

ECONOMIC CONTRIBUTION OF THE PEST MANAGEMENT INDUSTRY IN LOUISIANA



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Introduction

Household pests are common in human life. There are variations in the extent of pest infestations, in addition to the cultural and socioeconomic issues associated with the pest organisms (Schoelitz, Meerburg and Takken, 2019). Homes provide a habitable environment and resources for a wide diversity of pests that can affect mental and physical well-being (Leong et al., 2017). Given the persistent presence of household pests, the Professional Pest Management Industry (PPMI) has become an increasingly important part of the domestic economy.

To better understand the economic role of PPMI, this report measures the industry's economic contribution on the Louisiana economy for 2023 and an advanced estimate for 2024. The analysis is similar to previous studies made in Georgia and Tennessee (Winkles, Campbell and Forschler, 2024; Hughes and Vail, 2024), with some slight changes in data source and methodology. The analysis draws from multiple data sources, including the United States Bureau of the Census, Lightcast.io, Economic Impact Analysis software (IMPLAN) and the U.S. Bureau of Labor Statistics.

Method

An economic contribution analysis measures the economic value of a sector's existing economic output on a region's economy. Conceptually, it is measured by taking the difference between the total output that occurs in the economy with all sectors of the economy included compared to when all supply and demand for that specific sector is eliminated from the economy (Miller and Blair, 2022). In the literature, this approach is called Complete Hypothetical Extraction which is an application of input output models.

For the purposes of this study, IMPLAN software is used to evaluate the economic contribution of the PPMI in Louisiana for 2023 and 2024. IMPLAN applies an input-output model for the entire economy of Louisiana including all industries, households and government, as well as how they are interconnected, so the activity of an industry supports and impacts the economic activity of other industries (Clouse, 2023).

For measuring the economic contribution, the first step is estimating the direct economic contribution, or direct output, for a given year. The approach applied is like previous studies such as Winkles, Campbell and Forschler (2024) and Hughes and Vail (2024) but with some slight modifications. First, in measuring the direct contribution of the PPMI in Louisiana, a similar approach of using employee productivity through applying the output-to-employee ratio is used from the 2022 Economic Census for NAICS Code 561710 (Total Sales/Total Employees). That ratio is then multiplied by the total of employees reported by the Quarterly Census of Employment and Wages (QCEW)¹ for the reference year of the contribution. Because QCEW data does not include self-employed businesses, to address this issue an output to establishment ratio is calculated by taking total receipts and dividing by total employers for the 56171 five-digit NAICs from the Census Bureau's nonemployer survey for Louisiana. This ratio is then multiplied by the sum of full-time and part-time self-employed (Categories 3 and 4) from Lightcast.io reports for self-employed businesses. While this approach does require using data from a subscription service (Lightcast.io), the benefit of this approach is that Lightcast has projections of full-time and part-time paid employees, self-employees immediately after the end of the calendar year. This allows for an advanced estimate at the beginning

of the succeeding calendar year of the preceding calendar year’s direct contribution.²

In addition to traditional economic impact analysis, IMPLAN includes an industry contribution analysis option which calculates the economic contribution of an existing industry in the economy using the complete hypothetical extraction approach when provided the direct contribution of an industry. IMPLAN was applied in a similar manner to the previous studies mentioned above for the measurement of indirect and induced contribution effects needed to measure the total contribution. Indirect effects are the additional industry effects due to interlinkages with supplier industries, and induced effects are the additional output effects due to household spending by employees in the PPMI. Since the last model year for IMPLAN is 2023, the interlinkage assumptions between industries, households and government in 2023 are assumed to be similar for both 2023 and

2024. The IMPLAN software is then used to apply the 2024 direct contribution and subsequently measure the total 2024 economic contribution of PPMI to the Louisiana economy. The PPMI NAICS sector (56171) is located within the Services to Buildings and Dwellings (sector code 458) in IMPLAN’s 2023 model year and all indirect and induced effects from this sector are attributed to indirect and induced PPMI contribution.

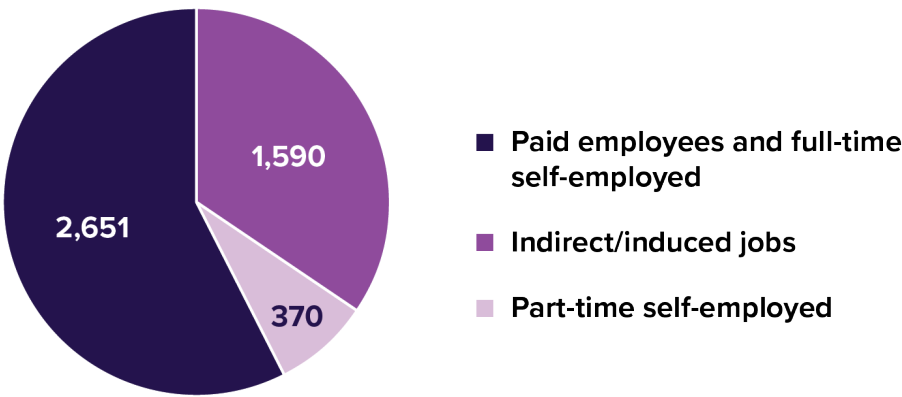
Results

In Table 1, the PPMI’s direct contribution to the Louisiana economy in 2023 included 3,021 jobs supported, \$117,548,288 labor incomes paid, \$150,476,675 in value added generated and \$354,231,000 in direct output created by the industry. When including the total contribution (direct + indirect + induced effects), the value increases to 4,610 jobs (Figure 1), \$201,880,296 in labor income, \$302,627,936 in value added and \$629,486,402 in total output generated by the PPMI.

Table 1. IMPLAN output for Industry Contribution Analysis for 2023.

Economic Indicators by Impact 2023 LA Method				
Impact	Employment	Labor Income	Value Added	Output
Direct	3,021	\$117,548,288.08	\$150,476,675.14	\$354,231,000.28
Indirect	867.93	\$48,459,229.23	\$81,736,478.72	\$156,828,175.43
Induced	721.59	\$35,872,779.03	\$70,414,782.77	\$118,427,226.33
Totals	4,610.52	\$201,880,296.34	\$302,627,936.63	\$629,486,402.04
Multiplier	1.53	1.72	2.01	1.78

Figure 1. Impact of the Louisiana PPMI on Louisiana Employment in 2023.



¹ We use a slightly modified version of QCEW generated by Lightcast.io. Lightcast.io reports as “Category 1” employees which includes all paid employees (full-time and part-time) covered by the unemployment insurance program and exactly match employment reported by the Bureau of Labor Statistics. They also include a “Category 2” employment which includes paid employees not covered by the unemployment insurance program. The sum of Categories 1 and 2 represent total employment in the denominator.

² It should be noted that Lightcast updates their estimates quarterly, so employment estimates in job categories that are not required to match QCEW estimates may change from quarter to quarter as improved source data becomes available. However, this approach is consistent with how the Bureau of Economic Analysis estimates revisions to their gross domestic product.

Furthermore, when evaluating multipliers, the employment multiplier for PPMI is 1.53. This means for every existing direct job, 0.53 additional jobs are generated in other industries in the state. For labor income, the multiplier is 1.72, meaning that for every one dollar of direct labor income, an extra \$0.72 in labor income is generated in other industries across Louisiana. In terms of state gross domestic product (GDP), for every dollar of direct value added, another \$1.01 is added to every other industry in the economy. Finally, for every dollar of

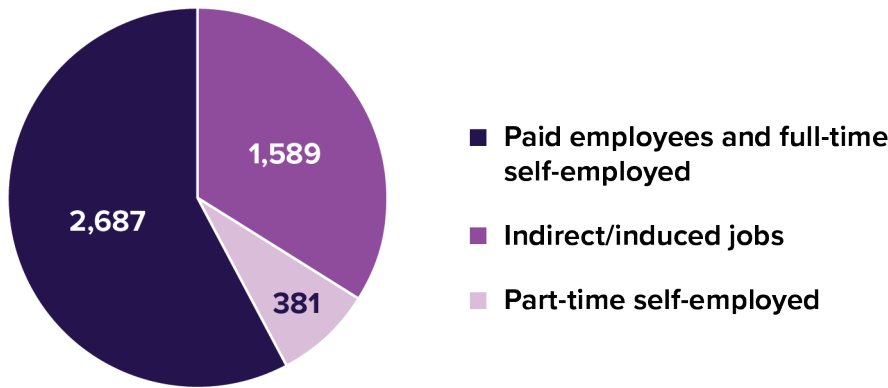
output generated directly by PPMI, another \$0.78 is generated in every other industry in the economy.

In Table 2, an advanced estimate of 2024 PPMI economic contribution is reported. This includes a direct output contribution of \$359,251,649, 3,068 jobs, \$119,214,344 in labor income and \$150,476,675 in value added. When including additional indirect and induced contributions in 2024, PPMI in Louisiana generated a total output contribution of almost \$639 million, total employment of 4,657 (Figure 2), annual labor income of \$204,751,336 and a total contribution to Louisiana’s GDP of \$307,133,645.

Table 2. IMPLAN output for Industry Contribution Analysis for 2024.

Economic Indicators by Impact 2024 LA Method				
Impact	Employment	Labor Income	Value Added	Output
Direct	3068	\$119,214,344.11	\$152,609,437.56	\$359,251,649.25
Indirect	867.51	\$49,096,410.93	\$82,836,027.05	\$158,897,257.88
Induced	721.23	\$36,440,581.61	\$71,688,180.98	\$120,504,642.14
Totals	4,656.74	\$204,751,336.65	\$307,133,645.59	\$638,653,549.27
Multiplier	1.59	1.72	2.01	1.78

Figure 2. Impact of the Louisiana PPMI on Louisiana Employment in 2024.



Further, in terms of output contributions for connected industries, these are concentrated in real estate (over \$17 million), employment services (over \$15 million), owner-occupied housing (over \$13 million), hospitals (almost \$10 million) and retail motor vehicle and parts dealers (\$8 million). Similar to output impacts, employment impacts were concentrated in employment services (160 jobs), other real estate (102 jobs), commercial and

industrial machinery and equipment repair and maintenance (57 jobs), management of companies and enterprises (36 jobs) and office administrative services (31 jobs). Major Gross State Product impacts were concentrated more in owner-occupied housing (\$12 million), employment services (almost \$9 million), other real estate (\$6 million), motor vehicle and parts dealers (almost \$6 million) and hospitals (\$5 million).

Discussion

There has not previously been an economic contribution study of the PPMI conducted for Louisiana. Using IMPLAN software and a modified approach following previous studies made in other states, the economic contribution of the PPMI in Louisiana for 2023 was estimated as well as an advanced estimate for 2024.

When reviewing the results, PPMI plays an important role in Louisiana's economy. The estimate for 2023 showed that the total economic output contribution of the PPMI was \$630 million, supporting 4,610 jobs in Louisiana. Advanced

estimates for 2024 indicated that the PPMI contribute to the Louisiana's economy with \$639 million in output, supporting Louisiana employment by generating 4,657 jobs.

The economic multipliers for PPMI show not only the industry support of the economy Louisiana with the direct contribution of jobs, income, and output, but also reflects the economic activity on related industries that are benefitted from PPMI upstream in the supply chain and household spending. As can be seen in Table 3, the industries that benefit the most from indirect and induced impacts included real estate, professional, scientific and technical services, and wholesale trade.

Table 3. Impact of the Louisiana PPMI in other industries.

Industry Display	Output	Value Added	Employment
316 - Leather and Allied Product Manufacturing	\$352.19	\$85.43	0
111 - Crop Production	\$187,424.39	\$52,471.65	1.2
112 - Animal Production and Aquaculture	\$128,288.88	\$49,809.24	0.64
113 - Forestry and Logging	\$7,478.05	\$6,906.36	0.13
114 - Fishing, Hunting and Trapping	\$27,992.20	\$27,089.12	0.58
115 - Support Activities for Agriculture and Forestry	\$7,948.85	\$7,416.74	0.25
211 - Oil and Gas Extraction	\$858,406.49	\$370,129.71	1.09
212 - Mining (except Oil and Gas)	\$663,182.28	\$415,590.60	0.77
213 - Support Activities for Mining	\$3,971.12	\$2,835.99	0.01
221 - Utilities	\$5,665,034.12	\$3,176,481.43	4.31
23 - Construction	\$2,111,425.92	\$1,086,274.97	11.73
311 - Food Manufacturing	\$690,105.86	\$141,811.86	1.55
312 - Beverage and Tobacco Product Manufacturing	\$333,018.55	\$79,610.15	0.58
313 - Textile Mills	\$918.12	\$195.52	0
314 - Textile Product Mills	\$12,882.25	\$3,351.67	0.07
315 - Apparel Manufacturing	\$20,235.72	\$3,003.61	0.2
321 - Wood Product Manufacturing	\$223,422.16	\$90,347.05	0.55
322 - Paper Manufacturing	\$1,396,418.17	\$487,478.26	1.78
323 - Printing and Related Support Activities	\$388,001.85	\$132,132.07	2.44
324 - Petroleum and Coal Products Manufacturing	\$7,666,846.11	\$1,607,017.53	1.3
325 - Chemical Manufacturing	\$2,961,023.01	\$1,026,400.05	2.01
326 - Plastics and Rubber Products Manufacturing	\$259,071.03	\$99,093.56	0.46

Industry Display	Output	Value Added	Employment
327 - Nonmetallic Mineral Product Manufacturing	\$212,779.26	\$80,021.19	0.51
331 - Primary Metal Manufacturing	\$36,277.57	\$5,379.42	0.04
332 - Fabricated Metal Product Manufacturing	\$457,840.43	\$192,394.28	1.9
333 - Machinery Manufacturing	\$126,040.23	\$34,505.17	0.3
334 - Computer and Electronic Product Manufacturing	\$2,772.14	\$769.20	0
335 - Electrical Equipment, Appliance and Component Manufacturing	\$2,963.95	\$748.73	0.01
336 - Transportation Equipment Manufacturing	\$195,149.42	\$27,213.06	0.41
337 - Furniture and Related Product Manufacturing	\$6,218.77	\$1,897.21	0.03
339 - Miscellaneous Manufacturing	\$242,491.89	\$81,990.28	1.12
42 - Wholesale Trade	\$16,822,046.60	\$9,719,571.18	43.52
441 - Motor Vehicle and Parts Dealers	\$8,034,436.72	\$5,869,291.09	38.46
444 - Building Material and Garden Equipment and Supplies Dealers	\$2,247,530.89	\$1,917,899.42	16.22
445 - Food and Beverage Stores	\$2,309,463.63	\$1,643,159.69	23.98
446 - Health and Personal Care Stores	\$1,448,283.16	\$1,106,657.82	12.17
449 - Furniture, Home Furnishings, Electronics and Appliance Retailers	\$899,934.65	\$799,174.05	9.84
455 - General Merchandise Retailers	\$2,804,271.86	\$1,970,054.57	29.81
457 - Gasoline Stations and Fuel Dealers	\$999,474.72	\$696,581.75	7.11
458 - Clothing, Clothing Accessories, Shoe and Jewelry Retailers	\$1,322,464.15	\$702,558.94	11.63
459 - Sporting Goods, Hobby, Musical Instrument, Book and Miscellaneous Retailers	\$1,360,191.35	\$819,797.29	22.83
481 - Air Transportation	\$1,272,536.62	\$572,797.24	2.51
482 - Rail Transportation	\$551,905.80	\$282,153.23	1.05
483 - Water Transportation	\$304,956.75	\$103,617.32	0.48
484 - Truck Transportation	\$3,060,595.60	\$1,343,772.79	15.49
485 - Transit and Ground Passenger Transportation	\$636,918.22	\$234,305.21	13.78
486 - Pipeline Transportation	\$159,409.49	\$68,475.77	0.24
487-488 - Scenic and Sightseeing Transportation and Support Activities for Transportation	\$663,718.35	\$538,274.49	5.36
492 - Couriers and Messengers	\$962,776.26	\$883,477.26	16.92
493 - Warehousing and Storage	\$1,806,569.75	\$1,262,938.54	16.03
512 - Motion Picture and Sound Recording Industries	\$863,613.85	\$300,100.06	3.52
513 - Publishing Industries	\$1,420,940.69	\$607,214.51	5.34
516 - Broadcasting and Content Providers	\$2,222,051.91	\$507,715.22	6.09

Industry Display	Output	Value Added	Employment
517 - Telecommunications	\$5,788,182.10	\$2,709,321.98	10.21
518 - Computing Infrastructure Providers, Data Processing, Web Hosting and Related Services	\$4,595,480.70	\$2,010,359.38	15.95
519 - Web Search Portals, Libraries, Archives and Other Information Services	\$1,539,697.31	\$449,932.01	2.01
521 - Monetary Authorities-Central Bank	\$5,763,799.45	\$3,412,418.94	16.99
522 - Credit Intermediation and Related Activities	\$1,847,251.32	\$734,961.71	6.76
523 - Securities, Commodity Contracts and Other Financial Investments and Related Activities	\$3,018,956.48	\$605,891.95	29.91
524 - Insurance Carriers and Related Activities	\$11,286,770.36	\$5,799,850.20	27.35
525 - Funds, Trusts and Other Financial Vehicles	\$897,310.89	\$198,490.59	6.78
531 - Real Estate	\$33,048,765.48	\$20,155,018.28	109.92
532 - Rental and Leasing Services	\$8,713,672.42	\$5,236,385.11	29.63
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	\$2,140,646.53	\$998,798.35	0.4
551 - Management of Companies and Enterprises	\$7,340,747.20	\$4,093,745.01	35.77
561 - Administrative and Support Services	\$23,412,441.14	\$163,350,769.60	4,346.67
562 - Waste Management and Remediation Services	\$3,701,023.62	\$1,513,410.38	12.66
611 - Educational Services	\$2,065,280.61	\$1,392,742.72	28.19
621 - Ambulatory Health Care Services	\$9,946,753.89	\$6,704,345.04	79.4
622 - Hospitals	\$9,685,748.56	\$5,285,387.18	48.48
623 - Nursing and Residential Care Facilities	\$1,594,962.96	\$972,515.93	18
624 - Social Assistance	\$1,733,192.40	\$1,025,179.18	32.22
65-541 - Professional, Scientific and Technical Services	\$19,845,443.40	\$12,401,871.08	129.5
711 - Performing Arts, Spectator Sports and Related Industries	\$1,805,981.67	\$1,116,219.90	15.18
712 - Museums, Historical Sites and Similar Institutions	\$92,477.63	\$51,764.91	0.71
713 - Amusement, Gambling and Recreation Industries	\$1,130,390.36	\$696,206.75	10.8
721 - Accommodation	\$141,658.59	\$89,804.66	1.2
722 - Food Services and Drinking Places	\$12,343,855.14	\$6,101,591.71	137.28
811 - Repair and Maintenance	\$17,899,191.29	\$10,714,059.51	126.27
812 - Personal and Laundry Services	\$1,330,267.93	\$813,620.94	29.72

Industry Display	Output	Value Added	Employment
813 - Religious, Grantmaking, Civic, Professional and Similar Organizations	\$1,404,661.24	\$986,687.70	10.06
814 - Private Households	\$116,563.27	\$116,563.27	7.13
93 - Non-NAICS	\$0.00	\$0.00	0
9A - Government Enterprises	\$3,954,156.14	\$1,649,984.09	14.66
9B - Administrative Government	\$0.00	\$0.00	0
Total	\$629,486,402.04	\$302,627,936.63	5,678.18

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