

## STUDY AREA

The area of focus for this research includes roughly 250 km<sup>2</sup> of high country in Yosemite National Park, California, in and around Tuolumne Meadows, including areas just outside of the park boundaries to the east (Figure 1). Yosemite (37° 48' N, 119° 30' W), the second national park dedicated in the United States, is located on the western slopes of the Sierra Nevada mountain range in east-central California. This study was conducted in an area loosely bounded by Mount Hoffman to the west, Young Lakes/Ellery Lake to the north, Parker pass/Dana Plateau to the east, and Emeric Lake to the south. The study area includes Sierra Nevada subalpine forest and alpine vegetation zones (Table 1) as described by the National Park Service (2008) (Figure 2).

**Table 1. National Parks Service Vegetation Zones**

Description and elevations for National Park Service defined vegetation zones for the Sierra Nevada Range along with the number of repeat-photography sites located in each zone.

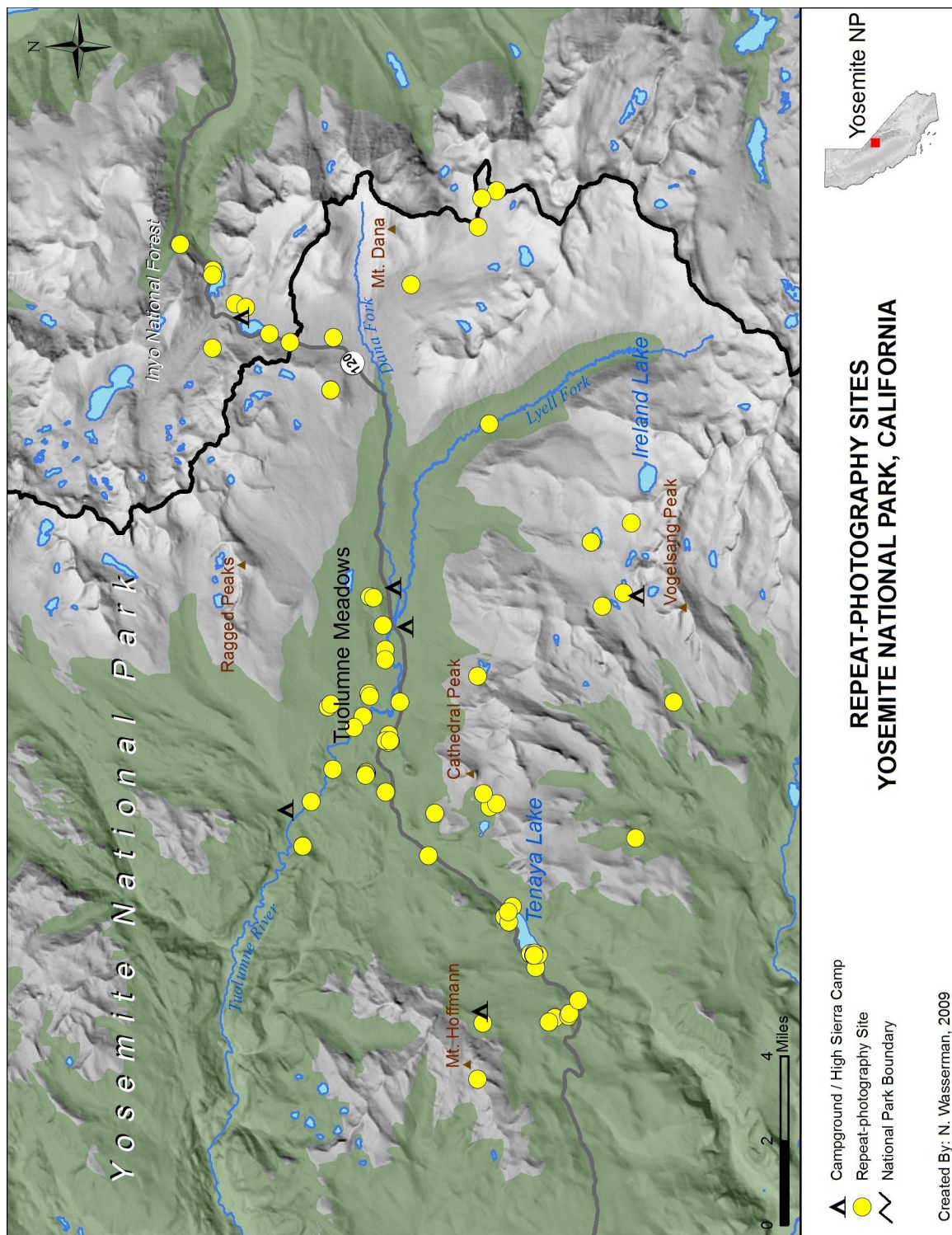
<b>Zone Name</b>	<b>Elevation</b>	<b># Photo Sites</b>
Foothill Woodland	Below 899m	-
Lower Montane Forest	900m – 1,799m	-
Upper Montane Forest	1,800m – 2,449m	-
Subalpine Forest	2,450m – 2,899m	52
Alpine Zone	Above 2,900m	31

(Source: National Park Service 2008)

The subalpine forest found in this area of the Sierra Nevada Range replaces the upper montane forest at about 2,450 m (8,000 ft). This vegetation community is

characterized by mainly *Pinus contorta ssp. murrayana*, *Tsuga mertensiana*, *Pinus monticola*, and *Pinus albicaulis* surrounding subalpine meadows and granite domes (Vale 1987; Fites-Kaufman *et al.* 2007; NPS 2008). Within Yosemite National Park 297,000 acres (1,200 km<sup>2</sup>) of subalpine forest habitat is present (NPS 2008). Sixty-three percent of photo locations used in this study were found here. Located above 2,900 m (9,500 ft), alpine communities are characterized by largely treeless tundra of short grasses, small patches of stunted and dwarfed trees, shrubs, and lichen covered rocks beyond a pronounced tree line. Snow, ice, and wind mark the extended winter, while a short and relatively cool summer allows for a short growing season for any vegetation found at these elevations (Johnston 1970; NPS 2008). Thirty-one photo sites, or 37 percent, were located in the alpine zone.

Figure 1. Study area and photo sites located during 2008 field visits.



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Figure 2. National Park Service forest zones and photo sites.

