Appendix S1. Summary of GLO survey methods used in the Greenhorn Mountains

Along 1.6 km (1 mile) section lines, surveyors recorded dominant trees and shrubs in order of abundance. At the 0.8 km (0.5 mile) mark, at quarter corners, they recorded the distance, azimuth, diameter, and species of two bearing trees, one on each side of the line. At the section corner at the end of the line, at the 1.6 km mark, they recorded the same information for four bearing trees, one in each 90-degree sector. Bearing trees were usually ≥ 10 cm at about 30 cm above the base (Williams and Baker 2011). Bearing trees were measured with sufficient accuracy to be placed in 10-cm diameter classes and were selected with little bias, based on our detailed studies of bias and error (Williams and Baker 2010, 2011). Section-line data provide a valid and unbiased line-intercept estimate of percent cover (Butler and McDonald 1983).

We used bearing-tree data to reconstruct total tree density and basal area, using 6-corner and 9-corner pools, respectively, pooled to increase the accuracy of the reconstructions, which follow methods of Williams and Baker (2011). An accuracy trial across three states showed that relative errors were 14.4-23.0% for tree density and 21.0-25.4% for basal area (Williams and Baker 2011). We used crown radius and Voronoi equations for the nearby western Sierra study area (Baker 2014). To compare GLO estimates to the timber inventory (Stephens et al. 2015), we also calculated tree density and basal area for conifers ≥ 30.5 cm diameter-at-breast-height (dbh). We measured differences between GLO and timber-inventory estimates using relative mean absolute error (RMAE), the mean percent error in the absolute value of one estimate relative to the other.

We classified section-line data into broad historical vegetation types, with section-lines that recorded pine or ponderosa pine first as most likely including Stephens et al.'s (2015) ponderosa pine type, and section-lines listing fir or cedar first as most likely including Stephens et al.'s (2015) mixed-conifer type. These two are the primary historical forest vegetation types inside the Stephens et al. boundary. Also, the GLO mixed-conifer polygon in the north (Figure 2 Main text) corresponds with where Stephens et al.'s mixed-conifer type occurs, based on their Figure 3. We calculated mean tree density and basal area by vegetation type along section-lines, including only reconstruction polygons at least half covering a section line. Surveyors did not often distinguish pines, leaving some ambiguity about the historical boundary between ponderosa and gray pine.

Surveyors recorded some early land uses, including 12 buildings, 22 fences, 31 roads, 43 trails, one telegraph wire, and one mine and sawmill (Figure 2 Main text). Stephens et al. (2015) said early logging was limited to horse-and-wagon transport and there was no railroad logging. Since these land uses were generally small and localized, and our purpose here was different, we did not remove a buffered area surrounding them before the analysis, as was done in the western Sierra (Baker 2014).

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