

## Labor Market Analysis: 0115.20 – Wildlife and Fisheries

### *Aquaculture Science – Associate of Science (A.S.) degree;*

*Certificate requiring 6 to <18 semester units*

Los Angeles Center of Excellence, August 2024

<b>Program Endorsement:</b>	<b>Endorsed: All Criteria Met</b> <input type="checkbox"/>	<b>Endorsed: Some Criteria Met</b> <input checked="" type="checkbox"/>	<b>Not Endorsed</b> <input type="checkbox"/>
<b>Program Endorsement Criteria</b>			
<b>Supply Gap:</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
<b>Living Wage: (Entry-Level, 25<sup>th</sup>)</b>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
<b>Education:</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
<b>Emerging Occupation(s)</b>			
	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	

## SUMMARY

This report analyzes whether local labor market demand is being met by community college programs aligned with the identified middle-skill occupations<sup>1</sup> or whether a shortage of workers exists. Labor market demand is measured by annual job openings while education supply is measured by the number of awards (degrees and certificates) conferred on average each year.

Based on the available data, there appears to be a supply gap for the three identified occupations in the region. While the majority of annual openings for the occupations in this report have entry-level wages that are lower than the self-sufficiency standard wage in both Los Angeles and Orange counties, the majority of annual openings for the occupations in this report typically require an associate degree.

**Recommendation:** Due to two of the three program endorsement criteria being met, the Los Angeles Center of Excellence for Labor Market Research (LA COE) endorses this proposed program.

## Key Findings

### Supply Gap

- 358 annual job openings are projected in the region through 2027. This number is greater than the three-year average of 11 awards conferred by educational institutions in the region.

<sup>1</sup> Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree. The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

- However, the SOC codes in this report include various agriculture occupations and not solely aquaculture-related jobs. Therefore, the number of annual job openings for aquacultural-related jobs is likely overstated.
- Over the past 12 months, there were 28 online job postings that listed “aquaculture” as a specialized skill. The highest number of job postings were for aquaculture managers, husbandry interns, aquaculture technicians, and animal care technicians.

### **Living Wage**

- 65% of annual job openings for these aquaculture-related occupations have entry-level wages **below** Los Angeles County’s self-sufficiency standard hourly wage (\$18.10/hour).<sup>2</sup>

### **Educational Attainment**

- 56% of the annual job openings typically require an associate degree for middle-skill occupations related to aquaculture in the LA/OC region.
- 52% of agricultural and food science technicians in the field have completed some college or an associate degree, according to national educational attainment data.
  - While only 15% of farmworkers, farm, ranch, and aquacultural animals have completed some college or an associate degree, 77% have completed a high school diploma or less educational attainment.

### **Community college supply**

- 2 community colleges issued awards related to natural resources in the greater LA/OC region.
- 11 awards (degrees and certificates) were conferred on average each year between 2021 and 2023.

### **Other postsecondary supply**

- No other educational institutions in the LA/OC region have conferred awards in aquaculture-related programs in the past three years.

## **TARGET OCCUPATIONS**

LA COE prepared this report to provide regional labor market and postsecondary supply data related to three middle-skill occupations. [For full occupation descriptions, please see Appendix.](#)

- **Agricultural Technicians (19-4012)**<sup>3</sup>
- **Food Science Technicians (19-4013)**<sup>4</sup>
- **Farmworkers, Farm, Ranch, and Aquacultural Animals (45-2093)**<sup>5</sup>

## **OCCUPATIONAL DEMAND**

Exhibit 1 shows the five-year occupational demand projections for these occupations related to aquaculture. In the greater Los Angeles/Orange County region, the number of jobs related to

<sup>2</sup> Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

<sup>3</sup> [Agricultural Technicians \(bls.gov\)](https://www.bls.gov/occupations/agricultural-technicians)

<sup>4</sup> [Food Science Technicians \(bls.gov\)](https://www.bls.gov/occupations/food-science-technicians)

<sup>5</sup> [Farmworkers, Farm, Ranch, and Aquacultural Animals \(bls.gov\)](https://www.bls.gov/occupations/farmworkers-farm-ranch-and-aquacultural-animals)

these occupations is projected to decrease by 17% through 2027. However, there will be more than 350 job openings per year through 2027 due to retirements and workers leaving the field. It is important to note that the SOC codes in this report include various agricultural occupations and not solely occupations related to aquaculture. Therefore, the data in Exhibit 1 is likely overstated for entry-level aquaculture occupations. The majority of jobs in 2022 for these middle-skill occupations (76%) were located in Los Angeles County.

**Exhibit 1: Current employment and occupational demand, Los Angeles and Orange counties<sup>6</sup>**

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	2,087	1,712	(375)	(18%)	263
Orange	668	580	(88)	(13%)	95
<b>Total</b>	<b>2,756</b>	<b>2,292</b>	<b>(464)</b>	<b>(17%)</b>	<b>358</b>

### Detailed Occupation Data

Exhibit 2 displays the current employment and projected occupational demand for each of the target occupations in Los Angeles County. The percentage of workers aged 55+ and automation index is included in order visualize upcoming replacement demand for these occupations.

**Exhibit 2: Current employment, projected occupational demand, percentage of workers aged 55+, Los Angeles County<sup>7</sup>**

Occupation	2022 Jobs	2027 Jobs	5-Yr % Change	Annual Openings	% Aged 55 and older*	Auto-mation Index**
Agricultural Technicians	318	357	12%	54	25%	94.8
Food Science Technicians	611	643	5%	91	27%	94.8
Farmworkers, Farm, Ranch, and Aquacultural Animals	1,158	712	(39%)	118	21%	107.3
<b>Total</b>	<b>2,087</b>	<b>1,712</b>	<b>(18%)</b>	<b>263</b>	<b>-</b>	<b>-</b>

\*The average percentage of workers aged 55 and older across all occupations in the greater LA/OC region is 27%. These occupations have a smaller or similar share of older workers, which typically indicates fewer replacements needs to offset the amount of impending retirements.

\*\*The automation index captures an occupation's risk of being affected by automation with a base of 100. An automation index greater than 100 indicates a higher-than average risk of automation; less than 100 indicates a lower-than-average risk.

### WAGES

The labor market endorsement in this report considers the entry-level hourly wages for these occupations related to aquaculture in Los Angeles County as they relate to the county's self-

<sup>6</sup> Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

<sup>7</sup> Ibid.

sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater Los Angeles/Orange County region.

### Los Angeles County

The majority, 65%, of annual openings for these aquaculture-related occupations have entry-level wages below the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$15.58 and \$20.88. (Exhibit 3).

One occupation has entry-level wages above the self-sufficiency standard wage:

- Food science technicians, \$20.88

Experienced workers can expect to earn wages between \$22.38 and \$30.28, which are higher than the self-sufficiency standard.

#### Exhibit 3: Earnings for occupations in Los Angeles County

Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)	Median Annual Earnings*
Agricultural Technicians	\$16.76	\$19.64	\$26.93	\$40,900
Food Science Technicians	\$20.88	\$24.01	\$30.28	\$49,900
Farmworkers, Farm, Ranch, and Aquacultural Animals	\$15.58	\$17.38	\$22.38	\$36,200

\*Rounded to the nearest \$100

### Orange County

The majority, 63%, of annual openings for these aquaculture-related occupations have entry-level wages below the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$15.54 and \$20.53 (Exhibit 4).

One occupation has entry-level wages above the self-sufficiency standard wage:

- Food science technicians, \$20.53

Experienced workers can expect to earn wages between \$21.66 and \$29.78, which are higher than the self-sufficiency standard.

#### Exhibit 4: Earnings for occupations in Orange County

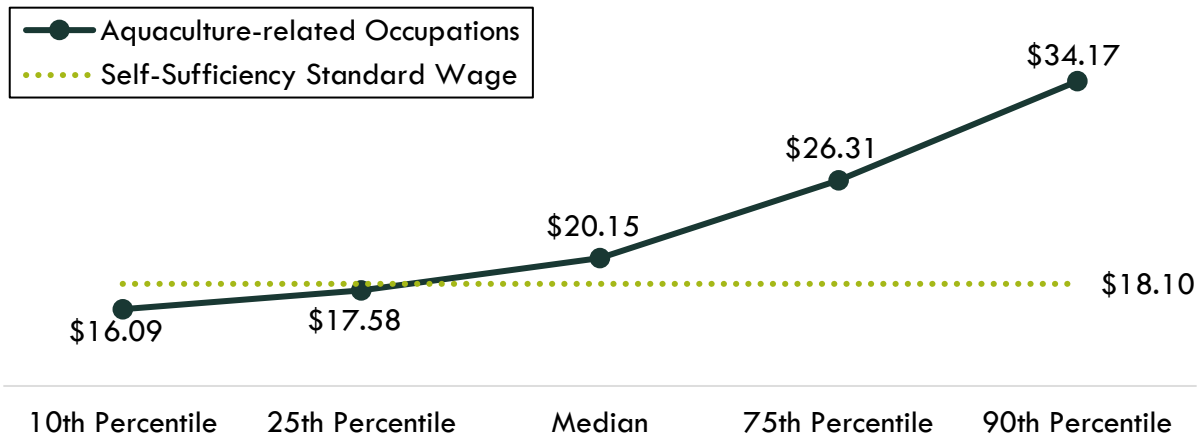
Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)	Median Annual Earnings*
Agricultural Technicians	\$16.08	\$18.86	\$25.79	\$39,200
Food Science Technicians	\$20.53	\$23.61	\$29.78	\$49,100
Farmworkers, Farm, Ranch, and Aquacultural Animals	\$15.54	\$16.79	\$21.66	\$34,900

\*Rounded to the nearest \$100

Across the greater Los Angeles and Orange County region, the average entry-level hourly earnings for the occupations in this report are \$17.58; this is below the living wage for one single

adult in Los Angeles County (\$18.10). Exhibit 5 shows the average hourly wage for the occupations in this report, for entry-level to experienced workers.

**Exhibit 5: Average hourly earnings for aquaculture-related occupations, Los Angeles and Orange counties**



## JOB POSTINGS

In the past 12 months, 28 online job postings in Los Angeles and Orange counties listed “aquaculture” as a specialized skill. The postings were analyzed for the most common job titles, skills, and employers associated with the target occupations in this report (Exhibit 6).

**Exhibit 6: Most commonly requested job titles, skills and employers in job postings, Los Angeles and Orange counties**

Top Job Titles	Top Skills	Top Employers
<ul style="list-style-type: none"> <li>• Aquaculture managers</li> <li>• Husbandry interns</li> <li>• Aquaculture technicians</li> <li>• Animal care technicians</li> </ul>	<ul style="list-style-type: none"> <li>• Aquaculture</li> <li>• Biology</li> <li>• Animal husbandry</li> <li>• Marine science</li> </ul>	<ul style="list-style-type: none"> <li>• Santa Monica College</li> <li>• CIS International Holdings</li> <li>• Quality Marine</li> <li>• Aerotek</li> </ul>

In the greater Los Angeles/Orange County region, 82% of the aquaculture-related job postings listed a minimum educational requirement. The number and percentage of job postings by educational level appear in exhibit 7. In addition to the education levels in exhibit 7, 7% of the job postings requested a master’s degree (2 postings), while 18% requested a Ph.D. or professional degree (5 postings).

**Exhibit 7: Education levels requested in job postings for occupations related to aquaculture, Los Angeles and Orange counties**

Education Level	Job Postings	% of Job Postings
Bachelor's degree	7	25%
Associate degree	7	25%
High school diploma or vocational training	2	7%

## EDUCATIONAL ATTAINMENT

In the greater Los Angeles/Orange County region, the majority of annual job openings (56%) typically require an associate degree (Exhibit 8). Furthermore, the national-level data indicates 52% of agricultural and food science technicians in the field have completed some college or an associate degree as their highest level of educational attainment. While only 15% of farmworkers, farm, ranch, and aquacultural animals have completed some college or an associate degree, 77% have completed a high school diploma or less educational attainment. The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the occupations in this report:

**Exhibit 8: Entry-level education preferred by employers nationally, Bureau of Labor Statistics**

Occupation	Education Level
Agricultural Technicians	Associate degree
Food Science Technicians	Associate degree
Farmworkers, Farm, Ranch, and Aquacultural Animals	No formal educational credential

## EDUCATIONAL SUPPLY

### Community College Supply

Exhibit 9 shows the annual and three-year average number of awards conferred by community colleges in the related TOP code: Natural Resources (0115.00). The two colleges with completions in the region are Saddleback and West LA. There are three other related TOP codes that train students for the occupations in this report, but have no current programs in the region or have not conferred awards in the past three years:

- Food Processing and Related Technologies (0113.00)
- Wildlife and Fisheries (0115.20)
- Ocean Technology (1920.00)

### Exhibit 9: Regional community college awards (certificates and degrees), 2021-2023

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
0115.00	Natural Resources	West LA	-	12	1	4
		<b>LA Subtotal</b>	<b>6</b>	<b>7</b>	<b>6</b>	<b>6</b>
		Saddleback	6	7	6	6
		<b>OC Subtotal</b>	<b>6</b>	<b>19</b>	<b>7</b>	<b>11</b>
<b>Supply Total/Average</b>			<b>6</b>	<b>19</b>	<b>7</b>	<b>11</b>

### Other Postsecondary Supply

For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for aquaculture. There are two CIP codes that are specifically related to aquaculture; however, there were no program awards conferred in the region under these CIP codes in the past three years:

- Aquaculture (01.0303)
- Agricultural/Biological Engineering and Bioengineering (14.0301)

Sustainable aquaculture research and programs continue to evolve in the Los Angeles/Orange County region. AltaSea at the Port of Los Angeles is a public-private ocean institute that has partnered with K-12 and higher education institutions in Los Angeles County to provide encourage ocean STEM opportunities, including aquaculture curriculum.<sup>8</sup> The USC Sea Grant continues to fund research and outreach programs, including the development of safe, environmentally sustainable, and socially responsible aquaculture products.<sup>9</sup>

### APPENDIX: OCCUPATION DESCRIPTIONS

LA COE prepared this report to provide regional labor market supply and demand data related to these target occupations:

- **Agricultural Technicians (19-4012)** Work with agricultural scientists in plant, fiber, and animal research, or assist with animal breeding and nutrition. Set up or maintain laboratory equipment and collect samples from crops or animals. Prepare specimens or record data to assist scientists in biology or related life science experiments. Conduct tests and experiments to improve yield and quality of crops or to increase the resistance of plants and animals to disease or insects.<sup>10</sup>
- **Food Science Technicians (19-4013)** Work with food scientists or technologists to perform standardized qualitative and quantitative tests to determine physical or chemical properties of food or beverage products. Includes technicians who assist in research and

<sup>8</sup> <https://altasea.org/education/>

<sup>9</sup> [Aquaculture - USC Sea Grant](#)

<sup>10</sup> [Agricultural Technicians \(bls.gov\)](#)

development of production technology, quality control, packaging, processing, and use of foods.<sup>11</sup>

- **Farmworkers, Farm, Ranch, and Aquacultural Animals (45-2093)** Attend to live farm, ranch, open range or aquacultural animals that may include cattle, sheep, swine, goats, horses and other equines, poultry, rabbits, finfish, shellfish, and bees. Attend to animals produced for animal products, such as meat, fur, skins, feathers, eggs, milk, and honey. Duties may include feeding, watering, herding, grazing, milking, castrating, branding, de-beaking, weighing, catching, and loading animals. May maintain records on animals; examine animals to detect diseases and injuries; assist in birth deliveries; and administer medications, vaccinations, or insecticides as appropriate. May clean and maintain animal housing areas. Includes workers who shear wool from sheep and collect eggs in hatcheries.<sup>12</sup>

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## DATA SOURCES

- O\*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)

Important Disclaimer: All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

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<sup>11</sup> [Food Science Technicians \(bls.gov\)](https://www.bls.gov)

<sup>12</sup> [Farmworkers, Farm, Ranch, and Aquacultural Animals \(bls.gov\)](https://www.bls.gov)