

AN ASSESSMENT OF THE CALIFORNIA LOGGING WORKFORCE

A LICENSED TIMBER OPERATOR (LTO) SURVEY

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California & Logging

Quick Facts:

33% of California is forested →
(Christensen et al., 2016)

USFS technical reports: declining employment
(McIver et al., 2015; Marcille et al., 2020)

Mechanization: CA uses mixed - manual & mechanized
(Morgan & Spoelma, 2008; He et al., 2022)

Rules and Regulations - CA FPR – strict, complicated

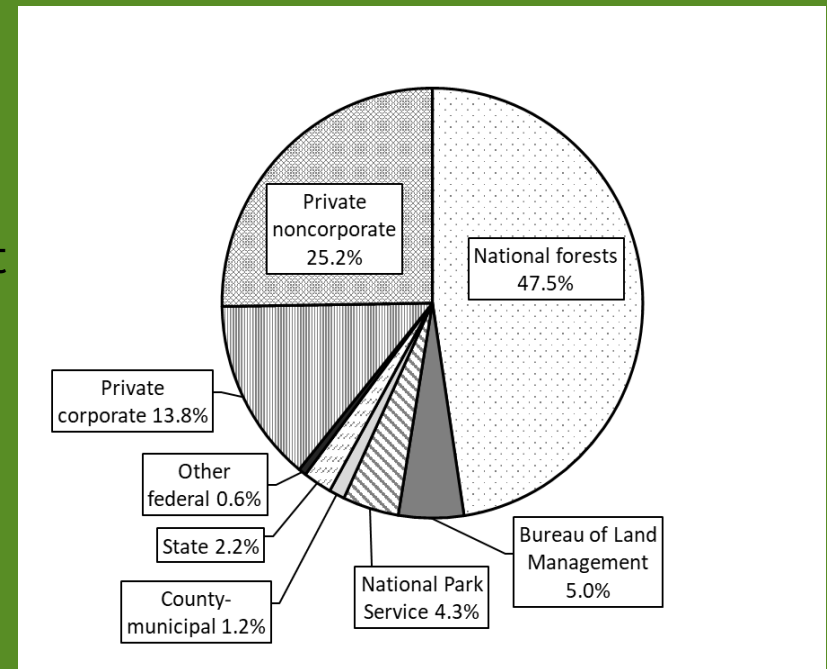


Figure 1. Percentage of forest type by ownership group in California, 2001-2010. Adapted from Christensen et al., 2016.

WHY SHOULD YOU CARE?

Data on California logging workforce is severely lacking

(Christensen et al., 2016; Marcille et al., 2020; US Bureau of Labor Statistics, 1999)

Capacity and capabilities of entire workforce are unknown

Let their voice be heard/contribute to potential policy discussion/decision-making

PROVIDE INSIGHT INTO WHETHER THE LOGGING WORKFORCE IS ABLE TO KEEP UP WITH DEMANDS PLACED BY FOREST MANAGERS FOR WOOD



WHAT IS THE PURPOSE?



Determine the size, scale, and capabilities of the logging workforce in California.

RESEARCH OBJECTIVES:

1

Quantify the number of crews that exist and their demographic diversity

2

Determine workforce capacity and capabilities

3

Improve our understanding of workforce challenges, opinions, business outlook, & visions for the future



METHODS

Data Collection & Analysis

1



Survey

SPSS

Descriptive Statistics
Hypothesis Testing

2



Interview

Anticipated Trends
Emergent Coding
Multiple Checks

SURVEY RESULTS

Number of Responses:

220

Response Rate:

24.6%

INTERVIEW RESULTS

Number of Responses:

9

Response Rate:

4.1%

of survey respondents

DEMOGRAPHICS

LICENSE TYPE (N=218)

A = 179 (81.7%)

B = 37 (17.0%)

C = 2 (0.9%)

RACE/ETHNICITY(N=167)

White = 148 (88.6%)

Other = 10 (6%)

American Indian/Alaska Native = 7 (4.2%)

EDUCATION(N=168)

Secondary Only = 67 (30.5%)

University Degree = 39 (22.9%)

AVERAGE TIME IN INDUSTRY (N=169)

3-66 years (Avg= 29.6)

GENDER (N=172)

Male = 166 (96.5%)

Female = 5 (2.9%)

Prefer Not to Say = 1 (0.6%)

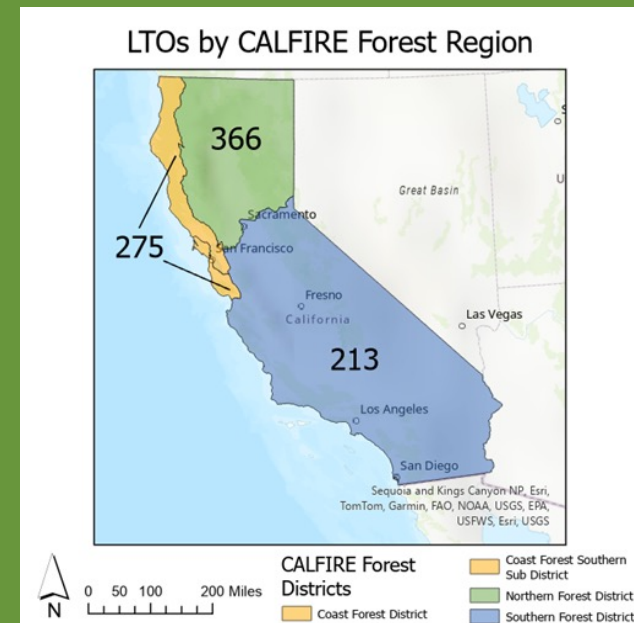


Figure 2. Location of Licensed Timber Operators within California divided into CAL FIRE Forest Districts. An additional 52 LTOs do not reside within the state of California. Map Author: Kendra Gerstenberg

EMPLOYMENT

CREWS (N=215)

Total = 432

Average = 1 crew/operation (77.2%)

EMPLOYEES (N=213)

Total = 899

Average = 5 employees/crew

BUT 49.8% = 1-3 crews

EMPLOYEE AGE (N=177)

25-54 years old = 145 (81.9%)

*EASE OF FINDING NEW EMPLOYEES (N=9)

Few skilled operators, low interest, issues with economy

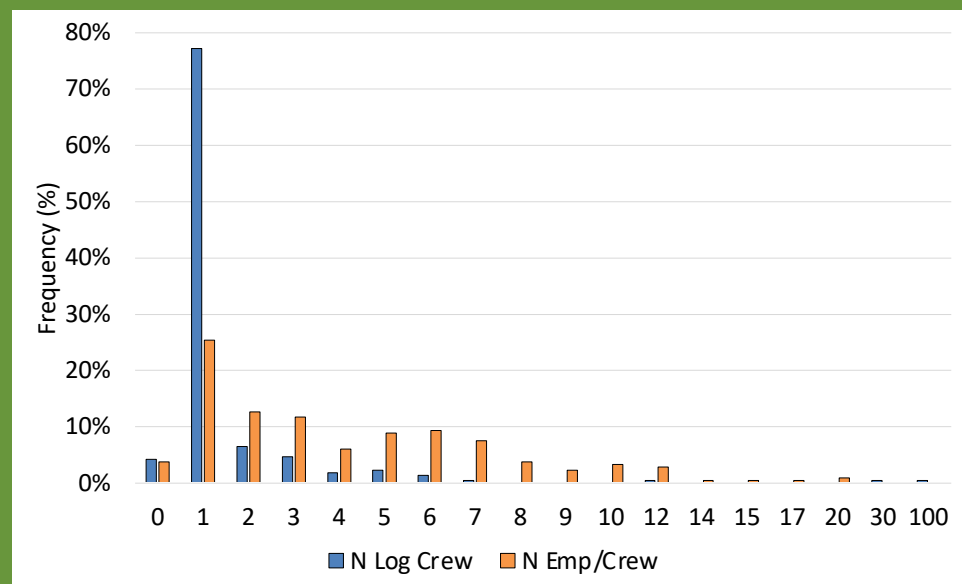


Figure 3. Frequency (% of responses) of average logging crews and employees/crew. N=213

EMPLOYMENT

HYPOTHESIS:

The age of an LTO is correlated with the age of their employee

TESTS

- Pearson's Correlation Test
- Ordinal Logistic Regression using probabilities of group membership

RESULT

Pearson's: Significant
($p < 0.001$; $r = 0.502$)

Statistically significant predictors of hire for LTOs: 25-34 ($p < 0.001$), 35-44 ($p < 0.001$), 45-54 ($p < 0.001$), 55-65 ($p < 0.001$), 65+ ($p < 0.001$)

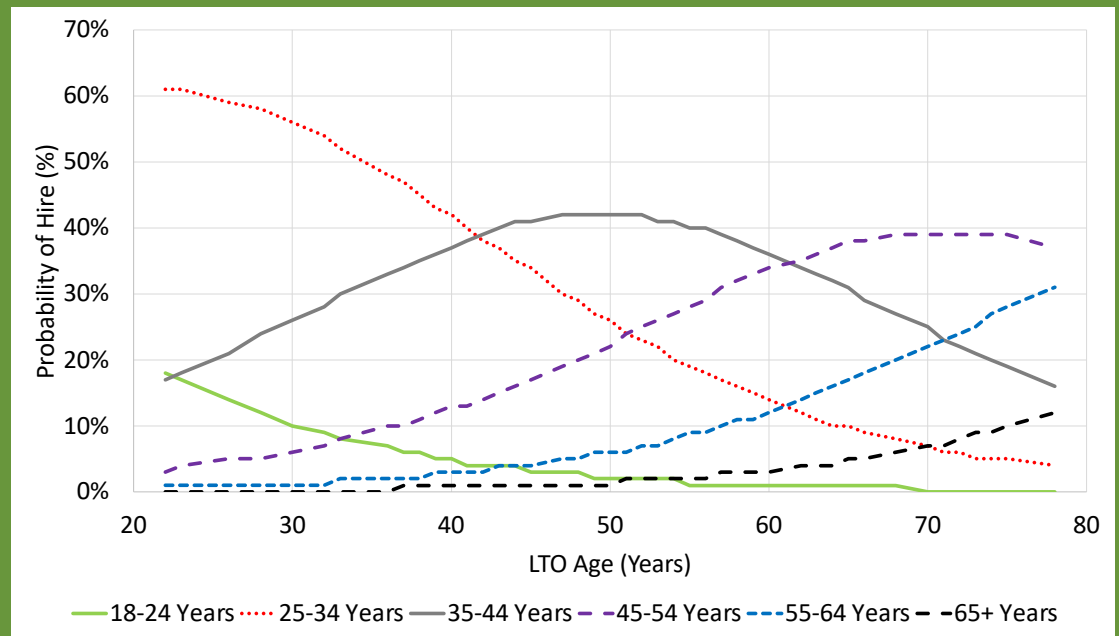


Figure 4. Predicted probability of hire (%) across different employee age groups based on Licensed Timber Operator age (years).

EQUIPMENT

MACHINES/EQUIPMENT (N=187)

Total = 5,415

w/o chainsaws = 1,473

Average = 5.5 machines/crew

FULL SYSTEM (N=148)

Full System = 48 (32.4%)

No Chip/Bio = 21 (14.2%)

TRUCKING (N=187)

Total = 1,542

Chip Trucks (122), Long Loggers (115),

Water Trucks (98)

*EASE OF BUYING EQUIPMENT (N=9)

Maintain job security, job requiring something you don't have, state programs
(Carl Moyer Program - CA Air Resources Board, 2025)

Tax implications, price reductions, lower interest rates, faster payments

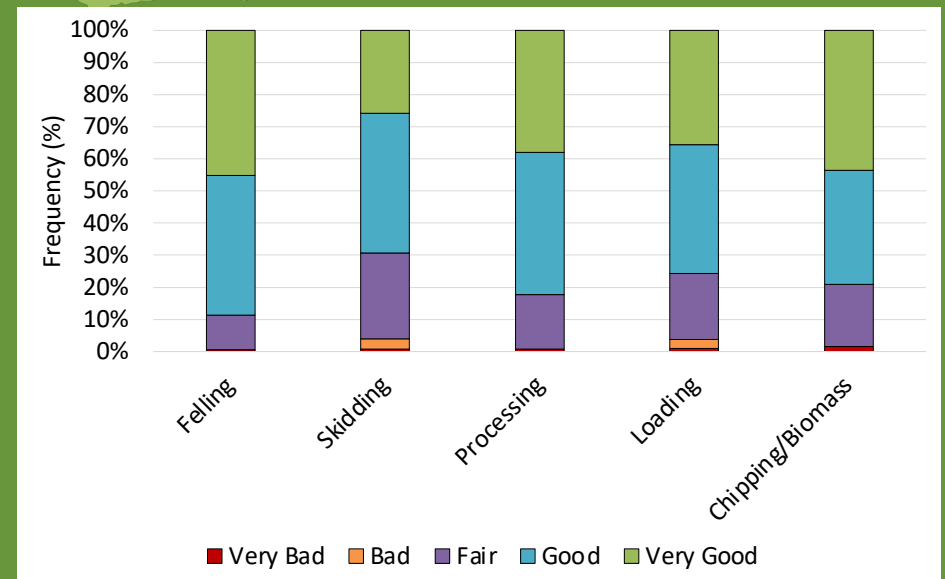


Figure 5. Frequency (% of responses) of average condition of equipment for each process. N=171, 133, 132, 123, 90 respectively.

Table 1. Average quantity, average age, and total number of equipment or machines used across Licensed Timber Operator logging practices.

Process	Average Quantity (#)	Average Age (Years)	Total Quantity (#)
Felling (N = 171)			
Chainsaw	6	3	2,147
CTL Harvester	0	0	30
Rubber Tire Feller Buncher	0	0	15
Tracked Feller Buncher	0	4	110
Other	1	.5	75
Total	7		2,377
Skidding (N = 115)			
Cable Skidder	0	0	24
Clam Bunk Skidder	0	0	1
Dozer	1	20	145
Forwarder	0	0	6
Grapple Skidder	1	10	254
Shovel	.5	3	88
Yarder	0	0	34
Other	1	9.5	56
Total	3.5		608
Processing (N = 144)			
Chain-Flail Delimber	0	0	2
Chainsaw	5	3	1,795
Delimiting Gate w/Pull Through Delimber	0	0	2
Pull Through Delimber	0	0	6
Swing Boom Delimber	0	0	16
Swing Boom Processor	1	4	98
Buck/Slasher Saw	0	0	1
Tree Length Only	0	0	6
Other	0	0	8
Total	6		1,934

Loading (N = 78)			
Front End Loader	1	11	67
Mobile Knuckleboom	1	6	130
Self Loader	0	0	12
Trailer Mounted Knuckleboom Loader	0	0	12
Other	1	10	96
Total	3		317
Chipping/Biomass (N = 75)			
Horizontal or Tub Grinder	0	0	13
Masticator	1	2	96
Whole Tree Chipper (Clean/Pulp Chips)	0	0	12
Whole Tree Chipper (Clean/Pulp Chips) and Grinder	0	0	3
Whole Tree Chipper (Dirty/Fuel)	0	1	32
Other	0	2	23
Total	1		179
Whole System	20.5		5,415

***How much do you budget for equipment?**

\$50,000-\$1,000,000 (Avg: \$560,000)

or % of operation cost

PRODUCTION

ANNUAL (N=129)

Range= 0-140,000 mbf

Average = 2,000 mbf

Total = 901.5 MMBF

Mill capacity 2016=1,870 Scribner MMBF

DAILY TARGET (N=121)

Range = 0.04 - 2,000 mbf

Average = 30 mbf (6 truck loads)

CHANGE? (N=165)

Decrease = 68 (41.2%)

Stay The Same = 59 (35.8%)

Increase = 38 (23.0%)

*FEDERAL GOVERNMENT (N=9)

Not interested (N=5) - overregulation, litigation on sales, killing innovation, micromanagement.

Interested (N=1) - lines in the sand, transparent, contract debriefing

Table 2. Distribution of logging operations by timberland ownership in California including frequency of involvement on industrial, non-industrial, and federal land as well as commercial, fuel reduction, restoration, and other logging activities.

	0% of Operations	1-99% of Operations	100% of Operations
Timberland Ownership			
Industrial Timberland	42.5%	25.9%	31.6%
Non-Industrial Timberland	48.3%	22.4%	29.3%
Federal Timberland	66.6%	28.1%	5.2%
Type of Work			
Commercial	46.0%	34.5%	19.5%
Fuel Reduction	43.7%	39.1%	17.2%
Restoration	78.7%	20.2%	1.1%
Other	74.1%	12.1%	13.8%

OPINIONS

HIGHEST THREAT/CHALLENGE (N=158)

Availability of Work = 45 (28.5%)

Employment = 35 (22.2%)

Health & Safety = 30 (19.0%)

RECOMMEND INDUSTRY (N=173)

Yes = 87 (50.3%)

Might or Might Not = 41 (23.7%)

No = 45 (26.0%)

VISION FOR THE FUTURE (N=173)

Optimistic = 84 (48.6%)

Neutral = 51 (29.5%)

Pessimistic = 33 (19.2%)

SUCCESSION PLAN

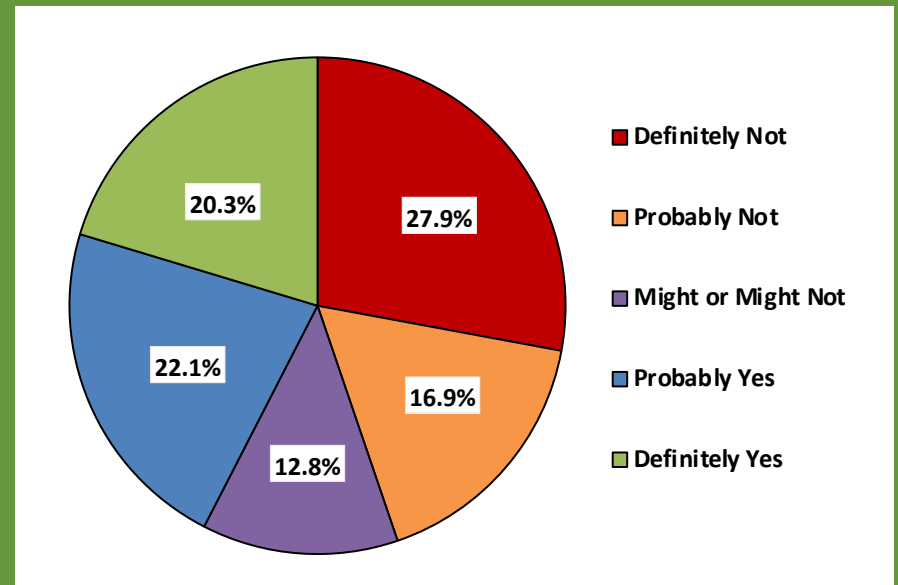


Figure 7. Frequency of respondents indicating whether or not they have a succession plan in place. N=172

INTERVIEW RESULTS

Ease of starting a logging business

Hard! - costs, loans, equipment, short contracts, experience

Compensation Satisfaction

Satisfied - you control your destiny, depends on how it's run, more work = less effective

Health Changes

Increase - more energetic, physically demanding
Decrease - behind a desk

Insurance

\$3,500-\$75,000/yr
frequency of incidents

Strengths:

Knowledge (5),
Variability (4), Quality (3)

Weaknesses:

Workforce (4), \$ (3),
Small (2)

Safety

Set rules, culture, physical items, regular safety meetings

Opportunities:

Work/contracts (7), New equipment (3),
Exportation (1)

Threats:

Limitations (6), Risk (4),
Outside forces (4)

SUMMARY

Crews & Demographics

- Benchmark set, now repeat regularly!!!
- Aging workforce with challenges recruiting young/diverse employees

Capacity & Capability

- Productivity steady & at or near mill capacity
- Infrastructure/Equipment needs & interest for fuel reduction & restoration?

Challenges & Opportunities

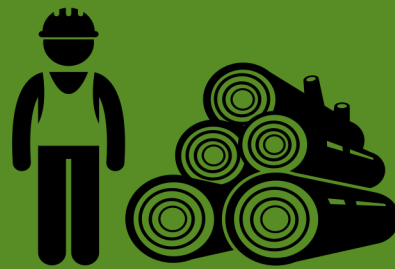
- Concerns CARB restrictions
- Wildfire impacts on workforce
- Raising LTO satisfaction
- Availability of work and attractive contracts
- Finding & retaining high quality employees
- Knowledgeable, adaptable & high standard of work & safety

Acknowledgements



USDA Forest Service

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CA Licensed Timber Operators

