Most Likely Strategies and Methods by Reach Attachment

This attachment shows which strategies are suitable in each reach, the method categories, , how they are associated with each strategy, and the most likely methods for each reach. The most likely methods by reach are based upon the most likely strategies and the methods most commonly used to implement each strategy. Methods can be used as part of a reach strategy or to address site-specific river maintenance purposes. The suitability and effectiveness of a given method are a function of the inherent properties of the method, the physical characteristics of the reach, and the reach strategy. As such, there is no single method that applies to all situations; and while the most commonly used methods have been identified for each reach, other methods also may be used. In addition, new methods are likely to be developed in the future that will be described in future reach or site-specific biological assessments. Table 1 shows which strategies are most suitable for each reach. Additional information may be found in the report entitled, *Middle Rio Grande River Maintenance Program Comprehensive Plan and Guide, Appendix A* (Reclamation 2012).

Table 2 contains the most applicable method category for each strategy. For a given strategy, more than one method category can apply.

Table 3 is the most applicable methods for each reach. For a given strategy and reach, more than one method can apply. The combination of methods used depends upon local river conditions, reach trends, reach constraints, and the inherent properties of the method.

References

Reclamation. 2012. *Middle Rio Grande River Maintenance Program Comprehensive Plan and Guide, Appendix A*, U.S. Department of the Interior, Bureau of Reclamation, Upper Colorado Region, Albuquerque Area Office, Technical Services Division, Albuquerque, NM.

Table 1. Summary of Most Likely Strategies by Reach

	Promote Elevation Stability	Promote Alignment Stability	Reconstruct/ Maintain Channel Capacity	Increase Available Area to the River	Rehabilitate Channel and Flood Plain	Manage Sediment
Velarde to Rio Chama	Not Suitable	Suitable	Not Suitable	Suitable	Suitable	Not Suitable
Rio Chama to Otowi Bridge	Suitable	Suitable	Not Suitable	Suitable	Suitable	Not Suitable
Cochiti Dam to Angostura Diversion Dam	Suitable	Suitable	Not Suitable	Suitable	Suitable	Not Suitable
Angostura Diversion Dam to Isleta Diversion Dam	Suitable	Suitable	Not Suitable	Not Suitable	Suitable	Suitable
Isleta Diversion Dam to Rio Puerco	Suitable	Not Suitable	Suitable	Suitable	Suitable	Suitable
Rio Puerco to San Acacia Diversion Dam	Not Suitable	Suitable	Not Suitable	Suitable	Suitable	Not Suitable
San Acacia Diversion Dam to Arroyo de las Cañas	Suitable	Suitable	Not Suitable	Suitable	Suitable	Suitable
Arroyo de las Cañas to San Antonio Bridge	Suitable	Not Suitable	Suitable	Not Suitable	Not Suitable	Suitable
San Antonio Bridge to River Mile 78	Suitable	Not Suitable	Suitable	Suitable	Not Suitable	Suitable
River Mile 78 to Full Pool Elephant Butte Reservoir Level	Suitable	Not Suitable	Suitable	Suitable	Not Suitable	Suitable

Table 2. Method Categories Associated with Strategies

Method	Promote Elevation Stability	Promote Alignment Stability	Reconstruct/ Maintain Channel Capacity	Increase Available Area to the River	Rehabilitate Channel and Flood Plain	Manage Sediment
Infrastructure Relocation or Setback				X		
Channel Modification			X		X	X
Bank Protection/ Stabilization		X				
Cross Channel (River Spanning) Features	X					
Conservation Easements				X	X	
Change Sediment Supply						X

Table 3. Most Likely Methods for Each Reach[1]

Method	Velarde to Rio Chama	Rio Chama to Otowi Bridge	Cochiti Dam to Angostura Diversion Dam	Angostura Diversion Dam to Isleta Diversion Dam	Isleta Diversion Dam to Rio Puerco	Rio Puerco to San Acacia Diversion Dam	San Acacia Diversion Dam to Arroyo de lasCañas	Arroyo de las Cañas to San Antonio Bridge	San Antonio Bridge to River Mile 78	River Mile 78 to Full Pool Elephant Butte Reservoir Level
Infrastructure Relocation or Setback	X	X	X		X	X	X		X	X
Channel Modification										
Complete Channel Reconstruction and Maintenance					X			X	X	X
Channel Relocation Using Pilot Channels or Pilot Cuts	X	X	X	X	X	X	X	X	X	X
Island and Bank Clearing and Destabilization	X	X	X	X	X	X	X			
Bankline Embayment			X	X	X	X	X			
Pilot Cuts Through Sediment Plugs								X	X	X
Side Channels (High Flow, Perennial, and Oxbow Re-establishment)	X	X	X	X	X	X	X			
Longitudinal Bank Lowering or Compound Channels	X	X	X	X	X	X	X			
Longitudinal Dikes					X			X	X	X
Levee Strengthening								X	X	X
Jetty/Snag Removal	X	X	X	X	X	X	X	X	X	X
Bank Protection/Stabilization										
Longitudinal Features-										
Riprap Revetment	X	X	X	X		X	X			
Other Type of Revetments	X	X	X	X		X	X			

Table 3. Most Likely Methods for Each Reach[1]

Method	Velarde to Rio Chama	Rio Chama to Otowi Bridge	Cochiti Dam to Angostura Diversion Dam	Angostura Diversion Dam to Isleta Diversion Dam	Isleta Diversion Dam to Rio Puerco	Rio Puerco to San Acacia Diversion Dam	San Acacia Diversion Dam to Arroyo de lasCañas	Arroyo de las Cañas to San Antonio Bridge	San Antonio Bridge to River Mile 78	River Mile 78 to Full Pool Elephant Butte Reservoir Level
Longitudinal Stone Toe with Bioengineering	X	X	X	X		X	X			
Trench Filled Riprap	X	X	X	X		X	X			
Riprap Windrow	X	X	X	X		X	X			
Deformable Stone Toe /Bioengineering and bank lowering		X	X	X		X	X			
Bioengineering	X	X		X		X	X			
Riparian Vegetation Establishment	X	X	X	X		X	X			
Transverse Features or Flow Deflection Techniques										
Bendway Weirs		X	X	X		X	X			
Spur Dikes		X	X	X		X	X			
Vanes or Barbs		X	X	X		X	X			
J-Hook		X	X	X		X	X			
Trench Filled Bendway Weirs		X	X	X						
Boulder Groupings	X	X	X	X		X	X			
Rootwads	X	X	X	X		X	X			
Large Woody Debris	X	X	X	X		X	X			
Cross Channel (River Spanning) Features										
Grade Control										
Deformable Riffles		X	X	X	X		X			
Rock Sills		X	X	X	X		X			
Riprap Grade Control (With or Without Seepage)		X	X	X	X		X			

Table 3. Most Likely Methods for Each Reach[1]

Method	Velarde to Rio Chama	Rio Chama to Otowi Bridge	Cochiti Dam to Angostura Diversion Dam	Angostura Diversion Dam to Isleta Diversion Dam	Isleta Diversion Dam to Rio Puerco	Rio Puerco to San Acacia Diversion Dam	San Acacia Diversion Dam to Arroyo de lasCañas	Arroyo de las Cañas to San Antonio Bridge	San Antonio Bridge to River Mile 78	River Mile 78 to Full Pool Elephant Butte Reservoir Level
Gradient Restoration Facility (GRF)		X	X	X	X		X			
Low-Head Stone Weirs (Loose Rock)		X	X	X	X		X			
Conservation Easements	X	X	X	X	X	X	X		X	X
Change Sediment Supply										
Sediment Augmentation (Sand Sizes)					X		X			
Natural or Constructed Sediment Basins								X	X	X

[1]This table identifies the most likely methods to be used in each reach. Due to river channel variability, every method may be used in each reach.