Socioeconomics of the Redwood Region[1]

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Abstract

We compiled data from federal, state, and private academic databases to characterize the changing socioeconomics of the redwood region, which is part of the broader geography of the American West. The American West has turned economically away from commodity markets such as timber toward an economy dependent on knowledge and innovation, with job growth in service industries. We illustrate this shift by first comparing two distinct areas of the redwood region, the non-metropolitan northern counties (Del Norte, Mendocino, and Humboldt) and the metropolitan southern counties (Sonoma, San Mateo, and Santa Cruz), on variables including employment, income, and education. These two areas display dramatically different levels of financial and human capital, and represent two very different aspects of the American West. One illustrative distinction is that the northern counties have maintained a forest products industry, while the southern counties have turned almost entirely to other sectors. We then profile the role of the forest products sector within the regional economy, and how it has changed in terms of markets, wood sourcing, and infrastructure. We include trend data for mill capacity, wood prices, and export markets.

Keywords: forest economics, forest sociology

Introduction

The people of the redwood region are part of the broader geography of the "New" American West, which has shifted from commodity markets such as lumber, toward an economy dependent on "people's knowledge, skills, and innovation," with job growth in service industries such as health, professional, and technical services and jobs in finance, insurance, and real estate sectors (Gude et al. 2012, p. 420). Many areas of the West have experienced growth as a result of amenity migration, in which people migrate to a region because of its recreational opportunities and natural beauty (Gosnell and Abrams 2011). Amenity migration and shifting economic sectors are two components of what has been termed "rural restructuring," along with altered human-land relationships, from extractive or productive land uses to consumptive (aesthetic, recreational, and conservation) land uses (Nelson 2001).

In this paper, we investigate the social and economic characteristics of northern California's redwood region. We divide this region into two parts: the northern counties (Del Norte, Humboldt, and Mendocino), notable for their relatively intact forest products industry and low population density, and the metropolitan southern counties (Sonoma, San Mateo, and Santa Cruz), typified by extensive exurban development. While several other counties have redwood forest land, we only included data from counties with over 5 percent in redwood forest. Stewart (2007) noted the three northern counties contain the majority of redwood acres, but the southern counties have large populations in which redwood forests are valued as open space and for recreation. Our objective was to compile baseline and recent trend data regarding 1) county-level demographics, such as employment, income and poverty, and education; and 2) the role of forestry within the regional economy, including how forestry has changed in terms of infrastructure, wood markets, and wood sourcing. The data were gleaned from several sources, noted in the figures. Demographic data were

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compiled through the Headwaters Economics Economic Profile System, which collates data primarily from federal sources. Unless otherwise indicated, timber industry data were collected by the Bureau of Business and Economic Research (BBER) at University of Montana, which conducts periodic censuses of primary wood products manufacturers across the western United States, including the redwood region.

Demographics of the Redwood Region

The three southern counties (SC) are about six times larger by population (1.5 million) than the northern counties (NC) (250,554). Both the NC and SC grew in population from 2000 to 2014 (fig. 1). However, their rates of growth (between 1.6 percent and 7.2 percent) were lower than the growth of the United States and California, which grew by 11.6 percent and 12.4 percent, respectively, over this time period.

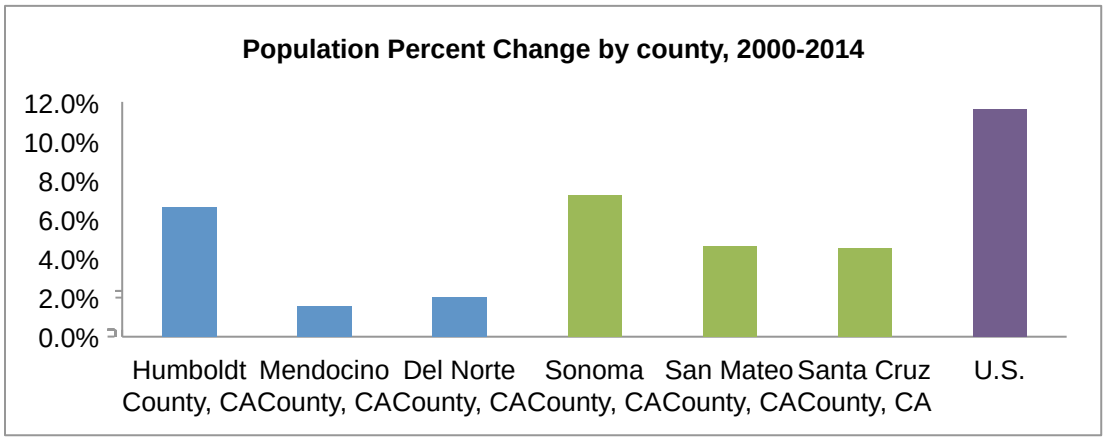

Figure 1—Population percent change from 2000 to 2014. Data compiled by Headwaters Economics; sources: U.S. Dept. of Commerce, Census Bureau (2015).

Economic Characteristics of the Redwood Region

The southern counties of the Redwood Region account for 88 percent of all employment in the region, and nearly all of the new growth is located in the southern counties—95 percent of new jobs since 2010 have located in the SC.

Virtually all of the new jobs are in services sectors, while non-services sectors have lost jobs during the last 15 years and make up a smaller share of the total employment base (fig. 2). The service sector consists of a wide mix of jobs, combining high-wage, high-skilled occupations (e.g., doctors, software developers) with low-wage, low-skilled occupations (e.g., restaurant workers, tour bus operators).[6] Non-services sectors consist of jobs in forestry, agriculture, construction, and manufacturing. Only including direct employment in forest industries, both regions have seen declines, though the NC still has significantly more people working in the timber industry (fig. 3). The timber industry, in this case, includes jobs associated with growing and harvesting timber, working in sawmills and paper mills, and wood products manufacturing.

[6] Despite the strong growth of employment in services, the term "services" is often misunderstood. The service sector typically provides services, such as banking and education, rather than creating tangible objects. However, some service sectors, such as utilities and architecture, are closely associated with goods-producing sectors.

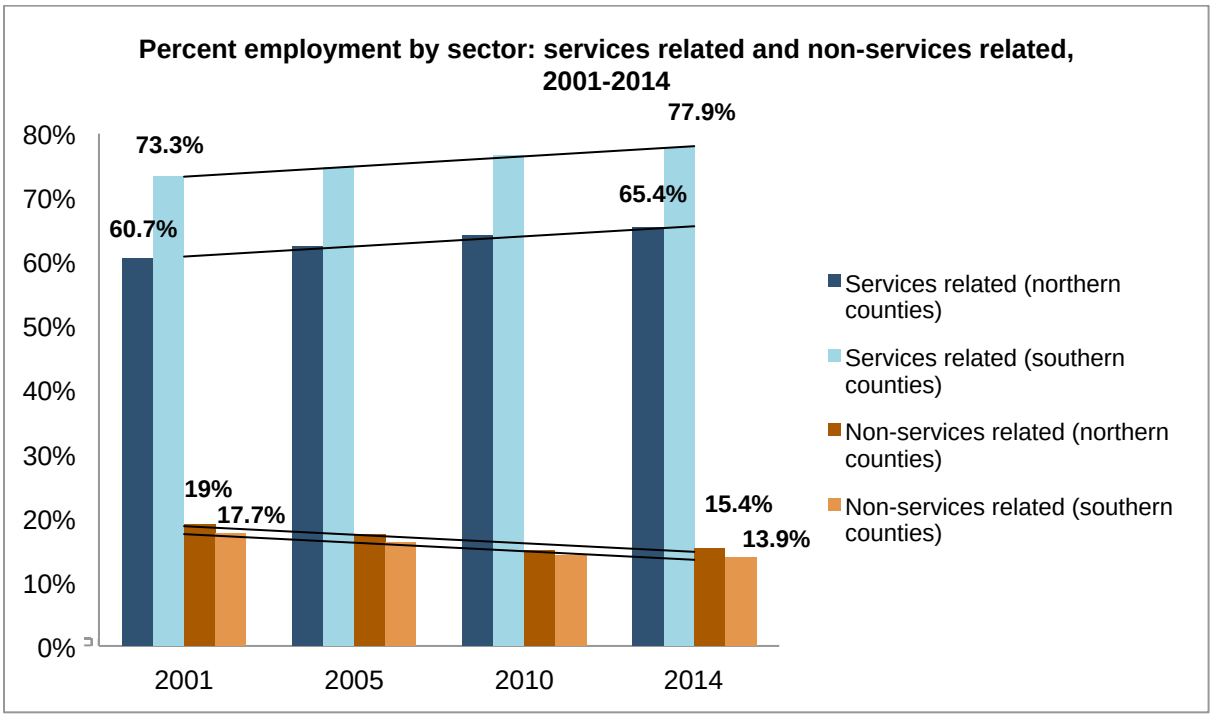

Figure 2—Percent employment by sector in the redwood region, 2001-2014. Data compiled by Headwaters Economics; sources: U.S. Dept. of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, DC. Table CA30.

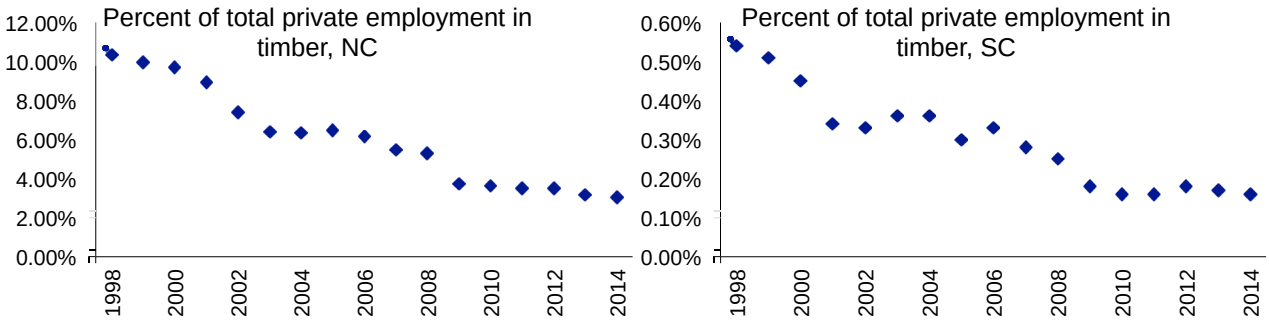

Figure 3—Percent of total private employment in the timber industry, 1998-2014. Data compiled by Headwaters Economics; sources: U.S. Dept. of Commerce. County Business Patterns, Washington, DC.[7]

On most socioeconomic indicators related to human and financial capital, the two parts of the redwood region displayed a bifurcated pattern, with higher levels of human and financial capital in the SC than the NC. This is evident in educational attainment (fig. 4). Residents of the NC had lower levels of education than residents of the SC, and the United States fell between the two.

[7] County Business Patterns data do not take into account the self-employed and are likely therefore underestimates of the total employment in the timber industry.

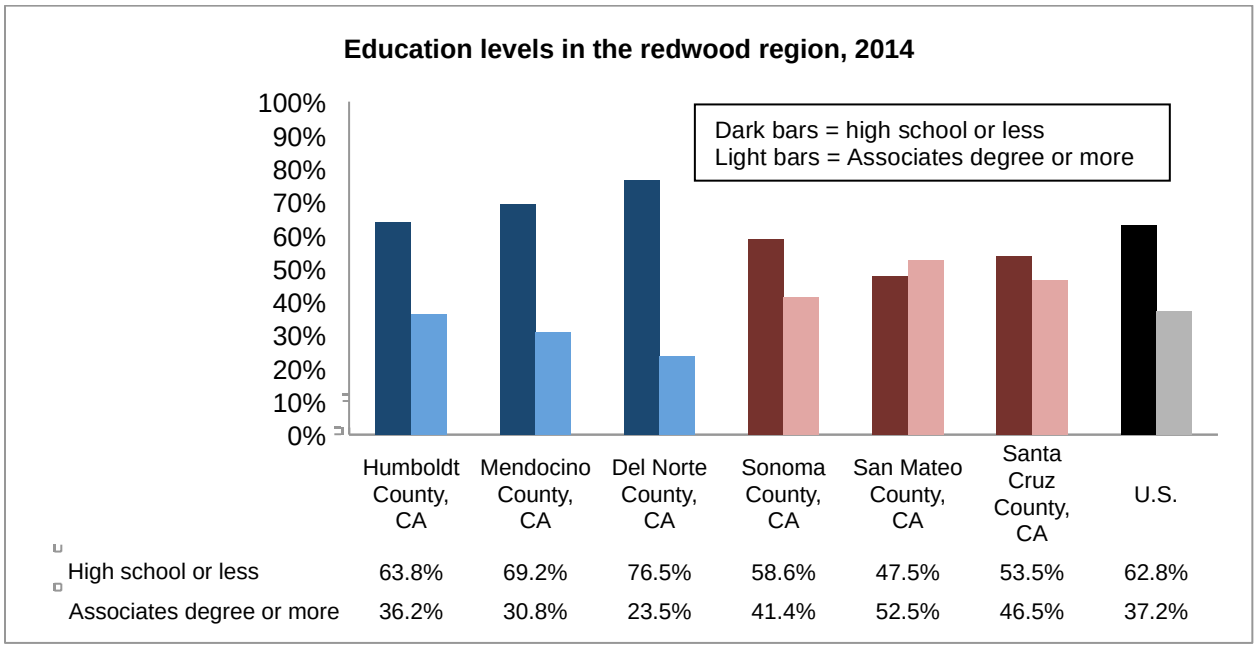

Figure 4—Percent of adults by county with a high school degree or lower (dark bars), or Associates degree or higher (light bars). Data compiled by Headwaters Economics; sources: U.S. Dept. of Commerce. 2015. Census Bureau, American Community Survey Office, Washington, DC.

Per capita income and average earnings per job also demonstrated this bifurcation (fig. 5). However, this divergence occurred over time – real per capita income levels and average earnings per job were much closer in 1970, and over time have stagnated in the NC, while rising in the SC, particularly in the early 1990s (fig. 5).

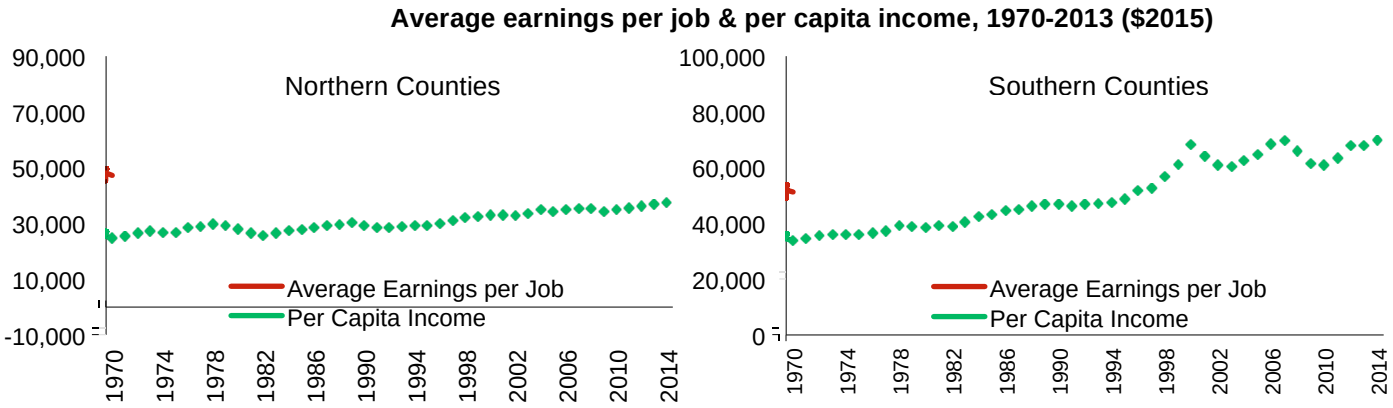

Figure 5—Average earnings per job (red) and per capita income (green) in $2015, from 1970 to 2013. Data compiled by Headwaters Economics, sources: U.S. Dept. of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, DC.

This growing difference in earnings is likely due to the loss of high-paying manufacturing jobs in the NC, and the rise in high-paying white-collar jobs in the service sector economy of the SC.

One aspect of this distinction in socioeconomic levels was evident in the percent of non-labor income relative to total personal income (fig. 6). In both the SC and the NC, non-labor income as a percent of total income grew. In the SC, non-labor income grew by 9 percentage points between 1970 to 2014, from 27 percent to 36 percent; in the NC, non-labor income grew by 21 percentage points, from 28 percent in 1970 to 49 percent in 2014. The types of non-labor income differed, however. In the SC, a much higher proportion of non-labor income was from dividends, interest and rent (e.g.,

investments). In NC, a much higher proportion of non-labor income comes from transfer payments, which are generally hardship-related (e.g., Medicaid and welfare) or age-related (e.g., medicare and social security).

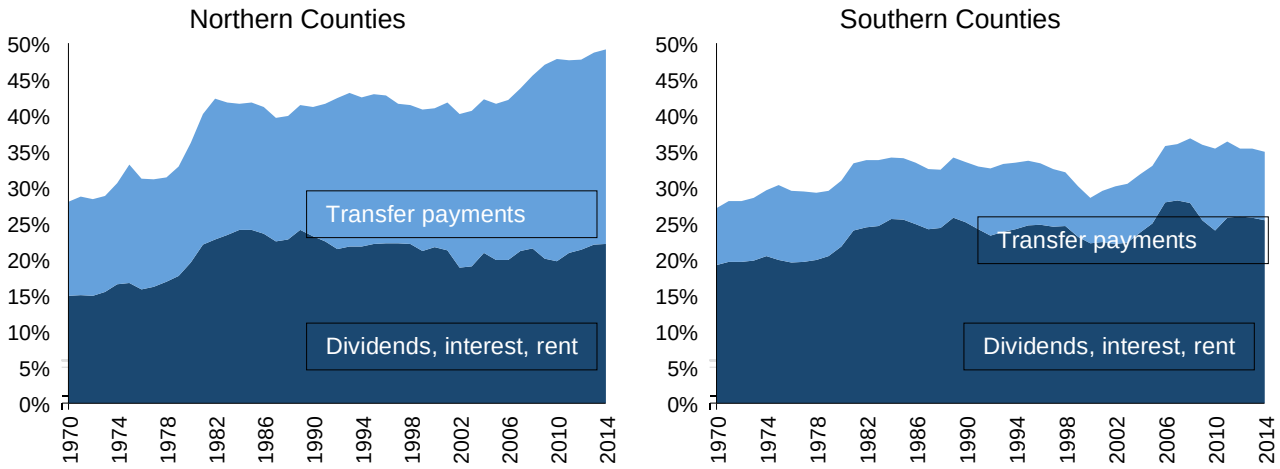

Figure 6—non-labor income as a percent of total personal income in the northern counties (NC) and southern counties (SC), from 1970-2014, including transfer payments (light blue) and dividends, interest and rent (dark blue).

Driving the uneven pattern of job and income growth between the NC and SC are dramatic structural changes in the United States economy in recent decades, affecting the economic opportunities for different types of counties. New jobs are being created in service sectors, the most important being a set of high-wage jobs in "innovation" sectors, including software, research and design, finance, and technology. High-wage service sector jobs create new wealth and support other sectors (e.g., they have multipliers that create additional jobs in related sectors) (Moretti 2012). Innovation jobs are locating in cities (and non-metropolitan areas connected to cities by airports that have access to finance, educated labor, and global markets). California's cities are competing successfully for these jobs and are driving the state's growth (Glaeser 2011).

Rural counties without easy access to markets or an educated labor force will not compete as successfully for these innovation jobs. They will remain more dependent on natural resources sectors. These sectors are volatile in price and production and subject to market and regulatory forces outside of California's full control, exposing rural communities to greater uncertainty over time. Manufacturing and timber jobs have also experienced significant productivity gains that have reduced the need for labor and stagnated wages in these sectors.[8]

Land Use and Ownership in the Redwood Region

In addition to being roughly three times larger than the southern counties, the northern counties also have a much higher proportion of forest land (71 percent vs. 33 percent for the SC), while the SC have more urban land, grassland, and shrubland (Miles 2016). Two metrics speak to the relative reliance on forests for their resource versus recreational value: the share of land in each region reserved from timber harvesting in the form of national parks, wilderness and national monuments; and the intensity of harvesting activities on those lands available to be harvested, termed timberland. Twenty percent of the acreage in the northern counties is reserved from harvesting activities, while 30

[8] U.S. Department of Labor, Bureau of Labor Statistics, "Productivity and Costs: Manufacturing and Mining Industries," 1987-2015. https://www.bls.gov/news.release/prin.toc.htm.

percent of the southern region is reserved (table 1). In addition, when comparing overall harvest volume in each region per hectare of timberland, the northern counties harvest nearly 30 percent more per hectare of timberland than do the southern counties (table 1). This difference indicates that landowners in the northern counties are more likely to actively manage their timberlands than the southern counties, where amenity values may be more important.

Table 1—Redwood Region total hectares, forestland hectares, and harvest volumes (BBER 2016, Miles 2016)

	Total (ha)	Forestland (ha)	Reserved (ha)	Timberland (ha)	Harvest (2012) (mbf)	Average harvest/ timberland (ha)
Northern counties	2,269,434	1,616,801	324,358	1,156,362	343,155	0.30
Southern counties	663,410	220,841	66,545	134,603	28,404	0.21

Counties in both the northern and southern redwood region are dominated by private land ownership (fig. 7). The one exception is Del Norte County, which has almost 70 percent of its total land ownership in public lands.

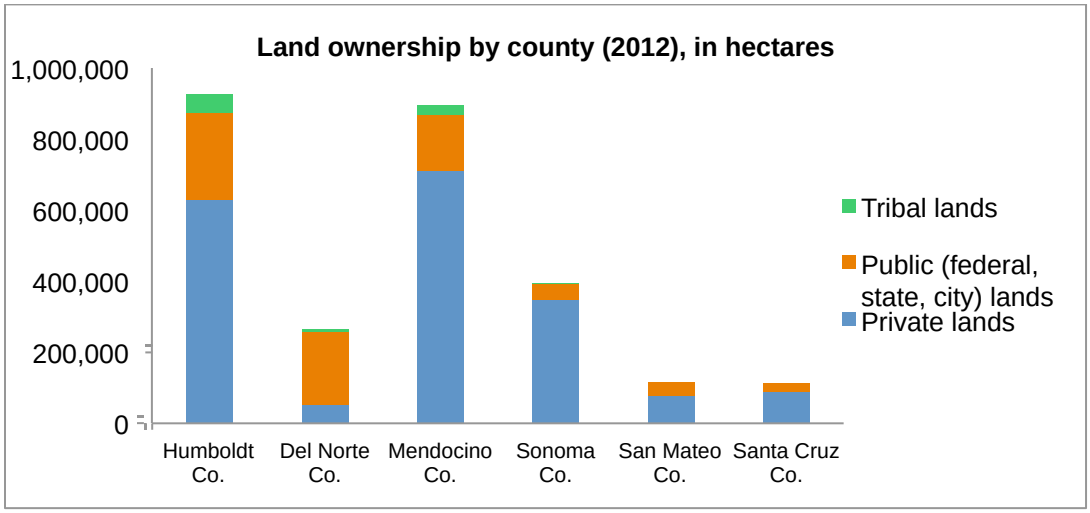

Figure 7—land ownership by county. Data compiled by Headwaters Economics; sources: U.S. Geological Survey, Gap Analysis Program. 2012. Protected Areas Database of the United States version 1.3.

Considering just the privately-owned lands of each county, the levels of urbanization and exurbanization are quite high. Urban and suburban development is defined as up to 1.7 acres per unit; exurban development is 1.7 to 40 acres per unit. When both of these forms of development are included, the counties of the SC have between 35 percent (Sonoma County) and 61 percent (Santa Cruz County) of the private land under development, compared to the NC, which has from 8 percent (in Mendocino and Humboldt counties) to 18 percent (Del Norte County) of the private land under development (fig. 8).

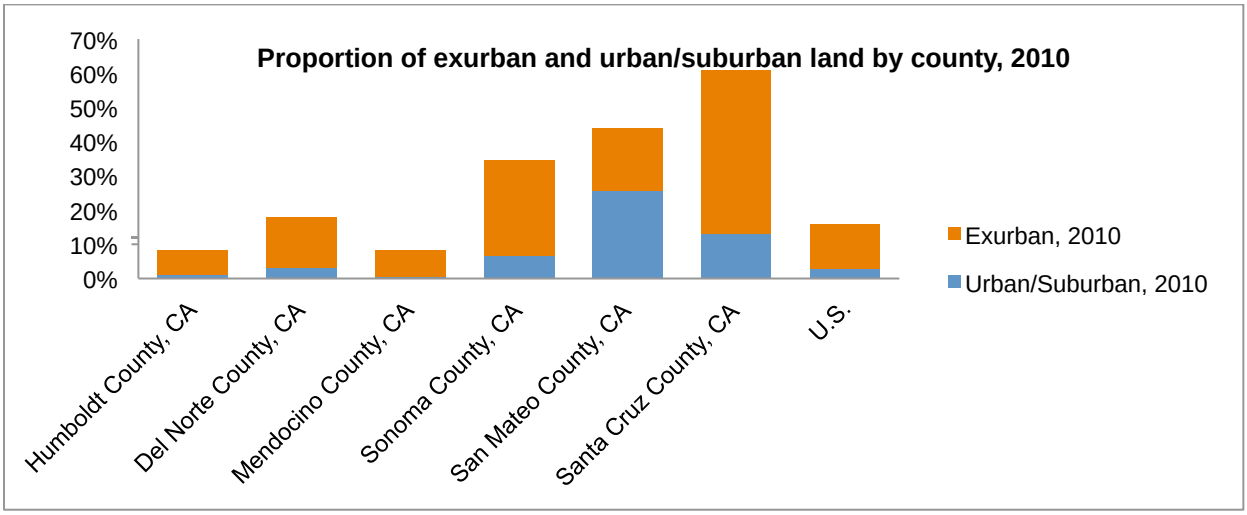

Figure 8—Percent of private land in residential development. Exurban development is defined as units from 1.7 to 40 acres per unit. Urban/suburban development is defined as units up to 1.7 acres.

Forest Industry in the Redwood Region

Figure 9 shows the relationship of timber harvest in the northern and southern counties, as compared to the rest of the state. Since 1978, statewide total timber harvest has ranged from a high of 4.7 billion board feet in 1988, to a low of just over 800 million board feet in 2009. Throughout this time period, the amount of timber harvest in the combined northern and southern counties ranged from a high of 40 percent of the total state harvest (in 1996) to a low of 21 percent (in 2009).

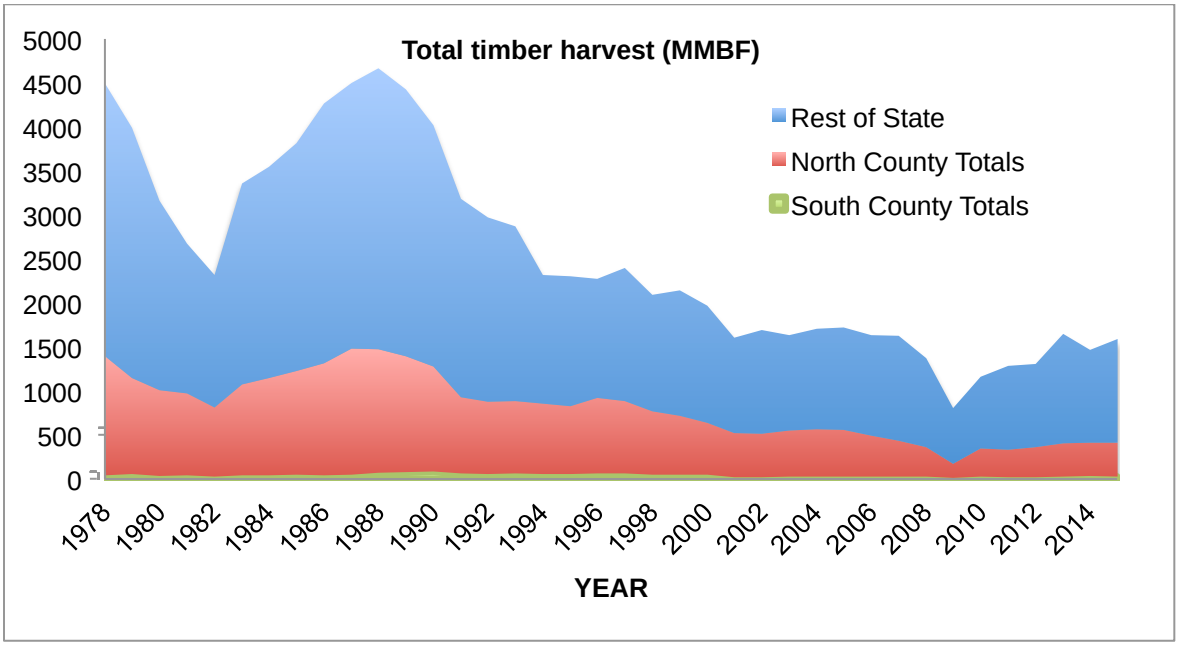

Figure 9—Total timber harvest in redwood region as compared to the rest of California, in million board feet, Scribner. Source: California State Board of Equalization various years.

The type of timber harvest has changed dramatically over the past 30 years. For example, in 1978, old growth represented almost 70 percent of the total timber harvest in the redwood region. This

decreased to less than 20 percent by 1996. The State Board of Equalization stopped reporting old growth harvest by 2000 because the harvest was almost exclusively young growth timber by that time. In the redwood region, redwoods have consistently accounted for roughly half of the total harvested volume (BBER 2016).

Accompanying the decline of timber harvest in the region is the decline in mill capacity (fig. 10). Capacity to utilize raw timber across all types of wood products manufacturers (measured in board feet, Scribner) has experienced steep declines since the 1980s. In recent years, capacity has been relatively stable with very few mills dismantled and permanently removed from the manufacturing base. However, the share of capacity actually being utilized declined significantly as a result of the Great Recession, and it has been slow to rebound. Adding to the low rates of capacity utilization is the closure of a handful of larger mills in California in recent years—two of which occurred in the redwood region. As a result of these and other closures, capacity in the redwood region has declined by 31 percent just in the last decade and capacity utilization has dropped by nearly half from 75 percent in 2006 down to a low of 43 percent in 2016.

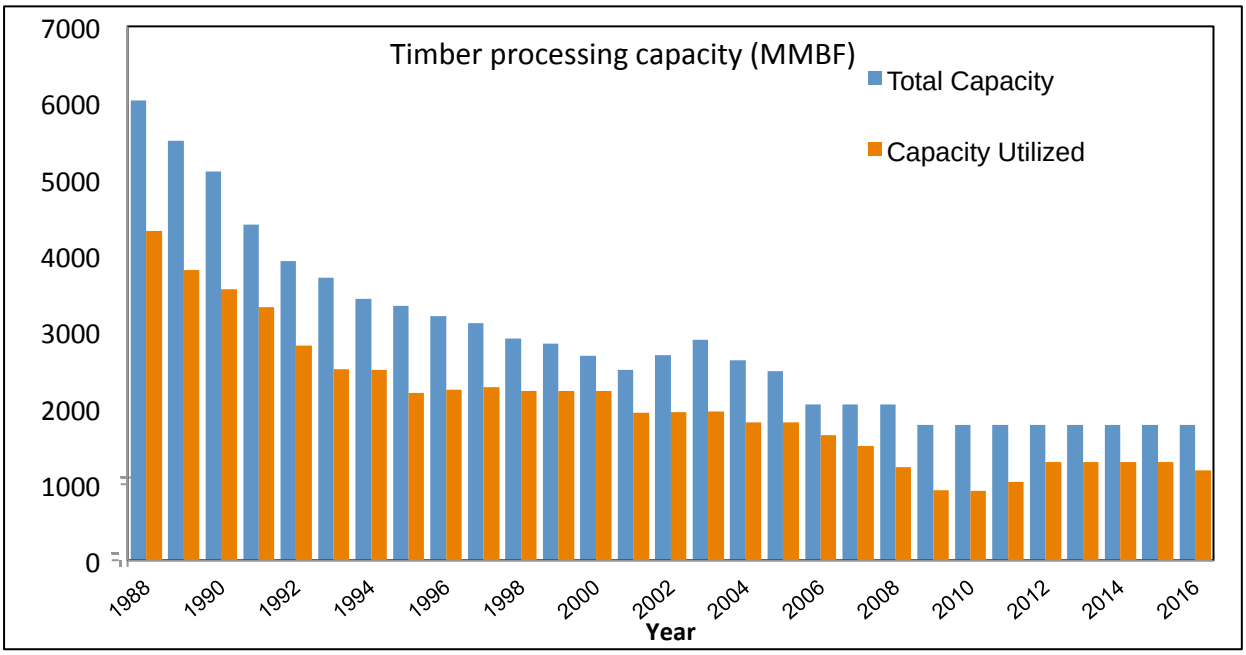

Figure 10—Redwood region timber processing capacity and use, in million board feet, Scribner 1988-2016 (BBER 2016).

Timber harvest in the redwood region takes place almost exclusively on private lands (BBER 2016). In the northern counties, the timber harvest has been heavily concentrated on industrial ownerships where they have provided upwards of 65 percent or more (table 1, fig. 11). In the southern counties, industrial and non-industrial private ownerships have each provided roughly half of the harvest over time (table 2).

Table 2—Redwood Region timber harvest by ownership class, selected years (BBER 2016)

Ownership	2000	2006	2012
		Million board feet[a]	
Private	**698.0**	**509.2**	**343.1**
Industrial	468.2	367.3	265.6
Nonindustrial private	229.8	136.3	69.4
Tribal		5.6	8.1
Public	**30.9**	**1.3**	**28.5**
National forest	8.0	1.3	3.7
State	22.8	0	24.7
BLM	0.1	0	0.0
Other public		0	0.1
Total	**728.9**	**510.5**	**371.6**

[a] Volume in Scribner Decimal C Log Rule, Eastside variant.

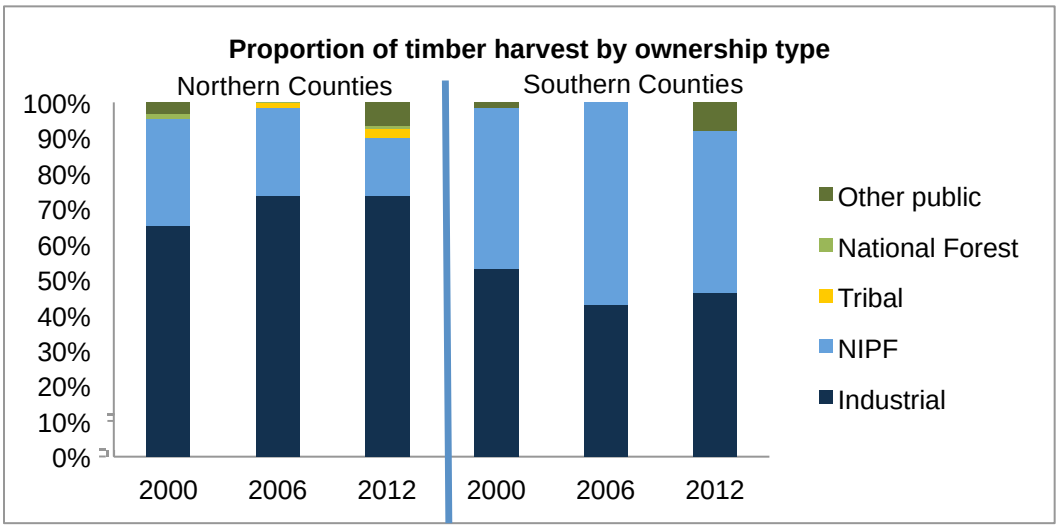

Figure 11—Volume of timber harvested (MMBF) in redwood region, redwood and all other species, selected years (source: BBER 2016).

Most of the harvested timber of the region was used for sawlogs, though a relatively high proportion (33 percent) of publicly-harvested timber was used for bioenergy (table 3). On private timberlands, only 2.3 percent of harvested timber was used for bioenergy.

Table 3—California redwood region timber harvest by ownership class and product type, 2012 (BBER 2016)

Ownership source	Sawlog	Veneer and other[a]	Bioenergy	All products
		Million board feet[b]		
Private timberlands	**332.7**	**2.4**	**7.9**	**343.0**
Industrial	255.2	2.4	7.9	265.5
Nonindustrial and Tribal	77.5	-	-	77.5
Public timberlands	**15.8**	**3.3**	**9.4**	**28.5**
National forests	0.4	3.3	-	3.7
Other public	15.4	-	9.4	24.8
Total	**348.5**	**5.7**	**17.3**	**371.5**

[a] Other product types include houselogs, firewood, furniture logs, and utility poles.
[b] Volume in Scribner Decimal C Log Rule, Eastside variant.

Capacity has exceeded timber harvest in the region as evidenced by the region's history of being a net importer of timber from other regions. This trend reversed slightly in 2012 when the distance timber traveled in all regions of California declined (BBER 2016). In general, most of the timber harvested in the region is being processed in the region (fig. 12).

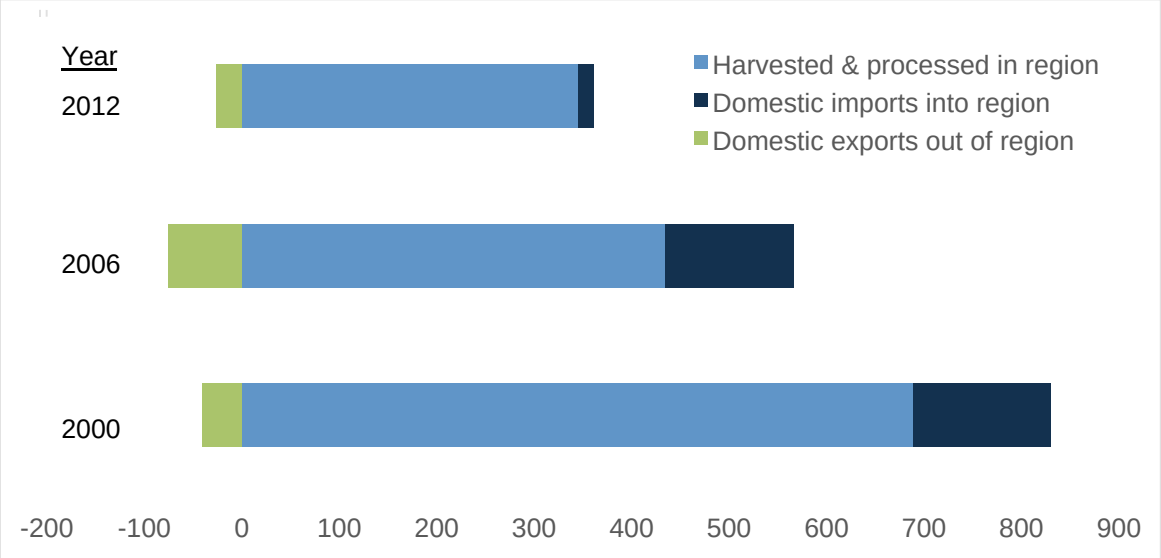

Figure 12—Volume of timber harvested (MMBF) in redwood region, redwood and all other species, selected years (source: BBER 2016).

Discussion

The redwood region mirror many trends of the American West and the United States economy as a whole, particularly in its shift in economic sectors away from commodity production (including forest products) toward service sectors. This shift has led to divergent economic opportunities between urban and rural places. Levels of human capital, as measured by federal indices, are generally low in the northern counties. This may not be surprising (it reflects the rural "brain drain" witnessed elsewhere) but it is a problem for these counties to address in an economy which increasingly values skills and expertise.

Several challenges are evident for rural western counties, including the northern counties. The challenges associated with over-reliance on single sectors, in particular those that fluctuate with

commodity markets, such as the timber industry, were evident in the recent national recession (Gude et.al. 2012). Counties that were more timber-dependent tended to lose jobs at a faster rate during the recession. Since the recession, job concentration in metropolitan counties has accelerated as most new business formation is occurring in cities (Economic Innovation Group 2016).

Dependence on natural resources, and the risks dependence entails are further heightened by fiscal policies related to revenue from federal timber harvests. The northern counties historically received more than 10 million dollars annually in revenue sharing payments from the U.S. Department of Agriculture, Forest Service (USDA FS) and later from appropriated payments through the Secure Rural Schools and Community Self-Determination Act (SRS) and Payments in Lieu of Taxes (PILT) (Gorte 2010). More recently, SRS expired in 2015 and payments from the USDA FS will revert to revenue sharing payments equal to 25 percent of the gross value of commercial receipts earned from commercial activities on the National Forests. Sharp declines in the value of federal timber harvests mean that a return to revenue sharing will reduce overall payments to counties. In total, the three northern counties would see USDA FS and PILT payments decline to about 3 million dollars annually. As payments have declined, pressure has mounted on Congress to reauthorize appropriations or to reform federal timber management to maximize receipts. These options may each be unattainable for the redwood region. The decline in payments represents another challenge for rural counties seeking to stabilize and diversify their economies.

While the northern counties have maintained a forest sector that continues to supply a high proportion of the state's timber, there has been consistent decline in timber harvest and mill capacity in the region. Reasons for this decline include the exhaustion of profitable old-growth timber, increasing forestry regulation, and changing markets, such as the high costs of shipping from the redwood region and lower wood production costs elsewhere. Notably, non-industrial private timber harvest has declined from 230 million board feet in 2000 to under 70 million in 2012 (table 2). This decline in harvest is at least partly attributable to shifting landowner objectives away from timber production to home development, recreation, aesthetics, and other objectives.

This decline in the timber industry, however, does not account for the many non-timber forestry jobs that have been created in the region. The restoration economy provides an important source of jobs and revenue in Humboldt County (Baker and Quinn-Davison 2011). As the forestry sector expands to include jobs in carbon sequestration, watershed restoration, and other activities, it may be important to capture changes in forestry employment using more comprehensive definitions of the forestry sector. Currently, these jobs are not counted as "forestry" positions by North American Industry Classification System.

The southern counties display very different patterns, with high levels of human and financial capital as a result of their proximity to a major metropolitan area (San Francisco) and a booming technology sector. In the southern counties, extensive exurbanization indicates that relationships between people and land have shifted from productive uses to consumptive uses, wherein the land is valued for aesthetics and other non-productive purposes.

While this overview of the socioeconomics of the redwood region provides a broad picture of regional change, it could be improved in several key ways. We looked at county-level data, but smaller scales could paint a different picture, demonstrating variability within the northern and southern county sections. For example, the low levels of human capital within the northern counties may not be evenly distributed. Even more importantly, one of the largest sectors of the economy of the northern counties, cannabis production, has been excluded from our consideration. Because cannabis is illegal under federal law, data for the sector are difficult to obtain and virtually impossible to integrate with other sectoral data.

The economic opportunities for the counties in the redwood region will continue to diverge, and economic development policies should also be sensitive and targeted to the types of opportunities that exist in different counties. The profound shift in how and where our economies generate value, jobs, and income represents an opportunity for California's cities, but challenges for rural parts of the state

that remain more reliant on sectors that have shed jobs due to productivity gains, increased competition, and challenging regulatory environments.

Acknowledgments

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