Final Report
August 2016
Rapid Assessment of Riverine Wetlands in the Gila Watershed
Southwestern New Mexico
Assistance Agreement No. CD-00F314-01-0 (FY 2010)

Gila NMRAM Hydrology Study Site and Sampling Area on the Gila River (Fall, 2013)

New Mexico Environment Department
Surface Water Quality Bureau
Wetlands Program

Project Goals and Objectives

This Project is a continuation of the development of wetlands rapid assessment methods geared towards New Mexico arid land wetlands with a focus on riverine wetlands in the Gila/San Francisco and Mimbres watersheds. New Mexico Rapid Assessment Method (NMRAM) data were collected from 34 sites split between montane riverine and lowland riverine hydrogeomorphic (HGM) subclasses of wetlands. Hydrology intensive data collection was conducted on an additional five sites to understand stream and floodplain dynamics in large lowland river systems. High-resolution multispectral imagery was collected from 58 Gila, San Francisco and Mimbres River unconfined floodplains and vegetation classification using multispectral images along with a legend developed from floristic data collection was completed for 34 floodplains expanded from NMRAM sample areas. The Project was designed to test the Montane Riverine NMRAM as developed by previous projects on the Upper Rio Grande, to expand the reference domain to the mountain ranges of Southern New Mexico and to refine the subclass description for montane riverine wetlands. The project also resulted in the development of the first NMRAM for large river systems (Lowland Riverine NMRAM). The SWQB Wetlands Program chose to develop the first Lowland Riverine NMRAM on the Gila River since it is largely an intact lowland river system. A number of new rapid assessment metrics were designed and tested as part of this project. Some of the unique challenges included designing metrics for large river floodplains, developing metrics for braided river systems, sizing the sample area to accurately reflect wetland conditions on larger floodplains and still complete an assessment in a day. This Project included the continued enhancements of the SWQB SQUID database to accept and store NMRAM data. The New Mexico Wetlands Roundtable, maintained by the SWQB Wetlands Program, was expanded to include roundtables in the southern part of the state that were conducted in Las Cruces in the spring and fall each year.

Through this project six major objectives were accomplished. 1) Data collection, analysis, and validation for NM's first Lowland Riverine NMRAM including the development of NMRAM Lowland Riverine Field Guide 1.0 and electronic data collection worksheets, 2) Validation and expanded utility to the southern part of New Mexico of the Montane Riverine NMRAM, including the development of NMRAM Montane Riverine Field Guide 2.0 and electronic data collection worksheets 3) Formation of a Technical Advisory Committee which met 3 times to provide input to NMRAM development, and two trainings for potential end users, one using Montane Riverine NMRAM and one using Lowland Riverine NMRAM (Technical Transfer), 4) Collection of high-resolution multispectral imagery from 58 Gila, San Francisco and Mimbres River unconfined floodplains and vegetation classification of 34 expanded sample area floodplains, 5) The New Mexico Wetlands Roundtable was maintained and expanded to target NGOs in New Mexico - the Agency Wetlands Roundtable and NGO Wetlands Roundtable each meeting twice per year - the meetings focused on the objectives established by the group. The SWQB Wetlands Program also hosted combined agency and NGO roundtables when the speakers and topics were relevant to both groups, the format included a professional facilitator and co-sponsorship by an NGO organization, 6) Finally, the SQUID database at SWQB has been expanded to accept

NMRAM data. The development of NMRAM has been shared locally and nationally through presentations and public events.

Figure 2. Chris Canavan (SWQB Watershed Protection Section Supervisor) setting up cross-sections for the hydrology metric on a Lowland Riverine site called The Nature Conservancy Gila Bird Area.

Project Outcomes

- The SWQB Wetlands Program and partners are provided wetland assessment capability to require better wetlands protection, restoration and mitigation.
- This project creates a tool for evaluating the condition of New Mexico's montane and lowland riverine wetlands in comparison to a level of human disturbance and that is relevant to New Mexico.
- NMRAM is filling a critical piece of an integrated and comprehensive approach to wetlands protection by SWQB and its partners.
- NMRAM will provide the supporting data and information needed to develop water quality standards for subclasses of New Mexico's wetlands resources.
- The NMRAM can be used to identify reference standard wetlands in need of special protection, and to identify those that are particularly impacted and those that can be restored.
- As future wetlands subclasses are described and assessed, an iterative monitoring program linked to water quality assessments by watershed will continue to be developed, and will increase the capacity and understanding of ecological linkages, natural variability and changes that result from human activities.
- Through our development of an integrated SQUID database at SWQB, wetlands assessment data will be available for inclusion in CWA Section 305(b) reports,

increasing access to stakeholders and decision makers to improve their knowledge and understanding of wetlands issues.

- The oversight of NMRAM wetlands data at NMED will provide the capability to combine wetlands data and results with other SWQB water quality programs that will result in overall improvement to water resources of the State.

- Expanding the Wetlands Roundtable to include meetings especially designed and planned for NGOs in New Mexico, establishes and solidifies new partnerships, increases the capacity of the Wetlands Program to reach a variety of stakeholders with relevant and up-to-date information and data-sharing regarding wetlands in New Mexico.

Project Location

The project is located in unconfined montane and lowland river valleys of the Gila and Mimbres Watersheds Reference Domain in southwestern New Mexico (Figure 3). The results of this project have statewide application.

Final SA locations for Gila NMRAM Project 2012
36 Total SAs: Montane = 19, Lowland = 17
Scale 1:650,000

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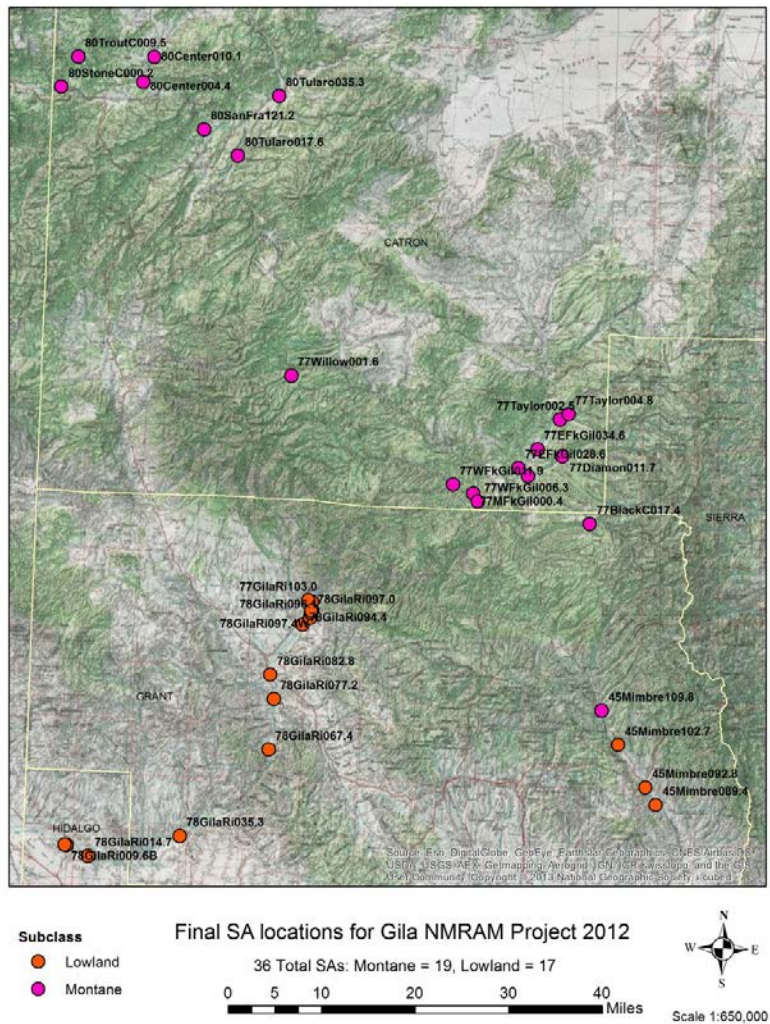August 2016

Figure 3. Map of NMRAM Sample Area locations in the Gila and Mimbres Watersheds Reference Domain. The orange dots are Lowland Sample Area locations and the pink dots are Montane Sample Area locations.

Original Timeframe

The grant award for this project was approved April 26, 2011, and was to be completed by December 31, 2014. The project was amended for a no cost extension to December 31, 2015, due to major wildfires in the Gila and to complete additional hydrology studies to validate our abiotic metrics for the Lowland Riverine NMRAM. The timeline was again extended to August 31, 2016 to complete the reviews of the Montane Riverine and Lowland Riverine Field Guides and datasheets and to complete database development work for Lowland Riverine NMRAM. The stated goals and objectives of the project remained the same, as well as the key project Tasks.

Partners Involved

UNM Natural Heritage New Mexico was the principal contractor in partnership with SWQB Wetlands Program in developing the Lowland Riverine NMRAM 1.1 and the Montane Riverine NMRAM 2.0 for this Project. TEKSystems, Inc. is responsible for developing the enhancements to the SQUID database at SWQB to accept NMRAM data, and for the interactive data collection worksheets. University of Montana Flathead Biological Station (Dr. Ric Hauer) provided multispectral imagery acquisition and consultant on the selection of the montane and lowland riverine subclass sites. USEPA (Arlene Gaines, Betty Ashley, Sondra McDonald and Sharon Daugherty, and Richard Prather) provided project progress guidance and technical assistance.

SWQB Wetlands Program was involved in every aspect of project and co-authored the Field Guides and data collection worksheets along with UNM Natural Heritage New Mexico (co-authors: Esteban Muldavin, Elizabeth Milford and Maryann McGraw). The Project involved an Advisory Committee whose members are as follows:

Advisory Team Members

Name	Organization
Julie Alcon	U.S. Army Corps of Engineers
Shelly Barnes	NMED/SWQB
James Bearzi	OSE
Lavonna Begay	US Forest Service
Steve Cary	Audubon New Mexico
Jony Cockman	Bureau of Land Management (AZ)
Martha Cooper	The Nature Conservancy
Cory Durr	Bureau of Land Management
Tim Frey	Bureau of Land Management
Ric Hauer	University of Montana, Flathead Lake Biological Station
Cassandra Hendricks	State Land Office
Micah Kiesow	US Forest Service

Nori Koehler	US Forest Service
Carolyn Koury	US Forest Service
Vernon Lente	US Forest Service
Anne Marie Matherne	US Geological Survey
David Menzie	NMED/SWQB
Aaron Miller	U.S. Department of Agriculture, Natural Resources Conservation Service
John Money	NMED/SWQB
Susan Rich	New Mexico State Forestry
Justin Riggs	U.S. Army Corps of Engineers
Jeffrey Samson	UNM
Matt Schultz	NMED/SWQB
Art Telles	US Forest Service

Independent Reviewers of the NMRAM Field Guides and Data Collection Worksheets:

Deanna Cummings	U.S. Army Corps of Engineers

Gila NMRAM Technical Team (field site selection, data collection, geodatabase development)

Hannah Burnham	UNM Nat Her
Chris Canavan	NMED/SWQB
Yvonne Chauvin	UNM Nat Her
Mark Horner	UNM Nat Her
Dave Menzie	NMED/SWQB
Scott Murray	NMED/SWQB
Matt Schultz	NMED/SWQB

Combined Agency and NGO Wetlands Roundtable presenters (statewide meeting): USACE, EPA Region 6, NM Wildlife Federation, NM Bureau of Geology and Mineral Resources, Bat Conservation International, Santa Fe Girls School, Audubon, Rio Grande Agricultural Land Trust, New Mexico Land Conservancy, USFWS Partners for Wildlife, Thaw Charitable Trust.

New Mexico Agency Wetlands Roundtable Presenters: SWQB Watershed Protection Section, USACE, USFWS NWR, USFWS NWI, UNM Natural Heritage, NRCS.

New Mexico NGO Wetlands Roundtable Presenters: SWQB Wetlands Program, Ecotone, Hawks Aloft, NM Wildlife Federation, BLM, USFWS, WildEarth Guardians.

Combined Agency/NGO Roundtable in Honor of Bill Zeedyk's 80th Birthday. USFS Retired, NPS, Rangeland Hands, Inc., SWQB Wetlands Program, Quivira Coalition, Albuquerque Wildlife Federation, USFWS NWR, Zeedyk Consulting, Inc., Altar Valley Conservation Alliance, Berg Ranch, The Nature Conservancy.

Additional partners who contributed to this project:

Julia Barnes, professional facilitator, facilitated some of the Wetlands Roundtables and helped with other Wetlands Program planning.

The NM Wildlife Federation, Alan Hamilton, co-sponsored the October 30, 2012 combined Agency and NGO Wetlands Roundtable, and the April 18, 2013 NGO Wetlands Roundtable.

The Quivira Coalition and the Albuquerque Wildlife Federation co-sponsored the combined Agency and NGO Wetlands Roundtable in honor of Bill Zeedyk's 80th birthday, March 26, 2015.

Funding

The original Federal amount was **$456,831.00** and **$153,842.00** match. The final federal amount spent was **$420,217.74**, and the **final match amount** was **$182,859.44 ($29,017.44 overmatched).** See semi-annual reports for details.

Major Project Highlights and Chronology

- This project was awarded federal assistance for this Project by EPA Region 6 on April 26, 2011.
- Maryann McGraw, the Wetlands Program Coordinator (WPC) and Project Officer for the Project, met with Dave Menzie and Matt Schultz (PTs) in Silver City to complete the selection of potential NMRAM data collection sites in the Gila Watershed. Dave Menzie and Matt Schultz prepared a preliminary map of potential site locations for Montane and Lowland unconfined riverine sample areas in GIS.
- A Sole Source contract was completed with University of Montana for Multispectral Imagery Acquisition for selected NMRAM sites on August 8, 2011.
- The WPC participated in water quality sampling site selection to ensure some water quality sampling sites correlated with potential NMRAM wetlands data collection sites.
- A first short course on the Montane Riverine NMRAM (Version 1.0) was conducted through a contract with UNM Nat Her paid for by EPA through the Albuquerque District of the ACOE. The training was held in Albuquerque and in the field at nearby locations to Albuquerque, November 11-13, 2011. The WPC participated as an instructor under this Project.
- The WPC met with Dave Menzie and Matt Schultz (PTs) in Silver City to annotate those potential NMRAM sites with stressor descriptions, preliminary ranking and access.
- The PQAPP for multispectral image acquisition was approved by EPA on March 8, 2012.

- The WTU match from the 2011 Gila Watershed Water Quality Survey was completed.
- The WPC met with Dave Menzie and Matt Schultz (PTs) in Silver City to complete the selection of final NMRAM data collection sites in the Gila Watershed.
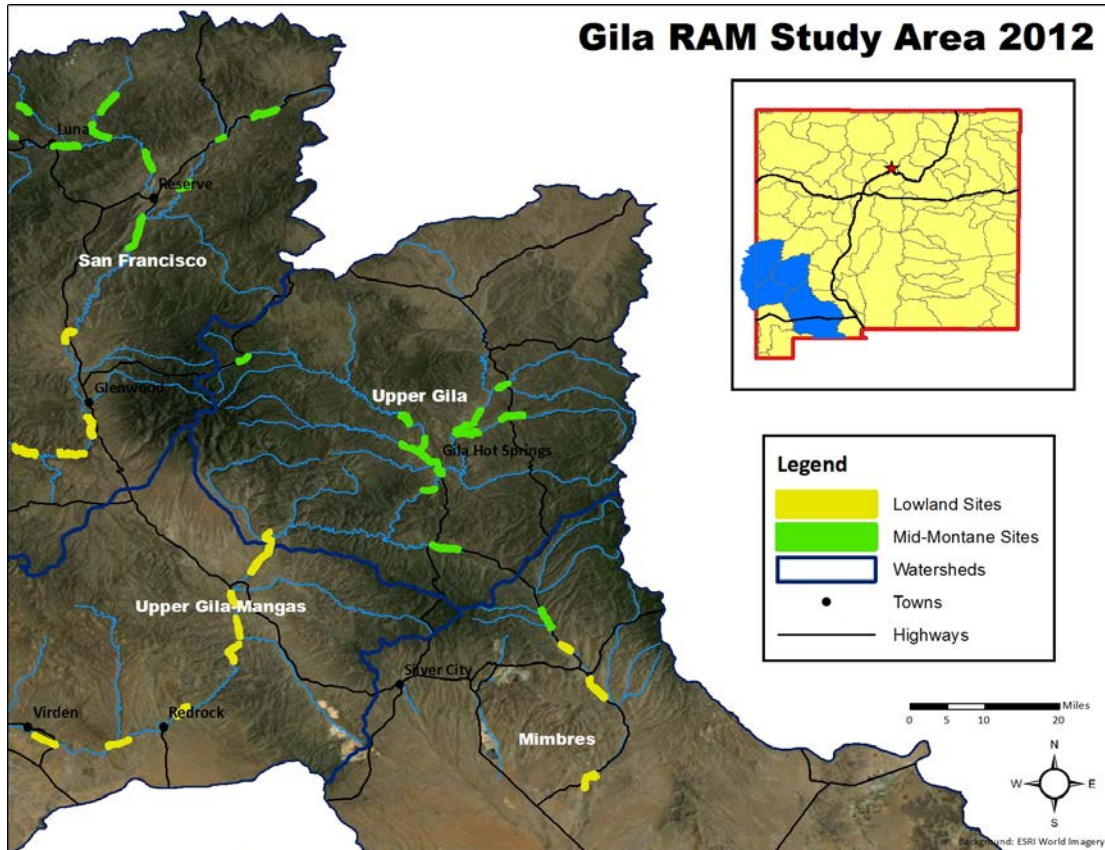

Figure 4. Location of Lowland Riverine and Montane Riverine Wetlands of Interest (WOI) in the Gila, San Francisco and Mimbres Watersheds. Sampling Areas will be located within these WOIs. This map with GIS locations was forwarded to University of Montana for multispectral image acquisition.

- An IGA was completed on June 4, 2012 with University of New Mexico Natural Heritage Program for NMRAM development and data collection for the Montane and Lower Riverine Subclasses in the Gila Watershed.
- Development of the PQAPP for NMRAM development and data collection on the Gila was approved on July 16, 2012.
- The huge Whitewater Baldy Fire broke out in the Gila (the largest in New Mexico history - over 278,000 acres burned during the months of May and June 2012) and the Gila National Forest was closed. This delayed the acquisition of multispectral imagery until the fall of 2012.
- The Advisory Committee was formed and the first Advisory Committee meeting was held in Silver City, NM on August 21, 2012 with 17 participants.
- A Pilot Study was conducted in the Gila Watershed in late August, 2012. Ten sites were visited by the Assessment Team to verify information in the draft field guides and answer questions developed during the Advisory Committee meeting. During the

pilot study, other metrics were suggested, such a determining litter cover, other indicators of floodplain hydrology, and soils. For these metrics the field crews were instructed to take notes since metrics for these parameters were not developed.
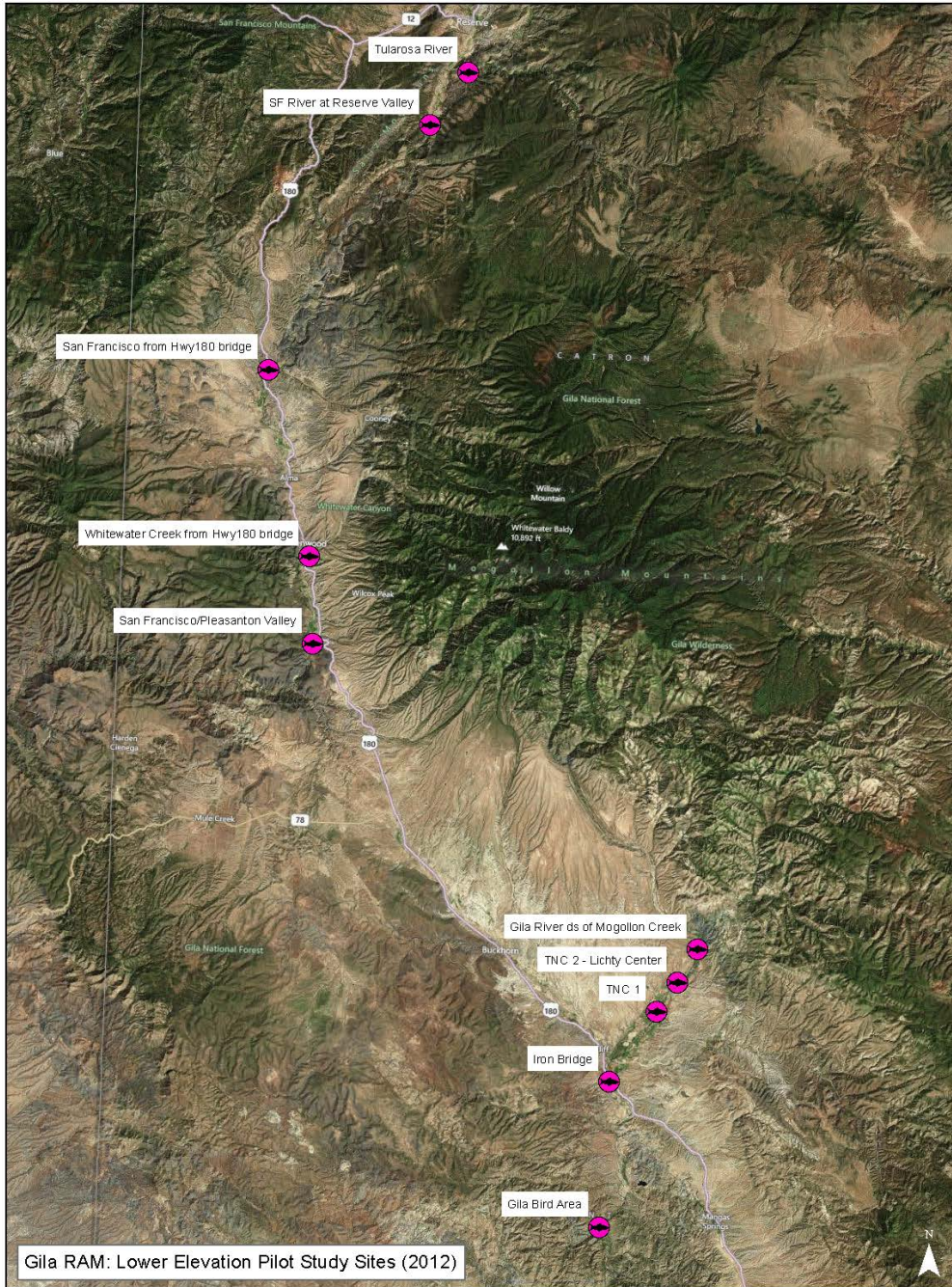

Figure 5. Pilot Study Sites.

• The PQAPP for the development of the NMRAM for the Gila was amended to include the Lowland Riverine subclass on September 25, 2012.

- Data collection from 40 reference sites from the Montane and Lower Riverine sites in the Gila and Mimbres watersheds began in September and ran through October, 2012. Of the initial 66 draft sites, field packets were made by UNM for 53 sites and 34 sites were actually sampled. Some sites were rejected due to impacts from the Whitewater/Baldy fire, others were rejected after the field team determined they did not fit the subclass.
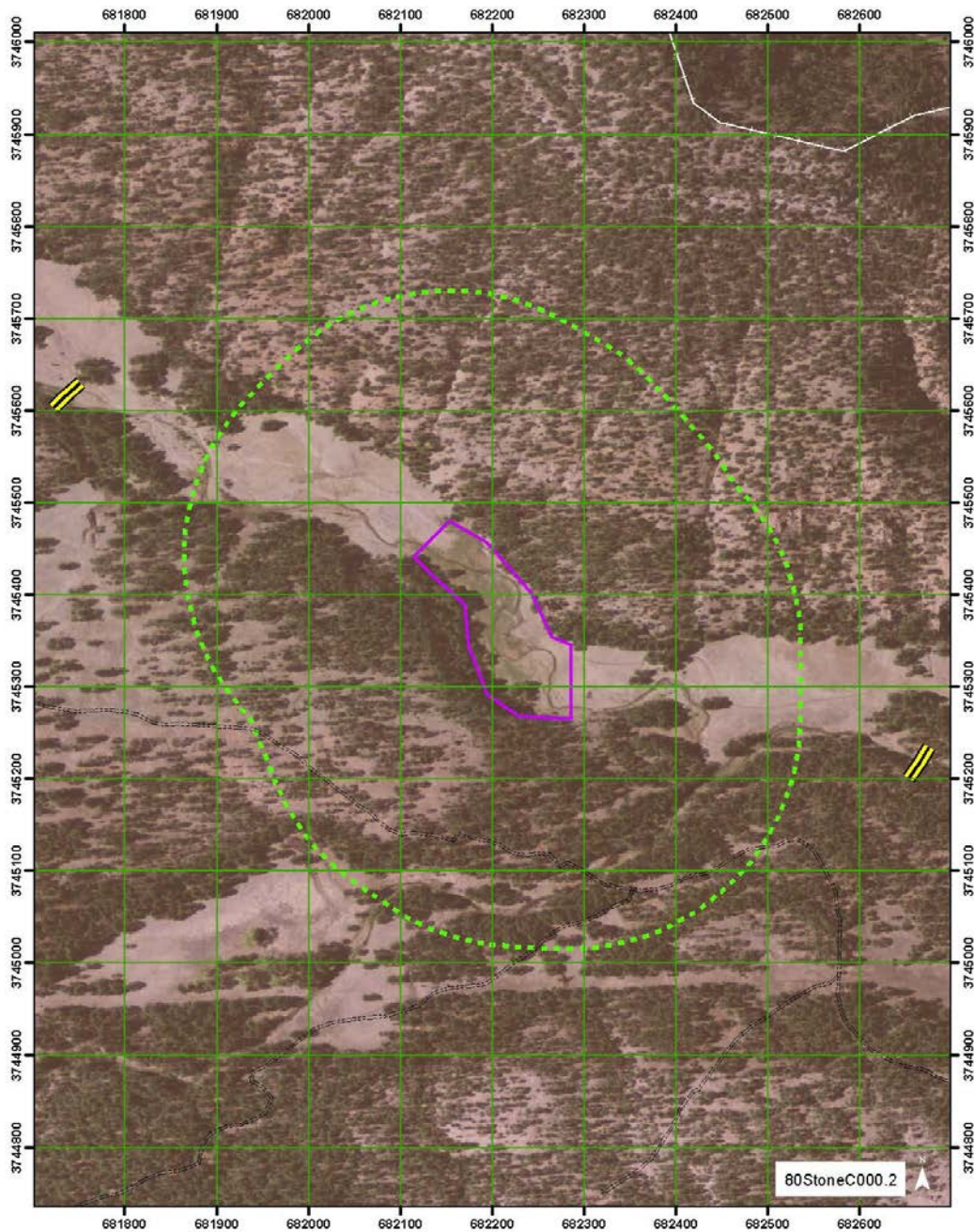

Figure 6. Overview map of Stone Creek montane riverine sampling area for field packets.
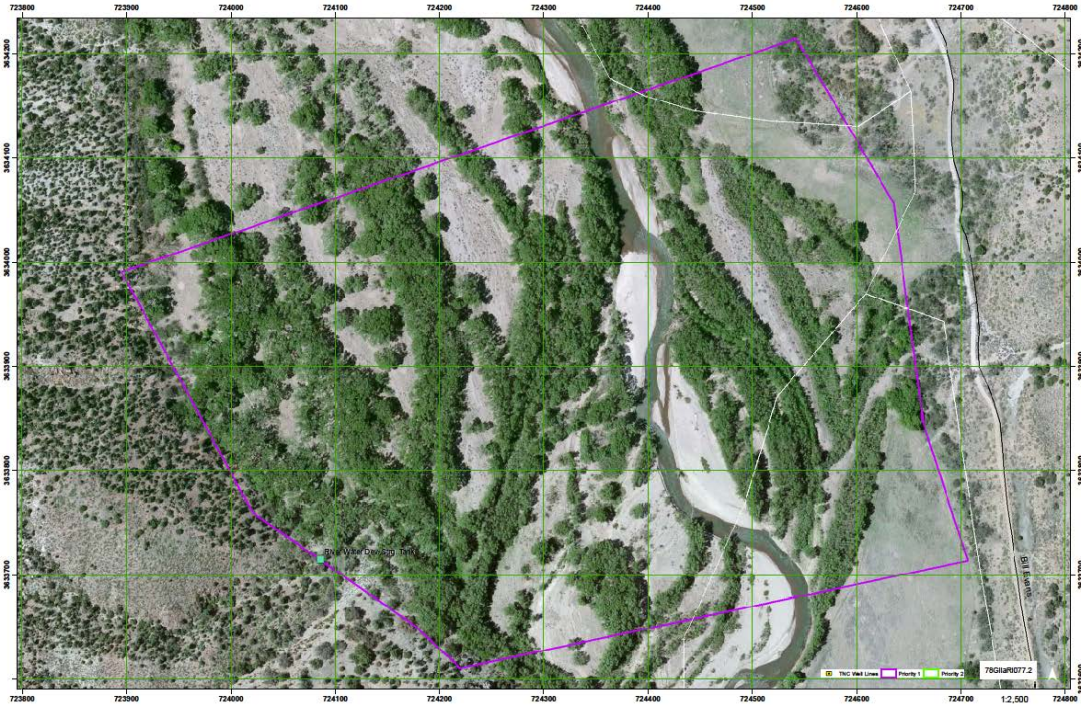
Figure 7. Overview map of Lowland Riverine sampling area on the Gila River.

- Technical training for the field crews was conducted on the first day of data collection for the Montane Riverine sites and under the approved PQAPP on August 30, 2012, after the Pilot Study. Technical Training for the Lowland Riverine sites and QA was conducted with the field crews on September 20, 2012.

Figure 8. NMRAM data collection site, floodplain on the Mimbres River, September, 2012.

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- Maryann McGraw and Matt Schultz presented the Gila NMRAM at the 2012 4th Gila Natural History Symposium in Silver City, NM on August, 2012.
- Multispectral Imagery collection was completed for the reference sites in the Gila and Mimbres watersheds in October, 2012.

Figure 9. Example of Gila NMRAM multispectral imagery collected in October 2012 (not mosaicked).

- The first Wetlands Roundtable under this project was conducted in October 30, 2012. The Wetlands Program partnered with New Mexico Wildlife Federation to conduct a combined NGO/Agency Roundtable in Santa Fe, NM. Approximately 52 participants attended the all-day meeting.
- The Assessment Team met with the Data Collection Team to report on how the metrics worked during data collection in late fall, 2012. It was determined that some of the lowland riverine sites are braided systems under bankful and higher flows, and would potentially fall under the D-sub C Rosgen Stream Classification. In addition, during the pilot study, it was determined in the Gila Watershed, the break between montane and lowland would be shifted higher than in the Upper Rio Grande. These shifts and differences are being examined for the final subclass descriptions for this project.
- The WPC met with Rayo McCollough and Esteban Muldavin to discuss including the web-mapping effort in database development on January 8, February 26, 2013 and through e-mails and conference calls. The CRAM web-accessible map and GIS was referenced as an example. UNM and the WPC held a series of conference calls with

the San Francisco Estuary Institute (SFEI) to ask if we could use some of their software or if they were interested in collaborating on our database development.

- The WPC attended and presented at the Association of State Wetland Managers State/Federal/Tribal Coordination Meeting "Clean Water, Wetlands and the Law: New Tools and Opportunities." March 19-21, 2013. The WPC made a presentation on using wetland monitoring and assessment data to inform decision making.

- The Agency Wetlands Roundtable was conducted in Santa Fe on March 28, 2013 with approximately 30 participants attending.

- The Wetlands Program partnered with the New Mexico Wildlife Federation to conduct an NGO Wetlands Roundtable on April 18, 2013 at the New Mexico State Library in Santa Fe, NM. Approximately 24 participants attended the meeting. The Wetlands Program hired a professional facilitator to conduct discussion sessions during these roundtable meetings.

- UNM Nat Her hosted a meeting to discuss lowland riverine abiotic metrics with Dr Mark Stone (UNM Hydrology professor) and Jeffery Sampson (UNM Hydrology grad student) on April 26th 2013. The biggest issue was characterizing a large lowland riverine floodplain with cobble-boulder material in an arid setting. Soils and groundwater hydrology are not measurable through the substrate for a rapid assessment.

- The WPC attended the Stream Pyramid Workshop sponsored by EPA Region 6 in Dallas Texas, on April 29 – May 2, 2013.

- In May 2013, UNM Nat. Her. provided vegetation polygon maps and a legend for NMRAM sampling areas located within multispectral images, to U. Montana to complete floodplain vegetation classifications.

- An amendment to the UNM Nat Her IGA was approved on December 16, 2013, to include more data collection to help describe the braided nature of the Lowland Gila floodplains.

- The PQAPP was updated in fall 2013 and approved October 24, 2013, to include additional data collection using Rosgen Level 2 methods.

- An IGA for the University of Montana was completed on October 30, 2013 to continue classification work of all Gila NMRAM floodplains that were sampled using NMRAM.

- The Data Collection Team collected more data from 5 Lowland Riverine Sites in November 2013, to improve abiotic site analysis, and to see if the NMRAM Lowland Riverine results were still valid after the White Water-Baldy Fire of 2012 triggered large flooding events through some of the sampling areas.

Figure 10. Gila Lowland NMRAM Site after a large (50 year) storm event in September 2013. Photo taken in November, 2013.

Figure 11. Same site as Figure 10. Note thick sediment deposited around riparian vegetation within the floodplain.

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Figure 12. Large flooding events of September 2013 caused the deposition of large woody debris and litter, pushed over vegetation, deposited sediment on the flooplain, and caused scouring of stream banks and channel avulsion. This evidence suggests lateral filling, channel widening and flow movement across the floodplain, and little indication of down-cutting.

- The Assessment Team consulted with Ellen Soles, a hydrologist contractor working in the Gila, about her data that shows how the braided floodplains of the Gila function for surface and hyporheic flows.
- The Assessment Team continued to conduct metric analysis and metric additions and revisions in early 2014. Because of the nature of the Gila Floodplain substrate, soils and groundwater hydrology are not measurable through the substrate for a rapid assessment. The Assessment Team looked into using surface indicators such as plant vigor and wetland indicator status to indicate groundwater hydrology. The hydrologic connectivity metric has been revisited as a descriptive metric based on the Rosgen Level 2 data collected in the field.
- A plan and budget from SFEI was presented to NMED IT and SWQB staff. It was determined through a series of meetings with SWQB Bureau Chief and NMED IT staff that the NMRAM database would move to NMED for further development and integration with other SWQB databases.
- Maryann McGraw presented the Gila NMRAM findings to date at the 5th Gila Symposium in Silver City on February 27 and 28, 2014. The large and diverse audience were very receptive to the NMRAM and are looking forward to the completed Manuals and Field Guides.
- Debra Sarabia (database manager for SWQB) attended the 5th Gila Symposium under this grant as cross-training with the Wetlands Program. Deby will be helping to create

new wetland assessment area codes for the current sampling areas and entering them into the SQUID database for this project.

- A second Advisory Team Meeting was held in Silver City on March 25-26, 2014. Sixteen participants attended the one and a half-day meeting which was focused on the Lowland Riverine metrics.

- The University of Montana completed the vegetation classification of all the multispectral images of Gila NMRAM Floodplains. The contract closed May 20, 2014. Other researchers in the Gila are already asking to share these data for other research projects involving the hydrology and riparian vegetation in the Gila Watershed.
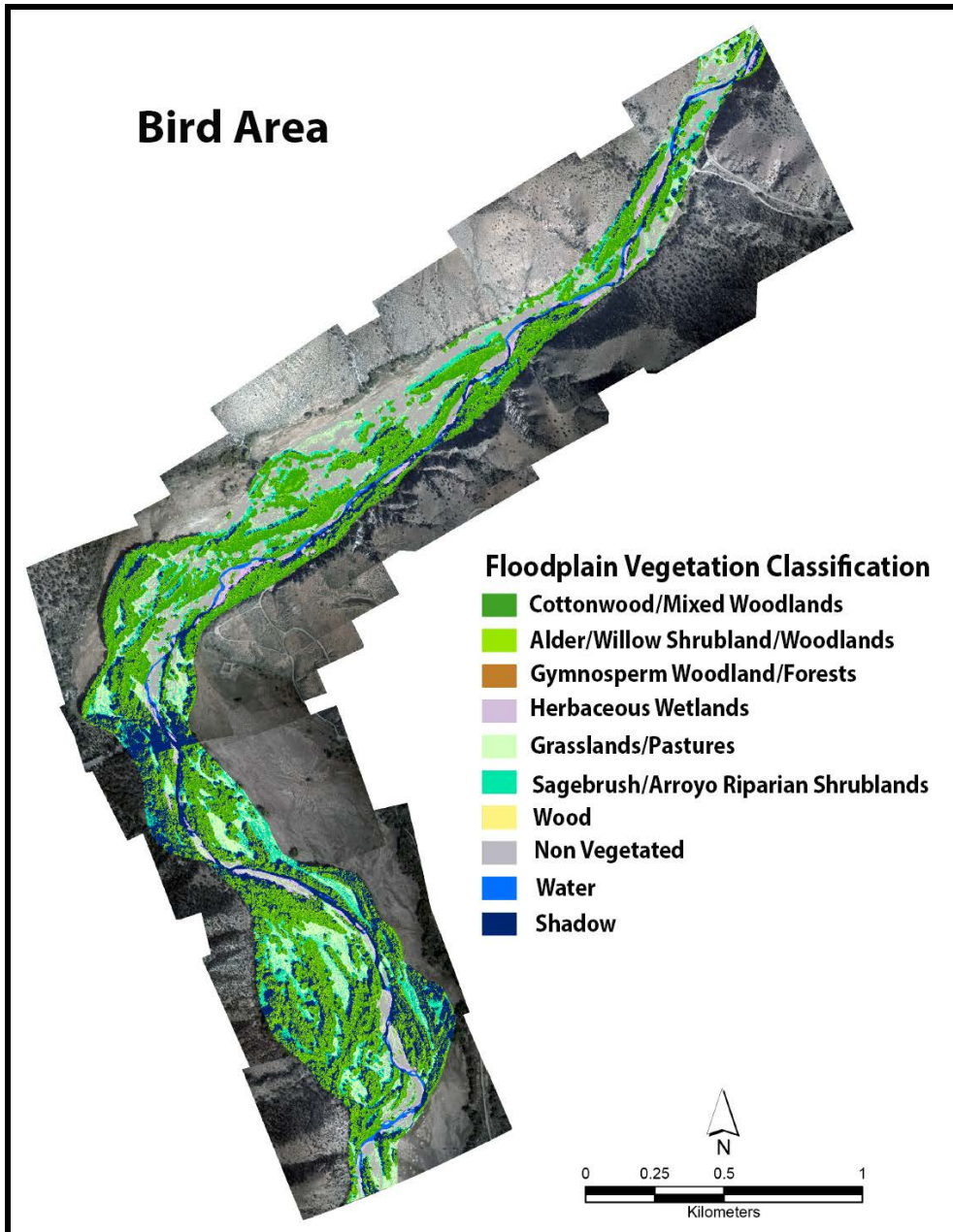

Figure 13. Example of Classified Floodplain Final Deliverable from University of Montana, Flathead Biological Station. The products provide more detail in the GIS.

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- A no cost amendment to extend the project until December 2015 was awarded by EPA on August 20, 2014, to provide more time for database development, completion of the manual and field guides and training tasks.
- A second Amendment to the UNM Nat Her IGA was approved on October 10, 2014, to extend the term to October 30, 2015 at no additional cost.
- The WPC worked with NMED IT staff to develop a scope of work and contract with TEKSystems for the integration of data collected through this project (NMWRAD) into the SQUID database. The Contract was signed November 12, 2014.
- A draft of the Montane Riverine Field Guide 2.0 has been forwarded to SWQB WPC for review.
- A request for an extension of the PQAPP (QTRAK #15-180) through December 31, 2015 was approved by EPA on March 9, 2015.
- A combined Agency and NGO Wetlands Roundtable was organized and conducted on March 26, 2015 in honor of Bill Zeedyk's (New Mexico Wetland Restoration Expert) 80th Birthday. Projects that he designed and restoration methods that he pioneered were featured as Presentations.

Figure 14. Attendees at Bill Zeedyk 80th Birthday Wetlands Roundtable, March 26, 2015 at the Rotunda at Science and Technology Park UNM, Albuquerque, NM.

- Maryann McGraw attended the Society of Wetland Scientists Rocky Mountain Chapter Annual Meeting in Golden, Colorado on April 2015. The SWQB Wetlands Program was one of many co-sponsors of the meeting.
- In order for continuation of the database development a license for Adobe Livecyle Designer was purchased.
- The WPC worked with NMED IT staff and TEKSystems to complete draft electronic data collection sheets for NMRAM Montane Riverine version 2.0. The database back end was also in draft form as part of SQUID database.
- UNM Nat Her was contracted by NM Department of Game and Fish to use the NMRAM method in June 2015, to evaluate wetlands on a newly acquired parcel of land on the Mimbres River.
- The final NMRAM Training under this project was conducted in Silver City and in the field on the Gila River on October 13-15, 2015.

Figure 15. NMRAM Lowland Riverine Training on the Gila at the Gila Bird Area site, October 14, 2015.

Figure 16. NMRAM Lowland Riverine Training on the Gila at the Iron Bridge site, October 15, 2015.

- A no-cost grant amendment request to extend the project to August 30, 2016 was approved by EPA on November 18, 2015.
- The WPC and NMED IT staff completed a new contract with TEKSystems for electronic data collection sheets for Montane Riverine NMRAM Version 2.0 and Lowland Riverine NMRAM Version 1.0.
- The WPC presented the New Mexico Wetlands Rapid Assessment Method for Lowland Riverine and Montane Riverine Field Guides at the 6th Natural History of the Gila Symposium in February 24, 2016 at Western New Mexico University in Silver City, New Mexico.
- The SWQB Wetlands Program purchased two ruggedized tablets for NMRAM data collection in the field, using electronic data collection sheets.
- The Montane Riverine NMRAM Version 2.0 and the Lowland Riverine NMRAM Version 1.1 of NMRAM Field Guide and electronic data collection worksheets are completed.

Figure 17. 6th Gila Natural History Symposium Presentation by Maryann McGraw

- The Spring 2015 Wetlands Roundtable organized in honor of Bill Zeedyk's (New Mexico Wetland Restoration Expert) 80th Birthday has been turned into a publication by the Quivira Coalition. The WPC contributed to this publication about WPDG Projects that he helped to design and restoration methods that he pioneered.
- TEKSystems completed the electronic data collection worksheets for Montane Riverine NMRAM Version 2.0 and the Gila draft of Lowland Riverine NMRAM

Version 1.0. The database back end is also in draft form as part of SQUID database and will be completed under another WPDG grant.

- The Montane Riverine NMRAM Version 2.0 Field Guide and the Lowland Riverine NMRAM Version 1.1 Field Guide and electronic data collection worksheets are complete.
- The SWQB Webmaster retired so the NMRAM Field Guides and data collection worksheets are on hold to be uploaded to the SWQB website.

List of Major Deliverables

- New Mexico Rapid Assessment Method, Montane Riverine Wetlands Field Guide Version 2.0 (2016) and electronic data collection worksheets.
- New Mexico Rapid Assessment Method, Lowland Riverine Wetlands Field Guide Version 1.1 and electronic data collection worksheets.
- NMRAM Training Materials and sign-in sheets
- Gila Watershed multispectral imagery
- Gila multispectral images with vegetation classified floodplains in GIS and PDF.
- NMRAM data sheets and site photos.
- Agency and NGO Roundtable agendas and presentations.
- Grant and Contracts and amendments.
- PQAPP and amendments.
- Semi-Annual and Final Reports, Match reporting

Lessons Learned

This project developed the first NMRAM for large river systems in an arid setting. A big issue was to determine the rating for floodplains in braided river system arid settings where drought is a common occurrence, if the floodplain was providing the expected functions. Another issue was the occurrence of fire and large flows subsequent to the fire. The Gila displayed resilience to the input of additional sediment as the system is naturally a high sediment regime, and endemic species are adapted to braided system hydrology. Historical flood data and photographic records provide evidence that the Upper Gila River has been prone to dramatic changes from major flood events, however, the nature of the river system, overall hydrology and floodplain function was not changed.

What made the project successful
NMRAM is proving to be a successful tool for identifying the condition of wetlands by subclass in New Mexico, identifying their range and abundance, and evaluating their condition. NMRAM adds a useful and versatile tool for the management of the State's wetland resources.

The expansion of the New Mexico Wetlands Roundtable has been invaluable as a change agent for the way the state views its wetlands. Wetlands are now more valued and work on assessment, restoration and protecting wetlands is more common. Wetlands are recognized as an indispensable resource.

The acceptance of SWQB to integrate, expand and maintain wetlands data as part of SQUID database ensures compatibility and integration with other state water quality databases and future EPA databases.

What made the project not so successful?

This project has been overall successful in achieving its goals.

Technical Transfer
What information can you pass along to other agencies, cooperators or local landowners in other watersheds about this project?

Agencies, Cooperators and local stakeholders have been invited to trainings in order to promote the understanding and use of NMRAM.

The SQUID will eventually have a web-access feature so that others can view the results on line and enter their own data.

EPA Feedback Loop
What would you suggest that EPA do differently to improve the process in regard to this project?

EPA was very supportive in all aspects of this project during the project period, especially allowing grant period extensions to complete high quality and meaningful work.

Future Activity Recommendations

- More trainings should be conducted in wetlands assessment methods to engage others in collecting needed wetlands data.
- New Mexico is in the process of developing rapid assessment methods (NMRAM) for various wetland subclasses throughout the state. There is a need to continue validation of our landscape and rapid assessment methods using more detailed and intensive methods and indicators, to ensure that NMRAM is providing an accurate picture of wetland condition.
- NMRAM will be adapted to ACOE use under another grant. Another adaptation will be to consider NMRAM as an iterative tool for long term monitoring of wetlands.