Final Report
June 2014
Rapid Assessment for New Mexico Wetlands Upper Rio Grande Phase 2
Assistance Agreement No. CD-966857-01-0B (FY 2008)

(This project is Part B of a larger 2008 grant award to NMED Wetlands Program entitled "2008 New Mexico Wetlands Award Project.")

Abiotic Metrics evaluation site on the lower Rio Embudo Assessment Area(photo M. McGraw).

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 with a focus on riverine wetlands in the Upper Rio Grande watershed as our reference domain. The project examined and tested a number of rapid assessment techniques, including HGM (Hauer et al. 2002), California Rapid Assessment Methods (CRAM) (Collins et al. 2008) and NatureServe's Ecological Integrity Assessments (Faber-Langendoen et al.2008) and selected the most advantageous attributes, metrics and protocols to continue development of the first rapid assessment of wetlands methodology to meet the management needs of New Mexico's wetland resources. In addition, this project included the continued development of a wetlands database for New Mexico wetlands rapid assessment data called the New Mexico Wetlands Rapid Assessment Database (NMWRAD). Another goal of this project was to engage a statewide wetlands workgroup to collaborate on defining and prioritizing goals for wetlands protection and management and to share information about ongoing wetlands efforts statewide. To this end, the New Mexico Statewide Wetlands Roundtable is maintained by the Wetlands Program, and was expanded to include Agency and NGO roundtable meetings that each meet twice a year. Through this project four major objectives were accomplished. 1) We completed data collection, analysis, and validation for NM's first state-sponsored Rapid Assessment Users' Manual and Field Guide that is focused on the Upper Rio Grande (URG) region http://www.nmenv.state.nm.us/swqb/Wetlands/NMRAM/index.html and conducted trainings for potential end users 2) Further investigation and analysis of concurrent intensive vegetation data collection and the incorporation of other floodplain vegetation data within the reference domain was used to develop and refine a vegetation index of biotic integrity (VIBI) for riverine wetlands. 3) The statewide wetlands workgroup was maintained and expanded to include two separate groups (the NGO Roundtable and the Agency Roundtable) meeting twice each per year. Meetings focused on the objectives established by the group. 4) Finally, the first web-based database was developed to accept NMRAM mid-montane riverine data and was transferred to NMED to begin development of links to other relevant data sets and prepare for GIS mapping capabilities. The development of NMRAM has been shared locally and nationally though a number of presentations, trainings and public events.

This rapid assessment methodology was developed for Montane Riverine Wetlands situated in north central New Mexico on tributaries of the Upper Rio Grande and Rio Chama. This version of NMRAM was developed for one subclass of wetlands to reduce the inherent variability displayed among wetland types so that the NMRAM process could be evaluated as a reliable indicator of wetland condition. The subclass of riverine wetlands that was selected as the focus of this project includes mostly 3rd or 4th –order unconfined drainages. NMRAM concentrated on riverine wetlands because it is possibly the most abundant type of wetland in New Mexico and the most impacted. The Upper Rio Grande reference domain was selected because of the availability of potential sites with a range of disturbance, the potential for future impacts to these sites by development, and to correspond with concurrent water quality assessments. Over 60 sites were identified initially that fit the subclass description.

Because of the complex nature of creating a rapid assessment methodology for wetlands, this project was split into two phases in 2008 and this Final Report is for Phase 2. Phase 2 tasks convened the Advisory Team which reviewed the Draft User's Manual and Field Guide; scheduled entry to selected wetlands that spans the range in variation; conducted field team training; and collected data from 31 wetland assessment areas. Tasks included multi-metric analyses and validation incorporating data into rating curves, analysis of the sensitivity of the chosen metrics, revision the NMRAM Manual according to comments and data collection and analysis findings, conducting verification field study to verify changes to the selected metrics, and completed an NMRAM Field Guide and Final NMRAM Manual http://www.nmenv.state.nm.us/swqb/Wetlands/NMRAM/index.html . This project also tested metrics at additional wetland sites to further define and potentially expand the reference domain, and provided training to end users. The expanded sites were located in the Chama, Pecos and Jemez watersheds in North-Central New Mexico. Task 8 continued the development and expansion of the vegetation index of biotic integrity (VIBI) by including Natural Heritage legacy sites and calibrating the floristic quality index (FQI) coefficients of conservatism. As part of the database development, this project updated the prototype NMWRAD database and entered NMRAM data collected by the field teams and the VIBI teams. In addition, the database was transferred to NMED who will house, update and maintain the database in the Oracle environment and will make it compatible with other NMED water quality databases. Developing steps to improve and upgrade the database was also part of the Phase 2 project.

Project Outcomes

- The Wetlands Program and our partners are provided wetland assessment capability so that we can require better wetlands protection, restoration and mitigation.
- This project creates a tool for evaluating the condition of New Mexico's mid-montane 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 Mexicos' 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 developing NMWRAD database, 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 NMWRAD 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.

In combination with the use of NMRAM, the VIBI provides a more comprehensive evaluation of wetland condition. It helps to detect local, historic and cumulative effects of degradation in a wetland and will help sort out which types of human disturbance causes degradation of suites of plants. The VIBI helps to determine the correlation of plant suites and the discriminating power of individual plants to human disturbance gradients.

Expanding the Wetlands Roundtable to include meetings especially designed and planned for NGOs 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.

Figure 2. Field Crew performs an initial site reconnaissance of the Assessment Area (AA) at Rio Pueblo de Taos, prior to filling in the survey sheets to ensure that there are no significant hydrologic breaks, to get familiar with major plant communities and to locate cross-section sites for abiotic metrics data collection (photo M. McGraw).

Figure 3. For placement of stream cross-sections, the stream reach is divided into 3 segments each encompassing one meander bend.

Project Location

The project is located in the Upper Rio Grande Reference Domain in northern New Mexico (Figure 1). The results of this project have statewide application.

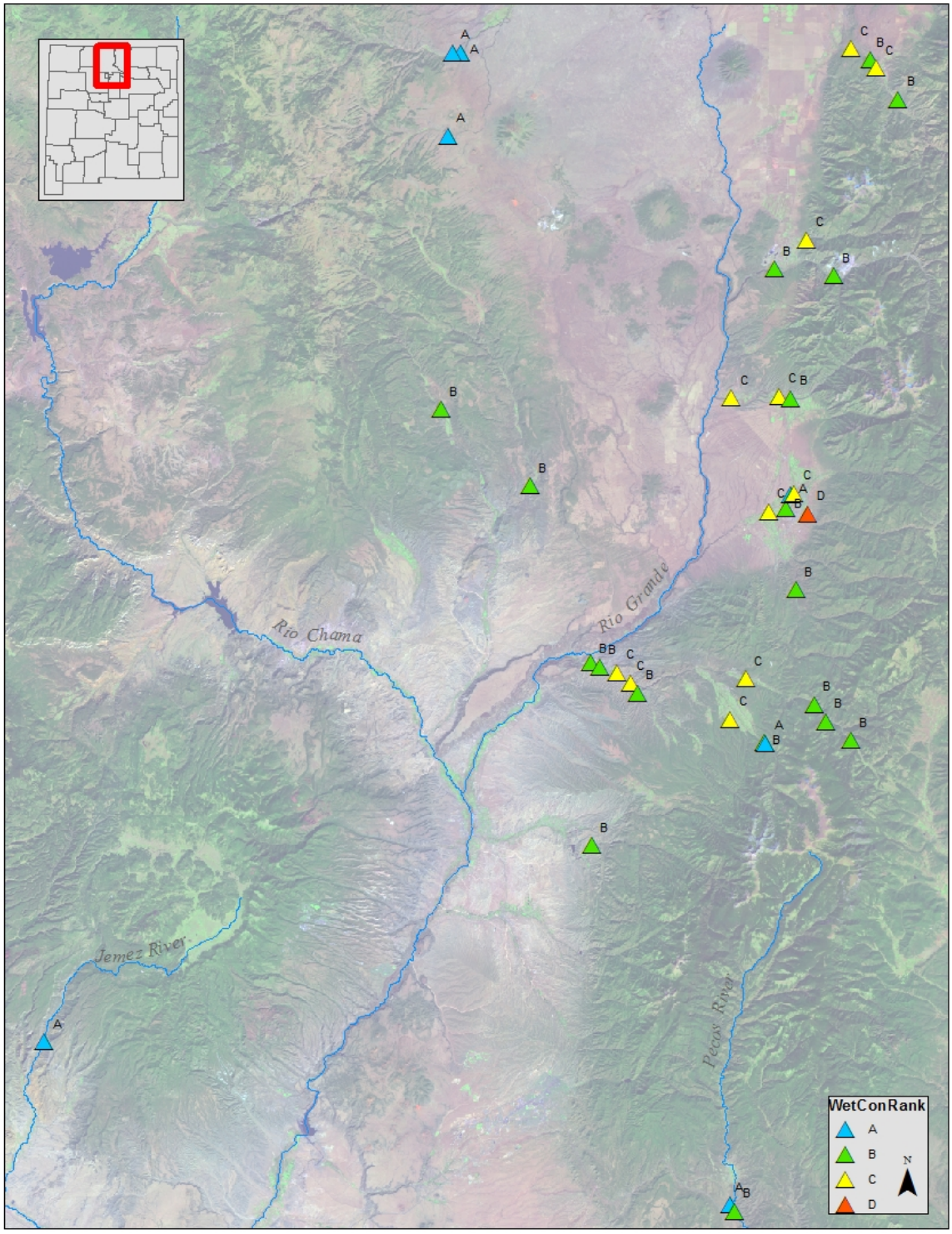

Figure 4. Map of NMRAM AAs in the Upper Rio Grande Reference Domain including six additional outlier sites where NMRAM was tested to determine the geographical limits of the assessment method application. Initial rankings after NMRAM data collection are also given.

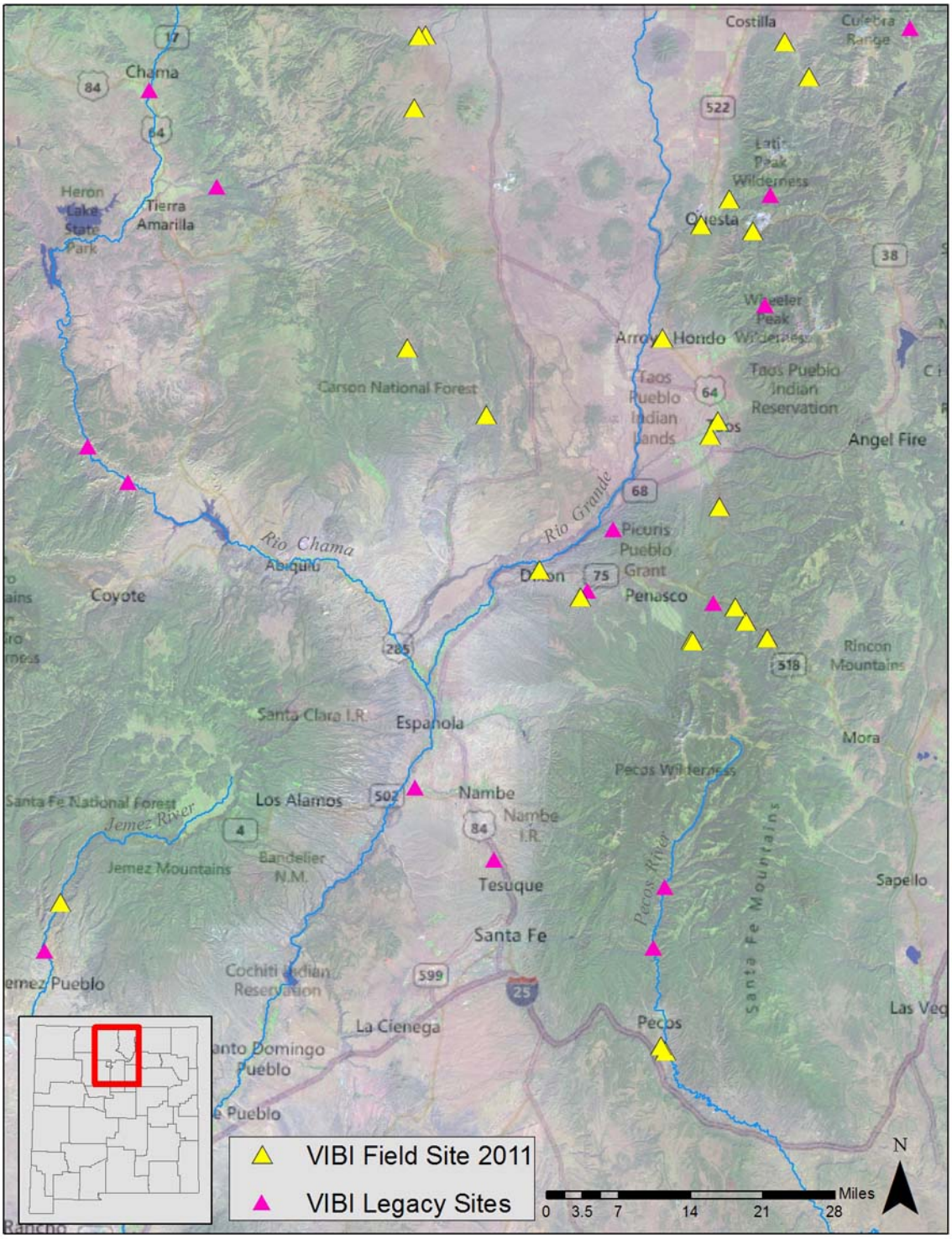

Figure 5. Location of data collection sites for VIBI and additional NMRAM data for testing post development, and also the VIBI legacy sites that were included in the VIBI study under Task 8 of this project.

Original Timeframe

The grant award that included this project was approved January 29, 2009, and was to be completed by December of 2012. The project was amended for a no cost extension to December 2013, so that our contractor could include legacy sites for the VIBI study under Task 8 and we could include additional Wetlands Roundtable meetings for NGOs and Agencies to meet our match requirement. The timeline was again extended to June 2014 to include additional work on transferring the database to NMED from UNM. The stated goals and objectives of the project remained the same, as well as the key project Tasks.

Partners Involved

UNM Natural Heritage was the lead contractor in developing the NMRAM and SWCA was subcontracted by UNM and participated as a principal partner in NMRAM development. UNM Natural Heritage was also responsible for developing the initial prototype database. SWQB Wetlands Program was involved in every aspect of project and NMED IT participated in database development and approval and transfer of the database to NMED Oracle environment.

Other project partners included:

University of Montana Flathead Biological Station (Dr. Ric Hauer) – Imagery acquisition and consultant on the selection of the subclass sites.

US Army Corps of Engineers – Review and advisement during the entire process, sponsor for some of the training.

NMDOT – Review and advisement during the process.

USEPA – Project Progress Guidance

Colorado Natural Heritage – Guidance in developing a condition assessment – defining condition and contributing information for the VIBI.

Advisory Team Members-

Kate Coleman	NMED/SWQB
Deanna Cummings	U.S. Army Corps of Engineers
Dave Gori	The Nature Conservancy
Greg Gustina	Bureau of Land Management
Randy Floyd	New Mexico Department of Game and Fish
Ric Hauer	University of Montana, Flathead Lake Biological Station

Christina Kelso	New Mexico Department of Transportation
Richard Prather	EPA
David Menzie	NMED/SWQB
Roy Jemison	U.S. Forest Service
Marcus Miller	U.S. Department of Agriculture, Natural Resources Conservation Service
Shann Stringer	NMED/SWQB
Richard Sumner	EPA
Lori Walton	New Mexico Department of Transportation

Independent Reviewers of the NMRAM Manual:

Russell Isaac	NMED/SWQB
Michael Scozzafava	EPA Headquarters
Chuck Klimas	ACOE ERDC

New Mexico Agency Roundtable presenters:

ACOE, EPA Region 6, NM Wildlife Federation, NRCS Los Lunas Plant Materials Center, NRCS, Santa Clara Pueblo, USFWS, NM Department of Game and Fish, NM State Parks, NM Energy Minerals and Natural Resources Department, USFS, Association of State Wetland Managers, NRCS, NMED Wetlands Program, UNM Natural Heritage.

New Mexico NGO Roundtable presenters

ACOE, NM Department of Game and Fish, NM Riparian Council, NM Wildlife Federation, NM Energy Minerals and Natural Resources Department, NRCS Los Lunas Plant Material Center, Hydra, Inc., La Calandria Associates, NMED Wetlands Program, USFWS, Earth Works Institute, UNM Natural Heritage, SWCA, Playa Lakes Joint Venture, SWQB Watershed Protection Section, EPA Region 6, RCS Southwest, Zeedyk Ecological Consulting, Save Our Bosque Task Force, NM Highlands University, The Quivira Coalition, Nature Conservancy, Restoration Ecology, Inc.

Funding

The original Federal amount was **$292,935.00** which was spent and **$131,620.00** match. The **final match amount** was **$171,474.79 ($39,854.79 overmatched).** See semi-annual reports for details.

Major Project Highlights and Chronology

- This project was approved and funded by EPA Region 6 Wetlands Program on January 29, 2009.

- A Professional Services Agreement with Regents of the University of New Mexico Natural Heritage Program was amended to include the contractual Tasks for this project on May 13, 2009.
- One meeting with the AA-Team was conducted on August 3, 2009 to review and comment on the first Draft User's Manual. The meetings were conducted with some AA-Team members attending and others participating using Ready-Talk. This allowed out-of-state participation and long-range in-state participation without the added time and travel expenses.
- The draft field sheets and protocols were added to the draft NMRAM User's Manual in September 2009.
- Rapid Assessment Field Technical Team Training was conducted on August 10 and 11, 2009 at two of the data collection sites, Rio En Medio and Rio Santa Barbara.

Figure 6. Field Crew members and the Assessment Team go over field sheets during the Technical Team training for collecting NMRAM data.

- NMRAM data was successfully collected from 31 reference sites by the Technical Team in September and October 2009. The Assessment Team accompanied the Technical Team the first days of data collection to ensure that the data collection process would proceed as planned.

Figure 7. Elizabeth Milford (UNM Nat Her) collecting biotic metric data from plant communities at the Rio En Medio Assessment Area during the Technical Team training.

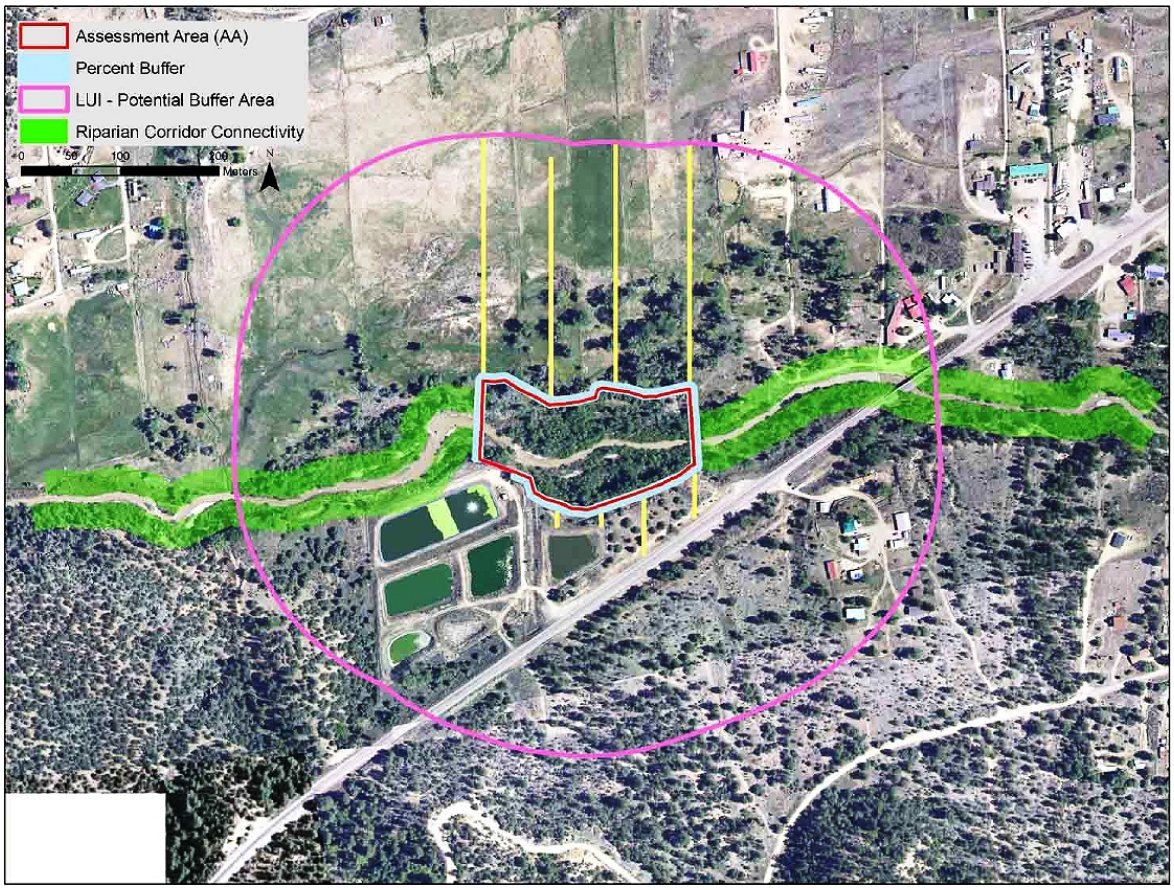

Figure 8. Figure taken from NMRAM Manual Version 1.1 showing how to evaluate the Buffer Integrity and Riparian Corridor Connectivity landscape metrics. The Buffer Percent and Buffer Condition submetrics are evaluated along the perimeter of the AA. The yellow sample lines are extended out from the AA boundary to a maximum of 250 m (820 feet) to measure the Buffer Width submetric. Riparian Corridor Connectivity is evaluated 500 m (1,640 feet) upstream and downstream for 25 meters width each on both banks.

- Data Analysis Meetings convened in January 2010.
- In early 2010, field data were uploaded into a prototype NMWRAD database at UNM Natural Heritage so that data analysis could begin.
- Abiotic, Biotic and Landscape metric review and analysis began in February 2010. The meetings were convened to discuss metrics sensitivity, redundancy, ease of data collection, ratings and other factors. Eight Assessment Team meetings were conducted to complete metric analysis and revisions.
- On September 1, 2010 the AA Team reconvened to review and comment on the results of the multi-metric analysis and revisions to the NMRAM by the Assessment Team.
- In March, 2010, Maryann McGraw, Project Officer and Wetlands Program Coordinator, attended and participated on a panel for the "Assessment of Wetland Condition" at the Association of State Wetland Managers Annual meeting in Shepherdstown, West Virginia.
- The first Agency Wetlands Roundtable meeting under this project was conducted on June 10, 2010. During that meeting Dr. Ric Hauer from the University of Montana

gave a presentation about the imagery he collected for GIS coverage of the URG Wetlands of Interest.

- The Assessment Team decides that the User's Manual will be divided into a Manual and Field Guide and revised chapters of each and appendices are circulated for review.
- Brian Bader, Greg Larson, and Brian Nicholson of SWCA and Maryann McGraw WPC conducted a two day field test of revised metrics in September 2010. Several sites were visited and data were collected using revised landscape, biotic, and abiotic metrics.
- The first end-user's training for NMRAM was conducted October 20-21, 2010 at the State Library in Santa Fe and at two NMRAM data collection sites near Embudo, New Mexico. In addition to the Assessment Team, 23 invited participants attended including representatives of EPA Region 6, US ACOE, USFS, BLM, Taos and Sandia Pueblos, NM Dept. Game and Fish, SWQB and private consultants. Participants' comments were incorporated editorially into the draft Manual and Field Guide.
- In October 2010, a meeting was held with USACE and SWQB 401 personnel to review the NMRAM as a tool for USACE to use for developing mitigation ratios for wetland impacts.
- In January 2010, NGO Wetlands Roundtable efforts were initiated by asking the New Mexico Riparian Council to partner with the Wetlands Program to conduct the meetings. The first New Mexico NGO Wetlands Roundtable was conducted in partnership with the New Mexico Riparian Council on December 3, 2010. The NGO Roundtable was planned with a different agenda from the Agency Roundtable, geared to NGOs, and based on feedback from questions asked of key NGOs that work with the Wetlands Program. The agenda consisted of science speakers, NGO spotlight presentation, updates by key agencies such as the ACOE and a panel discussion or training session in the afternoon.
- Maryann McGraw, Wetlands Program Coordinator, attended the National Wetlands Monitoring and Assessment Work Group meeting in Raleigh, North Carolina, December 7-10, 2010. The process of development of our NMRAM provides a unique "arid state" experience. Expenses were paid for by EPA.
- Meetings of the NM Wetlands Agency Roundtable and the NM Wetlands NGO Roundtable were conducted May 2 and May 5, 2011.
- The NMWRAD Phase 3 Contract was awarded on July 21, 2011 and work on revising the database and including more features is ongoing.
- The WPC participated as a presenter in conducting a NMRAM Workshop for ACOE on October 24-26, 2011.
- The WPC sent copies of the final NMRAM Manual and Field Guide to the ACOE Engineering Research and Development Center (ERDC) for review on December 14, 2011.
- The final versions of the NMRAM Manual and Field Guide **(Version 1.1)** for conducting the NMRAM are completed and printed for use in January 2012.
- The NMWRAD Phase 3 Contract was amended on January 10, 2012 to extend the end date until November 2012.
- Comments were received from Chuck Klimas of the ACOE ERDC on February 13, 2012.

- Meetings of the NM Wetlands Agency Roundtable and the NM Wetlands NGO Roundtable were conducted February 23, 2012 and March 1, 2012. Copies of the NMRAM Manual and Field Guide were distributed to interested stakeholders at these meetings.
- An amendment to an existing IGA for the University of New Mexico Natural Heritage Program to conduct additional VIBI tasks under Task 8 of this project was approved on May 24, 2012. The purpose of the amendment under Task 8 is to expand the validation of the VIBI to include legacy sites where floristic and assessment data have been collected within the reference domain and to calibrate FQI Coefficients of Conservatism against an independent environmental domain. The combination generated an additional 10-15 sites and 30-40 plots for comparing VIBI versus NMRAM scores in the validation process.
- A no-cost extension for the 2008 Wetlands Award was approved on October 31, 2012 to extend the grant to December 2013. Under this project, this time extension was principally used for completing the VIBI Task 8 and for database development.
- The NMRAM Field Guide **(Version 1.2)** is undergoes minor changes to improve the web document.
- The UNM Natural Heritage Program submitted a request to move funds between VIBI contract tasks in November 2012 so that all the final tasks would be completed with funding under this project. In addition, an Amendment #3 was completed to extend the VIBI contract through July, 2013.
- In December 2012, an Interim Final Report was completed for the VIBI under a separate Wetlands Program Development Grant. Some of the work that was to be completed under Task 8 was completed in that report. A letter was developed for EPA to explain the changes in the final reports for the other Wetlands Program Development Grant and Task 8 of this project.
- Data from 6 new sites to expand the reference domain were entered into the NMWRAD database.
- Work under the NMWRAD Phase 3 Contract was completed May 14, 2013, and the database was forwarded to NMED IT for review and acceptance.
- A one-day Botany Booster Training was conducted in June 20, 2013 as an outreach and technical transfer component of this project. About 15 agency and NGO participants attended.
- September 4-6, 2013 the Wetlands Program Coordinator attended a three-day training "Springs Inventory and Assessment" in Flagstaff, Arizona, in preparation for expanding NMRAM in the future to include springs and slope wetlands.
- The Final Report for the "A Vegetation Index of Biotic Integrity for Montane Riverine Wetlands in the Upper Rio Grande Watershed of New Mexico" was received from UNM Natural Heritage Program and accepted on September 24, 2013.
- On September 26, 2013, the WPC and Arlene Gaines (EPA Officer) travel to the Rio Santa Barbara and other URG NMRAM sites near Taos, New Mexico to review the NMRAM field data sheets and data collection methods.
- In November and December 2013, the WPC participated in conference calls with CRAM developers and UNM Nat Her to understand their database for collecting and entering CRAM data. These calls were to investigate their mapping capabilities to use

for further development of NMWRAD. A draft proposal was developed by the San Francisco Estuary Institiute (SFEI) to help develop the mapping portion of the NMWRAD.

- A no-cost extension for the 2008 Wetlands Award was approved on November 25, 2013 to extend the grant to June 30, 2014. Under this project, the time extension was used for transferring the database to NMED from UNM, converting to a compatible database with SWQB water quality databases and developing tasks for future versions of NMWRAD.
- In January 23, 2014 a webex conference call was conducted by SFEI and UNM Natural Heritage to present possible programming next steps for NMWRAD. SFEI presented the capabilities of the CRAM database and also a draft budget.
- On January 31, 2014, NMED IT staff and SWQB management agreed to house the NMWRAD at NMED and to continue with NMWRAD development in-house to ensure compatibility with NMED Oracle systems and future maintenance and upgrades.
- On February 6, 2014 a request was sent to EPA to move remaining project funds to Task 3 NMWRAD development, and was subsequently approved.
- A contract with TechSystems through an NMED Purchase Agreement was awarded to complete the NMWRAD transfer on May 1, 2014.
- An IGA was awarded to UNM to help with the transfer on May 12, 2014.
- A Final Contract Report was received from UNM for the database transfer IGA on July 16, 2013.
- A Final Contract Report was received from TechSystems on July 31, 2014.

List of Major Deliverables

- New Mexico Rapid Assessment Method, Montane Riverine Wetlands Manual Version 1.1 (2011). Hard Copy and NMED Website.
- New Mexico Rapid Assessment Method, Montane Riverine Wetlands Field Guide Version 1.1 Hard Copy, and Version 1.2 improved web document on NMED Website.
- New Mexico Rapid Assessment Method Rank Calculator (CD Version)
- NMRAM Training Materials and sign-in sheets
- NMRAM data sheets and site photos.
- Improved and updated NMWRAD Prototype for Montane Riverine Wetlands Version 1.2.
- Botany Booster Training materials and sign-in sheets.
- Agency and NGO Roundtable agendas and presentations.
- Final Report "A Vegetation Index of Biotic Integrity for Montane Riverine Wetlands in the Upper Rio Grande Watershed of New Mexico."
- Grant and Contract amendments.
- Semi-Annual and Final Reports, Match reporting

Lessons Learned

Comments were received from Chuck Klimas of the ACOE ERDC on February 13, 2012. Principal comments included:

"The use of NMRAM was not specifically described in the NMRAM Manual as appropriate for use in Section 404 permit evaluations and mitigation determination. However with certain changes it could be adapted for that use."

- The Assessment Team is looking into appropriate changes for ACOE use. The ACOE representative, Deanna Cummings, has been part of our NMRAM development during this entire project. The Wetlands Program is currently funded under a separate grant to address Section 404 use of NMRAM.

"NMRAM metrics are currently tailored to one subclass and therefore are not available for use in other subclasses until they are tested or supplemented for broader use."

- This version of NMRAM was developed for one subclass of wetlands to reduce the inherent variability displayed among wetland types so that the NMRAM process could be evaluated as a reliable indicator of wetland condition. NMRAM concentrated on riverine wetlands because it is possibly the most abundant type of wetland in New Mexico and the most impacted. We expect that NMRAM developed for Montane Riverine Wetlands will cover a majority of wetland 404 impacts in New Mexico principally by transportation and pipeline crossings etc. The Corps has given the Assessment Team examples of projects where NMRAM will be used for BAMI procedures. In addition, NMRAM is currently under development for big river systems, depressional wetlands and seeps and springs.

"Methods for determining the WOI do not appear to be applicable and would have to be modified for regulatory requirements to assess a specific project footprint."

- The Assessment Team is currently developing BAMI scenarios under a separate grant where the project footprint would fall within an NMRAM Assessment Area. The Assessment Area would be evaluated using NMRAM metrics before and after impacts to the Assessment Area.

"The reviewer thinks it will take longer than two days with two people to complete a NMRAM assessment primarily because of cross sections and plant ID.

- The NMRAM for Montane Riverine Wetlands has undergone additional refinement under a separate Wetlands Program Development Grant and Version 2.0 will be available in the near future. Version 2.0 has reduced the complexity of the plant metrics. In addition, a narrative will be available in place of the cross-sections for the ACOE NMRAM version.

"Too many worksheets to fill out. Too much expertise is needed."

- The ACOE NMRAM Version is expected to require about as much expertise as a Wetland Delineator might need.

"The range of scores is too limiting especially between the high and low scores to be discriminatory in the intermediate ranges."

- If one expects the metrics to be made simpler, then increasing the range of scores introduces a level of accuracy that is not supported by the data.

"They suggest eliminating metrics that can be collected only during the growing season."

- The NMRAM has been tested outside the growing season and can provide reasonable results unless the project area is covered in snow.

It has been determined that NMRAM can accommodate the suggested changes if needed. Any necessary revisions to accommodate ACOE use are being made as future development of NMRAM and not as a part of this project.

What made the project successful?

This is the first NMRAM for New Mexico and is proving to be a successful tool for identifying 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 development of the NMWRAD and acceptance of SWQB and NMED to upgrade, expand and maintain the database ensures compatibility and integration with other state water quality databases and future EPA databases.

The VIBI Task provided opportunities to expand our VIBI development, to provide outreach and training for using vegetation metrics and understanding IBIs, and provided information about the correlation of biotic indices overall with some of our metrics that are being used for NMRAM.

What made the project not so successful?

The project progressed slower than expected. In 2008, the SWQB lost key staff due to a hiring freeze and staff shortage.

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 NMWRAD 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 work needs to be done to reduce anthropogenic disturbance of wetlands and its affects locally, watershed wide and cumulatively.
- More trainings should be conducted in wetlands assessment methods to engage others in collecting needed wetlands data.
- The VIBI should continue to be developed for wetland subclasses in New Mexico because of its usefulness and relative inexpensive cost compared to other IBIs.
- 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.