

Rio Grande Project Drought Resilience Efforts Initiative

Information on the Quantitative Assessment Sheet (QAS)

This document provides a description of the Quantitative Assessment Sheet (QAS) metrics and discusses the technical assistance available from the NM Water Resources Research Institute (NM WRRI) to complete the QAS.

Table of Contents

1. Quantitative Assessment and Quantitative Assessment Sheet (QAS) Information and Glossary	1
2. Additional information on methodologies for the quantitative assessment assistance	2
3. Background: the NM WRRI-led Stakeholder Process Project and Quantitative Assessment Technical Assistance	10
4. NM WRRI Quantitative Assessment Technical Assistance Team Timelines	10
5. NM WRRI Quantitative Assessment Technical Assistance Team	11
References.....	12
Addendum A - NM WRRI Quantitative Technical Assistance Request Form.....	14

1. Quantitative Assessment and Quantitative Assessment Sheet (QAS) Information and Glossary

Project Quantitative Assessment – The project quantitative assessment is conducted by the Proposal Team (Technical Assistance is available). The project quantitative assessment criteria address the quality of proposed project impacts towards achieving the DRE goals. The Proposal Team will provide with their proposal a completed quantitative assessment sheet (QAS).

Quantitative Assessment Sheet (QAS) - The QAS is a summary and checklist of the biophysical and management characteristics of projects proposed to the Drought Resiliency Efforts (DRE) Program. The QAS functions as a checklist to assemble a key summary and quantitative information to support the NFWF review team to evaluate the projects per the RFP evaluation criteria. The QAS is required per the NFWF RFP. Instructions are included in the QAS.

NM WRRI Quantitative Technical Assistance Request Form (note that this is attached to this document as Addendum A): This information is needed for the NM WRRI Quantitative Assessment Technical Assistance Team to begin assistance with the quantitative assessments and provides the NFWF evaluation team a summary of the key elements of the project.

QAS - NFWF required metrics: The aim of the QAS is to summarize the use of numerical data and regional assessments to objectively measure and quantify the impact of the project on the DRE goals.

NM WRRI Quantitative Assessment Technical Assistance: The NM WRRI Quantitative Assessment Technical Assistance Team will assist the Proposal Teams if requested with the quantitative assessments of the biophysical and management effects on DRE goals of the proposed project for team members to incorporate into their proposals to NFWF.

2. Additional information on methodologies for the quantitative assessment assistance

This section provides additional information for the methodologies used for the hydrologic and habitat quantitative assessments. Note that NM WRRI Quantitative Technical Assistance Request Form is information required for the Quantitative Assessment Technical Support Team to conduct these analyses.

Related to Goal 1. Reduce damage from flooding and sedimentation. (Quantitative Assessment Technical Assistance Team Method for QAS1.3 and QAS1.4)

The NM WRRI Quantitative Assessment Technical Assistance Team has developed an assessment framework using existing hydrologic and hydraulic modeling tools to estimate the comparative flood runoff and flow energy mitigation effects of the proposed projects.

Our approach will quantify changes in runoff volume, peak flow, and infiltration/recharge per treated area by modeling runoff, 2D routing, and recharge under baseline and management scenarios using a GIS analysis utilizing GRASS addons including r.curvenumber (A. Azzam 2025a), r.timeofconcentration (A. Azzam 2025b), and r.runoff (A. Azzam 2025c). The analysis will be conducted for various return periods, from 2-yr to 500-yr storms, using the SCS Curve Number approach (D.R. Maidment 1993). GRASS addons r.curvenumber, r.timeofconcentration, and r.runoff will address quantitative assessment criteria QAS1.3 and QAS1.4 (Figure 1). Proposal Teams may have the expertise to conduct the analysis themselves, and can refer to this link for code instructions: <https://github.com/clawrim/modrio>.

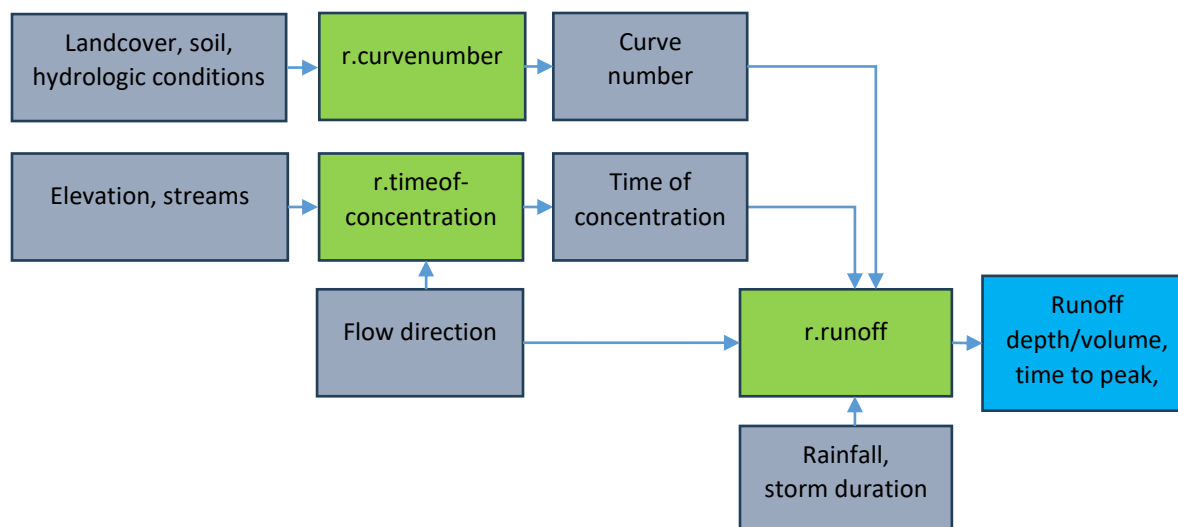


Figure 1. Workflow for Quantitative Assessment Criteria QAS1.3 (peak flow reduction) and QAS1.4 (mean annual runoff change). 2

Related to Goal 2. Promote aquifer recharge through stormwater management. (Quantitative Assessment Technical Assistance Team Method for QAS2.2)

The NM WRRI Quantitative Assessment Technical Assistance Team’s approach as described in Goal 1 will also inform aquifer recharge dynamics. To consider terrain modifications for project

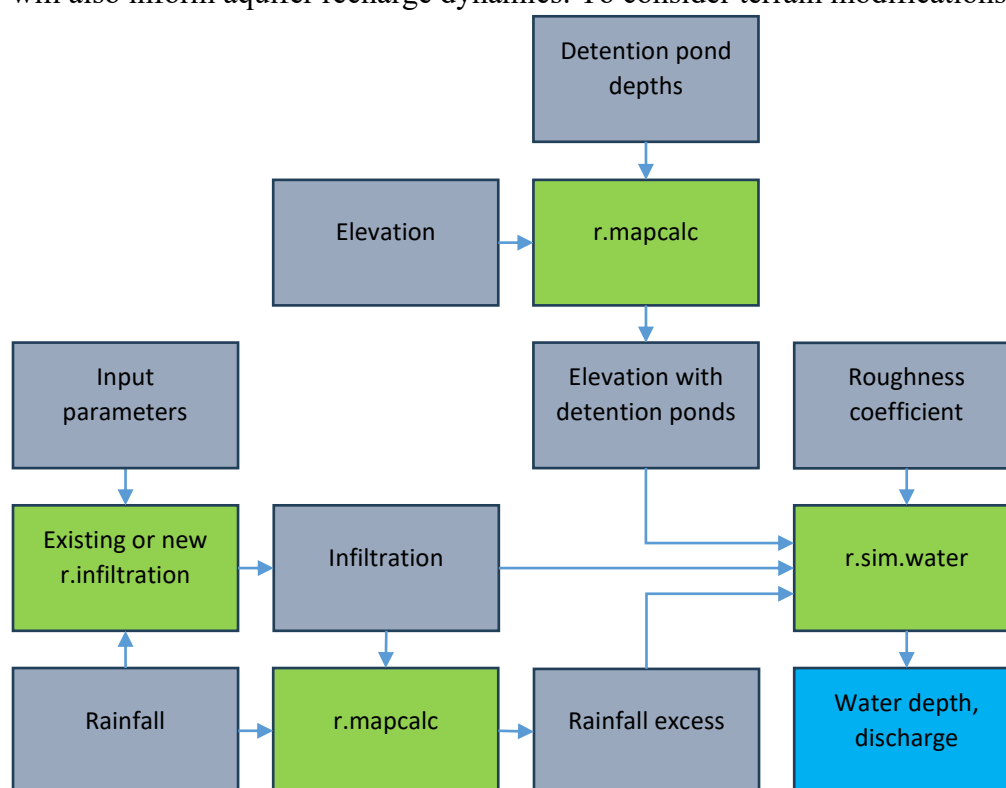


Figure 2. Workflow for Quantitative Assessment Criterion QAS2.2 (recharge volume increase).

practices, we will burn the digital elevation model (DEM) using the provided depth of each practice polygon. This burning process will provide the hydrodynamic model, r.sim.water (H. Mitsova et al., 2004), with more realistic physical representations of the practices, stormwater retention time, and depth. We will develop a new GRASS addon for infiltration rate analysis (e.g., r.infiltration) if no existing GRASS addons can solve any infiltration method. r.sim.water and the new/existing infiltration addon will address quantitative assessment criterion QAS2.2 (Figure 2).

Goal 3. No additional method information beyond the instructions in the QAS.

Related to Required Goal 4 (all projects must include this goal): Create and/or sustain habitat and promote watershed health (**Quantitative Assessment Technical Assistance Team Method for QAS4.4, QAS4.5, QAS4.6, and QAS4.7**)

Quality of general avian and target species habitat restored (as appropriate to site potential). NM WRRI has conducted analysis of groundwater conditions to establish vegetation/habitat site potential. While surface water flows are an important source of water availability that supports habitat, years of low surface water availability have shown to result in critical habitat mortality (U.S. Bureau of Reclamation. 2023a), thus we use groundwater levels as an indicator of site potential that could be relied upon more continuously. Note that a project can consider potential effects on surface water flows and groundwater as a justification for increased project potential. For example, if the team proposes stormwater capture and/or aquifer recharge, the estimated effect would serve as the basis for the habitat site potential. Three tiers of site potential were identified based on depth-to-groundwater trends in habitat areas (Figure 3): (1) target species (SWFL and/or Cuckoo), (2) riparian generalist avian, and (3) upland generalist avian, with a fourth class as unsuitable. The most mesic areas with low soil salinity have potential for target species, areas supporting woody riparian vegetation >15 ft tall (other than cottonwood-willow) have potential for riparian generalist avian habitat, and the driest areas have potential for upland avian habitat. Depth-to-groundwater trends were analyzed using the RGTIHM model groundwater elevation results for the period of 2005-2014 (the latest 10 year period of the current model) (Hanson, R.T. et al 2020). Maximum and minimum values were calculated from monthly time-step data. This model was built and calibrated using available data such as geologic conditions and groundwater wells, but Proposal Teams should note that this data should be seen as indications of trends and not a precise determination of actual groundwater predictions. Actual groundwater levels may vary due to many factors such as pumping and the averaging of estimates in the time-step of the model, thus these estimates are rough averages. During the project development stage, Proposal Teams should complete site observations of existing vegetation conditions and at areas of reference if available (a site that represents the design target) and include descriptions and pictures in the proposal. As well, ideally prior to proposal submission, but at a minimum as a first proposed project task, Proposal Teams should also include in proposals groundtruthing existing conditions and conditions at

areas of reference, including testing soils to determine soil type (texture class), determining depth to groundwater, and surveying existing vegetation conditions to validate the site potential.

We considered only areas where depth to water (DTW) was <25 ft and classified them into four classes: <5 ft (suitable for target species), 5–10 ft (suitable for riparian generalist), 10–15 ft (suitable for upland generalist), and >15 ft (not suitable). These thresholds were based on regionally relevant species' maximum rooting depths from Stromberg (2013), Stromberg & Merrit (2015), Stromberg et al. (1996), and The Nature Conservancy's Plant Rooting Depth Database (accessed 25 August 2025). For example, Goodding's willow (*Salix gooddingii*) has a maximum rooting depth of approximately 6.5–10 ft (Stromberg & Merrit 2015). Ideally, soil type data would also be used to estimate soil water wicking potential and root water availability; however, currently available soils data (NRCS SSURGO) do not include the riparian area.

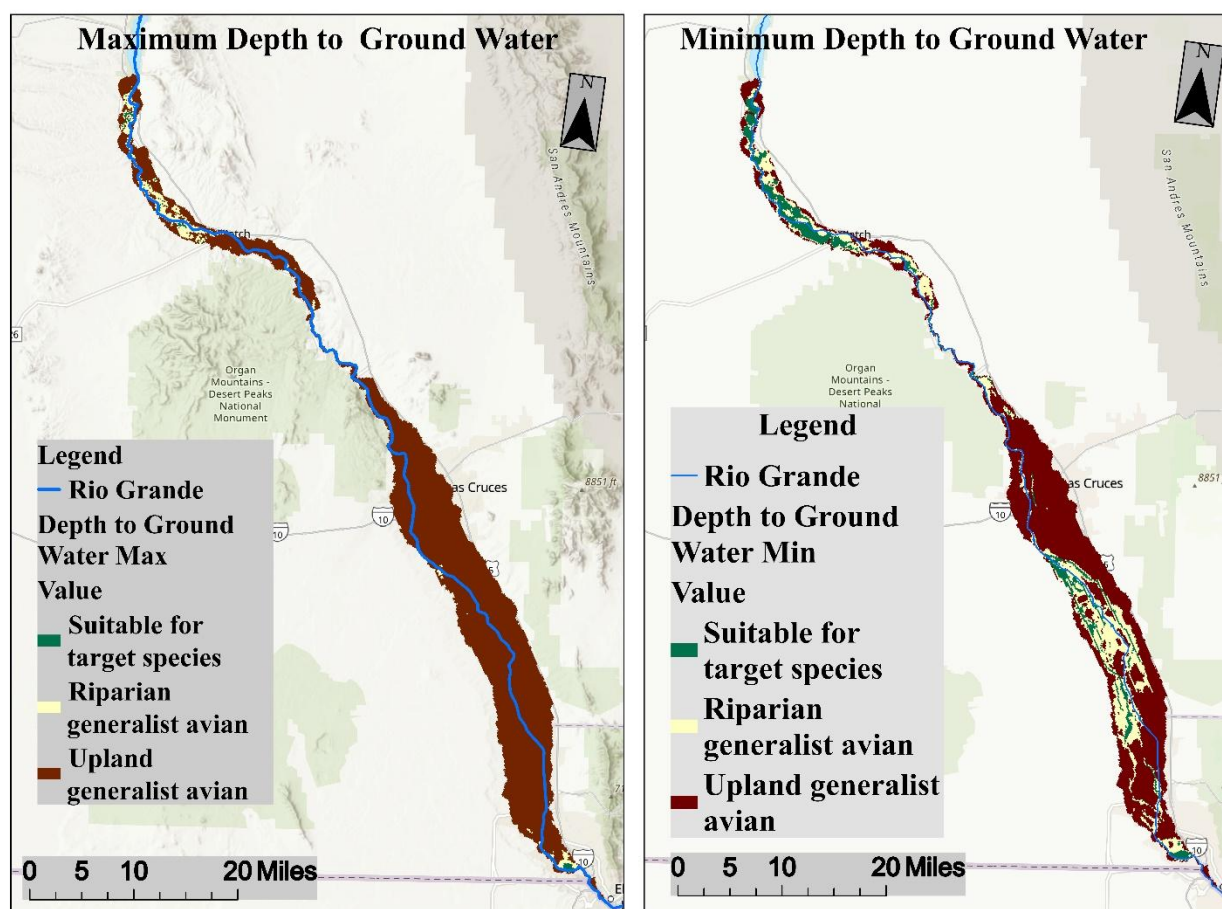


Figure 3: Maximum and Minimum Depth to Groundwater during the major growing season months (March – October, 2005-2014, a period that includes both wet and dry years) in the riparian zone, indicating habitat suitability classes based on root depths of potential habitat. The depth to groundwater levels per category are: Suitable for target species 0'-5', Riparian general avian 5'-15', Upland general avian 15'+. These maps will be made available to Proposal Teams upon release of final assessment criteria.

NM WRRI has identified habitat class specifications which provide objective measures for project aims. The main sources for assessment are habitat assessments that cover the entire region: the Bureau of Reclamation's (BOR) Habitat Assessment Methodology for Southwestern Willow Flycatcher (SWFL) Habitat Classification 2023 (U.S. Bureau of Reclamation. 2023a) and the Western Yellow-billed Cuckoo (Cuckoo) Habitat Classification 2023 report (U.S. Bureau of Reclamation. 2023b), herein referred to as "Reclamation Site Surveys". Note that further assessments contracted by NFWF to create a Bird Habitat Implementation Plan (BHIP) are currently underway and include the region from the north part of the NFWF region down to the Percha Diversion Dam (located 2 miles below the Caballo Dam), and in the event results become available before the RFP is due, they will be incorporated into our regional analysis and distributed as they become available. Both BOR Site Surveys use a scale from 0 to 5, where Class 0 indicates non-habitat, Classes 1 and 2 are considered unsuitable, Class 3 is marginally suitable, Class 4 is suitable, and Class 5 is highly suitable. Unsuitable habitat for SWFL or Cuckoo can be appropriate for other general avian fauna, as they are unsuitable due to patch size, unsuitable due to vegetation height, and lacking sufficient structure or canopy cover. In addition, we also consider the location of the proposed site and how far they are from the existing habitat of SWFL or Cuckoo. Rapid colonization and increased metapopulation stability of SWFL could be accomplished by establishing breeding sites within a maximum of 30 to 40 km (18 to 25 mi) of each other (Paxton et al. 2007, p. 4), with within-season movements of SWFL averaging 3.6 km during the pre-breeding period and up to 13.0 km for individuals switching territories (Paxton et al. 2007, p. 65). Sechrist et al. (2013) reported that Cuckoos moved daily a maximum distance of 0.2–1.7 km, although individuals could cover up a range of 365 m to 3 km within a season. Rather than isolated patches, connected habitat patches have been identified as more beneficial for habitat improvement. Therefore, patches with edges in closer proximity to existing suitable habitat have higher site potential for target species. The assessment process utilizes the Reclamation Site Survey maps to determine how far the proposed site is from Class 4 and 5 locations.

Quantitative assessment habitat approach

By the date of the NFWF RFP release, NM WRRI will provide access to Proposal Teams regional assessment maps (RAMs) and, by request, GIS tools in a geodatabase with layers including New Mexico Riparian Habitat Map (NMRipMap) information, habitat classes and target species survey data layers, groundwater maximums, and groundwater minimums. The NM WRRI Quantitative Assessment Technical Assistance Team can assist the Proposal Teams in assessing how the project supports the proposed habitat improvements per site potential primarily using the maximum depth to groundwater levels for the study period, with a secondary reference to the minimum depth to groundwater levels. Some Proposal Teams may have the expertise to conduct the assessment themselves. The below description outlines the steps to complete the assessment.

For QAS4.4: Proposal Teams should review and reference in their proposals the existing conditions of their site as documented on the NMRipMap. This information can be found on the

RAM or at the NMRipMap website (Muldavin, et al., 2023, <https://nhnm.unm.edu/riparian/NMRipMap>).

For QAS4.5: Relying upon the Proposal Team’s experience or referencing the RAMS, specify the site potential anticipating the results of the proposed project, such as proposed water harvesting or surface water diversions. If the Proposal Team wishes to refer to the RAMs, see the previous section “Quality of general avian and target species habitat restored (as appropriate to site potential)” for a detailed description of the assessment logic and methodology, and find following the steps for the assessment. First, locate the proposed project area on the map and note that these are the historic minimum groundwater and maximum groundwater levels results which the habitat may need to rely upon in years of low water availability. Pick the existing habitat target as indicated by minimum groundwater levels and address in the proposal the water source and anticipated strategies during drought or low water availability. Note that this data is only a rough comparative indicator, and groundtruthing will be required, at a minimum site observations. Also note that additional field or groundtruthed observations and data can be provided to indicate if the site potential indicates greater potential.

- **Suitable for Target species (SWFL and/or Cuckoo)**
- **Riparian general avian**
- **Upland general avian**

For QAS4.6: Considering the existing conditions and the proposed site changes, including for example proposed floodplain reconnection or capture and recharge of stormwater, select the class the Reclamation site surveys currently indicate for habitat potential and the proposed and anticipated class per the below conditions. If your project site potential is not anticipated to support targeted species, you only need to utilize the “SWFL and Riparian and/or Upland generalist avian habitat site potential” list of classes.

What class is your project site currently designated per the Reclamation site surveys, and what class would your project result in?

SWFL and Riparian and/or Upland generalist avian habitat site potential

- **BOR 2023 SWFL Class 0:** *SWFL Non-habitat, upland general avian low diversity suitable*
- **BOR 2023 SWFL Class 1:** *SWFL unsuitable, upland general avian suitable* (Habitat implementation plan assumes patch width of less than 10 m, height 3m or less, and supports avian species but not SWFL)
- **BOR 2023 SWFL Class 2:** *SWFL unsuitable, riparian general avian suitable* (Habitat implementation plan assumes patch width more than 10 m, height 3m or less, and supports avian species but not SWFL due to lack of sufficient structure and density)
- **BOR 2023 SWFL Class 3:** *SWFL marginally suitable, riparian general avian highly suitable* (Habitat implementation plan assumes patch width more than 10 m, height 3m or

less, and supports avian species and *moderately* suitable to SWFL due to lack of sufficient structure and density)

- **BOR 2023 SWFL Class 4:** *SWFL suitable, riparian general avian highly suitable* (Habitat implementation plan assumes patch width 10 m to 30 m, height between 3m and 7 m, and supports avian species and suitable to SWFL)
- **BOR 2023 SWFL Class 5:** *SWFL highly suitable, riparian general avian highly suitable* (Habitat implementation plan assumes patch width 10 m to 30 m, height between 3 m and 7 m, and supports avian species and highly suitable to SWFL)
- **Establish breeding site less than 13 KM from existing habitat** (Paxton et al. 2007, p. 65, Habitat implementation project plan is less than 13 KM from other breeding sites)

Cuckoo habitat site potential

- **BOR 2023 Cuckoo Class 0:** *Cuckoo Non-habitat, upland general avian low diversity suitable*
- **BOR 2023 Cuckoo Class 1:** *Cuckoo unsuitable, upland general avian suitable* (Habitat implementation plan assumes patch width of less than 20 m, height 5 m, and supports avian species but not Cuckoo)
- **BOR 2023 Cuckoo Class 2:** *Cuckoo unsuitable, riparian general avian suitable* (Habitat implementation plan assumes patch width more than 20 m to 35 m, less than 5m, but patch size less than 2 ha, and supports avian species but not suitable for cuckoo due to a lack of vegetation width, patch size and /or species composition)
- **BOR 2023 Cuckoo Class 3:** *Cuckoo marginally suitable, riparian general avian suitable* (Habitat implementation plan assumes patch width more than 20 m to 35 m, height greater than 5m patch size 2 to 5 ha, and supports avian species and marginally suitable cuckoo due to lack of vegetation width, patch size and /or species composition)
- **BOR 2023 Cuckoo Class 4:** *Cuckoo suitable, riparian general avian highly suitable* (Habitat implementation plan assumes patch width more than 50 m to 100 m, height greater than 5m patch size 2 to 5 ha canopy dominated by cottonwood/willow or mixed, and supports avian species and suitable cuckoo due to lack of vegetation width, patch size and /or species composition)
- **BOR 2023 Cuckoo Class 5:** *Cuckoo highly suitable, riparian general avian highly suitable* (Habitat implementation plan assumes patch width m greater than 100 m, height greater than 5m to 15 m, patch size 20 ha, canopy dominated by cottonwood/willow or mixed, and supports avian species and suitable cuckoo due to lack of vegetation width, patch size and /or species composition)
- **Establish breeding site less than 3 km from existing habitat** (Sechrist et al. 2013, Habitat implementation project plan is less than 3 km from other breeding sites)

For QAS4.7: Table 1 provides lists of plant species commonly associated with different soil conditions and groundwater depths that may be encountered in the project area. These species were developed based upon field experience and published literature (e.g. J.S. Stromberg 2013, J.S. Stromberg and D.M. Merritt, 2016) but are offered only as guides for project proponents. It is recognized that some sites will have unique revegetation opportunities and some Proposal Teams may have further experience informing their choice of plants.

Table 1. Potential plant species per general ecosystem conditions

Mesic Riparian	Xeric Riparian
Depth to Water (DTW) ≤6 ft below ground surface (bgs)	DTW >6- ≤12 ft bgs
RG cottonwood (<i>Populus deltoides</i> , <i>ssp wislizeni</i>)	Velvet ash (<i>Fraxinus velutina</i>)
Goodding's willow (<i>Salix gooddingii</i>)	Screwbean mesquite (<i>Strombocarpa pubescens</i>)
Velvet ash (<i>Fraxinus velutina</i>)	Honey mesquite (<i>Strombocarpa glandulosa</i>)
Coyote willow (<i>Salix exigua</i>)	Desert willow (<i>Chilopsis linearis</i>)
Willow baccharis (<i>Baccharis salicina</i>)	Netleaf hackberry (<i>Celtis reticulata</i>)
Torrey wolfberry (<i>Lycium torreyi</i>)	Mule-fat (<i>Baccharis salicifolia</i>)
False indigobush (<i>Amorpha fruticosa</i>)	4-wing saltbush (<i>Atriplex canescens</i>)
Mulefat (<i>Baccharis salicifolia</i>)	Giant sacaton (<i>Sporobolus wrightii</i>)
	Sanddrop seed (<i>Sporobolus cryptandrus</i>)
	mesa dropseed (<i>Sporobolus flexuosus</i>)
Saline Mesic Riparian (clay soils)¹	Upland
DTW ≤6 ft bgs	DTW >12 ft bgs
Screwbean mesquite (<i>Strombocarpa pubescens</i>)	Screwbean mesquite (<i>Strombocarpa pubescens</i>)
Alkali sacaton (<i>Sporobolus airoides</i>)	Honey mesquite (<i>Strombocarpa glandulosa</i>)
Inland saltgrass (<i>Distichlis spicata</i>)	Desert willow (<i>Chilopsis linearis</i>)
Yerba mansa (<i>Anemopsis californica</i>)	4-wing saltbush (<i>Atriplex canescens</i>)
Iodine bush (<i>Allenrolfea occidentalis</i>)	Screwbean mesquite (<i>Strombocarpa pubescens</i>)
	Alkali sacaton (<i>Sporobolus airoides</i>)
	Inland saltgrass (<i>Distichlis spicata</i>)

¹ Soil salinity is typically measured as the electrical conductivity of a soil water extract (i.e., saturated paste EC_e) in units of mmhos/cm or dS/m (mmhos/cm=dS/m). The USDA Salinity Laboratory considers soil to be saline if EC_e is greater than or equal to 4 dS/m. $EC_e > 12$ dS/m is considered extremely saline and beyond the tolerance thresholds for Screwbean mesquite and mulefat.

3. Background: the NM WRRI-led Stakeholder Process Project and Quantitative Assessment Technical Assistance

3.1 Independent Broad-brush Regional Analyses Commonly Shared

The New Mexico Water Resources Research Institute (NM WRRI) is currently underway with the project entitled the “NM WRRI-led Stakeholder Process” Project. The project was awarded through a competitive grant process from NFWF in November 2024 to conduct a community-based assessment process that includes conducting public meetings; gathering local knowledge and feedback; and conducting hydrologic, spatial, and ecological assessments of the region. The NM WRRI-led Stakeholder Process team includes technical experts and community partners in this region, which are creating regional analyses that will be shared with all Proposal Teams when they are complete. The initial regional analyses releases will be no later than the date of the RFP issuance by NFWF, and updates released thereafter as they are completed.

3.2. Quantitative Assessment Technical Assistance

The NM WRRI Quantitative Assessment Technical Assistance Team consists of NMSU and NM WRRI staff and will be available to provide assistance with quantitative assessments in support of project proposals per the quantitative assessment timelines and criteria described in this document. Note that the Proposal Teams will be providing the final assessment with their proposal submittal to the NFWF RFP.

4. NM WRRI Quantitative Assessment Technical Assistance Team Timelines

- Released with NFWF RFP: Attached to the NFWF RFP is the Quantitative Assessment Sheet (QAS). Proposal Teams will submit a QAS as a required upload to their Easygrants application.
- Up to 2 weeks prior to RFP final submissions: Assessment working meeting period with various members of the NM WRRI Quantitative Assessment Technical Assistance Team as necessary to identify and discuss project information needed for Proposal Teams to complete their QAS.
- As soon as possible, no later than February 1, 2026: Proposal Teams may contact NM WRRI Quantitative Assessment Technical Assistance Team if needed to assist with providing quantitative assessment technical assistance and submit the NM WRRI Quantitative Technical Assistance Request Form, within the availability limitations.

The NM WRI Quantitative Technical Assistance Request Form includes the basic information of projects needed to provide assistance.

5. NM WRI Quantitative Assessment Technical Assistance Team

The NM WRI Quantitative Assessment Technical Assistance Team includes NMSU and NM WRI staff.

See Addendum A following References for the NM WRI Quantitative Technical Assistance Request Form

References

- Azzam, A., 2025a. r.curvenumbercurvenumber: Generates the Curve Number raster from the landcover and hydrologic soil group rasters (GRASS GIS 8.5.0dev Addons manual). GRASS Development Team. <https://grass.osgeo.org/grass85/manuals/addons/r.curvenumber.html>.
- Azzam, A., 2025b. r.timeofconcentration: Computes per-cell time of concentration (Tc) using the Kirpich equation from longest upstream flow-path length and path-average slope. (GRASS GIS 8.5.0dev Addons manual). GRASS Development Team. <https://grass.osgeo.org/grass85/manuals/addons/r.timeofconcentration.html>.
- Azzam, A., 2025c. r.runoff: Computes runoff depth, volume and peak discharge for each cell using SCS Curve Number method (GRASS GIS 8.5.0dev Addons manual). GRASS Development Team. <https://grass.osgeo.org/grass85/manuals/addons/r.runoff.html>.
- Hanson, R.T., Ritchie, A.B., Boyce, S.E., Galanter, A.E., Ferguson, I.A., Flint, L.E., Flint, A., and Henson, W.R., 2020, Rio Grande transboundary integrated hydrologic model and water-availability analysis, New Mexico and Texas, United States, and northern Chihuahua, Mexico: U.S. Geological Survey Scientific Investigations Report 2019–5120, 186 p., <https://doi.org/10.3133/sir20195120>.
- Langevin, C.D., Hughes, J.D., Banta, E.R., Provost, A.M., Niswonger, R.G., and Panday, Sorab, 2017, *MODFLOW 6 Modular Hydrologic Model: U.S. Geological Survey Software*, <https://doi.org/10.5066/F76Q1VQV>
- Mitasova, H., Thaxton, C., Hofierka, J., McLaughlin, R., Moore, A., Mitas L., 2004, [Path sampling method for modeling overland water flow, sediment transport and short term terrain evolution in Open Source GIS](#). In: C.T. Miller, M.W. Farthing, V.G. Gray, G.F. Pinder eds., Proceedings of the XVth International Conference on Computational Methods in Water Resources (CMWR XV), June 13-17 2004, Chapel Hill, NC, USA, Elsevier, pp. 1479-1490. <https://grass.osgeo.org/grass85/manuals/r.sim.water.html>.
- Muldavin, E., E. Milford, J. Triepke, C. Gonzalez, A. Urbanovsky, G. McCartha, A. Kennedy, Y. Chauvin, J. Smith, J. Leonard, L. Elliot, P. Hanberry, D. Diamond, and A.E. Clark. 2023. *New Mexico Riparian Habitat Map (NMRipMap): Version 2.0 Plus*. New Mexico Natural Heritage, Museum of Southwestern Biology, University of New Mexico; USDA Forest Service, Southwest Region; Missouri Resource Assessment Partnership (MoRAP), University of Missouri, and USDA Forest Service, Geospatial Technology and Applications Center (GTAC), Salt Lake City, UT. Accessible at nhnm.unm.edu/riparian/nmripmap.
- National Drought Mitigation Center (NDMC), the U.S. Department of Agriculture (USDA), and the National Oceanic and Atmospheric Administration (NOAA). Website accessed 2025. <https://www.drought.gov/> and <https://www.drought.gov/data-maps-tools/us-drought-monitor>.

- Paxton, E.H., Sogge, M.K., Durst, S.L., Theimer, T.C., and Hatten, J.R., 2007, *The ecology of the southwestern willow flycatcher in central Arizona—a 10-year synthesis report: U.S. Geological Survey Open-File Report 2007-1381*, 143 pp.
- Ritchie, A.B., Galanter, A.E., Flickinger, A.K., Shephard, Z.M., and Ferguson, I.M., 2022, *Update and recalibration of the Rio Grande Transboundary Integrated Hydrologic Model, New Mexico and Texas, United States, and northern Chihuahua, Mexico: U.S. Geological Survey Scientific Investigations Report*, <https://doi.org/10.3133/sir20225045>.
- Sechrist, J., Ahlers, D.D., Zehfuss, K.P., Doster, R.H., Paxton, E.H. and Ryan, V.M., 2013. Home range and use of habitat of Western Yellow-Billed Cuckoos on the middle Rio Grande, New Mexico. *The Southwestern Naturalist*, pp.411-419.
- Stromberg, J.C., 2013. Root patterns and hydrogeomorphic niches of riparian plants in the American Southwest. *Journal of Arid Environments*, 94, pp.1-9.
- Stromberg, J.C. and Merritt, D.M., 2016. Riparian plant guilds of ephemeral, intermittent and perennial rivers. *Freshwater Biology*, 61(8), pp.17.
- Stromberg, J.C., Tiller, R. and Richter, B., 1996. Effects of groundwater decline on riparian vegetation of semiarid regions: the San Pedro, Arizona. *Ecological Applications*, 6(1), pp.113-131.
- U.S. Bureau of Reclamation. 2023 a, January. *Southwestern Willow Flycatcher Habitat Classification: Lower Rio Grande from Elephant Butte Dam to American Diversion Dam (Technical Report No. ENV-2023-096)*. U.S. Department of the Interior.
- U.S. Bureau of Reclamation. 2023 b , January. *Western Yellow-billed Cuckoo Classification2023: Lower Rio Grande from Elephant Butte Dam to American Diversion Dam (Technical Report No. ENV-2023-097)*. U.S. Department of the Interior.

Information on the Quantitative Assessment Sheet (QAS)

Addendum A - NM WRRRI Quantitative Technical Assistance Request Form

(next page)

NM WRRI Quantitative Technical Assistance Request Form		
#	Assessment Criteria	Checklist/ Information
	<p>Information Required for QA Technical Assistance: Note that the NM WRRI team will utilize the information provided here to estimate and provide comparative quantifications on the hydrologic and habitat dynamics. See Information on the QAS and NM WRRI Quantitative Technical Assistance section 5 for additional information on the methods.</p> <p>Note that if a project includes an initial planning stage, Proposal Teams should submit the general area and the specifications that would guide their team's design.</p> <p>Please provide this form to alamosa@nmsu.edu as soon as possible, no later than February 1, 2026.</p>	
1	<p>Proposal name.</p> <hr/> <p>Contact information</p> <p>Contact name: _____</p> <p>Contact entity: _____</p> <p>Contact email: _____</p> <p>Contact phone #: _____</p>	<input type="checkbox"/> complete
2	<p>Goals addressed. All projects must address at minimum two of the four goals, with a requirement that one be #4. Check all that apply.</p> <ol style="list-style-type: none"> 1. <input type="checkbox"/> Reduce damage from flooding and sedimentation 2. <input type="checkbox"/> Promote aquifer recharge through stormwater management 3. <input type="checkbox"/> Improve infrastructure to manage water 4. <input type="checkbox"/> (Required goal) Create and/or sustain habitat and promote watershed health 	<input type="checkbox"/> complete
3	<p>Project overall concept and anticipated benefits. In Notes section, provide a brief description of overall project concept and anticipated benefits (max 250 words).</p> <p><u>Notes:</u></p> <hr/>	<input type="checkbox"/> complete

4	<p>Proposed strategies (per the public ranking as outlined below), check below all that are proposed:</p> <ol style="list-style-type: none"> 1. <input type="checkbox"/> Restore upper watersheds to reduce floods and sediments washing into the valley, including adapting grazing management to advance and support restoration and respond to droughts 2. <input type="checkbox"/> Projects that recharge groundwater aquifers through capturing a portion of stormwater/flood flows and/or maintaining flows for downstream riparian areas 3. <input type="checkbox"/> Achieve groundwater resiliency for today and future generations (recharge to the aquifer is balanced with groundwater use by combinations of strategies) 4. <input type="checkbox"/> Create and/or sustain areas of bosque (which has river health, wildlife habitat, and recreation benefits), with an emphasis on high quality habitat for native riparian birds 5. <input type="checkbox"/> Integrated river management program to restore a bosque, natural river health and functions, and riparian habitat throughout the river corridor 6. <input type="checkbox"/> Use of stormwater/flood flows as an alternative water source for agriculture and bosque riparian areas 7. <input type="checkbox"/> Add ability for flood control dams to store stormwater for agricultural and recharge use 8. <input type="checkbox"/> Policies and programs to voluntarily incentivize farm water demand reduction and conservation (e.g. cover crops, shifts to profitable low-water use crops) 9. <input type="checkbox"/> Reduce flood risks and sediment transport into valley through improving built infrastructure 10. <input type="checkbox"/> Improve Elephant Butte Irrigation District infrastructure to conserve water 11. <i>Other major strategy categories provided by survey participants:</i> <ol style="list-style-type: none"> a. <input type="checkbox"/> Increase water quality and safety b. <input type="checkbox"/> Include public education and engagement in projects c. <input type="checkbox"/> Modify governance and increase planning 12. Other not included above, but are eligible under this program <hr/>	<input type="checkbox"/> complete
5	<p>Description of the implementation practices (or BMPs). In the notes section, provide a brief description of the practices that are proposed to be implemented, including the life expectancy of each practice (max 250 words). Note that details on plantings are to be included in #10. In the checklist/metrics column include areas of potential stormwater inundation.</p>	<input type="checkbox"/> complete <hr/>

	<u>Notes:</u> 	acres of inundation
6	Project extent polygon (kml or shapefile, file name format: [Prime applicant abbreviation]_LRGDRE_[1-2 word project description]_polygon.pdf Attachment file name: _____	<input type="checkbox"/> attached
7	Preliminary diagram. Include a diagram depicting the anticipated approach including volume dimensions of any land surface changes, diversion areas, and areas of restoration defined (pdf). File name format: [Prime applicant abbreviation]_RGDRE_[1-2 word project description]_diagram.pdf Attachment file name: _____	<input type="checkbox"/> attached
8	Riparian restoration. Enter # of riparian acres restored, including riparian buffers to benefit native riparian vegetation and federally protected birds. In NOTES section, specify landcover type prior to planting (barren, cropland, grassland), dominant vegetation being planted (Broadleaf, Conifer, Shrub, Grass, Marsh, Wet meadow, Swamp), and average width of riparian buffer. <u>Notes:</u>	_____ # of riparian acres restored
9	Non-riparian restoration. Enter # of acres restored. In Notes section, specify landcover type prior to planting (barren, cropland, grassland), dominant vegetation being planted (Broadleaf, Conifer, Shrub, Grass, Marsh, Wet meadow, Swamp). <u>Notes:</u>	_____ # of non- riparian acres restored
10	Revegetation strategies. In Notes section, specify the proposed quantities and species of plants and plant communities, targeted density or plant cover, the water source, and other practices to sustain revegetation over time. <u>Notes:</u>	<input type="checkbox"/> complete
11	Project site assessment. Conduct during the project development stage, provide in Notes section descriptions and attach pictures of site observations of existing vegetation conditions and at areas of reference if available (a site that represents the design target).	<input type="checkbox"/> complete

	<u>Notes:</u>	
--	---------------	--