3. Background

This section provides a general overview of the characteristics of the Taos Water Planning Region. Additional detail on the climate, water resources, and demographics of the region is provided in Sections 5 and 6. Maps illustrating the land use and general features of the region that were prepared by the New Mexico Water Resources Research Institute are provided in Appendix B.

3.1 General Description of the Planning Region

The Taos Region includes all of Taos County plus the portion of the Embudo watershed that lies within northeastern Rio Arriba County. The region is bounded by Colorado to the north, Rio Arriba County to the west, Rio Arriba and Mora Counties to the south, and Mora and Colfax Counties to the east. The total area of the Taos Region is 2,300 square miles. The highest point in the region is Wheeler Peak in the Sangre de Cristo Mountains, at 13,161 feet, and the lowest point is near the confluence of Embudo Creek and the Rio Grande, at about 5,830 feet (Figure 3-1). For this water plan, the Taos Region has been divided into four subregions (Figure 1-2) based on watershed boundaries.

Two pueblos are located in the region: Taos Pueblo and Picuris Pueblo. A large amount of federal (U.S. Forest Service and Bureau of Land Management) land and a smaller amount of state land are also present in the region (Figure 3-2).

The Rio Grande Gorge cuts through the center of the region. West of the gorge, the Taos Plateau (Figure 3-1) is a basalt-capped mesa with numerous extinct volcanoes. East of the gorge, the Costilla Plains province consists of alluvial-fan and valley-fill sediments that slope gently down from and were derived from the Sangre de Cristo Mountains to the east. The Sangre de Cristo Mountains province spans the eastern side of the planning region. This province is an upthrown fault block composed of Precambrian granite, gneiss, schist, quartzite and pegmatites, with Paleozoic-age sedimentary rocks in the south.

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TAOS REGIONAL WATER PLAN

Regional Map

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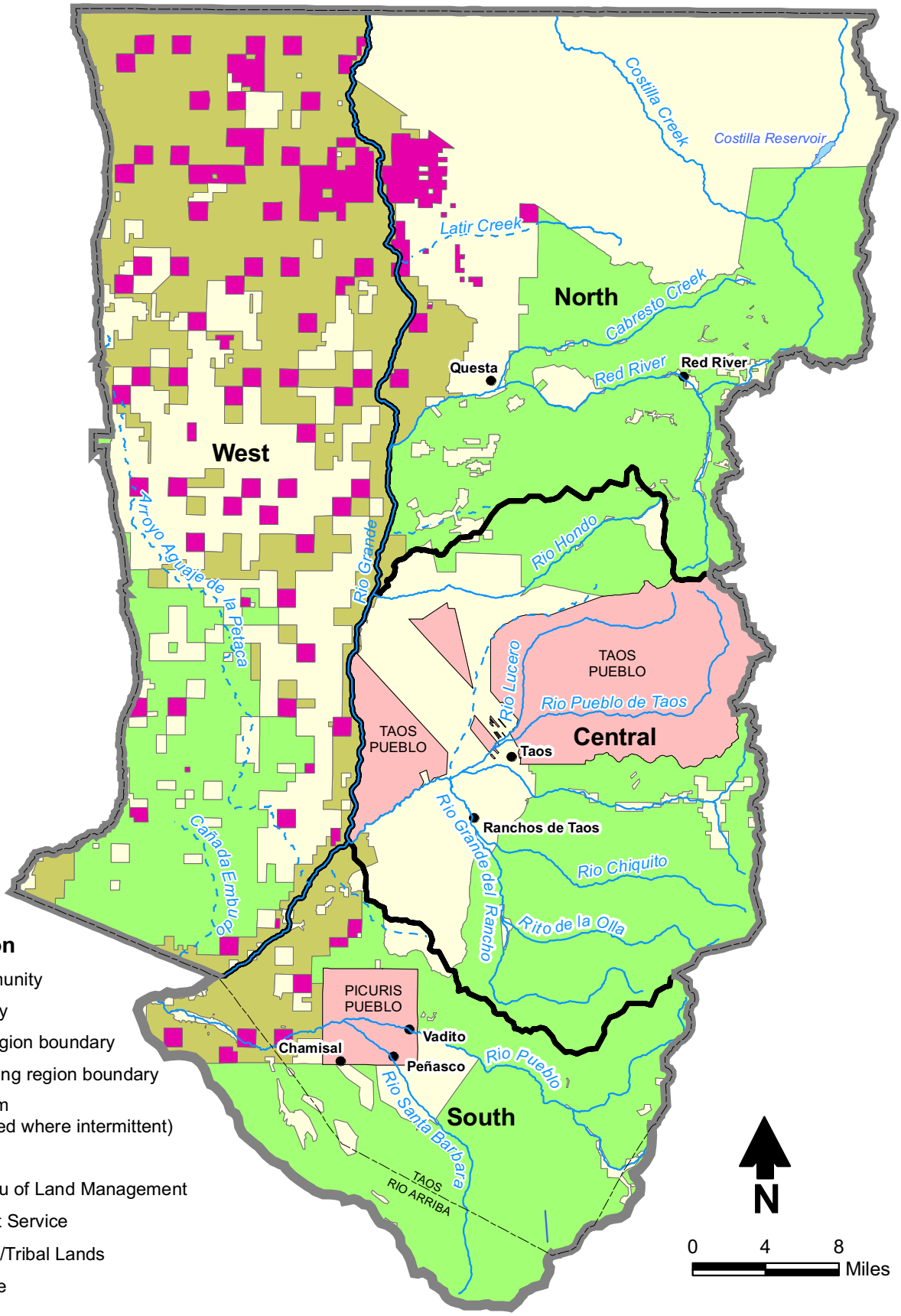
Figure 3-1



Explanation

- Community
- County
- Subregion boundary
- Planning region boundary
- Stream (dashed where intermittent)

Land owner

- Bureau of Land Management
- Forest Service
- Indian/Tribal Lands
- Private
- State
- State Park

TAOS REGIONAL WATER PLAN

Land Ownership

Figure 3-2

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M:/PROJECTS/WR05.0077_TAOS_REGIONAL_WATER_PLAN/GIS/MXDS/FINAL_REPORT/FIG3-2_LAND_OWNERSHIP.MXD 707211

The Taos Plateau and the Costilla Plains are within the southern part of the San Luis Basin. The basin extends north into Colorado and south to where the Embudo constriction separates the San Luis Basin from the Española Basin within the Rio Grande Rift (Coons and Kelly, 1984). In the Taos Region the San Luis Basin is bound on the east by the Sangre de Cristo Mountains.

Vegetation on the Taos Plateau is primarily desert scrub. The vegetation in the Sangre de Cristo Mountains consist primarily of subalpine coniferous forests with a smaller portion of montane coniferous forests, and vegetation in the Costilla Plains is a mix of juniper savanna, coniferous forest, and mixed woodland (Figure 3-3).

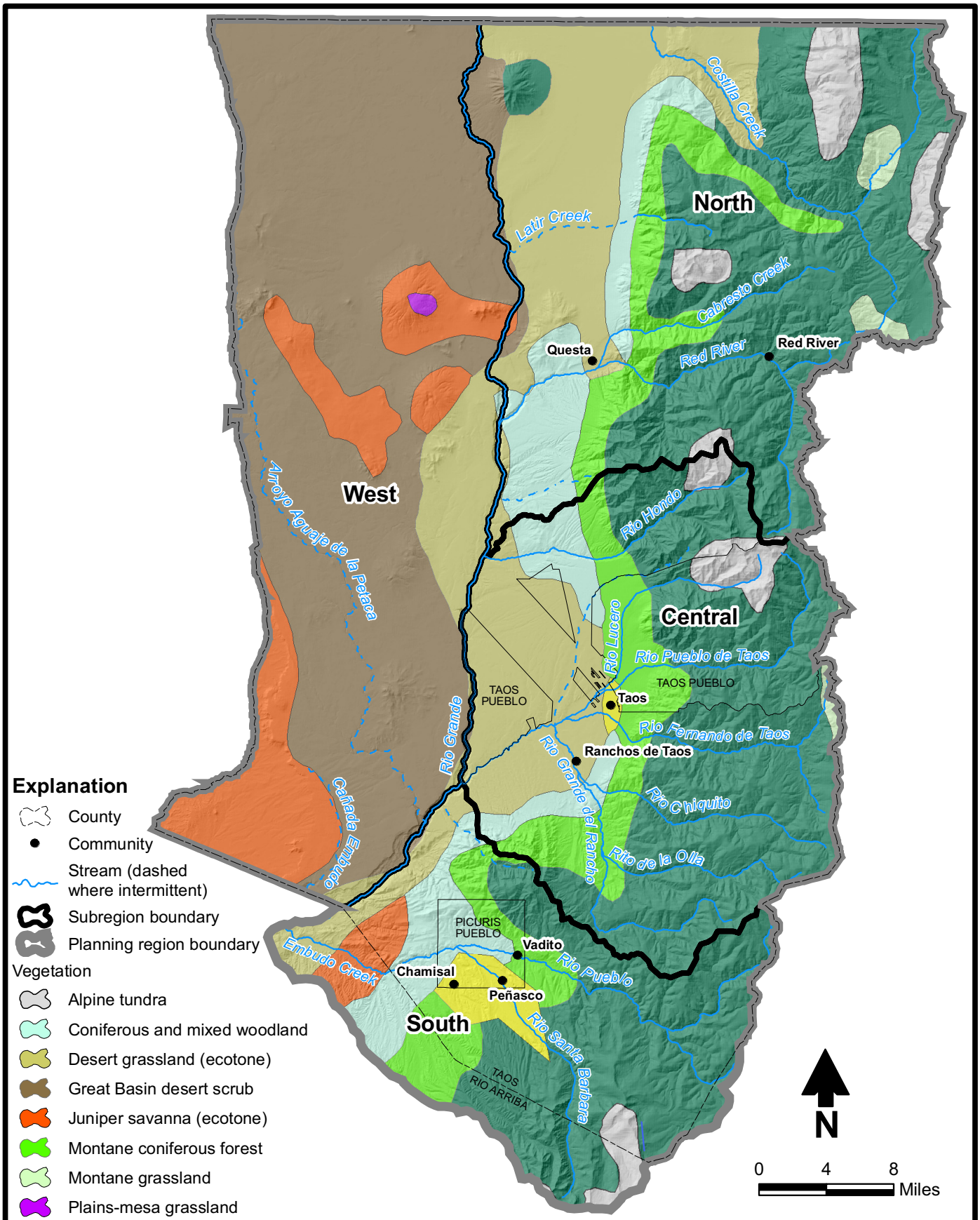
3.2 Climate

Most of the Taos Region is semiarid with mild summers and cold winters. The majority of the precipitation occurs as summer thundershowers. In the Sangre de Cristo Mountains, about one-third of the annual precipitation occurs as snowfall during December to March (Garrabrant, 1993). Runoff from snowmelt in the Sangre de Cristo supplies much of the water supply for acéquias in the region.

In the Taos area, temperatures range from an average minimum of approximately 23°F in Red River to an average maximum of approximately 64°F in El Rito. Average annual temperatures in the region range between 39°F in Red River and 49°F in El Rito (located just outside the region [Section 5.1]). Precipitation ranges from an average minimum of just under 5 inches in El Rito to an average maximum of 29 inches in Red River. Average annual precipitation in the region ranges between 12.2 inches in El Rito and 20.6 inches in Red River.

3.3 Major Surface Water and Groundwater Sources

Surface flows originate primarily in the higher elevations, as snowmelt during the spring and as monsoonal rainfall during the late summer. Key surface water features in the region (Figure 3-1) include the Rio Grande, Costilla Creek, Cabresto Creek, Red River, Rio Hondo, Rio Lucero, Rio Pueblo de Taos, Rio Fernando de Taos, Rio Grande del Rancho, Rio Pueblo, Rio Santa Barbara, Embudo Creek, and Arroyo Aguaje de la Petaca. The region's rivers and variability in their supply are discussed in Section 5.2.2; Section 5.2.3 presents information on the lakes and reservoirs within the planning region.



Explanation

- County
- Community
- Stream (dashed where intermittent)
- Subregion boundary
- Planning region boundary

Vegetation

- Alpine tundra
- Coniferous and mixed woodland
- Desert grassland (ecotone)
- Great Basin desert scrub
- Juniper savanna (ecotone)
- Montane coniferous forest
- Montane grassland
- Plains-mesa grassland
- Subalpine coniferous forest
- Urban, farmland or open water

Source: Earth Data Analysis Center (EDAC), 1991

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TAOS REGIONAL WATER PLAN

Vegetation

Figure 3-3

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Approximately 8 percent of the water currently used in the planning region is supplied by groundwater, which is used primarily for drinking water supplies through public water systems or mutual domestic associations and domestic wells. Groundwater supplies all of the communities in the region except for Red River and San Cristobal, which are partially supplied by surface water, and numerous stock and domestic wells are also located throughout the region. Groundwater is found primarily in volcanics and Santa Fe Group sediments on the Taos Plateau, in Santa Fe Group sediments on the Costilla Plains, and along river valleys or in near-surface fractures in the Sangre de Cristo Mountains. The yield and quality of this water is variable. Additional information on groundwater resources of the region is included in Section 5.3.

3.4 Overview of Historical Water Use in the Region

Approximately 90 percent of the water currently used in the planning region is supplied by surface water, most of which is used for irrigated agriculture. Surface water in the Taos Region has been used by the local pueblos and acéquias for hundreds of years and is currently used for agriculture by about 300 acéquias. By far, the largest water use in the Taos Region is for irrigated agriculture. Though not included in quantitative water use inventories, water in the region has traditionally been used for fishing and for instream flow to support other recreation and aquatic species. The next largest water uses are for public and self-supplied domestic use followed by evaporation and mining. Though groundwater represents a much smaller portion of the total supply, it is the primary water source for most of the public water systems in the region and also supplies domestic wells throughout the region.

3.5 Demographics, Economic Situation, and Land Use

Current statistics on the economy and land use in the planning region were compiled from the New Mexico Economic Development web site (NMEDD, 2004) and by SWPM (2006) and are summarized in Table 3-1. Additional detail on demographics, economics, and land use within the region is provided in Section 6.

Table 3-1. Summary of Demographic and Economic Statistics for Taos Region

Population [a]		Per Capita Income in 2000 ($/yr)	Farms / Ranches [b]					Largest Agricultural Commodities [b]	Employment Categories, 2000	
			Number		Acreage					
					Total		Average		Industry [c]	No. Employed
1990	2000		1997	2002	1997	2002	2002			
24,487	31,484	16,103	498	453	310,799	466,254	1,029	Cattle and calves	Social services	2,753
								Horses and ponies	Entertainment	2,595
								Layers ≥20 weeks old	Retail trade	1,732
								Sheep and lambs	Construction	1,367
								Forage	Professional	933
								Cut Christmas trees	Public administration	884
								Apples	Financial	729
								All wheat for grain	Other services	702
									Agriculture	593

Source: NMEDD, 2004, unless otherwise noted.

[a] SWPM (2006) estimates for entire planning region

[b] 2002 Census of Agriculture (USDA NASS, 2006b)

[c] Social services = Education, health, and social services
Entertainment = Arts, entertainment, recreation, accommodation and food services
Professional = Professional, scientific, management, administrative, and waste management services
Financial = Finance, insurance, real estate, and rental and leasing
Agriculture = Agriculture, forestry, fishing and hunting, and mining

The current population of the Taos Region is 31,500, more than half of which lives in the Central subregion, near the Town of Taos (SWPM, 2006, Table D). As shown in Table 3-1, the population has increased from 1990 to 2000 by about 29 percent (SWPM, 2006, Table D). Throughout the intermountain West, small mountain and rural communities have seen a trend of in-migration of baby boomers who are beginning to retire, second home owners, and professionals who, due to advances in technology, can work from anywhere. This trend is seen in Taos County, where individuals migrating to the county have been a large and significant component of population change with large implications for the economy and social services in the future. According to a report on migration patterns in Taos County (BBER, 2000), in-migration in Taos County between 1980 and 1990 accounted for 29.8 percent of the total population increase. Due to this in-migration, as well as out-migration by younger people seeking better economic opportunities, the Taos Region has seen a significant shift toward middle- and retirement-age individuals that are driving up demand for new homes, services, and health care (SWPM, 2006).

Whereas the economy of the planning area has traditionally been focused on agriculture, mining, and tourism, the current trend is toward more service and professional oriented occupations. According to the 2000 Census, the highest percentages were employed in management, professional services, and related occupations (31.5%), sales and office occupations (24.9%) and service occupations (24.9%) (SWPM, 2006). However, irrigated agriculture, with about 300 acéquias in the planning region, is still extremely important in the planning region, particularly in terms of water planning.