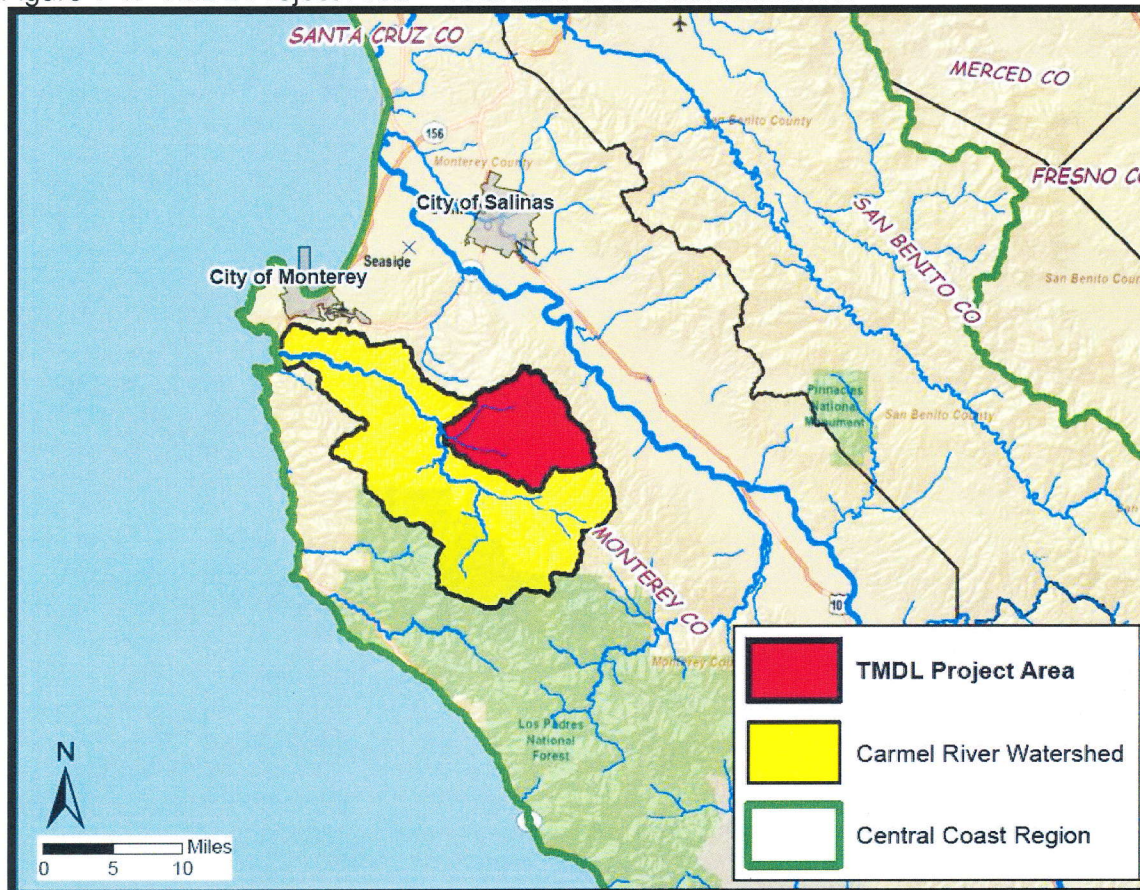


Figure 1-1. TMDL Project Area – Tularcitos Creek subwatershed.



### 1.3 Pollutants Addressed

The pollutant addressed in this TMDL is fecal waste. Pathogenic microbes are associated with fecal waste. Pathogens include viruses, protozoa, and pathogenic strains of bacteria. These microbes can cause a variety of diseases or illnesses (hepatitis, cholera, parasites, diarrhea, etc.) through ingestion of contaminated water or the consumption of contaminated shellfish. The presence of fecal waste in the water column is measured by taking water and analyzing those samples for the concentration of total coliform, fecal coliform and/or *E. coli*. These constituents will collectively be referred to as fecal indicator bacteria or FIB. FIB is used to determine the most probable number of fecal indicator bacteria in the water at a given time. This number is used to determine the risk associated with recreating in this water. Reducing the amount of fecal waste that enters a water body will help to preserve and maintain the beneficial uses.

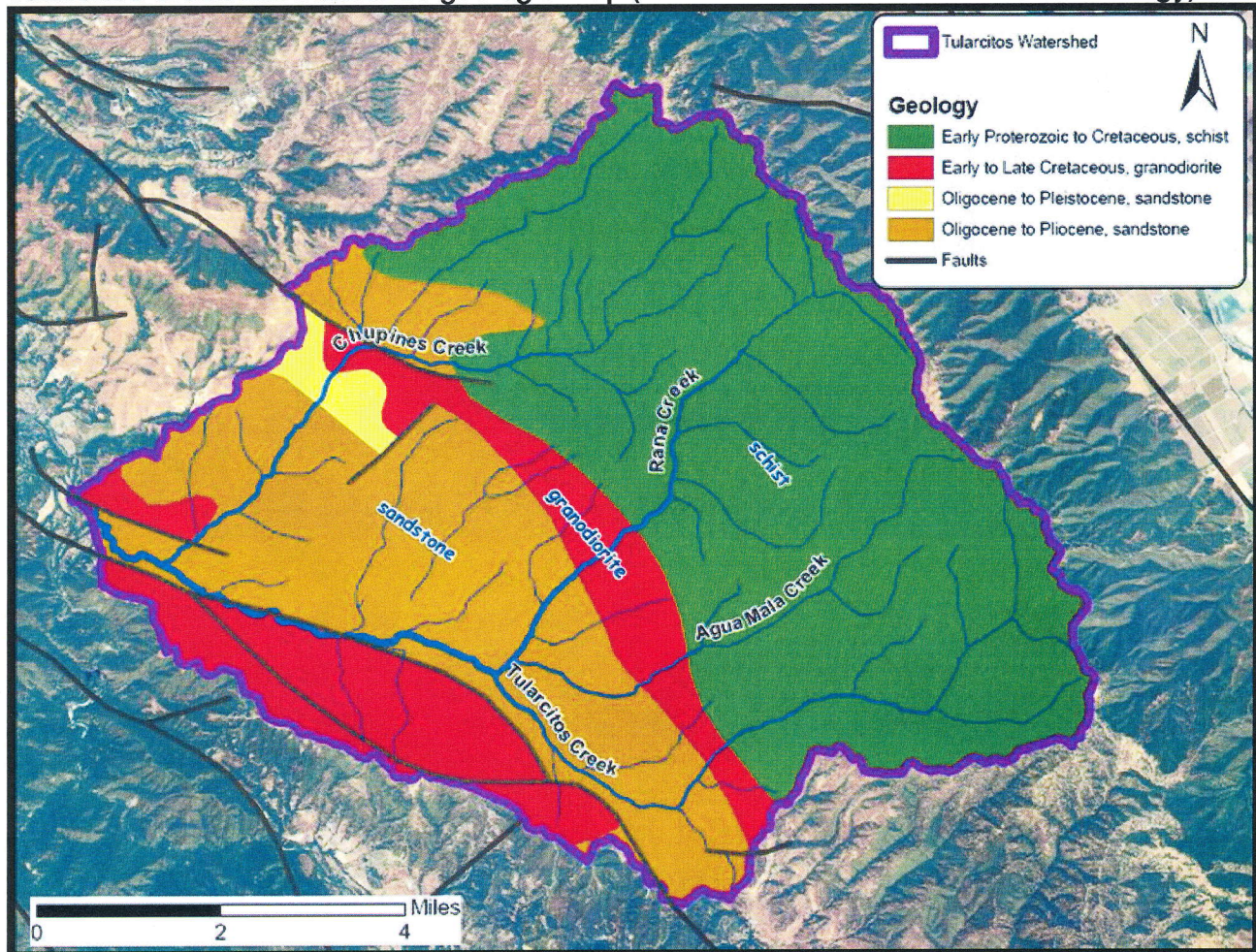
## 2 PROBLEM IDENTIFICATION

### 2.1 Watershed Description

The Tularcitos Creek drainage is located in the Sierra de Salinas range, and forms the northeastern headwater reaches of the Carmel River watershed (Figure 2-1). Tularcitos Creek is a tributary of the Carmel River; the confluence of the creek with the Carmel River is at river mile 15, approximately one and a half miles upstream of Carmel Valley Village. The Tularcitos Creek subwatershed is in a rural setting, characterized by sparse ranches in an ecosystem dominated



Tularcitos Creek subwatershed geologic map (Source: Calif. Div. of Mines and Geology).





## 7.2 Sierra de Salinas: Upper Cachagua, Tularictos and Klondike Drainages

The upper reaches of the Cachagua drainage and the sub-basins of the Tularictos drainage are cut into the Sierra de Salinas, forming the northwestern flank of Carmel Watershed. The landscape, climate, ecosystems and land-use differ markedly from the Santa Lucia range described above. The land tends to be more arid, with significantly lower annual rainfall. Hastings Natural History Preserve at the mouth of Bear Canyon subwatershed reports a rainfall average of 21.3 inches/yr (HNHP, 2004). The landscape is also more accessible than along the Santa Lucia Range. The land has traditionally been used for cattle ranching, with the impacts of overuse locally apparent. The region has sparse ranches set in a broad, annual grassland, oak forest, and chaparral ecosystem (Fig. 44 rana fork; Appendix A-4).



Figure 44: Rana Creek is drainage on the left. Oblique aerial photo toward the northeast.

### 7.2.1 Geology

The slopes of the Sierra de Salinas are underlain by a relatively weak metamorphic rock termed the “Schist of Salinas” (Appendix A-2). Also present in fault slivers adjacent to the Schist are granitic rocks and Tertiary sedimentary rocks including Monterey Shale and sandstone. The presence of both the highly weathered schist and Tertiary sedimentary rocks creates a geologic framework that is highly prone to erosion and soil slips, especially where there is a combination of steep slopes, dirt roads, and heavy cattle use.





Appendix A-1, Smith, D.P., Newman, W.B., Watson, F.G.R., and Hameister, J., 2004, Physical and Hydrologic Assessment of the Carmel River Watershed, California. The Watershed Institute, California State University Monterey Bay, Publication No. WI-2004-05/2, 88 pp.