



**Figure 1:** Geomorphic reaches, sub-reaches and segments of the Middle Rio Grande. Reaches represent major geomorphic shifts caused by sediment source and slope changes. A sub-reach is designated by either a diversion dam or a significant geomorphic change within the larger reach category. A segment is designated by a lesser geomorphic shift. In the "Site" column, "L"= location of a long term site, "S"= location of a supplemental site.

## **Middle Rio Grande Habitat Reach Break Outs**

Pueblo Division (Cochiti Reservoir to Corrales Siphon) rm 232.6 to rm 200

    Pena Blanca Reach (Cochiti Reservoir to Angostora) 232.6 to 209.7

        Cochiti Dam Segment (Cochiti Dam to Rio Galisteo confluence) 232.6 to 225.0

        Rio Galisteo Segment (Rio Galisteo confluence to Borrego Canyon confluence)  
            225.0 to 220.0

        Borrego Canyon Segment (Borrego Canyon confluence to Angostora Dam) 220.0  
            to 209.7

    Bernalillo Reach (Angostura Dam to Corrales Siphon) 209.7 to 200.0

        Rio Jemez Segment (Angostura Dam to Arroyo Venada confluence) 209.7 to  
            202.5

        Arroyo Venada Segment (Arroyo Venada confluence to Arroyo de las Lomas  
            Negras confluence) 202.5 to 200.0

Albuquerque-Belen Division (Rio Rancho to Rio Puerco Confluence) rm 200 to rm 127

    Albuquerque Valley Reach (Arroyo de las Lomas Negras confluence to Isleta Dam) rm  
    200.0 to rm 169.3

        Lomas Negras Segment (Arroyo de las Lomas Negras confluence to  
            AMAFCA North Diversion Channel confluence) 200.0 to 194.2

        North AMAFCA Segment (AMAFCA North Diversion Channel confluence to  
            San Antonio Arroyo confluence) 194.2 to 186.8

        San Antonio Arroyo Segment (San Antonio Arroyo confluence to Amafca South/  
            WWT) 186.8 to 177.0

        South AMAFCA Segment (AMAFCA South Diversion Channel confluence to  
            Isleta Dam) 177.0 to 169.3

    Isleta Reach (Isleta Dam to Rio Puerco confluence) rm 169.3 to rm 127

        Isleta Narrows Segment (Isleta Dam to Peralta Wasteway confluence) rm 169.3 to  
            152.5

        Peralta Wasteway Segment (Peralta Wasteway confluence to Abo Arroyo  
            confluence) 152.5 to 139.3

        Abo Arroyo Segment (Abo Arroyo confluence to U.S. Highway 60 bridge) rm  
            139.3 to 130.6

        U.S. Highway 60 Segment (U.S. Highway 60 Bridge to Rio Puerco Confluence)  
            130.6 to 127.0

Socorro Division (Rio Puerco confluence to Elephant Butte Reservoir narrows) rm 127 to rm 58

    Sevilleta Reach (Bernardo Arroyo Confluence to San Acacia Dam) 121.8 to 116.2

        Rio Puerco Segment (Rio Puerco confluence to Bernardo Arroyo confluence)  
            126.5 to 121.8

        Bernardo Arroyo Segment (Bernardo Arroyo confluence to Rio Salado  
            confluence) 121.8 to 119.0

        Rio Salado Segment (Rio Salado confluence to San Acacia Dam) 119.0 to 116.2

    Socorro Valley Reach (San Acacia Dam to South Bosque del Apache NWR) 116.2 to  
    178.0

        San Acacia Dam Segment (San Acacia Dam to Arroyo De La Parada confluence)

116.2 to 105.2  
Escondida Segment (Arroyo De La Parada confluence to Arroyo de las Canas confluence) 105.3 to 95.2  
Bosque Del Apache Segment (Arroyo de las Canas confluence to South Bosque del Apache) 95.2 to 78.0  
Black Mesa Reach (South Bosque del Apache to Lumbre Canyon confluence) 78.0 to 58.0  
Tiffany Segment (South Bosque del Apache to San Marcial Narrows) 78.0 to 64.0  
Elephant Butte Delta Segment (San Marcial Narrows to Lumbre Canyon confluence) 64.0 to 58.0

### **Explanation of Break outs:**

#### **Divisions:**

Divisions represent the broadest geomorphic differences within the Middle Rio Grande. There are 3 major geomorphic divisions: Pueblo, Albuquerque-Belen, Socorro.

The Pueblo Division is typified by: sediment starvation, a narrow incised channel, a meandering planform, a completely disassociated flood-plain. The reach spans from Cochiti Reservoir to Corrales siphon. The lower end of this reach has expanded southward in the last 5 years. 1992 statistics: average width= 393', width standard deviation= 159', slope= .0013.

The Albuquerque-Belen Division is typified by: armored bank (jetty jacks and Russian Olive trees), uniform channel width, braided planform (approaching meandering in places with bar stabilization), sand bars, disconnected flood-plain. 1992 statistics: average width= 550', width standard deviation= 90', slope= .0008.

The Socorro Division is typified by: wide and dynamic channel alternating with a narrow channel with frozen banks, sediment complexities, a large percentage of connected flood-plain. 1992 statistics: average width= 596', width standard deviation= 431', slope= .00057.

#### **Reaches:**

Reaches represent breaks caused by a diversion dam or a significant geomorphic change. Reaches have designated with the inclusion of the 3 major diversion dams of the Middle Rio Grande (Angostora, Isleta and San Acacia) as well as the final narrow channel of the Socorro Division (south end of Bosque Del Apache WNR to Elephant Butte Reservoir).

#### **Segments:**

Segments represent either a lesser geomorphic shift or a significant change in flow caused by an irrigation return.

#### **Segments in the Pueblo Division:**

- Cochiti: very sediment starved, cobble/ gravel/ sand substrate (Richards, 2000)
- Rio Galisteo: Increased sand from Rio Galisteo (Richards, 2000)
- Borrego Canyon: less incision due to downstream control by Angostora Diversion (Richards, 2000).
- Rio Jemez: below Angostora, restoration location for Santa Ana Pueblo
- Arroyo Venada: transition into Albuquerque-Belen Division, channel begins to widen, recent transition to single thread channel.

**Segments in ABQ-Belen Division:**

- Lomas Negras: transition from Pueblo Division, wider channel from Pueblo Division, active sand bar armoring (?).
- North AMAFCA: wide braided channel, locally dynamic banks
- San Antonio Arroyo: many frozen sand bars (frozen by vegetation), narrow channel associated with frozen sand bars, Albuquerque bridges.
- South AMAFCA: Increase in flow and contaminants from ABQ WWT.
- Isleta Narrows: Susceptible to drying.
- Peralta Wasteway: Increased base flows from Peralta Wasteway.
- Abo Arroyo: Increased sediment from Abo Arroyo.
- U.S. Highway 60: increased channel sinuosity from upstream, decreased bank stability from upstream.

**Segments in Socorro Division:**

- Rio Puerco: Increased sediment and flows from Rio Puerco, wide active channel (Richards, 2000).
- Bernardo Arroyo: narrow channel (Richards, 2000).
- Rio Salado: wide channel with good flood plain connectivity, due increased sediment and flows for the Rio Salado and control caused by San Acacia Diversion Dam (Richards, 2000)
- San Acacia Dam: incised, gravel-sand bed, disconnected flood plain.
- Escondida: semi-stable bed elevation, wide and narrow segments, flood plain connectivity at 5000 cfs in wide sections.
- Bosque Del Apache: active sediment aggradation, wide-narrow-wide, flood plain connectivity at 3000 cfs in wide sections..
- Tiffany: very narrow channel, active sediment aggradation.
- Elephant Butte Delta: anastomosing deltaic channel form.