGSM to the reintroduction effort at Big Bend and also contributed 21,218 RGSM to augmentation activities in the MRG.
- Los Lunas Silvery Minnow Refugium was completed in 2008 and tested water operations in that year. The facility was permitted in 2009 to begin holding silvery minnow and determining how well they survived through a series of testing phases. The facility passed all initial testing phases.
- In 2009, a majority of the construction was completed for the new Rio Grande Silvery Minnow Sanctuary located in Albuquerque, NM. This facility will serve as an additional tool in the conservation of the RGSM.
- In 2008 and 2009, RGSM tissue samples and specimens were provided to UNM for genetic analysis and monitoring of the repatriated population at Big Bend and the captive propagation program.
- Over 200 individually Passive Implantable Transmitter (PIT) tagged RGSM have been documented using the fish passage channel located at the Albuquerque-B ernalillo Country Water Utility Authority diversion.

During FY 2008 and FY 2009, numerous Collaborative Program projects were conducted and contributed to meeting the goals specified in Section 1.0 of this report. These projects are summarized in the following sections and are organized to correspond with program elements identified in the draft revised LTP.

3 PROGRAM ACCOMPLISHMENTS

3.1 Physical Habitat Restoration and Management

Habitat restoration and improvement activities include physical manipulations of the Rio Grande channel (riverine restoration) and adjacent bosque (riparian restoration) to benefit the listed species. For FY 2008 and FY 2009, habitat restoration priorities included planning, design, construction and monitoring of habitat restoration projects that would benefit the RGSM and SWFL in various locations throughout the Middle Rio Grande. Table 3.1 summarizes the status of the projects described under Physical Habitat Restoration and Management.

TABLE 3.1 | ***Collaborative Program FY 2008 and FY 2009 Funded Projects: Physical Habitat Restoration and Management***

	Funded Projects – Funded Entity	Entity Performing Work	Continuing Activity or Distinct Project	BiOp Requirement	Grant/ Contract #	Amount Appropriated	Year of Allocation
3.1.1	Post Construction Monitoring of Phase I, Albuquerque Riverine Restoration Project	NMISC	FY04-FY08	yes	07-FG-40-2704		
3.1.2	Phase II Albuquerque Riverine Restoration	NMISC	FY06-FY10	yes	06-FG-40-2549		
3.1.3	Alleviating Rio Grande Silvery Minnow (RGSM) Entrapment	USACE	FY06-FY11	yes	06-AA-40-2553 06-AA-40-2553	$61,320 $173,824	2008 2009
3.1.4	Design, Construction and Monitoring of Perennial Refugia for Rio Grande Silvery Minnow (RGSM) at Drain Outfalls	MRGCD	FY05-FY10	yes	05-FG-40-2436		
3.1.5	Isleta Reach Riverine Restoration and Habitat Improvements - Phase I	NMISC	FY08-FY10	yes	07-FG-40-2708		
3.1.6	Isleta Reach Riverine Restoration and Habitat Improvements - Phase II	NMISC	FY08-FY10	yes	08-FG-40-2832 08-FG-40-2832	$36,000 $125,000	2008 2009
3.1.7	City of Albuquerque (COA) Habitat Restoration Project	COA	FY03-FY10	yes	03-FG-40-2091 04-FG-40-2255		
3.1.8	Old Atrisco Diversion Habitat Restoration	NMISC; COA; MRGCD	FY06-FY10	yes	06-FG-40-2549		
3.1.9	Evaluation of Perennial Wetted In-Stream Habitat Use by Rio Grande Silvery Minnow (RGSM)	USGS; Habitech, Inc.	FY06-FY10	yes	06-AA-40-2572 06-CR-40-8144		
3.1.10	Los Lunas Habitat Restoration (HR) Monitoring - SWCA	SWCA	FY07-FY09	yes	07-FG-40-2671	$52,500	2009
3.1.11	Rio Grande Silvery Minnow (RGSM) Movement Studies at the Biological Park (BioPark)	COA, BioPark	FY07-FY09	yes	08-FG-40-2745	$37,107	2008
3.1.12	San Acacia Fish Passage: Environmental Compliance and Design	Reclamation	FY06-FY12	yes	Various Various	$342,156 $672,899	2008 2009
3.1.13	Rio Grande Silvery Minnow (RGSM) Egg Monitoring in Canals	USFWS	FY06-ongoing	yes	06-AA-40-2556 06-AA-40-2556	$25,899 $20,345	2008 2009
3.1.14	Water Needs For Southwestern Willow Flycatcher (SWFL) Habitat - Literature Search	ESO Resources Corporation	FY07-FY09	no	08-PE-43-0047	$32,876	2008
3.1.15	Ohkay Owingeh Southwestern Willow Flycatcher (SWFL) Habitat Restoration	Ohkay Owingeh Pueblo	FY03-FY08	yes	03-NA-40-2113		
3.1.16	Two Rivers Flycatcher Habitat Restoration (HR) and Expansion – Ohkay Owingeh	Ohkay Owingeh Pueblo	FY08-FY11	yes	08-FG-40-2830 09-FG-40-2916	$253,395 $79,496	2008 2009
3.1.17	Three Falls Habitat Restoration (HR) and Expansion – Ohkay Owingeh	Ohkay Owingeh Pueblo	FY08-FY11	yes	08-FG-40-2831 09-FG-40-2915	$203,360 $47,135	2008 2009
3.1.18	Pueblo of San Felipe Habitat Restoration	Pueblo of San Felipe	FY01-FY08	yes	01-FG-40-5930		

TABLE 3.1 (CONT.) | ***Collaborative Program FY 2008 and FY 2009 Funded Projects: Physical Habitat Restoration and Management***

3.1.19	Maintenance of Middle Rio Grande Endangered Species Collaborative Program Projects at Ohkay Owingeh	Ohkay Owingeh Pueblo	FY08-FY11	yes	08-FG-40-2829	$159,641	2008
3.1.20	Succession and Suitability in Southwestern Willow Flycatcher (SWFL) Habitat – Ohkay Owingeh	Ohkay Owingeh Pueblo	FY07-FY09	yes	07-NA-40-2705		
3.1.21	Southwestern Willow Flycatcher (SWFL) Territory, Food Base, and Habitat Monitoring at Ohkay Owingeh	Ohkay Owingeh Pueblo	FY08-FY10	yes	08-FG-40-2817	$141,618	2008
3.1.22	Rio Grande Channel and Floodplain Assessment During and After the 2008 Spring Runoff	USACE	FY02-FY05; FY09-FY13	yes	03-C6-40-8026	$360,367	2008
3.1.23	Pueblo of Sandia Habitat Restoration Analysis and Recommendations (Sandia A&R) Report	SWCA; Pueblo of Sandia	FY06-FY08	no	06-CR-40-8145		
3.1.24	Albuquerque Reach Habitat Restoration Analysis and Recommendations (A&R)	USACE	FY07-FY10	no	07-AA-40-2703	$145,073	2008
3.1.25	San Acacia: Developing a Vision for a Sustainable Reach Workshop	Reclamation	FY09	no	08-C3-40-8228	$29,598	2009
3.1.26	Isleta Reach Habitat Restoration Analysis and Recommendations (Isleta A&R)	Parametrix	FY06-FY08	no	06-CR-40-8146		
3.1.27	Velarde Reach Habitat Restoration (HR) Analysis and Recommendations (A&R)	Parametrix	FY07-FY10	no	07-CS-40-8188		
3.1.28	Habitat Restoration Planning – Pueblo of Santa Clara	Pueblo of Santa Clara	FY08-ongoing	yes	08-NA-40-2801	$172,902	2008
3.1.29	Study Channel Realignment – San Acacia	Tetra Tech; Mussetter Engineering, Inc.; S.S. Papadopulos and Associates; Parametrix; Soil & Water West, Inc.; UNM	FY08-present	yes	8A0-40-8177A 8A4-40-8177B	$320,152 $325,477	2008 2008
3.1.30	Rio Grande Nature Center (RGNC) Habitat Restoration Project Post-Construction Monitoring	USACE	FY04-FY09	yes	04-AA-40-2251 R09-PG-40-011	$51,128 $59,960	2008 2009
3.1.31	Santo Domingo Tribe Endangered Species Habitat Improvement Project - Phase III	Santo Domingo Pueblo	FY07-FY09	yes	07-NA-40-2702		
3.1.32	Santo Domingo Endangered Species Habitat Improvement Project - Phase IV	Santo Domingo Pueblo	FY08-FY10	yes	08-FG-40-2838	$489,496	2008
3.1.33	Sandia Pueblo Habitat Restoration Project	Pueblo of Sandia	FY02-present	yes	02-NA-40-8480		
3.1.34	Pueblo of Sandia Riverine Habitat Restoration Project	Pueblo of Sandia	FY07-FY11	yes	07-NA-40-2707		
3.1.35	Technical Assistance to Develop the Collaborative Program's Habitat Restoration (HR) Comprehensive Monitoring Plan	Intermountain Aquatics, Inc.	FY09-FY10	yes	09-PG-40-8286	$42,304	2009
3.1.36	Pueblo of Santa Ana: Rio Grande and Rio Jemez Biological and Habitat Survey	Pueblo of Santa Ana	FY08-ongoing	yes	08-FG-40-2819	$350,285	2008
3.1.37	Pueblo of Sandia Habitat Restoration Monitoring	SWCA; Pueblo of Sandia	FY08-FY12	yes	08-FG-40-2818	$615,965	2008

3 PROGRAM ACCOMPLISHMENTS

3.1 Physical Habitat Restoration and Management

3.1.1 POST CONSTRUCTION MONITORING OF PHASE I, ALBUQUERQUE RIVERINE RESTORATION PROJECT

Phase I of this riverine restoration project was to develop, construct and evaluate egg retention, larval rearing, young of year, and over-wintering habitat for the RGSM utilizing various techniques at several locations within the Albuquerque Reach of the river. Techniques were implemented on islands, bars, and banklines to evaluate the river's ability to naturally mobilize sediments and create RGSM habitat under a variety of flow conditions. The post construction monitoring effort was conducted to determine if these techniques can improve habitat suitability for the four critical life stages of the RGSM: egg, larvae, juvenile, and adult. The benefit of each technique was also evaluated in contributing to the large-scale goals for suitable habitat development for the RGSM in the Albuquerque Reach of the MRG.

Benefits to Species: Four restoration/rehabilitation techniques implemented in Phase I should benefit the RGSM as follows:

- Island and bar modifications create more complex habitat for RGSM by reducing average channel depth, widening the channel, and increasing backwaters, pools, eddies, and runs of various depths and velocities.
- Ephemeral channels create shallow, ephemeral (normally dry), low-velocity aquatic habitats important for RGSM egg and larval development during high flow time periods.
- Bankline embayments are intended to retain drifting RGSM eggs and to provide rearing habitat and enhance food supplies for developing RGSM larvae.
- Terrace and bank lowering provides for increased retention of RGSM eggs and larvae.

In addition, the increase in native vegetation on islands and bars may provide migratory stopover sites for the SWFL.

3.1.2 PHASE II ALBUQUERQUE RIVERINE RESTORATION

This project constructed almost 97 acres of new aquatic habitat during the first two phases and includes an effective area of almost 300 acres. The purpose of Phase II was to develop, construct, and evaluate egg retention, larval rearing, young of year, and over-wintering habitat for the RGSM utilizing various techniques at five locations within the Albuquerque Reach of the river, and to determine if these techniques can improve habitat suitability for the RGSM. The project also evaluated the benefit of each technique in contributing to the large-scale goals for suitable habitat development for the RGSM. Seven primary restoration/rehabilitation techniques were implemented on islands, bars, and banklines to evaluate the river's ability to naturally mobilize sediments and create RGSM habitat under a variety of flow conditions.

Benefits to Species: The techniques selected and benefits for the RGSM included:

- Passive restoration to increase sinuosity and allow for development of complex and diverse habitat.
- Island and bar modifications to create more complex habitat for RGSM by reducing average channel depth, widening the channel, and increasing backwaters, pools, eddies, and runs of various depths and velocities.

- Ephemeral channels to create shallow, ephemeral (normally dry), low-velocity aquatic habitats important for RGSM egg and larval development during periods of high flow.
- Bankline embayments to retain drifting RGSM eggs and to provide rearing habitat and enhance food supplies for developing RGSM larvae.
- Terrace and bank lowering to provide for increased retention of RGSM eggs and larvae.
- Removal of lateral confinements to create wider floodplain with more diverse channel and floodplain features, resulting in increased net-zero and low-velocity habitat for RGSM.
- Woody debris to create slow-water habitats for all life stages of RGSM, provide shelter from predators and winter habitat, and provide structure for periphyton growth to improve food availability for RGSM.

The increased inundation from four of the restoration techniques also benefits native vegetation growth and potentially increases habitat for the SWFL.

3.1.3 ALLEVIATING RIO GRANDE SILVERY MINNOW (RGSM) ENTRAPMENT

The objective of this project is to restore ecological function and mitigate the negative effects that historical channel alterations have created by physically altering elevations of the Rio Grande floodplain to minimize the formation of isolated pools on the floodplain. Project activities are intended to alleviate the entrapment of larval, juvenile, and adult minnow on the floodplain and provide a means for the species to return to perennial flow as floodwaters subside. This project includes one site south of the south boundary of the Isleta Pueblo (Bosque Farms Site) on the east side of the river.

Isolated pools within the Bosque Farms Site following the peak spring runoff flow of close to 5,000 cfs on May 15th (Photos courtesy of Ryan Gronewold from the COE Albuquerque District, May 22, 2009)

Benefits to Species: Design and environmental compliance activities are ongoing. When constructed, this project will minimize take of RGSM by preventing stranding in areas of temporarily inundated floodplain habitat.

3.1.4 DESIGN, CONSTRUCTION AND MONITORING OF PERENNIAL REFUGIA FOR RIO GRANDE SILVERY MINNOW (RGSM) AT DRAIN OUTFALLS

Large cottonwood snag structures anchored into the banklines were used to aid RGSM conservation in the MRG through implementation of habitat enhancement measures. Nine drain outfalls were evaluated to determine which were best suited for habitat enhancement. Evaluation factors included: stream flow (in the river and in the drain), water depth and velocity distribution, cover availability, substrate composition, water temperature, and water quality (pH, dissolved oxygen [DO], conductivity, and nutrients). Three drains in the Isleta Reach were selected: Lower Peralta #1 Drain, Peralta Wasteway, and the Los Chaves Wasteway. Project permitting, regulatory compliance, and structure installation took place in 2007. Post-installation monitoring began in February 2008 and was completed in September 2009.

Benefits to the Species: This project, which involved placement of woody debris (anchored cottonwood snags) in the river channel at the mouth of three drain outfalls, is expected to benefit the RGSM by: (1) creating and enhancing perennially wetted refugial habitat and (2) increasing aquatic habitat diversity. Monitoring should continue at all three drain outfall sites to help determine project success.

3.1.5 ISLETA REACH RIVERINE RESTORATION AND HABITAT IMPROVEMENTS - PHASE I

The HR techniques in this project were aimed at improving the quality and quantity of effective habitat for life stages of the RGSM within the Isleta Reach of the MRG. This project included two subreaches: the Peralta Subreach and LP1DR Subreach.

Construction activities for the project were performed from February 27 to April 15, 2009. Seven features were constructed within the Peralta Subreach, with a total of 6.58 acres of backwater, bankline benches, ephemeral channels, and islands impacted. Nine features were constructed within the LP1DR Subreach, including 4 backwater areas, 2 bankline modifications, 2 series of ephemeral channels, and 1 bosque inundation area. A total of 17.51 acres were impacted.

Monitoring continued following the completion of construction activities. The NMISC and its contractor completed the collection of field data in order to assess the effectiveness of the project both in the near and long term during the October 1 to December 31, 2009 quarter. Monitoring included topographic surveys to assess the geomorphic conditions as well as vegetation surveys to assess how the sites have responded after the disturbance of construction.

Benefits to Species: These activities have increased shallow, low-velocity habitat, and created areas for larval development and refugia for young RGSM. This project may provide benefit for the SWFL through generation of suitable vegetation communities required for breeding.

3.1.6 ISLETA REACH RIVERINE RESTORATION AND HABITAT IMPROVEMENTS - PHASE II

Planning and design activities were initiated for restoration and rehabilitation techniques designed to create aquatic habitat in the Rio Grande south of Belen. Construction of this project is being accomplished with American Recovery and Reinvestment Act funding, with Reclamation providing acquisition and construction management services. The HR goals for this project include: 1) diversifying mesohabitat types, focusing on spawning, egg retention, larval fish, and young-of-year habitat; 2) creating refugial habitat for the RGSM during prolonged dewatering/no-flow periods in locations that are adjacent to perennial water sources; 3) designing strategic inundation of disconnected bosque habitat to encourage and increase the extent of overbank inundation; and 4) encouraging fluvial processes and river dynamics. Accomplishing these goals will require: 1) the creation of backwaters and embayments to create slackwater areas; 2) the reduction in height of banklines, bank-attached bars, and islands; and 3) the creation of ephemeral high-flow channels to carry water into hydrologically disconnected overbank areas and bank-attached bars and islands. Construction is planned to start in fall 2010, after the migratory bird season ends, and will be completed by spring 2011.

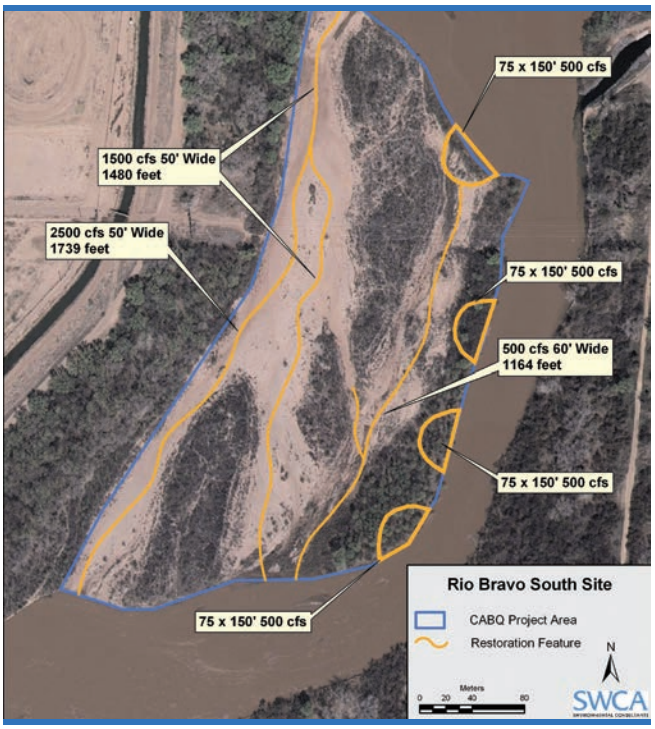
Benefits to Species: When constructed, this restoration effort will increase measurable habitat complexity in support of various life stages of the RGSM by providing slackwater habitat and facilitating lateral migration of the river across bars and riverbanks during various mid-level and high-flow stages. Specific restoration treatments will be implemented, monitored, and evaluated to inform the restoration plans of future phases.

In 2008, a grant agreement between the New Mexico Interstate Stream Commission (NMISC) and the Collaborative Program to provide financial assistance to NMISC to plan, design, conduct environmental compliance and implement active and passive habitat restoration techniques in the area known as Isleta Phase II.

In 2009, activities of the NMISC grant agreement continued. Preliminary environmental compliance documents were completed and the design for the Habitat Restoration construction continued.

3.1.7 CITY OF ALBUQUERQUE (COA) HABITAT RESTORATION PROJECT

This project combined two HR projects originally proposed and funded in FY2003 and FY2004: "Habitat Restoration Project in the Albuquerque Reach Rio Bravo Northeast site" and "Low Impact-High –Yield Habitat Enhancement and Restoration in the Albuquerque Reach", The project implemented several HR techniques at three sites within the Rio Bravo Subreach of the MRG to create and improve habitat for the RGSM and the SWFL. The restoration at the Rio Bravo north site encompassed 66 acres of the bosque, and the low-impact, high-yield habitat project at the Rio Bravo south site included a 20-acre point bar and six-acre island. This



combined project included: 1) the clearing of non-native vegetation; 2) planting of native vegetation; 3) excavation of ephemeral side channels and embayments; 4) removal of jetty jacks; and 5) development of moist soil areas in the Albuquerque Reach of the Rio Grande. This project provided refuge for aquatic organisms, including RGSM, and restoration of native riparian vegetation. From 2004 through 2007 the COA completed planning, designs, environmental compliance, and bosque restoration.

In the spring of 2008, the COA performed approximately 1.3 acres of bosque restoration at the Rio Bravo north site. The

restoration included the planting of a swale with Goodding's and coyote willows as well as riparian shrubs.

During February 2009, a second phase of this project constructed a third shallow depression north of Rio Bravo, removed an additional 140 jetties, re-treated 20 acres of re-sprouting non-native vegetation, and planted 40 cottonwoods, 250 black willows, and 4,000 sedges and rushes. The COA, SWCA, and the University of New Mexico Bosque Ecological Monitoring Project (BEMP) are working together to coordinate monitoring efforts. Fisheries, vegetation, wetlands, and geomorphology effectiveness monitoring was conducted in 2009 for all treated areas.

Benefits to Species: This project contributes to RPA Element S, restores 1600 acres of habitat by 2013 and has resulted in long-term positive changes to all three project areas, affecting a total of 58.3 acres, that benefits both the RGSM and the SWFL.

3.1.8 OLD ATRISCO DIVERSION HABITAT RESTORATION PROJECT

The Atrisco Habitat Project (also known as Phase IIa of the Albuquerque Riverine Restoration project) will improve an existing return flow channel that leads from the MRGCD's Atrisco irrigation diversion structure, which is currently not used for irrigation purposes. The channel will be graded, widened, and contoured so that the river can form an approximately 3-acre backwater during spring runoff. The site will provide habitat for the silvery minnow, which seek shallow, low velocity environments to spawn, and for newly hatched fish to grow. Vegetation, primarily invasive species such as Russian olive and salt cedar, has been removed from the area and the site will be replanted or reseeded with native plants and grasses. During extremely dry periods, as in recent history, the backwater can be used to contain water to hold rescued fish. This 'refugia' will be maintained to hold water within the backwater area and groundwater will be pumped into the refugia. A groundwater well and a series of gates have been installed for this purpose.

Benefits to Species: The site will provide refugial habitat, including shallow, low velocity habitats for spawning as well as nursery habitat for larval RGSM. This site may also be used for maintaining RGSM when the river dries.

Project implementation is March 2009 - December 2010.

3.1.9 EVALUATION OF PERENNIAL WETTED IN-STREAM HABITAT USE BY RIO GRANDE SILVERY MINNOW (RGSM)

The use of woody structures to form pools that can be more permanently wetted through periodic water releases from irrigation drains may contribute to the long-term survival and recovery of the RGSM. This study is evaluating the effectiveness of these habitats by monitoring RGSM use, health, and survival relative to hydrology and water quality. The study is being conducted at sites on the Pueblo of Isleta where woody structures have been installed at irrigation drain outfalls. A final report is in preparation.

Benefits to Species: When completed, this project will increase understanding of the habitat formed by woody debris at drain outfalls in the upper Isleta reach of the MRG.

3.1.10 LOS LUNAS HABITAT RESTORATION (HR) MONITORING - SWCA

Previous HR work at the Los Lunas site (located approximately 5.0 km (3.1 miles) south of Los Lunas along the west bank of the Rio Grande) recoupled a portion of the MRG with its floodplain to enhance RGSM reproduction and recruitment. This HR site was monitored to determine whether RGSM were utilizing the site as nursery habitat. Monthly ichthyofaunal surveys were initiated in November 2007 in the river adjacent to the HR site to characterize the structure of the adult fish community. Inundated floodplain habitat was sampled during spring runoff in 2008 and 2009 to determine if spawning and/or larval RGSM were present at the restoration site. Water quality parameters were measured during the initial monitoring event. A total of 1,672 fish, representing 10 species, were collected in monthly main channel surveys from Oct. 2008-Feb. 2009. Red shiner and RGSM were most abundant, comprising 67% and 15% of the total catch, respectively.

Main channel sampling found RGSM were most numerous in moderately deep (0.5 to 0.75 meter deep) runs immediately adjacent to shorelines. Overall, the condition of the collected RGSM was found to be good. Occupancy of the floodplain at the site by reproductively mature RGSM was documented over the duration of sampling from May 20 to June 6, 2008. A total of 12,531 were captured. Reproductively mature males and females were most commonly found at sample sites where low velocity flows predominated. A heightened level of floodplain occupation by reproductively mature males and females occurred with a rise in river flow over the period of May 21 to May 23, 2008. Spent females, i.e., females that had obviously

spawned, were not observed until calendar week 22 (May 25–May 31). A total of 2,507 RGSM were captured during May 2009 at the four inundated floodplain monitoring sites.

Benefits to Species: Spring 2008 monitoring in the restored site included evaluations of a total of 295 RGSM eggs and 2,632 larval fish that were collected from inundated floodplain habitats. Reproductively mature males and females were most commonly found where low-velocity flows pre dominated. Approximately 98% of the fish collected in wetted floodplain habitat in May 2009 consisted of colonizing species (RGSM, red shiner and common carp). Survey results contribute to knowledge of the habitats used by spawning and larval RGSM.

3.1.11 RIO GRANDE SILVERY MINNOW MOVEMENT STUDIES AT THE BIOLOGICAL PARK (BIOPARK)

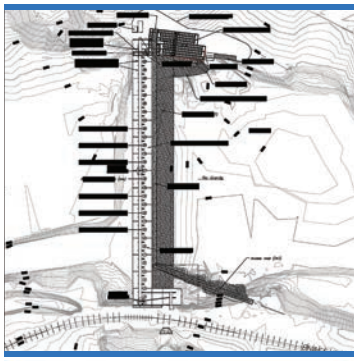
A value engineering study for the San Acacia Fish Passage project identified a need to investigate a newly proposed, lower cost fish passage alternative. Albuquerque BioPark personnel, with oversight provided by a Denver Technical Services Center Senior Fisheries Biologist, tested a pipe and valve system at the Rio Grande Silvery Minnow Rearing and Breeding Facility that was proposed to move fish upstream during both checked and un-checked reservoir operations. The horizontal pipe movement studies were carried out over a 12-month period to determine if there are any diurnal or seasonal variations in RGSM use of this fish passage alternative.

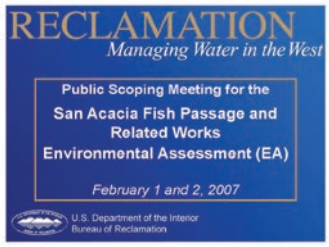
Benefits to Species: Results of the study indicated that the proposed system does not appear to be a feasible alternative for lifting the RGSM up and over a 14-foot high barrier. No conclusive information was found about diurnal or seasonal RGSM movement patterns.

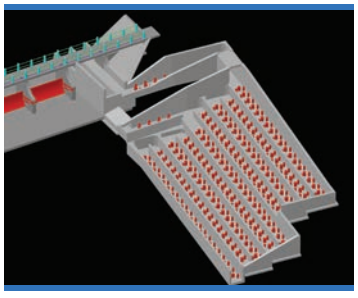
3.1.12 SAN ACACIA FISH PASSAGE: ENVIRONMENTAL COMPLIANCE AND DESIGN

- Fish and Wildlife Coordination Act Report for Fish Passage at San Acacia (05-AA-40-2382,)
- San Acacia Fish Passage NEPA (06-PE-40-0211)
- Fish Passage at San Acacia ESA (07-PE-43-0108)
- San Acacia Fish Passage Engineering Designs and Specifications (09AFUC-09-010)
- San Acacia Fish Passage DEC Review (SADEC)

San Acacia fish passage initial NEPA compliance support services were funded in FY 2006, with initial ESA compliance support services funded in FY 2007. The preferred alternative for fish passage at San Acacia Diversion Dam (SADD) was selected in April 2008. Feasibility-level (30%) engineering designs, cost estimates and construction schedule were completed in December 2008. A non-destructive ground penetrating radar survey of the downstream apron conditions and acoustic testing to determine the top of the bedrock location were completed. 90%-level engineering designs and draft specifications were delivered in June 2009. A Reclamation-mandated Design, Engineering, and Construction (DEC) review of the facility design, drawings, cost estimates, and "constructability" was conducted the week of September 14, 2009. Recommendations from the DEC review are being implemented in FY 2010 including revising cost estimates, specifications and engineering drawings. A Coordination Act Report was prepared by the U.S. Fish and Wildlife Service and submitted to Reclamation on October 15, 2009 as required by the







Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667e). The Service provided recommendations to prevent and reduce adverse project effects on fish and wildlife resources during construction, operation, and maintenance of the proposed project.

Benefits to Species: When constructed, this project will provide for upstream movement of RGSM past the San Acacia Diversion Dam.

3.1.13 RIO GRANDE SILVERY MINNOW (RGSM) EGG MONITORING IN CANALS

This project has been performed each year since 2006 to document RGSM entrainment in main canals associated with all three (Angostura, Isleta, and San Acacia) diversion dams during the RGSM spawning period during May 1-May 31 and provide real-time notification of RGSM egg entrainment for action agencies to minimize take due to diversions.

Benefits to Species: Egg entrainment is lower in years with average spring runoff, supporting the use of environmental flow management for reducing entrainment and increasing recruitment. Entrainment monitoring data when evaluated with spawning periodicity and fish community data indicates that entrainment of eggs into irrigation canals does not have measureable effects on RGSM recruitment.

3.1.14 WATER NEEDS FOR SOUTHWESTERN WILLOW FLYCATCHER (SWFL) HABITAT – LITERATURE SEARCH

An assessment of the scientific and technical literature on SWFL habitat requirements related to the presence of water was conducted to:

- improve the understanding of the timing, duration, proximity to open water, moist soil, flowing water, and other water-related requirements for the SWFL;
- to aid in developing suitable habitat restoration projects and managing limited water resources;
- improve understanding of whether this water is required to sustain suitable vegetation, insect populations, or other SWFL life history needs;
- determine the minimum water requirements for successful nesting; and
- minimize the loss of SWFL territories.

The summary report found that there was insufficient information to answer questions on the extent and duration of water availability needed to benefit SWFL reproductive success during the breeding season. The authors suggested, among other things, that future studies focus on the scale of territories to measure resources that may affect SWFL fitness, including the amount and duration of water availability, because of its effect on nest success and food availability.

Benefits to Species: Information assessed as part of this literature search is useful for HR planning and will help direct future research that may clarify water management needs for SWFL management and conservation.

3.1.15 OHKAY OWINGEH SOUTHWESTERN WILLOW FLYCATCHER (SWFL) HABITAT RESTORATION

This Ohkay Owingeh Pueblo project created 10 acres of new SWFL habitat, within 30 acres of restored bosque on the east bank of the Rio Grande, north of the Highway 74 crossing. The project area is adjacent to the habitat created in the FY 2003 "northern restoration area." New SWFL habitat was created by deepening existing old river channels and former backwater ponds in the floodplain and reconnecting them as high-flow channels to the Rio Grande. New water supplies contribute to passive restoration and revitalization of these potential future nesting sites, and in addition, Russian olives and other invasive trees were removed and coyote, Gooding's, and other willow species were planted to augment the existing stands of coyote willow in the project area.

NOTE: This project was previously referred to as the San Juan SWFL Habitat Restoration.

Benefits to Species: The Ohkay Owingeh restoration projects resulted in (1) the removal and replacement of invasive trees and non-native species with coyote willow, Gooding's willow, and other species used by nesting SWFLs; (2) reconfiguration of the channel of the former Chavez arroyo; and (3) excavated high-flow channels on the Rio Grande.

3.1.16 TWO RIVERS FLYCATCHER HABITAT RESTORATION (HR) AND EXPANSION – OHKAY OWINGEH

Under the Two Rivers HR project, the Ohkay Owingeh Pueblo performed ecological restoration of riparian habitats within the Pueblo lands. Key HR project objectives included:

- Creating at least 15 acres of new SWFL habitat within five to seven growing seasons;
- Excavating a channel connecting the Rio Grande with existing former river channels, old ponds, and areas of existing coyote willow thicket and permitting flow-through into the collaborative Forest Restoration Program 2005 restoration channel/wetland system;
- Enhancing the density, diversity, and vigor of vegetation in the restoration area by planting willow species and other native wetland plants in suitable microhabitats;
- Connecting two existing, relatively small, SWFL habitat creation sites creating a larger contiguous habitat patch of about 20 to 35 total acres adjacent to another 25-acre patch.

Under the Two Rivers expansion project, the Ohkay Owingeh Pueblo has extended the project area northward from the boundary of the HR project 260 meters (850 feet) along the Rio Grande, encompassing an additional 10 acres. The expansion enabled more abandoned Rio Grande channels to be re-connected to the river and then expanded and re-vegetated with coyote willow and native herbaceous marsh plants to create additional potential SWFL habitat.

Benefits to Species: This HR and expansion project contributes to the long-term goal of riparian ecological restoration at Ohkay Owingeh – to re-create conditions that existed in the bosque before river channelization/levee construction and introduction of non-native plants. This projects restored a contiguous area of 40 to 60 acres of potential SWFL habitat.

3.1.17 THREE FALLS HABITAT RESTORATION (HR) AND EXPANSION – OHKAY OWINGEH

Under the Three Falls HR project, the Ohkay Owingeh Pueblo created approximately 12 to 14 acres of SWFL habitat by altering the course of the lower 500 feet of Arroyo Chinguague. The project provided a new source of surface water to an area of former SWFL habitat that had been abandoned since 2000. Additionally, the restoration area was enhanced by planting willow species and other native wetlands plants, and created additional habitat contiguous with other projects.

Under the Three Falls expansion project, the Ohkay Owingeh Pueblo is enhancing approximately 10 acres of SWFL habitat. This project effectively connects the original Three Falls HR project area with the Middle Rio Grande Endangered Species Collaborative Program 2003 "South" project area where SWFL habitat is developing well to create a contiguous area encompassing over 50 acres. The three principal activities performed in the expansion project area include:

- Limited-scale earthmoving to direct water flow where needed, keep unintended "escape" channels to the river from developing, and spread, slow, and direct water to maximize the area of shallow water and marshland conditions where SWFL nesting and foraging habitat can develop;
- Enhancement planting of coyote willow and native wetland plants where SWFL nesting and foraging habitat can develop;
- Continued control of invasive trees and herbaceous weeds as needed.

Benefits to Species: The key benefit of this project is the restoration of abandoned SWFL habitat and creation of new habitat totaling 12 to 14 acres. New (or newly restored) habitat will be well protected, adjacent to other SWFL habitat creation sites, leveraging the value of all the projects and creating a bigger contiguous habitat patch. It will provide a dependable additional source of surface flows that will benefit nearby projects and enhance their value and eventual extent. The increased water flow made available by the expansion project can be managed and directed to significantly increase the area of shallow marsh and wet meadow creating potential SWFL habitat.

3.1.18 PUEBLO OF SAN FELIPE HABITAT RESTORATION

The Pueblo of San Felipe (in 2001) proposed to clear non-native vegetation from 10 acres of tribal land in the bosque on the east bank of the Rio Grande and replant it with native species. The goals of this project included: (1) to help maintain and sustain the habitat specifically with Southwestern willow

flycatcher (SWFL) needs in mind; (2) reducing the fire danger; and (3) providing accessibility for cultural activities. In 2006, San Felipe staff presented a proposed scope revision, under which the restoration included extraction of non-native plant species (e.g., Tamarisk, Siberian elm) and the planting of native species of shrubs, grasses, and trees. In early 2008, the Pueblo removed approximately 10 acres of non-native vegetation adjacent to the Rio Grande and planted native cottonwood, Gooding's willow, and shrubs and grasses. The Pueblo continues to monitor the vegetation at the site.

Benefits to Species: The project improved habitat for SWFL in the Pueblo which benefits the species by promoting recovery of the SWFL and promoting overall ecosystem health through the restoration of terrestrial community assemblages.

3.1.19 MAINTENANCE OF MIDDLE RIO GRANDE ENDANGERED SPECIES COLLABORATIVE PROGRAM PROJECTS AT OHKAY OWINGEH

The Ohkay Owingeh Pueblo conducted maintenance on a total of 110 acres in three project areas within Pueblo land including:

- Continued control of invasive woody species;
- Control of invasive herbaceous species;
- Seeding of native herbaceous species into invasive weed outbreaks to provide competition;
- Structural maintenance of water supply channels;
- Control of cattail in selected coyote willow stands, along with extensions of coyote willow plantings.

Benefits to Species: This project benefits SWFL recovery efforts by:

- Maintaining constructed habitats to ensure that these habitats are following an acceptable successional trajectory to becoming desirable SWFL habitat; and

Providing information needed in planning maintenance activities and adaptive management in ongoing projects, to maximize the value and extent of habitat being created or enhanced in restoration work.

3.1.20 SUCCESSION AND SUITABILITY IN SOUTHWESTERN WILLOW FLYCATCHER (SWFL) HABITAT – OHKAY OWINGEH

Ohkay Owingeh (formerly San Juan Pueblo) contains the only known occupied SWFL habitat within the Velarde Reach of the Rio Grande and hosts an important breeding population.

The purpose of this multiphase project was to study SWFL habitat preferences at Ohkay Owingeh, and then utilize the results of the study in designing habitat improvements.

Activities accomplished include the following

- SWFL surveys were conducted;
- Twelve sites were sampled using the B-Bird, 4-concentric-circle methodology;
- Habitat modifications were designed using data and visual observations from the sampling, and included removing dead willow stems, increasing density, and removing exotic trees that shaded willow stands;
- Habitat modifications began in February 2008 and were completed in November 2008.

Recently occupied, and now abandoned, SWFL habitat was monitored and compared to better understand how long habitat remains suitable, how long new areas take to develop into suitable habitat, and whether attractiveness can be restored in abandoned habitat. Using the information gained, a total of 13.5 acres of abandoned habitat and adjacent coyote willow-dominated bosque were treated to restore habitat suitability in a priority area that already contains SWFL territories and nests, and tested lower cost approaches for creating suitable SWFL habitat.

Benefits to Species: This project enhanced SWFL recovery by helping to understand how habitat develops and proceeds through ecological succession. In addition, it provided information on whether restoring former habitat is a viable restoration technique when natural river processes cannot provide natural vegetation succession. The information learned from this monitoring and restoration effort can be used to enhance the Collaborative Program's ability to successfully restore and enhance habitat for SWFL in the future.

3.1.21 SOUTHWESTERN WILLOW FLYCATCHER (SWFL) TERRITORY, FOOD BASE, AND HABITAT MONITORING AT OHKAY OWINGEH

The overall objective of this project is to better understand the successional dynamics of the SWFL at Ohkay Owingeh Pueblo, such that restoration efforts create or enhance as many suitable habitats as possible. Activities include:

- SWFL surveys at the Ohkay Owingeh bosque;
- Data collection on flying insect diversity, abundance, and biomass in currently occupied, abandoned, and in-restoration flycatcher habitat;
- B-BIRD vegetation plot data for the oldest Collaborative Program restoration site, for comparison of similar data for occupied sites; and
- Modified Whitaker plot vegetation data to guide maintenance and adaptive management.

Benefits to Species: This project benefits SWFL recovery efforts by:

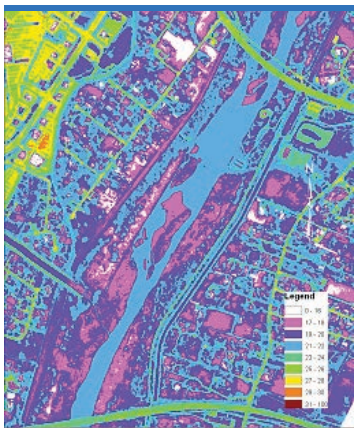
- Helping clarify the role of SWFL food supply in habitat abandonment;
- Determining if there are differences in insect guild diversity, abundance, biomass in occupied habitats as opposed to abandoned or immature habitat;
- Assessing the success of ecological restoration projects for increasing critical habitat for SWFL in the Velarde reach at Ohkay Owingeh;
- Collecting information that can be used to better provide optimal habitat in terms of food supply for insectivorous birds; and

Providing information needed in planning maintenance activities and adaptive management in ongoing projects to maximize the value and extent of habitat being created or enhanced in restoration work.

3.1.22 RIO GRANDE CHANNEL AND FLOODPLAIN ASSESSMENT DURING AND AFTER THE 2008 SPRING RUNOFF

The intent of the 2008 Rio Grande Channel and Floodplain Assessment was to provide the Collaborative Program with data on the Rio Grande for prediction of the spatial and temporal distribution of flows in the river and the vegetative and morphological changes that occur as a result of such flows .

Reclamation contracted for digital, ortho-rectified, four-band aerial photography to be taken for portions of the MRG in June, July and August, 2008. The intent was to capture visual "snap shots" of the effects (e.g., inundation patterns, physical channel changes resulting from high flow) of various flow periods: peak or high flow (~5,000 cfs), moderate (~2,000 cfs), and low flow (~500 cfs). Thermal imagery was also obtained at the moderate flow to capture temperature variations across the floodplain. Three post flight mapping projects looked at flow inundation patterns for the high flow photography (~5,000 cfs,) flow inundation patterns for the moderate flow photography (2,000 cfs), and vegetation and morphological changes for the low flow photography. Geodatabases showing these patterns were developed through a comparison with a set of aerial photography collected by Reclamation in 2006. The 2008 photography and mapping products are available on the Collaborative Program website.



Thermal Imagery near Albuquerque, NM collected June 26-27, 2008, showing temperature in degrees Celsius (Map Courtesy of the Bureau of Reclamation).

Benefits to Species: The prediction and monitoring of overbank flows and the morphological changes caused by such flows are important for researchers, scientists, and engineers to help optimize river operations, restoration efforts, and potential water salvage. The collected thermal imagery will be used to assess if there is a correlation between documented silvery minnow use of certain habitat features along the Rio Grande and temperature.

3.1.23 PUEBLO OF SANDIA HABITAT RESTORATION ANALYSIS AND RECOMMENDATIONS (SANDIA A&R) REPORT

The Sandia A&R report, finalized in June 2008, evaluates and recommends habitat improvement needs for all life stages of the RGSM and SWFL in the Sandia subreach of the MRG. The recommended HR projects specified in the Sandia A&R aim to provide habitats for the recovery of both the RGSM and

the SWFL. Recommended HR for RGSM includes creating, enhancing, and maintaining habitat for all life stages, including: (1) egg retention, larval development, and young-of-year habitat; (2) overwintering habitat; and (3) year-round adult habitat. Recommended HR for SWFL includes creating dense, willow-dominated habitat patches that are adjacent to or over moist soil or standing water.

Benefits to Species: In addition to providing habitats for the RGSM and SWFL, implementation of the HR recommendations could provide general ecosystem benefits, including (1) promoting overall ecosystem health through the restoration of key ecological and physical processes, and (2) promoting the hydrological connectivity between the active river channel and the floodplain.

Improvements to surface water hydrology and overbank flooding should have the additional benefit of supporting the generation of suitable SWFL habitat in the approximately 1,100 acres that lie within the area between a federally-constructed levee on the east side of the river and the river itself. Implementation of the recommended HR projects could potentially result in the creation of more than 118 acres of habitat for the RGSM and the SWFL.

3.1.24 ALBUQUERQUE REACH HABITAT RESTORATION ANALYSIS AND RECOMMENDATIONS (A&R)

This project continued evaluation and recommendation of projects aimed at improving habitat for both the RGSM and SWFL in the Albuquerque Reach of the MRG. The Albuquerque Reach A&R included a thorough analysis of current and desired habitat conditions; identification of specific areas in the reach that are most appropriate for each identified restoration technique; analysis and quantification (in acres) of the suitability of existing habitat; and potential limiting factors. This analysis focused on all life stages of RGSM and nesting habit quality for the SWFL and included a comparison of current habitat conditions to future anticipated conditions with project implementation (quantified in acres). Each specific suitable HR project was described with information such as: location; acreage and techniques employed; benefits to the RGSM and/or SWFL; estimated project costs; potential limiting conditions; water requirements and net depletion analysis; maintenance requirements; applicability to established priorities; and cumulative impacts from other HR projects already constructed and/or planned.

Future trends were projected in terms of habitat suitability. Evaluation criteria and methods for proposed projects were developed and incorporated into a monitoring plan recommendation with adaptive management strategies for HR projects. The draft report was developed during 2008 and 2009. A final report is expected in 2010. USACE provided technical oversight and contract administration for the development of the A&R report. Oversight included coordination of reviews by HRW, assembling comments, and coordinating with the contractor for final changes to the report.

Benefits to Species: Reach-specific A&Rs provide guidance for future restoration projects and help the Collaborative Program to prioritize potential projects. The recommended HR projects for the Albuquerque Reach will benefit the species by:

- Improving habitat, supporting scientific analysis, and promoting recovery of the RGSM and SWFL;
- Promoting overall ecosystem health through the restoration of key ecological and physical processes and restoration of aquatic and terrestrial community assemblages;
- Promoting the hydrological connectivity between the active river channel and the floodplain.

3.1.25 SAN ACACIA: DEVELOPING A VISION FOR A SUSTAINABLE REACH WORKSHOP

The "San Acacia: Developing a Vision for a Sustainable Reach Workshop" was held February 20 - 21, 2009 in Socorro, NM, with more than 80 people attending. It included a half-day of presentations which covered a historical overview of the San Acacia portion of the MRG spanning from the 1500s to the present followed by expert panel discussions on water management, ecosystem functions, and valley community.

This workshop was a first step towards raising awareness among multiple stakeholders about the southern portions of the MRG. The stakeholders succeeded in:

- Developing a common understanding of: (1) existing conditions; (2) how we got there (including physical and geological causes); (3) stakeholder values; (4) planned/potential agency actions in the sub-reach; and the (5) lack of sustainability of current practices;
- Beginning to develop a shared vision and common goals for the future condition of this sub-reach; and

- Developing next steps including (1) providing information about how all workshop participants can continue to be involved; and (2) making it clear that while the Collaborative Program is committed to this sub-reach, it can not be responsible, or fund, all actions needed to reach the desired future state.

The workshop products included a final report that listed sustainability recommendations, recommended actions, and workshop outcomes. This report was developed to: (1) begin the "visioning" process; (2) document the agreed-upon next steps; and (3) document all the information that was presented about the sub-reach and make it accessible via the MRGESCP website.

Benefits to Species: The Workshop panel discussions and presentations allowed the participants to ask questions, gain feedback, and begin to formulate their own ideas and thoughts about the needs and future of the SAR. Needs identified can be used to guide future research and restoration projects.

3.1.26 ISLETA REACH HABITAT RESTORATION ANALYSIS AND RECOMMENDATIONS (ISLETA A&R)

Finalized in July 2008, the Isleta A&R report focuses on the development of scientifically-based, reach-specific habitat restoration recommendations intended to improve the habitat and population status for the RGSM and the SWFL. The project area for this HR A&R is along the MRG between the south boundary of the Isleta Pueblo and the San Acacia Diversion Dam (i.e., the Isleta Reach).

Several restoration conceptual designs and techniques were hypothesized in the HR A&R to improve habitat conditions for the RGSM and SWFL in the Isleta Reach. The recommended restoration techniques included:

- Reworking stable, accreted islands and vegetated bars to enhance the active channel and improve hydraulic conditions for RGSM habitat at moderate and high flows.
- Destabilizing channel bank-lines to stimulate channel migration and facilitate the deposition of large woody debris into the channel. By increasing channel bank erosion and encouraging the introduction of large woody debris into the channel, more low-velocity, deep pool habitat for the RGSM may be created during low-flow conditions in proximity to the woody debris piles.
- Constructing Gooding's and coyote willow habitat and backwater channels in areas near existing SWFL breeding sites. These projects are intended to facilitate expansion of breeding territories in the project reach. The backwater channels are also intended to provide low-velocity refuge habitat for the silvery minnow during moderate and high flows.

Benefits to Species: Recommendations offered by this study are meant to address some of the key issues and opportunities for enhancing aquatic and riparian habitats for the RGSM and SWFL. Proposed projects were selected to function under variable hydrologic conditions and all will require varying levels of adaptive management to be sustained over the long term.

3.1.27 VELARDE REACH HABITAT RESTORATION (HR) ANALYSIS AND RECOMMENDATIONS (A&R)

The Velarde Reach A&R evaluated and recommended projects aimed at improving habitat for the RGSM and SWFL in the Velarde Reach of the MRG and the Rio Chama and focused on four sub-reaches:

1) Taos to Pilar;

2) Pilar to Embudo Station;

3) Velarde to Ohkay Owingeh;

4) Monastery to Big Eddy.

The recommendations included conceptual level design drawings, planning level cost estimates, monitoring recommendations and adaptive management considerations. A&R key points presented to the HR work group in July 2008 included information on floodplains, water quality, water temperature, RGSM spawning, and drying conditions; and potential reasons for decline of the SWFL in the Velarde Reach. A draft report was provided for Collaborative Program review in July 2009. The final report is expected to be finished by the end of FY 2010.

Benefits to Species: This project evaluated and recommended projects aimed at improving habitat for both the RGSM and SWFL in the Velarde Reach of the MRG. Reach-specific A&Rs provide guidance for future restoration projects and help prioritize potential projects and benefit the species by:

- Improving habitat and supporting scientific analysis
- Promoting overall ecosystem health

Promoting the hydrological connectivity between the active river channel and the floodplain channel and floodplain

3.1.28 HABITAT RESTORATION PLANNING – PUEBLO OF SANTA CLARA

This contract was awarded to the Pueblo of Santa Clara to complete the Pueblo of Santa Clara Reach-Specific Habitat Restoration Plan. The project employs a three-part strategy for river and bosque restoration targeted at creating the habitat conditions necessary for the survival of riverine and riparian obligate species, including the SWFL. This strategy consists of gathering available data and collecting baseline physical, chemical, and ecological data; analyzing and interpreting information and data; preparing a comprehensive and strategic restoration plan that incorporates community values and the Pueblo's long-term vision.

Benefits to Species: In 2008, planning for the project began but little measureable progress was made. In 2009, surveys for SWFL territories were completed. Fifty-eight Intensive Modified Whittaker plots were recorded. The data collected was organized in a database and analyzed. Other bosque sites were identified for BBIRD plots and additional Intensive Modified Whittaker plots in wetland areas were scheduled for recording. Preliminary research was conducted for historic photographs of Santa Clara bosque and eco-historical research was conducted.

3.1.29 STUDY CHANNEL REALIGNMENT – SAN ACACIA

This project includes planning and design of a potential Channel Realignment project at a site along the Middle Rio Grande in the vicinity of River Mile 83. The project extends from the north boundary of the Bosque del Apache Refuge to approximately 2 miles south. The first draft report was submitted on December 2009. The final report, expected in 2011, will include an additional alternative, and will enable the Collaborative Program to determine if the proposed alternatives are worth implementing. The cost of the project, and the benefits and impacts to that section of river will be assessed before the Collaborative Program decides to allocate funds for implementation. Specific objectives for the study included:

- Compile information on existing Rio Grande silvery minnow (RGSM) and Southwestern willow flycatcher (SWFL) habitat quality, wetland, river channel, and floodplain physical characteristics for a range of discharges and under various conditions, and to investigate groundwater and surface water availability.
- Develop a minimum of three alternatives with feasibility design for manipulation at the project area that would support a functioning river channel, provide benefits to both listed species, and improve surface water connectivity with wetlands and the historic floodplain. Specifically, design components that alleviate RGSM stranding, provide for the most reliable low flows, and offer wetted refugia during drying events were prioritized. Design components that maximize the establishment of dense willows for future SWFL habitat were also prioritized.
- Describe the necessary hydrology to support fluvial processes and to improve habitat for both listed species.
- Develop monitoring plan to determine changes in physical habitat over time and resulting benefits to, and use of, the project area by the listed species.
- Develop costs estimates and perform a depletions analysis for the alternatives.

Benefits to Species: When the planning is finalized, the Collaborative Program will have to assess if the proposed project should move forward. It is anticipated that the proposed alternatives will provide long term benefits to both species. The next step would be to fund detailed designs and proceed to complete necessary environmental compliance processes under NEPA, ESA, and CWA. If determined feasible, the third phase will be the implementation of the preferred alternative.

3.1.30 RIO GRANDE NATURE CENTER (RGNC) HABITAT RESTORATION PROJECT POST-CONSTRUCTION MONITORING

The USACE developed and constructed a HR project located in the Rio Grande Nature Center (RGNC. This project provided 3,300 feet of ephemeral side channel habitat for the RGSM and about 10 acres of enhanced bosque habitat that benefits

the RGSM and may be suitable for the SWFL. Two embayments were constructed where the channel connects with the river. Another two embayments were constructed along the side of the channel. These additional embayments are inundated at higher flows. USACE completed construction of the RGNC Restoration Project in March 2008. The newly-restored habitat features a high-flow side channel (3 acres) with embayments that reconnect the Rio Grande with the bosque. In addition, 10 acres of exotic vegetation were removed and native shrubs were planted. This project has resulted in the restoration of a total of 13 acres of habitat for the RGSM and SWFL. USACE conducted the first two years of post-construction monitoring in 2008 and 2009.

Benefits to Species: Monitoring in 2008 showed that the total area of the pools during inundation was 3073.8 m2, while the sandbars that formed during runoff had an area of 1129.1 m2. A total of 1444 fish were collected and identified during seven sampling trips from pools at each of the four inlets. The most numerous species were red shiners (Cyprinella lutrensis) and young of year common carp (Cyprinus carpio). The 268 RGSM (Hybognathus amarus) were all adults. No RGSM eggs were collected during sampling with seines or kicknets. There were few signs of avian predation at the pools before or after they became isolated from the main channel. The pools maintained suitable depth and water quality after becoming isolated by seepage through the sandbars. Fish remaining in the pools appeared to be in good condition.

The number of RGSM and red shiners in the pools 3-5 days prior to isolation suggests escapement occurred prior to the pools becoming disconnected from the channel. No increases in predator tracks were noted during visits prior to or after the pools became isolated. The presence of carp (C. carpio) and fathead minnows (P. promelas) in the isolated pools also indicates that RGSM emigrated from the pools rather than removal by predators. The differential emigration of RGSM and red shiners versus other fish (carp and fathead minnows) suggests an undescribed mechanism for their exit behavior. Understanding this behavior may provide useful insights for how RGSM avoid pools during river drying.

Temperatures in the pools were higher than the adjacent channel when the river flow was lower (2000-3000 cfs). The trends with dissolved oxygen indicate good water exchange between the river, the channel, and the pools. The higher dissolved oxygen in the pools later in the day indicates local primary productivity by algae.

There is currently not enough groundwater sampling data to show trends but the information has been utilized in order to plant native vegetation along the banks of the channel during the winter of 2008 and 2009.

3.1.31 SANTO DOMINGO TRIBE ENDANGERED SPECIES HABITAT IMPROVEMENT PROJECT – PHASE III

Phase III of the restoration project at Santo Domingo Pueblo involved habitat construction and thinning of non-native phreatophytes in the Rio Grande bosque which contributed to the enhancement and recovery of the RGSM and the SWFL in the Cochiti Reach of the MRG. Phase III projects, at four sites along the Rio Grande, complemented prior year HR projects in the Cochiti Reach. The tribe used multiple HR techniques aimed at enhancing riverine features to accommodate the needs of the RGSM. This work involved completing the removal of non-native phreatophytes, while the remaining projects refurbished low-flow side channels and backwater habitats. Each project incorporated embayments or scallops and other habitat features associated with desirable RGSM nursery habitat and will provide and expand suitable habitat for the RGSM.

The Pueblo thinned 75 acres of salt cedar and Russian olive at sites 6, 8, and 1. Replanting at sites 6 an 8 was done in February and March. Site 1 had an additional 45 acres of thinning done by late in the year. Completion of construction was by the end of 2009.

Benefits to Species: The Rio Grande projects included the diversification of habitat for the RGSM by removing sediment from an abandoned oxbow and enhancing two nonfunctioning Bureau of Reclamation restoration sites. These projects affected approximately 48.7 acres in the Rio Grande Bosque, which was inundated with non-native phreatophytes and provided marginal wildlife habitat. The activities will benefit terrestrial and aquatic species and result in positive long term benefits in the Cochiti Reach of the Rio Grande.

3.1.32 SANTO DOMINGO ENDANGERED SPECIES HABITAT IMPROVEMENT PROJECT - PHASE IV

Phase IV continued Santo Domingo's HR projects on the Pueblo. One of the three project sites for this phase complements the FY 2007 project's Site 5, while the other two project sites are new. Phase IV work includes:

- Re-opening and enlarging an isolated channel into a low velocity flow through habitat;

- Modifying and enhancing an existing backwater/side channel habitat created in the FY 2007 project;
- Conducting a bank line modification project to enhance RGSM nursery habitat northwest of Site 5;
- Removing invasive tamarisk and Russian olive and planting native willow, cottonwood, and shrubs.

Only environmental compliance and some non-native vegetation removal were completed during this reporting period.

Benefits to Species: The activities enhance and expand management techniques that promote overbank flooding, re-establish isolated habitats, and utilize historic natural features in the Rio Grande corridor for the benefit of the RGSM and SWFL. The Tribe is restoring abandoned oxbows and side channels that are functional attributes to benefit the RGSM and SWFL. Management activities to create new or restore existing key habitat components need to be incorporated for successful population expansion.

3.1.33 PUEBLO OF SANDIA HABITAT RESTORATION PROJECT

This habitat restoration project approximating 46 acres included both riparian restoration for the Southwestern willow flycatcher (SWFL) and abandoned floodplain modifications near the river for the Rio Grande silvery minnow (RGSM). The bosque restoration component of the project included removal of non-native species and re-vegetation with native cottonwood, shrubs, and grass species. Initial treatment occurred in 2004 with work continuing in 2008 and 2009 to remove re-sprouting invasive vegetation. In the second phase of the project, a high-flow side channel was constructed through part of the abandoned floodplain that connects to surface water of the Rio Grande. The channel was designed to simulate historic floodplain conditions and provide additional RGSM habitat by inundating during spring runoff. Environmental compliance was done in 2008 and 2009 with construction completed at the end of 2009. The approved approach was selected by the Sandia Pueblo Tribal Council after the habitat design and feasibility study had been completed.

Construction on Sandia Side Channel during Oct 2009.

Benefits to Species: The bosque project activities provide newly restored areas with conditions favorable for native riparian vegetation, which benefit the SWFL. The high-flow side channel provides benefits to the RGSM by creating a slow-moving habitat into which RGSM eggs could settle out of the current, and shallow areas in which the fish could spawn. Riparian birds, mammals, reptiles, and amphibians would also find improved habitat along the channel.

3.1.34 PUEBLO OF SANDIA RIVERINE HABITAT RESTORATION PROJECT

This project is intended to increase riverine habitat complexity to support various life stages of the Rio Grande silvery minnow (RGSM). Improvements to surface water hydrology and overbank flooding should have the additional benefit of supporting the creation and enhancement of suitable Southwestern willow flycatcher (SWFL) habitat in the approximately 1,100 acres that lie within the area between a federally constructed levee on the east side of the river and the river itself. This project builds on the Pueblo of Sandia HR Analysis and Recommendations (A&R) Report conducted in FY 2006 – FY 2008.

The planning effort resulted in recommendations that focused on improving habitat needs for all life stages of the RGSM and the SWFL within the Sandia Subreach. Implementation of this construction project could result in the creation of more than 30 acres of habitat for the RGSM and the SWFL. The main components of this construction project include:

- Passive restoration, island and bar enhancement: vegetation removal and destabilization for several banks, bars, and islands;
- Bank lowering: bank-line bench terraces at several sites designed for inundation at lower flows (1,000; 1,500; 2,000; and 2,500 cfs);
- Embayments: multiple embayments for backwater habitat; and
- Woody Debris: While this project does not directly include the use of large woody debris, woody debris from vegetation clearing may be utilized to provide additional habitat.

Construction should be completed by early January 2011. During the construction period, the Pueblo will monitor threatened and endangered species (RGSM and bald eagle), water quality, and all construction activities.

Benefits to Species: Year-round RGSM augmentation and salvage efforts have placed thousands of RGSM in areas directly upstream and within Pueblo of Sandia lands. Improvements to surface water hydrology and overbank flooding should have the additional benefit of supporting the creation and enhancement of suitable SWFL habitat. Therefore, habitat improvements in this reach have the potential to provide significant benefit to the species. Increased habitat diversity will provide better egg retention and larval rearing so that the RGSM's population may increase naturally within this area. This construction seeks to improve habitat needs for all life stages of the RGSM and the SWFL within the Sandia Subreach.

3.1.35 TECHNICAL ASSISTANCE TO DEVELOP THE COLLABORATIVE PROGRAM'S HABITAT RESTORATION (HR) COMPREHENSIVE MONITORING PLAN

The Collaborative Program required the technical assistance of an experienced researcher to develop a scientifically sound effectiveness monitoring plan (EMP) for completed HR projects. Intermountain Aquatics, Inc. worked with the Monitoring Plan Team (MPT) and guided the development of a 2-year monitoring plan. The researcher assisted with the development of an overall monitoring framework including: scientific research components, past research/monitoring efforts and results, and monitoring elements addressing scientific questions and hypotheses (including appropriate statistical design, field methods, sampling frequency, and analysis of data collected).

Benefits to Species: The Collaborative Program's goal was to obtain objective input in designing a 2-year pilot EMP for the Albuquerque and Isleta reaches of the MRG. Having an experienced researcher helps facilitate the development of the pilot 2-year EMP. Furthermore, it allows the MPT to focus on the minimum set of parameters that needs to be monitored, to determine the benefit to the species of the constructed habitat restoration projects, and to evaluate the effectiveness of various habitat restoration techniques.

3.1.36 PUEBLO OF SANTA ANA: RIO GRANDE AND RIO JEMEZ BIOLOGICAL AND HABITAT SURVEY

The objective of this project is to develop monitoring protocols that can be used to develop and sustain habitat restoration projects within the Pueblo of Santa Ana. Project activities include the performance of a variety of surveys, including icthyofaunal, macro-invertebrate, silvery minnow population and habitat, southwestern willow flycatcher population and habitat, soil salinity/texture, and micro-climate measurements. Collected data will be used to evaluate trends in the populations of silvery minnow and southwestern willow flycatcher, evaluate population utilization of restored sites, and correlate patterns of use/non-use to measureable habitat features, such as vegetation characteristics and micro-climate measurements.

Rio Grande silvery minnow monitoring on the Rio Grande through the Pueblo of Santa Ana using seine nets (Photo courtesy of the Pueblo of Santa Ana, Spring 2009)

Benefits to Species: The intensive monitoring specified in this project will provide the ability to assess ecosystem changes within the six-mile Rio Grande corridor through the Pueblo of Santa Ana. This assessment will not only provide input on how the silvery minnow and southwestern willow flycatcher populations are faring within this reach, but also provide data on habitat characteristics preferred by these species which will help in future habitat restoration efforts.

3.1.37 PUEBLO OF SANDIA HABITAT RESTORATION MONITORING

A comprehensive 10-year monitoring plan is being developed and implemented to evaluate and monitor habitat conditions for the RGSM and SWFL and their existing or potential habitats throughout the Pueblo of Sandia Subreach. The Sandia Monitoring Project is comprised of two phases over a 5-year period. Phase 1, initiated and developed between 2008 and 2009, is the development of the Sandia Monitoring Plan and individual monitoring plans for all existing Pueblo HR projects. Phase 2 is the implementation of monitoring surveys or studies for individual restoration projects. The Sandia Monitoring Plan will address monitoring needs across several spatial and temporal levels, including implementation, effectiveness, and validation monitoring.

Benefits to Species: The results of a well-conceived comprehensive monitoring program should inform future management activities through an adaptive management process.

3 PROGRAM ACCOMPLISHMENTS

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 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 LFCC pumping to meet compliance requirements and activity objectives on the ground. The purpose of other Collaborative Program-funded water management activities is to provide assistance and expertise to accomplish the Program goals. Reclamation works to secure potential supplies of water and storage space and implement management strategies to meet BiOp requirements and Program goals. Table 3.2 summarizes the status of the water management projects.

TABLE 3.2 | ***Collaborative Program FY 2008 and FY 2009 Funded Projects: Water Management***

	Funded Projects – Funded Entity	Entity Performing Work	Continuing Activity or Distinct Project	BiOp Requirement	Grant/ Contract #	Amount Appropriated	Year of Allocation
3.2.1	USGS Middle Rio Grande River Gage Operation and Maintenance (O&M)	USGS	FY05-ongoing	yes	07-AA-40-2622	$86,440	2008
					07-AA-40-2622	$89,148	2009
3.2.2	Decision Support System	MRGCD; NMISC	FY03-FY12	no	07-CS-40-8208	$159,639	2008
					07-CS-40-8208	$166,963	2009
3.2.3	Bureau of Reclamation (BOR) – Supplemental Water Program	BOR	FY01-ongoing	no	Various	$3,048,206	2008
					Various	$3,853,708	2009
3.2.4	Upper Rio Grande Water Operation Model (URGWOM) Modeling to Support New Biological Assessment/Biological Opinion (BA/BO)	USACE; URGWOM Technical Team; MRGESCP	FY06-ongoing	no	06-AA-40-2545	$200,000	2008
					R09-PX-40-005	$99,998	2009
3.2.5	Development of Riparian Groundwater Models for the Middle Rio Grande (MRG)	NMISC	FY03-FY10	no	07-CS-40-8209		

3.2.1 USGS MIDDLE RIO GRANDE RIVER GAGE OPERATION AND MAINTENANCE (O&M)

The USGS operates and maintains a network of 24 streamflow gages in the MRG, including 12 in the mainstream of the Rio Grande and 12 in tributaries or distribution features. The Collaborative Program has funded four of these gages. The USGS performs manual stream flow measurements regularly at each gage. The manual measurements are used for calibration and generation of ratings curves for each station. The ratings curves convert gage height into stream discharge and allow the USGS to update their webpage with information on flows and provide accurate up-to-date information for water management.

Benefits to Species: The collection of MRG stream flow information helps ensure that required Water Operations elements of the BiOp are met. The data from these gages are critical for efficient management of flows in the MRG, helping MRG water management agencies meet the needs of water users, fulfilling the requirements of the Rio Grande Compact, maintaining sufficient water in storage for future needs, and maintaining adequate water in the river to support the RGSM.

3.2.2 DECISION SUPPORT SYSTEM

Since Fiscal Year 2003, the Program has been supporting efforts to develop a decision support system (DSS) to further the implementation of efficient scheduled water delivery in the MRG irrigation system, which will allow irrigation demands to be met with reduced diversions from the Rio Grande. The DSS model and related data files were completed for all four MRGCD divisions – Albuquerque, Cochiti, Belen, and Socorro – by September 2009 (FY08 ESA funding). The DSS was implemented for the entire Belen Division in FY09.

The DSS is a network of interlinked models that compute demand information at the farm level, and use that information to prioritize and schedule water delivery. For FY09, work focused on expanding the use of the DSS within MRGCD and by other entities, public outreach and technical support, and continuous updating of the model data sets. Improvements to the quantification of flows through the MRGCD system will significantly enhance operational efficiency within the MRGCD. With improved efficiency and management, it is possible that the system will require smaller water diversions to meet the consumptive use requirements.

Benefits to Species: This effort will allow irrigation demands to be met with reduced diversions from the Rio Grande. In water-short years, the efforts could extend the irrigation season and the proportion of the season during which irrigation flows can support in-stream flows to benefit the species and their critical habitats.

3.2.3 BUREAU OF RECLAMATION (BOR) – SUPPLEMENTAL WATER PROGRAM

Water acquisition funding in 2008 and 2009 made possible releases of supplemental water to meet the flow requirements of the 2003 BiOp and benefited the RGSM and SWFL. Collaborative Program funds in the amount of $1,715,887 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. In addition, funds in the amount of $2,933,947 were used for Low Flow Conveyance Channel (LFCC) pumping, in which water is pumped from the LFCC into the Rio Grande to enhance river flows to benefit the RGSM and SWFL. Funds in the amount of $2,505,900 were also used for the Emergency Drought Water Agreement and to make payment to the MRGCD for water under the 2000 Agreed Order. Shown in Table 3.2.1 is a summary of water leases for 2008 and 2009.

3.2.4 UPPER RIO GRANDE WATER OPERATION MODEL (URGWOM) MODELING TO SUPPORT NEW BIOLOGICAL ASSESSMENT/BIOLOGICAL OPINION (BA/BO)

The 2006 contract supported the SWM workgroup using the URGWOM model to evaluate reservoir storage options and to estimate supplemental water needs to support the 2003 Biological Opinion. The modeling analysis suggested that hydrology and Rio Grande Compact Article VII restrictions are the factors limiting conservation storage potential and that up to 90,000 AF of storage in the conservation pool may be needed to meet Biological Opinion target flows in any given year.

TABLE 3.2.1 | ***2008 and 2009 Funding for the San Juan-Chama Project (SJCP) Supplemental Water Lease Agreements***

SJCP CONTRACTOR	2008 LEASED ACRE-FEET	2008 FUNDING	2009 LEASED ACRE-FEET	2009 FUNDING
Uncontracted Allocation	2,990	$48,286	2,990	$38,504
Jicarilla Apache Nation	3,000	$237,000	3,000	$225,000
City of Santa Fe	2,500	$127,500	2,500	$117,500
Ohkay Owingeh (formerly San Juan Pueblo)	2,000	$102,000	2,000	$94,000
County of Los Alamos	1,200	$61,200	1,200	$56,400
City of Espanola	850	$43,350	850	$39,950
City of Belen	470	$23,970	400	$18,800
Town of Bernalillo	320	$16,320	400	$18,800
Town of Taos	400	$20,400	200	$9,400
Santa Fe County	375	$19,125	375	$17,625
Village of Los Lunas	331	$16,881	200	$9,400
Town of Red River	60	$3,060	60	$2,820
Village of Taos Ski Valley	15	$765	15	$705
Total	**14,511**	**$719,857**	**14,190**	**$648,904**

TOTAL 2008 and 2009	LEASED ACRE-FEET	FUNDING
	28,701 AF	$1,368,761

During the PHVA workshop in December 2007, work groups identified several water operations scenarios that could be evaluated using PVA models. This effort includes evaluating various water management scenarios using URGWOM to (1) to estimate the amount of supplemental water that would be needed to meet the flow targets in an alternate water management scenario; (2) as inputs for the PVA models; and (3) to help analyze the effects the water management scenarios would have on the species and its habitat.

Updates and modifications to the URGWOM model concerning supplemental water usage, groundwater/surface water interactions, and river drying calibration allowed for more effective projection of supplemental water needs. URGWOM was also used to test a wide variety of alternate water management alternatives. Eleven water management scenarios were developed and run through the updated URGWOM model for five hydrologic sequences, culminating in an initial screening of alternatives.

Benefits to Species: URGWOM assists water managers in better determining the hydrologic effects of alternate water management scenarios, evaluating the amount of supplemental water needed to meet modified flow targets, and supporting other modeling to evaluate the effects of possible water management alternatives on listed species.

3.2.5 DEVELOPMENT OF RIPARIAN GROUNDWATER MODELS FOR THE MIDDLE RIO GRANDE (MRG)

Riparian groundwater models have been developed and have undergone initial calibration in eight reaches of the Rio Grande, covering the near-river zone and shallow groundwater regime from Cochiti Dam to Elephant Butte Reservoir. These models were developed as part of the Endangered Species Collaborative Program (Collaborative Program) in projects funded in FY03, FY04, FY07 and related projects funded by the U.S. Army Corps of Engineers (USACE) and the NM Interstate Stream Commission (NMISC, 2005, 2006, 2007, 2008). Models can be used to support habitat restoration projects. The riparian groundwater models provide a tool that can add detail to the projected results using URGWOM and other models, to further evaluate sensitive near-river hydrologic conditions.

Benefits to Species: The riparian models can be used to address multiple issues associated with Collaborative Program projects such as evaluating HR projects, invasive species removal, and other activities with the potential to cause depletions by altering landforms and vegetation. Additional potential model applications include the identification of flow levels that could help establish and maintain groundwater conditions for SWFL habitat; or assessment of the water supply needs, incremental depletions, and sustainability of stream restoration projects under variable flow conditions that are being considered for improving RGSM habitat.

These models can be used to support restoration activities such as: site selection and assessment, feasibility studies, project design, project monitoring, and O&M. They can also be used by water managers to support quantification of depletions, seepage losses, and return flows under various hypothetical conditions. The multi-year project was completed in 2009.

3.3 Population Augmentation/Propogation (Silvery Minnow Only)

The Collaborative Program has funded the construction, operation, and maintenance of two rearing and breeding facilities for the RGSM in the MRG: the City of Albuquerque's BioPark Refugium, and the NMISC's Los Lunas Silvery Minnow Refugium. A third facility, the Rio Grande Silvery Minnow Sanctuary is currently under construction. These facilities serve to provide sufficient populations for reestablishingand augmenting the silvery minnow 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 in Fiscal Years 2008 and 2009. The projects are described in the following sections.

TABLE 3.3 | ***Collaborative Program FY 2008 and FY 2009 Funded Projects: Population Augmentation/Propogation (Silvery Minnow Only)***

	Funded Projects – Funded Entity	Entity Performing Work	Continuing Activity or Distinct Project	BiOp Requirement	Grant/ Contract #	Amount Appropriated	Year of Allocation
3.3.1	Assessment and Monitoring of Rio Grande Silvery Minnow (RGSM) Genetics	UNM	FY09-FY10	yes	07-FG-40-2662 07-FG-40-2662	$158,956 $167,251	2008 2009
3.3.2	Rio Grande Silvery Minnow (RGSM) Age and Growth Sampling and Analysis	ASIR	FY09-FY10	no	R09-PX-40-0012	$88,819	2009
3.3.3	Fund Minnow Sanctuary Operation and Maintenance (O&M) – U.S. Fish and Wildlife Service (Service)	BOR; Service; MRGCD; COA	FY08-ongoing	yes	08-AA-40-2812 08-AA-40-2812	$252,747 $189,928	2008 2009
3.3.4	U.S. Fish and Wildlife Service (Service) Rearing/Breeding Operation and Maintenance (O&M) - Dexter	Service	FY03-ongoing	yes	07-AA-40-2634 07-AA-40-2634	$349,012 $300,000	2008 2009
3.3.5	City of Albuquerque (COA) Rearing/Breeding Operation & Maintenance (O&M)	COA	FY03-ongoing	yes	08-FG-40-2743 08-FG-40-2743	$154,210 $74,460	2008 2009
3.3.6	Rearing/Breeding Operation and Maintenance (O&M) New Mexico Interstate Stream Commission (ISC) Naturalized Refuge	NMISC	FY07-ongoing	yes	08-FG-40-2803 08-FG-40-2803	$252,912 $261,170	2008 2009
3.3.7	U.S. Fish and Wildlife Service (Service) Experimental Augmentation and Monitoring	Service	FY02-ongoing	no	08-AA-40-2770 08-AA-40-2770	$133,090 $84,208	2008 2009
3.3.8	Reintroduction of Experimental Rio Grande Silvery Minnow (RGSM) Populations (Big Bend)	Service	FY08-FY12	no	08-AA-40-2777 08-AA-40-2777	$133,285 $139,690	2008 2009

3.3.1 ASSESSMENT AND MONITORING OF RIO GRANDE SILVERY MINNOW (RGSM) GENETICS

Genetic sampling and analysis are being conducted on wild and artificially propagated stocks of RGSM. The project allows: (1) tracking of the genetic effects of changes in RGSM abundance and (2) monitoring of the effects of river fragmentation and supportive breeding on the wild population. The RGSM genetic 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 further inform captive propagation and augmentation strategies aimed at species recovery. Genetic monitoring of the RGSM using nuclear microsatellites and mitochondrial DNA (mtDNA) commenced in 1999 and has continued annually since that time.

Benefits to Species: 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.

3.3.2 RIO GRANDE SILVERY MINNOW (RGSM) AGE AND GROWTH SAMPLING AND ANALYSIS

A comparative analysis of otolith and scale aging techniques is being performed on the RGSM in order to accurately estimate the age-class structure of RGSM throughout its current range. The full range of size-classes appears to be represented in current studies of RGSM, however actual ages of the individuals in those samples are still unknown. This study addresses the uncertainty regarding the age-class structure of RGSM. A key component for evaluating general population trends and annual recruitment/survival patterns for the RGSM is an understanding of the age-class structure of individuals for all representative size-classes temporally and spatially throughout its present range in the MRG.

Benefits to Species: This age and growth study will provide information necessary to evaluate general population trends, annual recruitment, and survival for the RGSM and allow for improved management of the species under varied conditions in different reaches of the MRG.

3.3.3 FUND MINNOW SANCTUARY OPERATION AND MAINTENANCE (O&M) – U.S. FISH AND WILDLIFE SERVICE (SERVICE)

This cooperative project will provide a naturalized system for rearing of RGSM for augmentation efforts. The off-channel sanctuary is located one mile south of Bridge Street in Albuquerque. Once fully operational, the facility will mimic wild conditions which may increase survival of RGSM released into the river. The facility may be used as an outreach and educational tool and will also serve as one of the additional refugia required by the BiOp. The majority of construction was completed in October 2009, with the exception of security fencing and cameras, and in June 2010, the Service will begin conducting water quality and operations testing in preparation for full facility operations in late 2011.

Benefits to Species: This project will aid in developing and refining methods for rearing of the RGSM for augmentation efforts.

3.3.4 U.S. FISH AND WILDLIFE SERVICE (SERVICE) REARING/ BREEDING OPERATION AND MAINTENANCE (O&M) – DEXTER

This cooperative project at the Service's Dexter National Fish Hatchery and Technology Center (Dexter) utilizes the joint expertise of federal, state, and educational institutions to significantly aid in reestablishing, stabilizing, and enhancing populations of the RGSM within its historic range of the Rio Grande Basin. Dexter 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 2008, Dexter maintained a captive broodstock of 15,000 wild-caught adult fish. A total of 400,000 RGSM were produced which required the spawning of 744 broodstock. In August 2008, an additional 1,000 larvae/young-of-year fish were caught for incorporation into the broodstock. Dexter also provided 395,000 RGSM for reintroduction at the Big Bend, TX reach. In 2009, Dexter NFH&TC maintained a captive broodstock of 15,000 wild caught adult fish from the 2005, 2006, 2008 and 2009 Year Classes. Dexter maximized its production for the species by producing over 500,000 age-0 fish. In 2009 Dexter staff and partners successfully hauled and released 509,993 RGSM into the Big Bend Reach of the Rio Grande, TX.

Field crews conduct first quarterly post-stocking sampling for Rio Grande silvery minnow at Santa Elena Canyon. Several fish were collected for fish health assessment.

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.

3.3.5 CITY OF ALBUQUERQUE (COA) REARING/BREEDING OPERATION & MAINTENANCE (O&M)

This project provides funding for the O&M of the COA RGSM Rearing and Breeding Facility located at the Albuquerque BioPark. The continued operation of the facility promotes the recovery of the RGSM and increases RGSM numbers in the wild through captive propagation and augmentation. The Rearing and Breeding 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 the 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.

In 2008, approximately 4,200 juvenile RGSM were collected from the Isleta Reach for eventual incorporation into broodstock. A total of 205,500 viable (fertilized) RGSM eggs were produced; 199,900 were induced using Carp Pituitary Gland Extract (CPE) and 2,000 of the total were sent to the USGS for research. In early 2008, 3,600 RGSM were held in the Naturalized Refugium. This number increased to 15,700 larval RGSM by mid-June.

At the beginning of 2009, the facility held 75,154 RGSM of which 19,350 were held in the Naturalized Refugium. During the year, the facility released approximately 61,000 RGSM to the Rio Grande at Big Bend, TX and 21,235 tagged fish were released at Bosque del Apache. Approximately 2,000 fish were sent to USGS for research and another 4,000 were sent to the Service for Passive Implantable Transmitter (PIT) tag studies. In 2009, 119,520 viable eggs were produced via CPE-induced captive spawning. Also, approximately 6,000 juvenile RGSM were collected from the Isleta Reach for rearing and use as broodstock. By the end of 2009, the total number of RGSM held at the facility was 8,500.

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 facilities significantly aid in reestablishing, stabilizing, and enhancing populations of the RGSM within its historic range of the Rio Grande Basin.

3.3.6 REARING/BREEDING OPERATION AND MAINTENANCE (O&M) NEW MEXICO INTERSTATE STREAM COMMISSION (NMISC) NATURALIZED REFUGIUM

The Los Lunas Silvery Minnow Refugium, built and managed by the NMISC, opened for operation in May 2009. It is designed to provide a naturalized environment for captive RGSM. The outdoor refugium is 0.5 acres and provides a range of RGSM habitat including backwaters and overbank areas. The refugium has a 1,500 ft2 indoor holding facility. The facility is currently completing a three phase permitting process prior to full operation projected for 2011.

Benefits to Species: The naturalized refugium is intended to provide conditions for RGSM that are more similar to natural river conditions. The facility is intended to be used for:

- Spawning and propagation of RGSM to augment existing populations in the MRG, as well as other stretches of Rio Grande.
- Housing of a refugial population, for species protection against extinction in the case of river disasters.

Housing of an additional "insurance" captive population in case a disease affects other RGSM breeding and propagation facilities.

3.3.7 U.S. FISH AND WILDLIFE SERVICE (SERVICE) EXPERIMENTAL AUGMENTATION AND MONITORING

This program evaluates the effectiveness of RGSM population augmentation into the MRG and monitors the temporal and spatial movements of released RGSM. Specific objectives include (1) determining survival of released RGSM, (2)

determining temporal and spatial dispersal of released RGSM, (3) identifying and characterizing river reaches where survival of released RGSM is maximized, (4) evaluating the effects of augmentation on future recruitment, (5) developing protocols for stocking and (6) increasing the density of RGSM.

Beginning in 2008, the Service initiated a new operating plan for a five year period (2008-2012) for augmentation in the MRG. Focusing on the Isleta and San Acacia Reaches during this period will allow for adequate evaluation of the long-term effects without augmentation on the Angostura Reach. All released fish will be supplied by supported hatchery operations with guidance from the RGSM Genetics Management and Propagation Plan.

Benefits to Species: Over one million hatchery-raised RGSM have been released in the MRG since 2002. While generally considered positive, the quantitative contribution of augmentation in currently occupied reaches needs additional study.

3.3.8 REINTRODUCTION OF EXPERIMENTAL RIO GRANDE SILVERY MINNOW (RGSM) POPULATIONS (BIG BEND)

In December 2008, the Service published a final rule designating a nonessential experimental population area in the Big Bend Reach of the Rio Grande in Texas under section 10(j) of the ESA for the endangered RGSM. With support from the Collaborative Program and Reclamation, and assistance from many other partners, the Service began releasing RGSM into the Big Bend Reach in December 2008. The Service released approximately 445,000 RGSM in 2008 and approximately 509,000 in 2009. The four release sites are distributed across federal, state, and private lands: one in Big Bend Ranch State Park; two within Big Bend National Park; and one on the Adams Ranch del Carmen, a privately-owned and managed conservation area. The RGSM came from the Service's Dexter National Fish Hatchery and Technology Center and the City of Albuquerque's RGSM Rearing and Breeding Facility.

Post-release monitoring of the relative abundance of RGSM to other fish species in proximity to the four release sites began in May 2009. Seven adult RGSM were found during monitoring in May 2009, indicating at least some, and likely many, of the fish released in December 2008 survived over the winter. No RGSM were found in August or October 2009. Good numbers of other native fishes were also captured during these monitoring efforts, suggesting that many fish benefited from the record level flooding of the Rio Grande in the fall of 2008.

Benefits to Species: The goal of this reintroduction effort is to reestablish a self-sustaining population of the federally endangered RGSM in potentially suitable habitat found within the species' historic range in the Rio Grande within the Big Bend area of Texas.

3.4 Water Quality Management (Silvery Minnow Only)

The Collaborative Program is interested in furthering the understanding of deteriorating water quality as as environmental stressor to the silvery minnow. Several research and monitoring studies have been conducted to evaluate water quality impacts and whether these are affecting reproduction and survival of existing and reintroduced populations of silvery minnow. Information could assist the Program in managing flows to improve water quality, especially during low flow conditions and storm events. The overall goal would be to improve water quality within occupied areas and reintroduction sites to support recruitment and survival rates.

TABLE 3.4 | ***Collaborative Program FY 2008 and FY 2009 Funded Projects: Water Quality Management (Silvery Minnow Only)***

	Funded Projects – Funded Entity	Entity Performing Work	Continuing Activity or Distinct Project	BiOp Requirement	Grant/ Contract #	Amount Appropriated	Year of Allocation
3.4.1	Effects of Nutrient Availability on Periphyton Growth	UNM	FY07-FY10	no	07-CR-40-8204	$135,414	2008
					07-CR-40-8204	$126,921	2009
3.4.2	Toxicity of Adverse Water Quality Conditions to Rio Grande Silvery Minnow (RGSM)	USGS	FY04-present	yes	04-AA-40-2247		
3.4.3	Rio Grande Silvery Minnow (RGSM) Water Quality Monitoring/Estrogenic Biomarkers	USGS	FY08-present	yes	08-AA-40-2823	$143,903	2008
					08-AA-40-2823	$178,052	2009

3.4.1 EFFECTS OF NUTRIENT AVAILABILITY ON PERIPHYTON GROWTH

Method development and data collection are being used to test hypotheses on the availability of nutrients for the production of algae and diatoms in the MRG. This study investigated:

- the longitudinal relationship between periphyton and environmental parameters, including nitrogen (N) and phosphorus (P), and
- the effects of N and P availability on algal biomass and species composition in the MRG using nutrient-diffusing substrates (NDS).

In the MRG, invertebrate and fish grazers, including the federally endangered RGSM, are dependent on attached algae (periphyton) as a food resource. However, the relationships between environmental factors and algal biomass/community structure in the MRG are poorly understood. Understanding the diversity and role of algae in arid land rivers is crucial to our understanding of how management in the MRG watershed affects this riverine ecosystem.

Benefits to Species: The recovery of food resources following channel drying and re-wetting has habitat quality implications for RGSM. Understanding these ecological processes will contribute to habitat management and recovery of the RGSM.

3.4.2 TOXICITY OF ADVERSE WATER QUALITY CONDITIONS TO RIO GRANDE SILVERY MINNOW (RGSM)

The purpose of this laboratory study was to analyze and provide information on the tolerance of different life stages of RGSM to adverse water quality conditions. Specifically, the study was performed to: (1) determine the upper lethal levels of temperature and the lower lethal levels of dissolved oxygen (DO), both separately and in combination, for different life stages of RGSM; and (2) determine the relative sensitivity of RGSM larvae to ammonia in laboratory water, river water, and effluents from two waste water treatment plants that discharge into the Angostura Reach through constant exposure to ammonia concentrations over a 4-day period.

These studies delineated what constitutes an acutely toxic event resulting episodic ammonia release into the MRG and provided new information on the effects of transient ammonia concentrations to RGSM.

The study was funded in 2004 and testing performed in 2005 through 2009. In the FY 2008 – 2009 testing, all chemical analyses associated with the two chronic ammonia tests were completed and the biological and water quality data were validated and statistically analyzed. A set of tests for juvenile RGSM tolerance to low oxygen waters was conducted in early FY 2009 using an improved equipment set-up. Repeating the

temperature tests is recommended to assess the variability and precision of the test results.

A final report is in preparation.

Benefits to Species: The results for DO and water temperature may be useful in salvage operations to identify pools where live RGSM may still be present. The data on ammonia tolerance will be useful in predicting the effects of brief exposures to elevated ammonia concentrations that may occur from upset events at wastewater treatment plants or due to runoff from livestock operations.

3.4.3 RIO GRANDE SILVERY MINNOW (RGSM) WATER QUALITY MONITORING/ESTROGENIC BIOMARKERS

Laboratory and field analyses are being conducted to measure the physiological responses of the RGSM to known endocrine disrupting chemicals, and determine the suitability of selected biomarkers of endocrine disruption for use in field studies. The information can be used to evaluate the impacts of wastewater effluents on a primary constituent element of RGSM critical habitat, water of sufficient quality. Task 1 includes an assessment of short-term screening methods for use in detecting exposures of RGSM to estrogenic active substances. The goal is to characterize the responses of RGSM to exposure to a known estrogenically active chemical. Information from this pilot study will be used to select appropriate life stage(s), exposure duration, and endpoints for use in Task 2. Task 2 involves an assessment of endocrine disruption and toxicity of three wastewater effluents to the RGSM.

Benefits to Species: These studies will better delineate what constitutes an acutely toxic event resulting from episodic ammonia release into the Middle Rio Grande and provide new information on the effects of transient ammonia concentrations to RGSM. The lab studies will also measure the physiological responses of RGSM to a known endocrine disrupting compound and test the suitability of selected biomarkers of endocrine disruption for use in field studies.

3.5 Research, Monitoring and Adaptive Management

The Collaborative Program pursues scientifically based solutions to address the needs of the listed species and the ecosystems upon which they depend. Monitoring and adaptive management are used to ensure that Collaborative Program activities achieve the desired objectives. The science and monitoring priorities for Fiscal Years 2006 and 2007 included: 1) assessing key habitat requirements of the silvery minnow and flycatcher essential to alleviate jeopardy and promote recovery; 2) assessing hydrologic and geomorphic impacts on habitat qualities; and 3) monitoring and assessing the population status of the silvery minnow and flycatcher. Table 3.5 summarizes the research, monitoring, and adaptive management projects funded by the Collaborative Program for FY08 and FY09. The projects are described in the following sections.

TABLE 3.5 | ***Collaborative Program FY 2008 and FY 2009 Funded Projects: Research, Monitoring, and Adaptive Management***

	Funded Projects – Funded Entity	Entity Performing Work	Continuing Activity or Distinct Project	BiOp Requirement	Grant/ Contract #	Amount Appropriated	Year of Allocation
3.5.1	Acquisition of Data for Population Viability Analysis (PVA) Models	ASIR	2009	no	09-PG-40-8924	$20,000	2009
3.5.2	Population Viability Analysis and Population Habitat Viability Assessment for the Rio Grande Silvery Minnow, Collaborative Program	Service	FY07-ongoing	no	07-AA-40-2673	$93,940	2008
3.5.3	Rio Grande Silvery Minnow (RGSM) Spawning and Recruitment Study (Hypothesis Testing)	NMISC	FY09-FY10	no	R09-PC-40-009	$199,000	2009
3.5.4	Rio Grande Silvery Minnow (RGSM) Population Monitoring	ASIR	FY02-ongoing	yes	03-CR-40-8029	$259,620	2008
					R09-PC-40-005	$228,210	2009
3.5.5	Rio Grande Silvery Minnow (RGSM) Spawning & Reproductive Effort Monitoring	BOR; ASIR	FY02-ongoing	yes	03-CR-40-8031	$153,144	2008
					09-PG-40-8295	$92,160	2009
3.5.6	Rio Grande Silvery Minnow (RGSM) Rescue and Salvage	Service	FY01-ongoing	no	06-AA-40-2491	$350,705	2008
					06-AA-40-2491		2009
3.5.7	Rio Grande Silvery Minnow (RGSM) Population Estimation	ASIR	FY06-FY12	no	05-CR-40-8119	$168,288	2008
					R09-PC-40-006	$134,206	2009
3.5.8	Rio Grande Silvery Minnow (RGSM) Sampling Methods Calibration and Evaluation	SWCA	FY09-FY11	no	R09-PC-40-007	$253,366	2009
3.5.9	Independent Peer Review	SEI	FY09-ongoing	no	R09-PD-40-007	$29,360	2009
3.5.10	Longitudinal Movement (Passive Implantable Transmitter [PIT] Tag Studies)	Service	FY07-2011	no	07-AA-40-2711	$71,978	2008
					07-AA-40-2711	$64,032	2009
3.5.11	Water Requirements for Southwestern Willow Flycatcher (SWFL) Habitat and Nesting at the Pueblo of Isleta	UNM; Pueblo of Isleta	FY06-FY09	no	06-CR-40-8147	$44,396	2008
3.5.12	Southwestern Willow Flycatcher (SWFL) Surveys – Bureau of Reclamation (BOR)	BOR	FY95-ongoing	no	05-PE-81-1079	$245,965	2008
					05-PE-81-1079	$245,965	2009
3.5.12	Southwestern Willow Flycatcher (SWFL) Surveys – Bureau of Reclamation (BOR)	Denver Technical Services Center	FY95-ongoing	no	Denver TSC	$260,000	2009
3.5.13	Data Collection to Better Define the Interaction of the Surface- and Groundwater Systems in the Middle Valley	USGS	FY04-ongoing	no	04-AA-40-2246	$319,850	2008
					R09-PG-40-005	$219,959	2009
3.5.14	Endangered Species Restoration Analysis and Recommendations on the Pueblo of Isleta, New Mexico	Pueblo of Isleta	FY08-present	no	08-FG-40-2744	$190,402	2008
3.5.15	Mapping and Analysis of Existing Data	RESPEC	FY08-FY10	no	08-PE-43-0054	$180,000	2008

3.5.1 ACQUISITION OF DATA FOR POPULATION VIABILITY ANALYSIS (PVA) MODELS

A PVA is a species-specific model designed to evaluate the relative effects of demographic stochasticity, environmental variation, and management activities on a population's long-term extinction risk. PVAs determine the probability that a population will go extinct within a given number of years. The larger goal in mind when conducting a PVA is to ensure that the population of a species is self-sustaining over the long term. PVA can be used in endangered species management to develop a plan of action, rank the pros and cons of different management scenarios, and assess the potential impacts of habitat loss.

Two PVA models are being developed concurrently and jointly for the RGSM – one, using RAMAS software (Conservation Breeding Specialist Group) and the other utilizing the FORTRAN computer programming language (Dr. Goodman, Montana State University). The scope of work for this effort includes coordination with the PVA Biology ad hoc work group and PVA modelers to provide additional data needed to refine the PVA models and evaluate different management scenarios. This data may include, but is not limited to, data from previous population estimation, longitudinal movement, egg monitoring in canals and spawning monitoring studies, and museum specimens. Mining, review, quality assurance, and additional analysis of these data may also be required.

Benefits to Species: Raw data from RGSM population monitoring studies will be used to inform the PVA models currently under development and will help ensure that assumptions used to develop the models will best reflect actual relationships and predictions of minnow responses to management actions.

3.5.2 POPULATION VIABILITY ANALYSIS AND POPULATION HABITAT VIABILITY ASSESSMENT FOR THE RIO GRANDE SILVERY MINNOW, COLLABORATIVE PROGRAM

The purpose of this project is to develop a population viability analysis model (PVA) for the silvery minnow and to use the resulting PVA as a platform to test possible hydrologic scenarios for the MRG. Tasks include creation of quantitatively-defined scenarios for use in a framework for simulation modeling for population viability analysis, evaluation of water management scenarios to gain insight into the relationships between MRG water resource management and RGSM population dynamics, and to document the processes involved in PVA scenario creation, the mechanics of scenario evaluation, the results of the analyses, and the implications for resource management in the MRG. Questions to be examined include, but are not limited to:

- What are demographic benefits of augmentation and salvage?
- What are the demographic benefits of expanding the range of silvery minnow into the Cochiti Reach of the MRG?
- What are the demographic benefits of providing fish passage?
- What is the demographic benefit of providing greater frequency of adequate recruitment flows (i.e., reducing environmental variability around vital parameters)?
- What are the relative demographic benefits of creating many small perennially wet reaches versus one large connected reach?
- What is the demographic impact of reducing the frequency and magnitude or catastrophic drying events?

Benefits to Species: The PVA will provide valuable information that can assist in the decision-making process for long-term management of water resources in the MRG and its relation to RGSM conservation management.

3.5.3 RIO GRANDE SILVERY MINNOW SPAWNING AND RECRUITMENT STUDY (HYPOTHESIS TESTING)

The purpose of this project is to determine how the river channel and its floodplain are utilized by RGSM during spawning and what factors contribute to age-0 RGSM recruitment. There are two hypotheses to be tested in this study:

- Spawning habitat preference
  - Do RGSM prefer to spawn in the river channel?,
  - Do RGSM prefer to spawn on inundated riparian habitat features?, or,
  - Are RGSM opportunistic spawners?
- Life History
  - Does egg and larval drift with no substantial egg retention contribute substantially (>25%) to young of year (YOY) recruitment?,

- Does riparian spawning with subsequent egg retention contribute substantially (>25%) to YOY recruitment?,
- Does egg drift and or egg retention contribute substantially (>25%) to YOY recruitment, depending upon spring runoff volume?

Benefits to Species: Testing the above hypotheses in the controlled environment of the Los Lunas Silvery Minnow Refugium will provide an opportunity to better understand the how RGSM utilize the river channel and floodplain during spawning and help determine factors contributing to age-0 recruitment, thereby improving decision-making regarding RGSM, habitat restoration and water-resources management.

3.5.4 RIO GRANDE SILVERY MINNOW (RGSM) POPULATION MONITORING

Population monitoring of RGSM and the associated MRG (Algodones, NM to Elephant Butte Reservoir) fish community has been systematically conducted at multiple sites 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, and provides a measure of the success of HR efforts.

The consistent monitoring protocol implemented for this project has yielded a nearly seamless long-term ecological data set under Collaborative Program objectives to:

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

Benefits to Species: Monitoring data have provided the foundation necessary to assess changes in the MRG ichthyofaunal community over long-term periods. Specifically, these data have been used to document temporal and spatial trends in native and nonnative 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 the RGSM and associated fish fauna, including population trends in response to water management practices and whether increased sampling frequency provides better population data.

3.5.5 RIO GRANDE SILVERY MINNOW (RGSM) SPAWNING & REPRODUCTIVE EFFORT MONITORING

This monitoring project acquires important (daily) information on the reproductive output of RGSM in the MRG at multiple sites between Albuquerque and Elephant Butte, along the length of the river. 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. 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. Previous studies demonstrated that May and June is the primary period of RGSM reproductive activity.

In 2008 extended high spring flows at the Albuquerque Gauge exceeded 3,000 cfs for most of May and June. A cumulative total of 2,132 RGSM eggs were collected at three sites during 2008. The vast majority (n= 1,917; 89.9%) of the catch was taken at the Sevilleta Site. The number and cumulative percent of RGSM eggs collected at the Albuquerque (n= 60; 2.8%) and San Marcial sites (n= 155; 7.3%) were low.

The 2009 study monitored the spatial and temporal (May-June) reproductive output of RGSM in the two downstream-most river reaches (Isleta and San Acacia). A cumulative total of 1,489 RGSM eggs were collected at the two sites during 2009. The majority (n= 844; 56.7%) of the catch was taken at the Sevilleta Site while the number and cumulative percent of RGSM eggs collected at the San Marcial site (n= 645; 43.3%) was slightly lower. For this sampling effort, new screens were utilized that were more efficient at sampling water than the old screens.

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 remains necessary for recovery efforts and

to facilitate effective management decisions. Each yearly effort is also designed, in part, to provide insight to 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.

3.5.6 RIO GRANDE SILVERY MINNOW (RGSM) RESCUE AND 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 fluctuates as the level of water Elephant Butte Reservoir changes, but approximates 150 river miles (241 km). The intent of this project by the Service 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 BiOp due to water operations and drying. Rescue and salvage operations were performed each year from 2001 through 2009 except in 2008 when the river did not dry.

Between 16 July and 20 October 2009, 20.0 miles of the main channel of the Middle Rio Grande were dry, all within the San Acacia Reach. An estimated total of 18,473 Rio Grande silvery minnow were salvaged from isolated pools in 2009. Of these, 17,199 were transported and released alive within the San Acacia Reach.

Benefits to Species: The MRG rescue and salvage program seeks to salvage RGSM from intermittent reaches of the Rio Grande between Angostura Dam and Elephant Butte Reservoir that, without management intervention, would likely result in substantial RGSM mortality. The RGSM are rescued from isolated pools and transported to upstream perennial reaches (e.g., Albuquerque and Isleta reaches) where they are released.

3.5.7 RIO GRANDE SILVERY MINNOW (RGSM) POPULATION ESTIMATION

The Population Estimation Program supplements the current Population Monitoring Program by providing a robust yearly estimate of the RGSM population during a single time-period (e.g., October). This RGSM population estimation study incorporates several methodologies in an effort to provide a statistically rigorous estimate of population size. This study includes data collection, statistical analyses, development and testing of RGSM population quantification methods, estimates of RGSM numbers in the MRG, and development of site occupancy rates. The project includes mapping the habitat composition of the river at 20 study sites and collection of ichthyological density data in different mesohabitats. The population estimation study provides an alternative metric to the RGSM/Fish Community monitoring.

In 2008 the population estimation study found RGSM population was highest in the Isleta Reach (1,027,489) and lowest in the San Acacia Reach (404,864). Population estimates were also generated using data from the Population Monitoring Program October 2008 sampling efforts. In contrast, these population estimates found the highest numbers in the San Acacia Reach (1,020,935) and the lowest numbers in the Angostura Reach (204,488).

Benefits to Species: Estimation of the RGSM population is an essential component in tracking the status of the species and assessing the effectiveness of Collaborative Program activities. In addition, population estimates are required to coordinate augmentation needs with propagation activities (RPA Y-AA), and to assess the effectiveness of salvage and rescue activities (RPM 1.3). Data from future year's efforts will provide additional information that will supplement recent population estimation activities and furnish valuable information necessary to gauge recovery of RGSM in the three principal reaches of the MRG. Ultimately, these data will also be used to evaluate progress towards meeting RGSM recovery goals and to assess ichthyofaunal changes following both management actions and stochastic environmental events.

3.5.8 RIO GRANDE SILVERY MINNOW (RGSM) SAMPLING METHODS CALIBRATION AND EVALUATION

Sampling methodologies and gear, used presently or in the past in the MRG, or used in other river systems, are evaluated and compared in order to:

1) Assimilate and evaluate past and ongoing fish sampling gears and methods for the MRG;

2) Assimilate and compare and contrast fish sampling gears and methods from other river systems;

3) Develop a reliable and robust study design for spring broodstock estimates, fall population estimates, and summer recruitment estimates of RGSM;

4) Conduct, evaluate, and refine the study design with a description of gears, methods, expected data precision and accuracy, logistical and labor needs, and costs;

5) Provide the Collaborative Program with a refined and robust study design that will provide a reliable, accurate, and precise assessment of the RGSM and the associated fish community of the MRG.

Benefits to Species: Results of this project may allow for development of more robust methods to be considered for future addition to the RGSM monitoring program to facilitate effective management decisions. Accurate population demographics are an essential component of tracking the status of the species. Population estimates are needed to coordinate augmentation needs with propagation activities and to assess the effectiveness of salvage and rescue activities.

3.5.9 INDEPENDENT PEER REVIEW

An independent scientific review panel, with complete autonomy from all agencies provides an independent evaluation of RGSM and SWFL research and monitoring activities. Beginning in FY 2009, the Collaborative Program nominates and selects project reports and documents that undergo the peer review process. Peer review findings are used to assist in better understanding the needs of the RGSM and SWFL in addition to improving Collaborative Program project designs.

FY 2009 focused on the review of the San Acacia Reach Analysis and Recommendations (SARAR) final report. Scientists under Sustainable Ecosystem Institute's (SEI) supervision and guidance reviewed the "science" presented in the SARAR to determine if best available science was utilized in the analyses and recommendations within the document. At the end of the review process, SEI along with the lead peer reviewer presented the review results and findings to the Collaborative Program.

Benefits to Species: Peer review ensures that best available science is used in Collaborative Program projects and activities that contribute toward recovery of the species.

3.5.10 LONGITUDINAL MOVEMENT (PASSIVE IMPLANTABLE TRANSMITTER [PIT] TAG STUDIES)

In 2007, the first phase of the RGSM longitudinal movement study was conducted and consisted of studying the efficacy of using PIT tags in RGSM. PIT tags are small devices resembling a grain of rice that are inserted into fish body cavities and contain electronically coded information.

Phase two of the study was implemented in 2008 and involved tagging, transportation, and stocking fish; equipment; monitoring; and report writing.

Benefits to Species: This activity improves understanding of the distances and rates of dispersal of adult RGSM and contributes to meeting RPA Element R, complete fish passage at San Acacia and Isleta diversion dams.

3.5.11 WATER REQUIREMENTS FOR SOUTHWESTERN WILLOW FLYCATCHER (SWFL) HABITAT AND NESTING AT THE PUEBLO OF ISLETA

To determine SWFL water requirements, nesting was monitored and habitat preferences were studied on the Pueblo of Isleta. Wet versus dry areas of the study site and corresponding vegetation on the sites were mapped. The general goals of this project were to: (1) understand surface water requirements for territory establishment, nesting, and habitat development/maintenance at the Pueblo of Isleta, (2) inform plans for water management to benefit nesting SWFL at the Pueblo, and (3) monitor to measure SWFL reproductive success.

After monitoring SWFL nesting, studying habitat preferences, and mapping water distribution and vegetation, it was determined that SWFL at the Pueblo of Isleta fit the typical SWFL habitat profile well. The SWFL at the study site more often establish territories in three vegetation types, all of which contain a cottonwood overstory and coyote willow and/or Russian olive understory. Within territories, SWFLs tend to nest on the edges of clumps, near open meadow habitat, and over wet soil. Nests are typically placed in vegetation that is denser than at other spots in the territory. Nests with low-density vegetation above the nest appear to be at increased risk of nest parasitism. Soil moisture patterns appear to be spatially associated with development of native shrub structure. Nesting success appears to vary with the temporal and spatial distribution of standing water. Due to the varying weather patterns during each year of the study, additional research is needed before definitive conclusions can be reached on the relationship between reproductive success and the presence of moist soils and standing water.

Benefits to Species: These results will benefit future SWFL habitat management and restoration.

3.5.12 SOUTHWESTERN WILLOW FLYCATCHER (SWFL) SURVEYS – BUREAU OF RECLAMATION (BOR)

Under this project, presence/absence surveys are being c onducted at selected sites from Velarde to Elephant Butte Project Lands (i.e., Railroad Trestle). Biologists with Reclamation have conducted SWFL surveys and studies since 1995. These studies were designed to provide further insight into potential threats to and habitat requirements of SWFL populations. The 2008 and 2009 surveys and studies included the continuation of:

- Nest monitoring studies;
- Avian point counts to determine the distribution and abundance of Brown-headed Cowbirds (BHCO) in the MRG;
- Studies to monitor and evaluate the impacts of livestock grazing on the establishment and development of riparian vegetation;
- SWFL habitat suitability assessment;
- Vegetation mapping;
- Study to quantify vegetation at known SWFL breeding sites.

During the summer of 2008, surveys were conducted and nests monitored in eight distinct reaches along approximately 200 kilometers of the Rio Grande between Velarde and Elephant Butte Reservoir. There were 480 resident SWFLs documented in 287 territories and forming 193 breeding pairs. As in previous years, the San Marcial reach of the river was by far the most productive containing 235 territories and 168 pairs. Nest monitoring was conducted at all sites where nesting pairs were detected. Nests were monitored for success rates, productivity, and BHCO parasitism. The San Marcial reach proved most productive, producing 186 nests and fledging 209 SWFL young. The Sevilleta reach produced 13 nests and fledged 12 SWFL young.

During the summer of 2009, surveys were conducted and nests monitored again.. There were 629 resident SWFLs documented in 367 territories and forming 262 pairs. The San Marcial reach, which is outside of the Collaborative Program boundaries, was by far the most productive containing 319 territories and 224 pairs. Nests were monitored for success rates, productivity, and BHCO parasitism. The San Marcial reach proved most productive, producing 294 nests and fledging 356 SWFL young. The next best productive reach at Bosque del Apache produced 19 nests and fledged 28 SWFL young..

Benefits to Species: This project is an essential component of tracking the status of the species.

3.5.13 DATA COLLECTION TO BETTER DEFINE THE INTERACTION OF THE SURFACE- AND GROUNDWATER SYSTEMS IN THE MIDDLE VALLEY

This project supplies hourly shallow groundwater and surface-water level data at selected cross sections across the Rio Grande Bosque and adjacent riverside drains from Cochiti Dam to San Acacia. Objectives of the data collection are to use nested piezometers at various depths between the river and riverside drains and outside the bosque, and surface-water-level gages to supply corresponding elevation data. The data are used to examine the hydrologic interactions between the river and riverside drains, the river and the shallow groundwater system, riverside drains and adjacent irrigated areas, and further understand flow variability in the bosque shallow groundwater system and the adjacent deeper groundwater system.

Benefits to Species: Long-term groundwater and surface-water-level data will be useful in supporting ongoing hydrologic modeling; evaluating changes in adjacent municipal pumping and surface water diversions, and evaluating seasonal changes in surface water-groundwater relationships. Information on hydrologic interactions is also useful for habitat restoration planning and siting needs.

3.5.14 ENDANGERED SPECIES RESTORATION ANALYSIS AND RECOMMENDATIONS ON THE PUEBLO OF ISLETA, NEW MEXICO

This project included: gathering, reviewing, and summarizing existing data pertaining to the physical, biological, and policy issues affecting habitat restoration; utilizing monitoring data and other relevant tools to evaluate existing habitat conditions and projects; analysis of existing conditions in the project area to recommend site specific RGSM and SWFL habitat restoration projects; and identifying and developing monitoring and adaptive management strategies and approaches to ensure long-term habitat restoration project success. In addition to using existing data; sediment transport and 2d flow models have been developed to identify possible restoration projects for both RGSM and SWFL through the

Isleta reach. All of the data collection and field studies have been completed. The report is currently being developed.

Benefits to Species: Habitat restoration for RGSM and SWFL may be successful in that the methods used to create habitat for the two species will bring the river back to a more historic functionality. Functionality in the sense that it will become connected to its floodplain again, thereby allowing higher flows to inundate floodplain areas which in turn create the desired habitat for RGSM spawning and rearing.

In addition to the RGSM spawning grounds, the connection to the floodplain may also lead to more natural recruitment of native vegetation species through seeds deposited during high flow events. This may have a positive effect on the SWFL in that there could be more types of vegetation suitable for nesting sites for the SWFL.

3.5.15 MAPPING AND ANALYSIS OF EXISTING DATA

This activity utilized data from previously conducted species and habitat monitoring activities and HR planning activities that have developed GIS map layers for specific reaches. The data collected was incorporated into a database and mapping tools were developed to assist with synthesizing information to help answer key questions for the RGSM:

- Where have RGSM been found historically and consistently through time?
- Where does the river tend to dry, maintain flow, etc?
- How is habitat for different life stages distributed among reaches?
- How is habitat affected by different duration/frequency/discharges of flow?

Data and tools were also developed to help answer the following key question for the SWFL:

- Where are the best opportunities to enhance or restore habitat to benefit the southwestern willow flycatcher (SWFL)?

Existing information, including RGSM population monitoring data, SWFL monitoring data, River Eyes, reach-specific A&R reports, geomorphology and mesohabitat information, vegetation classification, 2005 overbank mapping, and FLO-2d modeling was collected and mapped. Relationships among and within sets of information were analyzed (spatial autocorrelation) and documented.

Benefits to Species: The maps produced by this activity can be used to help determine where the best opportunities occur to maintain RGSM during extreme drying events and where opportunities exist for habitat restoration and enhancement to benefit the RGSM and the SWFL.

3.6 Public Outreach

The Collaborative Program has a responsibility to educate and inform the general public, stakeholders, and State and Federal Legislators about Collaborative Program activities and accomplishments. Program outreach efforts support: 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; 3) increased awareness by the general public and decision-makers regarding the collaborative problem-solving approach and funding requirements of the Collaborative Program. Table 3.6 summarizes the public outreach activities funded by the Collaborative Program for FY08 and FY09. The projects are described in the following sections.

TABLE 3.6 | *Collaborative Program FY 2008 and FY 2009 Funded Projects: Public Outreach*

	Funded Projects – Funded Entity	Entity Performing Work	Continuing Activity or Distinct Project	BiOp Requirement	Grant/ Contract #	Amount Appropriated	Year of Allocation
3.6.1	CP Public Outreach	PIO Work Group	FY05-ongoing	no	Collaborative Program	$19,937	2008
					Collaborative Program	$15,000	2009
3.6.2	CP Webpage Hosting & Maintenance	Icetech, Inc.	FY07-ongoing	no	07-PE-43-0093	$25,949	2008
					07-PE-43-0093	$26,590	2009

3.6.1 CP PUBLIC OUTREACH

The PIO work group is tasked with bringing more positive publicity and public awareness to the Collaborative Program. The PIO receives Collaborative Program funding to implement the tasks outlined in the PIO Annual Work Plans.

Benefits to Species: In 2008 and 2009, the PIO provided information about Collaborative Program accomplishments and MRG endangered species issues in the following ways: (1) produced brochures to inform State and Federal legislators; (2) attended Rio Grande Day at the Roundhouse in January 2009; (3) hosted an Open House at the Rio Grande Nature Center on September 25-26, 2009 for the general public; (4) developed children's coloring pages with species information for the RGSM and SWFL; (5) participated in New Mexico State Game & Fish exhibits and the New Mexico State Fair; and (6) assisted the PMT in designing and maintaining a publicly accessible web site containing project reports, event calendars, and a variety of information about the Collaborative Program.

3.6.2 CP WEBPAGE HOSTING & MAINTENANCE

The new Collaborative Program web site, www.mrgesa.com or www.middleriogrande.com , provides updated information about the Program such as the Calendar of Events and press releases. It also provides links to Collaborative Program-produced documents such as quarterly updates, annual accomplishment reports, the LTP, final project deliverables, financial reports, datasets, surveys, final meeting notes, and other related background information such as the 2003 BiOp and information about the listed species. The web site also contains links to Signatory web sites. The new web site became operational in early 2008. When completed, the Collaborative Program's geospatially-referenced database will also be accessible through the website.

Benefits to Species: The web site educates Collaborative Program participants, legislative bodies, and the general public on the issues and rationale for regulatory and management actions, provides access to project reports, and may garner support for RGSM and SWFL recovery actions, including HR and water conservation projects.

3.7 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 implemention of the BiOp RPA and the RPMs, with the exception of the San Marcial Railroad Bridge realignment. Program management involves setting and reviewing objectives, coordinating activities across projects and workgroups, and overseeing the integration of interim work products and results. Specific tasks include: contract administration; budget administration and financial management; serving as a PMT liaison to technical workgroups; reporting to the EC, CC, PMT and other groups or agencies as appropriate; support for Collaborative Program activities such as meeting coordination, website administration, participating in outreach activities arranged by the Public Information and Outreach (PIO); and other Program related management functions.

TABLE 3.7 | ***Collaborative Program FY 2008 and FY 2009 Funded Projects: Public Outreach***

	Funded Projects – Funded Entity	Entity Performing Work	Continuing Activity or Distinct Project	BiOp Requirement	Grant/ Contract #	Amount Appropriated	Year of Allocation
3.7.1	Bureau of Reclamation (Reclamation) Program Management and Support	BOR	FY01-ongoing	no	Bureau of Reclamation	$1,276,031	2008
					Bureau of Reclamation	$913,635	2009
3.7.2	U.S. Fish and Wildlife Service (Service) Program Management and Technical Support	Service	FY02-ongoing	no	08-AA-40-2737	$328,303	2008
					08-AA-40-2737	$370,000	2009
3.7.3	U.S. Army Corps of Engineers (USACE) Middle Rio Grande Endangered Species Collaborative Program Coordination	USACE	FY02-FY10	no	07-AA-40-2672	$197,993	2008
					07-AA-40-2672	$200,000	2009
3.7.4	Collaborative Program Technical and Administrative Support – Contracted	Collaborative Program; Tetra Tech; EMI; GenQuest Inc.	FY02-ongoing	no	05-PE-43-0151; 08-CS-40-8228	$310,081	2008
					08-CS-40-8228	$399,579	2009
3.7.5	Program Database Development	USACE	FY07-ongoing	no	07-AA-40-2691	$376,800	2008
					07-AA-40-2691	$232,019	2009

3.7.1 BUREAU OF RECLAMATION (RECLAMATION) PROGRAM MANAGEMENT AND SUPPORT

Reclamation has provided contracting and financial management support for the Program since 2001, managing more than $115 million in federal funding. Reclamation also provides representatives to participate in Program committees. In 2008 and 2009, Reclamation provided a Program Manager and provided management staff responsible for overall Program administration, coordination and dissemination of information about Program activities. In addition, Reclamation provided an Executive Committee member, Program Management Team member, Coordination Committee member, representatives for the technical workgroups, and contracting support.

Benefits to Species: Program management and support activities are required to implement all aspects of the 2003 BiOp Reasonable and Prudent Alternative (RPA) and the Reasonable and Prudent Measures (RPMs), with the exception of the San Marcial Railroad Bridge realignment. Reclamation serves (1) as the fiscal agent for the Program, managing the Federal funding allocated by Congress to the Program and (2) as the contracting agency, administering interagency agreements, financial assistance, and contracts for Program projects. Reclamation conducts water operations and management of supplemental water in compliance with federal and state law. Reclamation also provides technical support to assist with the evaluation of proposed projects; review of project deliverables; development of scopes of work and independent government cost estimates; and development of monitoring and program assessment plans.

3.7.2 U.S. FISH AND WILDLIFE SERVICE (SERVICE) PROGRAM MANAGEMENT AND TECHNICAL SUPPORT

In 2008 and 2009, the Program provided funding for a full time staff biologist from the Service to serve as a member of the Program Management Team. The staff biologist assisted in coordinating, planning and managing workgroups staffed by Program participants, to fulfill Program bylaws and the Long Term Plan. The Service's biologist assisted in facilitating Section 7 consultations under the Endangered Species Act for the Collaborative Program. The Service also provided an MRG ESA Coordinator to serve on the Coordination Committee.

Other tasks performed exclusively by the Service representative included: serving as Service contact for ESA (and other) compliance necessary for Program activities including a Programmatic Biological Assessment, as needed; serving as liaison between Program and other Middle Rio Grande projects providing coordination particularly with regard to ESA compliance (both Section 7 and Section 10).

3.7.3 U.S. ARMY CORPS OF ENGINEERS (USACE) MIDDLE RIO GRANDE ENDANGERED SPECIES COLLABORATIVE PROGRAM COORDINATION

In 2008 and 2009, the Corps provided a representative that served as a member of the Program Management Team. In addition, the Corps provided contracting support for the proposed Program Database and Albuquerque Reach Analysis & Recommendations.

Benefits to Species: Program coordination is required to implement all aspects of the 2003 BiOp RPA and RPMs. The Corps is either directly or indirectly fulfilling these BiOp requirements through use of Corps employees, contractors, or contracts.

3.7.4 COLLABORATIVE PROGRAM TECHNICAL AND ADMINISTRATIVE SUPPORT – CONTRACTED

In 2008 and 2009 staffing was contracted to perform general and administrative tasks in furtherance of the Program's mission. Contracted support duties included, at a minimum: (1) technical note-taking at various Program meetings, (2) preparation and distribution of meeting summaries and time-sensitive action items, (3) content maintenance of the Program website, (4) technical editing assistance with the revision of the Program's Long-Term Plan, and (6) providing technical support for workshops, working meetings, and seminars.

2009 Accomplishments:

- San Acacia Workshop
- State of the Science Workshop
- Program Workgroup and Committee Meeting Minutes
- Executive Committee Retreat
- Long Term Plan Revision (initiated)
- Program Workgroup and Committee Meeting Minutes

3.7.5 PROGRAM DATABASE DEVELOPMENT

The USACE awarded an indefinite delivery contract in September 2008 for development of a database management system. When completed, the database will serve many different Collaborative Program needs including: integration and spatial correlation of disparate data types generated by the numerous research and monitoring projects, analysis of monitoring data to determine the effectiveness of Collaborative Program activities in meeting Program goals, access to project information via spatial and non-spatial queries, and project tracking. The database will be a key component in implementing Adaptive Management.

Extensive coordination with Collaborative Program stakeholders was performed to obtain input on system requirements. This coordination is continuing as the system is being developed and will be required to perform testing of a pilot database management system. The pilot system is expected to be developed by spring 2011.

Benefits to Species: The database will assist in analyzing the effectiveness of Collaborative Program activities towards meeting recovery plan goals and ensuring that BiOp requirements are being met. This activity allows synthesis and analysis of historical and current data sets to determine trends, analyze effectiveness of Collaborative Program activities, and report results.

4 SUMMARY

The Collaborative Program is actively involved in long-term planning towards a goal of becoming a Recovery Implementation Program (RIP).

The Collaborative Program is actively involved in long-term planning towards a goal of becoming a Recovery Program. Implementation of the revised LTP will help to meet this goal. The revised LTP will be tied to species recovery plans and will include future activities identified for 2011 through 2020. The work groups, the PMT, the CC, and the EC are working to determine and prioritize the future activities needed for BiOp compliance and recovery plan implementation. Additionally, past activities have been summarized and compiled to be included as an appendix to the revised LTP.

Continued involvement by all signatories is critical for continued Collaborative Program successes.

5 REFERENCES

MRGESCP Website Link:
http://www.middleriogrande.com.

Service. 2002. *Southwestern Willow Flycatcher Recovery Plan.* Albuquerque, New Mexico. i-ix + 210 pp., Appendices A-O.

Service. 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.

MRGESCP. November 13, 2006. *Middle Rio Grande Endangered Species Act Collaborative Program Long-Term Plan 2005 - 2014.*

MRGESCP. August 23, 2007. *Charter for Habitat Restoration Work Group of the Middle Rio Grande Endangered Species Collaborative Program.* Albuquerque, NM.

MRGESCP. August 23, 2007. *Charter for Public Information and Outreach Work Group of the Middle Rio Grande Endangered Species Collaborative Program.* Albuquerque, NM.

MRGESCP. August 23, 2007. *Charter for Science Work Group of the Middle Rio Grande Endangered Species Collaborative Program.* Albuquerque, NM.

MRGESCP. May 2008. *Memorandum of Agreement Middle Rio Grande Endangered Species Collaborative Program.* Albuquerque, NM.

MRGESCP. September 17, 2009. *By-Laws Middle Rio Grande Endangered Species Collaborative Program.*

MRGESCP. April 15, 2010. *Charter for Species Water Management of the Middle Rio Grande Endangered Species Collaborative Program.* Albuquerque, NM.

MRGESCP and Water Consult, Engineering and Planning Consultants. 2010. Final Draft. *Long Term Plan Middle Rio Grande Endangered Species Collaborative Program.* Albuquerque, NM.

Service. 2010. *Rio Grande Silvery Minnow (Hybognathus amarus) Recovery Plan,* First Revision. Albuquerque, NM. viii + 210 pp.

6 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 Collaborative Program Management Team, Coordination Committee or work groups.

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

Listed Species: Federally listed species under the ESA, with special emphasis on the RGSM and 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 and technical support to the EC, Coordination Committee, and work groups and consists of a Program Manager and management staff employed by Reclamation, Department of the Interior and Corps staff, administrative and clerical staff (federal employees or contractors), and Signatory representatives.

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.

7 CONTACTS AND MEETING SCHEDULES

PROGRAM MANAGEMENT TEAM (PMT)
PMT Liaison: Monika Mann (monika.mann@usace.army.mil
PMT Liaison: Stacey Kopitsch (stacey_kopitsch@fws.gov)
PMT Liaison: Terina Perez (tlperez@usbr.gov)
Contracting Officer: Jericho Lewis (jlewis@usbr.gov)
Program Specialist: Diana Herrera (dherrera@usbr.gov)
Program Admin Assistant: Alighieri Saenz (Ali) (asaenz@usbr.gov)
Program Manager: Yvette McKenna (yrmckenna@usbr.gov)

Meets every 2nd and 4th Wednesday from 9:00am-12:00pm at Reclamation and every 3rd Friday at 11:30am for lunch/ meeting (locations vary)

EXECUTIVE COMMITTEE (EC)
Federal Co-chair: Brent Rhees (brhees@usbr.gov)
Non-federal Co-chair: Estevan López (estevan.lopez@state.nm.us)

Meets the 3rd Thursday of the month from 9:00am-1:00pm at Reclamation (Rio Grande Rm)

COORDINATION COMMITTEE (CC)
Federal Co-Chair: Susan Bittick (susan.m.bittick@usace.army.mil)
Non-federal Co-chair: Brooke Wyman (brooke@mrgcd.us)

Meets the 1st Wednesday of the month from 1:00pm-4:00pm at Reclamation and as needed

SCIENCE WORKGROUP (SCW)
PMT Liaison: Stacey Kopitsch (stacey_kopitsch@fws.gov)
Federal Co-chair: Jennifer Bachus (jennifer_bachus@fws.gov)
Non-federal Co-chair: Alison Hutson (alison.hutson@state.nm.us)

Meets the 3rd Tuesday of the month from 9:00-11:30am at Interstate Stream Commission

MONITORING PLAN TEAM AD HOC WORKGROUP (MPT)
PMT Liaison: Stacey Kopitsch (stacey_kopitsch@fws.gov)
Federal Co-chair: Ondrea Hummel (ondrea.c.hummel@usace.army.mil)
Non-federal Co-chair: Anders Lundahl (anders.lundahl@state.nm.us)

Meets the 3rd Tuesday of the month from 11:30am-12:30pm at Interstate Stream Commission

HABITAT RESTORATION WORKGROUP (HRW)
PMT Liaison: Monika Mann (monika.mann@usace.army.mil)
Federal Co-chair: vacant
Non-federal Co-chair: Rick Billings (rbillings@abcwua.org)

Meets the 3rd Tuesday of the month from 12:30-3:30pm at Interstate Stream Commission

DATABASE MANAGEMENT SYSTEM AD HOC WORKGROUP (DBMS)
PMT Liaison: Monika Mann (monika.mann@usace.army.mil)
Federal Co-chair: Kelly Allen (kelly.e.allen@usace.army.mil)
Non-federal Co-chair: Liz Zeiler (elizabeth.zeiler@state.nm.us)

Meets the 2nd Monday of the month from 1:00-2:00pm at US Army Corps of Engineers

SPECIES WATER MANAGEMENT WORKGROUP (SWM)
PMT Liaison: Terina Perez (tlperez@usbr.gov)
Federal Co-chair: Chris Banet (chris.banet@bia.gov)
Non-federal Co-chair: vacant

Meets the 1st Wednesday of the month from 10:00am-12:00pm at Bureau of Indian Affairs

SAN ACACIA REACH AD HOC WORKGROUP (SAR)
PMT Liaison: Terina Perez (tlperez@usbr.gov)
Federal Co-chair: Gina DelloRusso (gina_dellorusso@fws.gov)
Non-federal Co-chair: Page Pegram (page.pergram@state.nm.us)

Meets the 4th Thursday of the month from 12:30-3:30pm (Location TBD)

POPULATION VIABILITY ANALYSIS WORKGROUP (PVA/BIOLOGY)
PMT Liaison: Stacey Kopitsch (stacey_kopitsch@fws.gov)
Federal Co-chair: Dave Campbell (david_campbell@fws.gov)
Non-federal Co-chair: Dave Gensler (dgensler@mrgcd.us)

Meetings Vary

POPULATION HABITAT VIABILITY ANALYSIS AD HOC WORKGROUP (PHVA/HYDROLOGY)
PMT Liaison: Terina Perez (tlperez@usbr.gov)
Federal Co-chairs: Leann Towne (ptowne@usbr.gov) and Stephen Kissock (stephen.r.kissock@usace.army.mil)

Meetings Vary

PUBLIC INFORMATION & OUTREACH WORKGROUP (PIO)
PMT Liaison: Ali Saenz (asaenz@usbr.gov)
Federal Co-chair: Mary Carlson (mcarlson@usbr.gov)
Non-federal Co-chair: Julie Maas (julie.maas@state.nm.us)

Meetings Vary