

Agricultural and Food Policy Center
Texas A&M University

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Economic Impact of the Texas Deer Breeding and Hunting Operations



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Research Report 17-3

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**Agricultural and Food Policy Center
The Texas A&M University System**

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Executive Summary

- This report is an update to the initial study completed for the Texas Deer Association in 2007 that reported impacts as of 2005. This survey was performed in mid-2016 and asked for information describing the operations in 2015.
- The survey asked detailed questions regarding inventory, size of operation, annual expenditures, revenue sources, and production system. This survey asked additional questions regarding CWD testing in the area of veterinary & animal supplies.
- Breeding operations reported expenditures averaging \$283,000 per year.
- The deer breeding industry has a direct economic impact of \$349.4 million annually.
- When incorporating the indirect impacts of the industry, for example, the farm's expenditures on feed, veterinary supplies, fuel and other purchases, the total economic impact of the industry to the Texas economy is \$786.9 million.
- Many of these breeding operations also have hunting or sell stocker bucks to other hunting operations. The study estimated the impact of hunting dollars spent on the products of deer breeders (with hunters as buyers of the deer breeders' products) and determined an additional \$860 million is generated by the deer breeding industry.
- The total impact of the industry to the Texas economy, combining the breeding and hunting components, is \$1.6 billion annually.
- The economic activity of the deer breeding industry supports 16,892 jobs, most of which are in rural areas of the state. If this industry did not exist, those jobs would have to be supported by some other economic activity.
- These results continue to highlight the fact that the deer breeding industry is a growing and important segment of the Texas economy, contributing to the vitality of rural areas of the state.

Introduction

While deer farming has been a well-established industry for nearly a century, over the past 10 years there has been a spike in interest concerning the demand and supply of this nontraditional agricultural sector. The production side of the industry is represented by operations involved in breeding and raising deer. Other industry breeders and hunting operations represent the consumption side. This developing industry has become vital to the economic growth and stability of many rural communities across the country. According to the Texas Parks and Wildlife Department, the number of permitted breeding facilities in Texas has grown from 946 in 2006 to 1,257 in 2016.

In Texas, the majority of the facilities are permitted for breeding and hunting. Breeding operations involve the scientific breeding and raising of deer with the intention of selling to other breeding operations or hunting facilities. Hunting operations purchase deer to stock their operations. A 2007 study on the economic impact of Texas deer breeding and hunting operations on the state's economy found that breeding operations contributed a total economic impact of \$523 million annually with an additional \$129 million generated by hunting operations for a combined impact on the Texas economy of \$652 million annually.¹

As the industry continues to grow, understanding its economic impact becomes increasingly relevant. Lawmakers have grown interested in industry regulations, legalizations, and restrictions, as well as aid in conservation efforts by preserving space for wildlife.

Methodology

To estimate the economic impact of the deer breeding industry, a survey instrument was developed to collect detailed operational information from industry participants. This information was then combined with the inventory of deer breeding operations to analyze the production side of the industry. In addition, an analysis was performed to determine the impact of hunting operations that are related to the deer breeding industry. These two components were then combined to perform the economic impact analysis of the deer breeding industry.

Data Collection

The survey instrument used in the 2007 study was reviewed by industry leadership, revised, and sent to over 1,300 members of the Texas Deer Association (TDA) throughout the late spring and summer of 2016. Overall, the extensive survey achieved a low response rate with only 46 completed surveys. Of these, 14 were breeding only operations, 30 were breeding and hunting, and only 2 were self-described hunting only operations. Due to confidentiality and data disclosure policies, the data for hunting only operations cannot be provided in this report. There are likely a number of reasons for the low response rate. First, the survey instrument was very detailed and required both production and accounting knowledge to complete. Secondly, there are a significant number of TDA members who are associated with the industry (such as feed and equipment suppliers) but do not have breeding facilities or hunting operations and did not return the survey.

The full survey is provided in the Appendix. For the purpose of the survey, the deer breeding industry was segmented into three operational structures: breeding only, breeding and hunting, and hunting only operations. Breeding only operations were defined as those that only involve the scientific breeding and rearing of deer. Hunting only operations relate to only those hunting operations that purchase deer from breeding operations as stockers or as breeding stock for release into the hunting facility. Operations that manage their deer

¹ Anderson, David P., Brian J. Frosch, and Joe L. Outlaw, "Economic Impact of the Texas Deer Breeding Industry," AFPC Research Report 97-3, College Station, TX: Texas A&M University, Agricultural and Food Policy Center, August 2007.

Table 1: The Herd Structure of Deer Breeding Operations.

	Breeding	Breeding and Hunting
Operation		
Year Started	2004	2004
Area of Breeding Operation (acres)	21	30
Area of Hunting Operation (acres)	N/A	1,627
Number of Pens	9	15
Area of Pens (acres)	10	20
Herd Inventory		
Total Number of Breeder Deer	180	242
Breeder Bucks (number)	51	59
Stocker Bucks (number)	33	48
Does (number)	56	78
Fawns (number)	40	57
Mortality Rate (percent)	10%	6%

populations by selective harvest and nutritional supplements, rather than supplementing the natural genetics with deer released from breeding operations, are not included in this study. Breeding and hunting operations represent those that engage in breeding activities while also utilizing their own breeding stock, or purchased breeding stock, to supplement the genetics and/or populate their hunting operation.

The surveys proved to be quite extensive in order to capture an accurate picture of the industry and its impact. For breeding operations, the survey included questions regarding the operation in general, herd inventory, purchases, sales, capital expenditures, veterinary expenditures, labor, feeding rates and expenditures, utilities, and other miscellaneous expenses. For hunting operations, the base operational questions remained the same; however, hunting related questions were included as well, such as the number of hunters, harvest rate, percentage of herd from breeding operations, hunt revenues, processing, and taxidermy.

Survey Results

On average, there was very little difference in the herd structure of breeding only operations and breeding and hunting operations (Table 1). For deer breeding, operations that specialize in breeding only use about 21 acres, and breeding and hunting operations dedicate an average of 30 acres to breeding. The number of pens on the property is typically determined by the size of the herd. Deer are grouped based on age, typically with about 20 does per pen per buck. Breeding and hunting operations had more pens on the property. This is because these ranches typically used the breeding operation to stock the hunting operation. Breeding and hunting operations have an average of 15 pens on 20 acres of land. Those operations that are dedicated to breeding only were slightly smaller with 9 pens on 10 acres. Of these breeding operations, 75% reported having whitetail deer and 9% reported other species. These other species include elk, fallow, axis, and eight other unidentified species of exotic cervids.

The survey results revealed that breeding operations averaged 180 breeder deer with 51 breeder bucks, 31 stocker bucks, 56 does, and 40 fawns. Breeding only operations reported an average annual mortality rate of 10%. This mortality rate refers to the death percentage of deer over 12 months of age. Breeding and hunting operations reported a slightly larger herd. Breeding and hunting operations average 242 breeder deer with 59 breeder bucks, 48 stocker bucks, 78 does, and 57 fawns (Table 1). Breeding and hunting operations reported an average annual mortality rate of 6%.

Table 2: Average Breeding Stock Purchases in 2015.

	Breeding	Breeding and Hunting
Number Purchased		
Breeder Bucks (number)	2	2
Total Cost of Breeder Bucks (dollars)	\$18,500	\$18,300
Stocker Bucks (number)	0	14
Total Cost of Stocker Bucks (dollars)	\$0	\$67,000
Open Does (number)	1	5
Total Cost of Open Does (dollars)	\$7,000	\$18,625
Bred Does (number)	2	6
Total Cost of Bred Does (dollars)	\$27,833	\$38,750
Fawns (number)	2	2
Total Cost of Fawns (dollars)	\$5,438	\$18,590
Semen (number)	7	9
Total Cost of Semen Straws (dollars)	\$16,125	\$25,937
Total Number Purchased	13	38
Total Cash Cost for Breeding and Hunting Stock	\$74,896	\$187,202

Operational Costs

When assessing operational costs for deer breeding versus breeding and hunting operations, it is apparent that breeding and hunting operations had higher costs associated with obtaining their herd (Table 2). The most significant differences were in the cost of stocker bucks, doe, fawn and semen costs. In total, breeding stock purchases for breeding only operations averaged \$74,896 while breeding and hunting operations spent an average total of \$187,202 on breeding stock in 2015.

Data describing the normal production practices and expenditures for breeding and hunting operations were collected, as well as the number of hunters and non-hunters that use the facility. In 2015, the average breeding and hunting operation had 37 hunters and 63 non-hunters. These operations release an average of 22 stocker deer and 15 exotic deer. The average annual total cost of released stocker deer was \$58,531, and the cost of released exotic deer averaged \$22,000. These operations also reported an average of 49 deer and 16 exotics harvested each year.

Of the total number of harvested animals on breeding and hunting operations, 54% are sent to a taxidermist. Breeding and hunting operations reported an average taxidermy cost of \$615 per animal. Another cost incurred when harvesting animals is a meat processing cost. These operations spent an average of \$227 per animal for meat processing.

Table 3 provides a summary of average capital and operational expenditures for breeding and breeding and hunting operations on an annual basis. The first cost category refers to capital expenditures (the cost to acquire a fixed asset). The most significant fixed asset in the deer breeding industry is land. The total average land value for breeding only operations is \$489,238 while the total land value of breeding and hunting operations is \$5,189,250.

Other capital expenditures include fencing, shelters, improvements, and buildings. Other facility costs include handling facilities as well as lodging and other guest facilities. Handling facilities ease tasks associated with herd management. Of breeding only operations, 50% chose to invest in a handling facility. These facilities averaged \$82,857 for breeding only operations. Seventy-seven percent of breeding and hunting operations had handling facilities. The average cost of a handling facility for breeding and hunting operations is \$84,689. The final cost in this category is lodging and guest facilities. These facilities cost breeding and hunting operations an average of \$600,541.

Table 3: Average Annual Operational Costs.

	Breeding	Breeding and Hunting
Operation		
Year Started	2004	2004
Area of Breeding Operation (acres)	21	30
Area of Hunting Operation (acres)	N/A	1,627
Number of Pens	9	15
Area of Pens (acres)	10	20
Capital Expenditures		
<u>Fixed Expenses</u>		
Land Inherited (acres)	N/A	917
Land Purchased (acres)	21	546
Total Land Value (\$)	\$489,238	\$5,189,250
Fencing (\$)	\$95,171	\$139,236
Shelters (\$)	\$58,070	\$48,852
Improvements (\$)	\$25,174	\$120,334
Buildings (\$)	\$125,804	\$118,795
Cost of Handling Facility (\$)	\$82,857	\$84,689
Lodging and Guest Facilities (\$)	N/A	\$600,541
Total Fixed Expenses (\$)	\$876,313	\$6,301,697
<u>Equipment</u>		
Large Equipment (\$)	\$128,466	\$130,298
Farm Implements (\$)	\$124,360	\$28,837
ATVs (\$)	\$17,242	\$25,505
Ranch Vehicles (\$)	\$57,060	\$60,993
Trailers/Transport Crates (\$)	\$29,610	\$20,410
Feeding Bins/Feeding and Watering Equipment (\$)	\$41,968	\$35,063
Camera/Video Equipment (\$)	\$3,311	\$4,252
Sedation Equipment (\$)	\$3,969	\$5,053
Hunting Blinds (\$)	N/A	\$41,606
Freezer/Cooler (\$)	\$3,500	\$7,262
Other Equipment (\$)	N/A	\$59,826
Total Cost of Equipment (\$)	\$409,487	\$419,103
Annual Operating Expenses		
<u>Veterinary and Animal Supplies</u>		
Medical Supplies (\$)	\$4,136	\$5,116
Veterinary Expenses (\$)	\$4,534	\$6,282
Sedations (\$)	\$6,153	\$5,848
Artificial Insemination (\$)	\$7,677	\$14,275
CWD Testing (\$)	\$1,127	\$2,560
DNA Testing (\$)	\$3,012	\$4,494
I.D. Tags/RFID Tags/Microchips (\$)	\$273	\$529
Total Cost of Veterinary & Animal Supplies (\$)	\$26,910	\$39,104

Table 3: Average Annual Operational Costs (Continued).

	Breeding	Breeding and Hunting
Labor		
Number of Salaried Employees	2	2
Number of Hourly Employees	1	2
Number of Part-time Employees	7	3
Total Salary Wages Paid (\$)	\$53,186	\$76,713
Annual Salary Per Employee (\$)	\$22,794	\$38,170
Total Hourly Wages Paid (\$)	\$29,893	\$21,508
Annual Hourly Wages Per Employee (\$)	\$29,893	\$11,908
Total Part-Time Wages Paid (\$)	\$5,000	\$11,958
Annual Part-Time Wages Per Employee (\$)	\$690	\$4,279
Outsources Services (\$)	\$3,277	\$11,004
Total Labor Expenses	\$91,356	\$121,183
Utilities		
Utilities (\$)	\$5,841	\$7,733
Fuel (\$)	\$4,137	\$6,079
Total Cost of Utilities (\$)	\$9,977	\$13,812
Miscellaneous		
Feed and Hay (\$)	\$84,072	\$175,355
Food and Beverages for Guests (\$)	N/A	\$8,449
Maintenance and Repairs (\$)	\$22,936	\$36,352
Rental Equipment (\$)	\$1,725	\$4,259
Operating Supplies (\$)	\$7,157	\$10,286
Lodge Supplies (\$)	N/A	\$11,295
Insurance (\$)	\$5,236	\$8,788
Advertising/Marketing (\$)	\$7,406	\$7,559
Taxidermy (\$)	\$1,709	\$6,216
Travel/Meeting Attendance (\$)	\$5,184	\$4,842
Property Taxes (\$)	\$5,171	\$10,411
Permit/Licenses (\$)	\$514	\$538
Hunting Lease (\$)	N/A	\$16,417
Seed and Fertilizer (\$)	N/A	\$4,539
Other Expenses (\$)	\$14,231	\$15,866
Total Cost of Miscellaneous Expenses (\$)	\$155,341	\$321,170

Equipment is another expensive capital expenditure. It includes large equipment such as tractors or bobcats, ranch vehicles, ATVs, trailer and transport crates, as well as feeding equipment. In addition, this category also includes camera/video equipment, sedation equipment, hunting blinds, freezers or coolers, and a category labeled other equipment. Breeding operations spent an average of \$409,487 on equipment while breeding and hunting operations averaged \$419,103.

The next category of costs contains information related to annual operating expenses. The first section is veterinary and animal supplies. This includes the cost of medical supplies, veterinary services, sedations, artificial insemination, DNA testing, CWD testing, and I.D. tags. The total cost to breeding only operations averaged \$26,910 annually, and breeding and hunting operations averaged \$39,104 each year. The newest cost category is the cost of CWD testing. In August of 2016, new management rules went into place to reduce the spread of CWD. These rules establish a minimum level of post-mortem tests that must be submitted. Testing for CWD

costs for breeding only operations averaged \$1,127 each year while breeding and hunting operations averaged \$2,560 per year.

Labor makes up a large percentage of total operating expenses. The average breeding only operation employs a total of 10 employees and the average breeding and hunting operation has 7 employees. Of the survey respondents, breeding only operations reported an average total wages expense of \$91,356 per year while breeding and hunting operations spent \$121,183 per year.

Both types of operations outsourced certain services. Breeding only operations paid about \$3,277, while breeding and hunting operations paid an average of \$11,004 annually.

Another expense incurred by breeding and hunting operations is utilities. Breeding only operations paid an annual average of \$5,841 for utilities and \$4,137 for fuel. Breeding and hunting operations spent an average of \$7,733 for utilities and \$6,079 for fuel.

The final operating expense category is described as miscellaneous expenses. The largest cost in this category is feed and hay. Supplemental feed can allow genetically superior animals to realize their full potential. For breeding only operations, the total cost of feed includes the cost of feed and hay, protein feed for penned animals, textured/treated feed for penned animals, alfalfa hay for penned animals, and the cost of feeding fawns. The total cost of feed for fawns includes milk replacers and fawn supplement feed. Of the operations described as breeding only, 93% stated that fawns were bottle-fed. All of the breeding and hunting operations stated that fawns were bottle-fed. Breeding only operations had an average annual total feed cost of \$84,072. The majority of that expenditure comes from feed and hay, representing 54% of the total cost. Protein feed accounts for 40%, textured and treated feed is 8%, alfalfa hay represents only 6%, and the cost of bottle-feeding fawn represents 1% of the total cost.

The total feeding cost for breeding and hunting farms combines the cost of feed and hay, protein feed for breeding animals, textured/treated feed, alfalfa hay, the total cost of fawn feed, as well as protein feed for pasture animals, and corn/bait food for pasture animals. Total feeding costs for breeding and hunting operations averaged \$175,355 annually. Protein feed makes up the majority, representing 44% of the total cost. Feed and hay is about 35%, textured and treated feed is about 10%, and 2% of the total cost is alfalfa hay. The remaining 10% of the total cost is described as corn and bait, which accounts for 4%, and fawn feeding, which accounts for 6%. Breeding and hunting operations also indicated food plots were on the property. The average operation has 265 acres of food plots. The main costs associated with food plots are the cost of seeds and fertilizer and the cost to maintain them. Breeding and hunting operation's annual average expenditure for seed and fertilizer is \$4,539. Maintaining these food plots costs these operations about \$4,310 annually.

This section also includes the cost of lodging supplies and food and beverages for guests. While breeding only operations do not incur this cost, hunting and breeding operations have a significant expenditure. Breeding and hunting operations averaged \$20,000 each year for guests' food and beverages. Other expenses included the cost of maintenance and repairs and rental equipment. Breeding only operations average \$22,936 annually on maintenance and repairs, while breeding and hunting operations average \$36,352 annually. Other miscellaneous costs include the cost of operating supplies, lodge supplies, insurance, advertising/marketing, and taxidermy.

Operating supplies and lodging supplies are significant costs to deer operations. Operating supplies cost breeding only operations \$7,157 and breeding and hunting operations \$10,286 per year. Breeding and hunting operations average \$11,295 annually for lodge supplies. Other miscellaneous expenses include insurance, advertising and marketing, taxidermy, travel and meeting expenses, and property taxes.

On average, breeding operations paid a total of \$5,236 on insurance. The average insurance cost to breeding and hunting operations was far more significant, with insurance costs averaging \$8,788. Advertising and mar-

keting expenses for breeding only and breeding and hunting operations both averaged around \$7,500. Other miscellaneous expenses include the cost of leasing hunting land and other miscellaneous expenses. On average, the cost of leasing hunting land for breeding and hunting operations was \$16,417. All other miscellaneous expenses for breeding only farms averaged \$14,231. Breeding only operations described these expenses as the cost of cell phones, seeds, LLC corporation fees, and other association fees. Miscellaneous fees for breeding and hunting operations average \$15,866 annually. Breeding and hunting operations described these fees as equipment maintenance, any necessary chemicals or pesticides, road maintenance and dozer work, and other association fees.

Figure 1 illustrates a breakdown of the annual costs of typical deer breeding only operation. Operational expenses cover supplies, labor, utilities, insurance, maintenance, travel, etc. Operational expenses averaged \$150,977 for breeding operations. This category accounts for 53 percent of total costs. Feed includes the cost

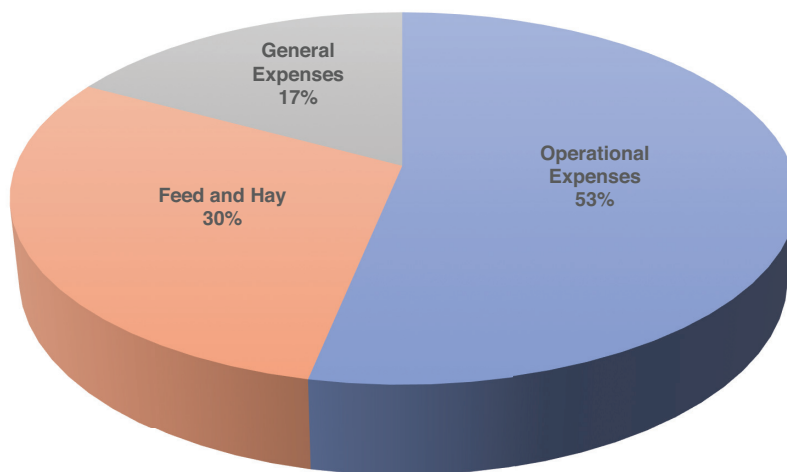


Figure 1: Annual Operation Expenditures for Breeding Only Operations.

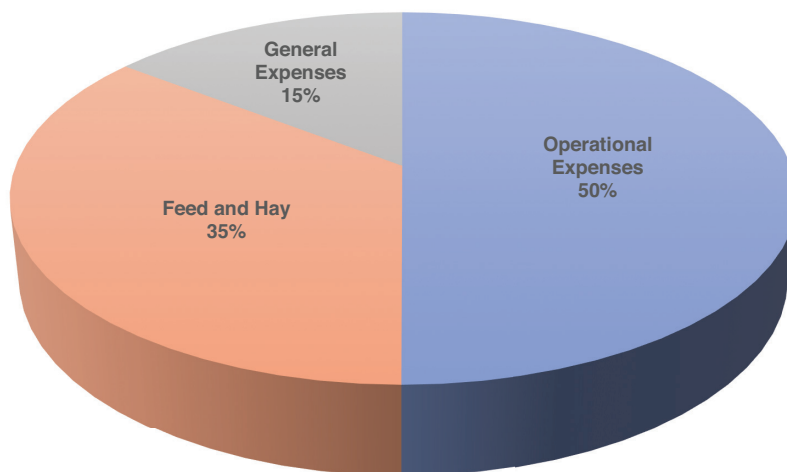


Figure 2: Annual Operation Expenditures for Breeding and Hunting Operations.

Table 4: Annual Income From Breeding Stock.

	Breeding	Breeding and Hunting
Breeder Bucks Sold (number)	5	3
Income from Breeder Bucks (\$)	\$38,400	\$41,120
Stocker Bucks Sold (number)	14	18
Income from Stocker Bucks (\$)	\$54,550	\$91,400
Open Does Sold (number)	0	9
Income from Open Does Sold (\$)	\$0	\$17,760
Bred Does Sold (number)	14	15
Income from Bred Does Sold (\$)	\$40,700	\$55,689
Fawns Sold (number)	4	6
Income from Fawns (\$)	\$1,600	\$47,743
Semen Straws Sold (number)	10	18
Income from Semen Straws Sold (\$)	\$5,000	\$32,800
Total Number Sold	47	69
Total Income Earned	\$140,250	\$286,511

of feed and hay, supplemental feed, and fawn feeding supplies. Feeding expenditures account for 30% of total costs. Breeding operations spent an average of \$84,072 for feed. General expenses include the cost of veterinary expenses, CWD testing, DNA testing, taxes, permits, taxidermy, etc. Finally, general expenses amount to only about 17% of total operation costs. Breeding operations spent about \$48,535 on these expenses. The breakdown for breeding and hunting operations was – operational expenses (50%), feed and hay (35%) and general expenses (15%) (Figure 2).

Income

Income associated with deer breeding and hunting operations comes from a variety of areas (Table 4). The survey was used to collect data on the sales of breeder bucks, stocker bucks, open does, bred does, fawns, and semen straws.

Breeding only operations sold an average of 5 breeder bucks and 14 stocker bucks. Income for breeder bucks averaged \$38,400 and stocker buck income averaged \$54,550. Sales of open does, bred does, fawns, and semen straws totaled an average of \$47,300. In total, the average income derived from deer and semen sales for a deer breeding operation in 2015 was \$140,250.

Income for breeding and hunting operations is shown divided into two parts. Income from the breeding operation comes from animal sales. These breeding and hunting operations sold an average of 3 breeder bucks for a total income of \$41,120. Income from selling 18 stocker bucks totaled \$91,400. Breeding and hunting operations sold an average of 9 open does and 15 bred does. Income from open does averaged \$17,760. Income from bred does average \$55,689. For breeding and hunting operations, income from sales of fawns and semen straw was very significant. On average, 6 fawns were sold for a total of \$47,743. In 2015, breeding and hunting operations sold an average of 18 semen straws for a total income of \$32,800.

Income from the hunting operations comes from the deer hunters, non-hunters, exotic hunters, other game on the property, and outdoor enthusiasts. The average breeding and hunting operation hosted 37 hunters and 63 non-hunters. Of these hunters, deer hunters provided an average of \$143,568 in income and exotic hunters provided \$25,685. Income from non-hunters averaged a \$36,500. Several operations stated other animals were hunted on the property. Of the operations that responded, 40% stated game such as dove, turkeys, ducks, and other birds were hunted. Average income from other game averaged \$9,786. Some operations also

reported income from other activities that take place on the property. These activities included bike races, ATV riding, fishing, leasing to outdoor writers, and camping. The total income associated with these other activities averaged \$27,140. In 2015, the average total income from operations associated with the breeding and hunting of deer was \$244,679.

Economic Impact

IMPLAN® (Impact Analysis for Planning), an input/output model, was used to estimate the economic impact of the deer breeding industry on the Texas economy. Originally developed by the U.S. Forest Service, the IMPLAN model is now managed and maintained by the Minnesota IMPLAN Group (MIG). The model is, arguably, the most used and cited model for performing economic impact analyses in the United States. The IMPLAN model is driven by purchases of final goods and services in a certain region, such as a state, a group of states, or the entire nation. These purchases represent the dollar value of the increase in finished goods and services demanded, and create an impact that ripples throughout the economy. Industries produce goods and services for final use and purchase goods and services from other industries. These other producers and industries buy goods and services as well, which IMPLAN designates as indirect purchases. In addition, each step along the cycle pays wages and salaries to employees, who, in turn, make additional expenditures into the economy of the region.

In determining the overall economic impact of an industry, the IMPLAN model uses a set of multipliers, separated by sector, to estimate the direct, indirect, and induced effects (induced being effects of household spending) on the economic cycle. Over 500 sector codes are included in the IMPLAN model, where each code represents a unique industrial sector that a specific product or category of products is represented by. The multipliers that are derived for each sector quantify the ripple effects of a dollar increase in final demand, thus resulting in an estimation of the economic impact.

Output is a measure of the value of goods and services produced in the state as a result of the increased demand created by expenditures by deer operations. Output is measured by purchases of all intermediate production inputs and value added. Value Added is the total wages and salaries plus business profits generated by the economic activities of a particular industry. In this case value added is the direct and indirect wages, salaries and profits generated in a state by the activities of buying inputs and production products by deer farm operators. Number of Jobs is the number of all wage and salary employees as well as self-employed jobs resulting from total expenditures by deer farms. The number of jobs does not accumulate, because it is an annual measure. Labor income is an IMPLAN calculation based on number of jobs and survey wage information by the Bureau of Economic Activity and the USDA-ARMS survey.

Results

In determining the economic impact of the deer breeding industry, the categories of the survey were prepared for input into the IMPLAN model. This was accomplished by extrapolating the survey results against the inventory of operations to arrive at total industry expenditures for each category. These totals represent the value of final goods and services demanded by the industry and were the baseline inputs for the IMPLAN model.

Table 5 provides a summary of the economic impact of the Texas deer breeding industry. Deer breeding operations generate an estimated \$349.4 million in direct economic impacts on the Texas economy. This value represents the estimated increase in final demand of all goods and services consumed by the industry. These industries include feed suppliers, farm and ranch supply stores, veterinary services, medical and sedation product suppliers, construction, utilities, advertising, insurance, and numerous others. As these direct expenditures are multiplied throughout the economy, the deer breeding industry generates an estimated \$786.9 million of economic activity. This value represents the total industry output generated by the deer breeding industry and

Table 5: Economic Impact Results.**Economic Impact of Deer Breeding on the Texas Economy, 2015.**

Impact Type	Employment (#)	Labor Income (\$)	Total Value Added (\$)	Output (\$)
Direct Effect	4,690	58,704,909	108,635,954	349,401,708
Indirect Effect	2,546	78,103,250	136,097,790	315,166,665
Induced Effect	836	40,196,068	69,513,147	122,367,532
Total Effect	8,071	177,004,227	314,246,891	786,935,906

Economic Impact of Deer Hunting from Breeding Operations on the Texas Economy, 2015.

Impact Type	Employment (#)	Labor Income (\$)	Total Value Added (\$)	Output (\$)
Direct Effect	5,125	64,153,885	118,719,519	381,833,095
Indirect Effect	2,782	85,352,776	148,730,356	344,420,364
Induced Effect	914	43,927,058	75,965,342	133,725,658
Total Effect	8,820	193,433,719	343,415,216	859,979,117

Total Economic Impact of the Deer Breeding and Hunting Industry on the Texas Economy, 2015.

Impact Type	Employment (#)	Labor Income (\$)	Total Value Added (\$)	Output (\$)
Direct Effect	9,814	122,858,794	227,355,473	731,234,804
Indirect Effect	5,327	163,456,026	284,828,146	659,587,029
Induced Effect	1,750	84,123,126	145,478,489	256,093,190
Total Effect	16,892	370,437,946	657,662,108	1,646,915,023

those industries that supply it in Texas. The additional expenses associated with operating hunting operations adds an additional \$860 million in economic impacts.

When combined, the deer breeding and deer hunting operations within the industry generates \$1.6 billion of economic activity for the Texas economy. In addition, the industry provides the economic activity that supports 16,892 jobs in the economy, most of which are located in rural areas of the state.

Conclusion

With over 1,200 operations, the deer breeding industry has an established presence across the state, with the majority of operations located in rural areas. In addition, while traditional forms overwhelmingly dominate the hunting industry, the small niche of hunters this market serves continues to increase in importance to the Texas economy. This increase in demand is fueling the growth in the breeding industry. Over \$700 million in direct expenditures are poured into the state economy each year by the deer breeders and sportsmen of this industry. In turn, this generates \$1.6 billion of economic activity while supporting 16,892 jobs. All told, these results highlight the fact that the deer breeding industry continues to be an important and vital contributor to the rural economies of Texas.

Texas Deer Industry Economic Impact Survey

Please indicate type of operation:

Breeding Only ___ Breeding and Hunting ___ Hunting Only ___

Whitetail Breeding ___ Non Whitetail Cervids ___ Specify _____

Instructions are provided at the end of the survey. For Hunting Only operations, please skip first two pages.
Please use 2014 annualized figures where appropriate.

I. Operation

1. Year started _____ 2. Area of breeding operation: _____ (acres) 3. Land valuation _____

II. Herd Inventory (Final 2014 inventory, or 2015 if appropriate)

- 1.! Total number of breeder deer _____
2.! a. Total # bucks _____ b. Number of stocker bucks _____ c. Number of does _____
3.! a. Fawns in 2014 _____ b. Fawns in 2015 _____
4.! Annual mortality rate (12 mo. and older) _____ %

5.! Annual sales (2014 figures)

Breeder Bucks:	_____	Income \$:	_____
Stocker Bucks:	_____	Income \$:	_____
Open Does:	_____	Income \$:	_____
Bred Does:	_____	Income \$:	_____
Fawns:	_____	Income \$:	_____
Semen straws:	_____	Income \$:	_____

Annual Purchases (2014 figures)

Breeder Bucks:	_____	Costs \$:	_____
Stocker Bucks:	_____	Costs \$:	_____
Open Does:	_____	Costs \$:	_____
Bred Does:	_____	Costs \$:	_____
Fawns:	_____	Costs \$:	_____
Semen straws:	_____	Costs \$:	_____

III. Facilities

1. Number of pens: _____ 2. Area of pens: _____ (acres)
3. Capital cost fencing: \$ _____ 4. Capital cost of shelters: \$ _____
5. Capital cost of other improvements like roads, water lines, etc.: \$ _____
6. Capital cost of buildings: \$ _____
7. Do you have a handling facility? Yes ___ No ___ 7a. If yes, capital cost of facility: \$ _____
8. Do you have a misting system? Yes ___ No ___ 8a. If yes, capital cost of system: \$ _____
9. Annual cost of maintenance and repairs: \$ _____

IV. Equipment

1. Purchase price of all large equipment, combined (i.e. tractor or bobcat): \$ _____
2. Purchase price of all ranch vehicle(s), combined: \$ _____
3. Purchase price of ATV(s), combined: \$ _____
4. Purchase price of all implements, combined: \$ _____
5. Purchase price of all trailer(s)/transport crate(s), combined: \$ _____
6. Purchase price of all bulk feed bin(s), combined: \$ _____
7. Purchase price of all feeding equipment, combined: \$ _____
8. Purchase price of all watering equipment, combined: \$ _____
9. Purchase price of all camera/video equipment, combined: \$ _____
10. Annual cost of all rental equipment: \$ _____
11. Purchaser cost of insect fogger/sprayer: \$ _____
12. Annual cost of dart/sedation equipment: \$ _____
13. Purchase price of dart gun: \$ _____

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Fax: (979) 845-3140

Questions may be directed to Brian Herbst at 979-845-3310 or TXDeerSurvey@afpc.tamu.edu

V. Veterinary & Animal Supplies

- | | |
|--|--|
| 1. Annual cost of operating supplies: \$ _____ | 2. Annual cost of feed and hay: \$ _____ |
| 3. Annual cost of medical supplies: \$ _____ | 4. Annual veterinary expense: \$ _____ |
| 5. Annual number of sedations: _____ | 6. Annual cost of sedations: \$ _____ |
| 7. Annual number of does A.I.'d: _____ | 8. Annual cost for A.I.'ing: \$ _____ |
| 9. Annual number of CWD tests: _____ | 10. Annual CWD costs: \$ _____ |
| 11. Number of animals DNA tested: _____ | 12. Annual cost for DNA certifications: \$ _____ |
| 13. Annual costs for I.D. tags/RFID tags/microchips/other: _____ | |
| 14. Annual cost for semen storage: _____ | 15. Annual insecticide costs: \$ _____ |
| 16. Annual miscellaneous costs: _____ | |

VI. Labor

- | | | | |
|--|----------------|--------------|-----------------|
| 1. Number of employees: | Salaried _____ | Hourly _____ | Part-time _____ |
| 2. Total wages paid: | Salaried _____ | Hourly _____ | Part-time _____ |
| 3. Annual expense for outsourced services: | _____ | | |

VII. Utilities

1. Annual cost of utilities: \$ _____
2. Annual cost of fuel/diesel/etc.: \$ _____

VIII. Miscellaneous Expenses

1. Annual insurance expense: \$ _____
2. Annual advertising/marketing expense: \$ _____ (include booths/sponsorships/ads/web)
3. Annual taxidermy expense: \$ _____
4. Annual travel/meeting attendance expense: \$ _____
5. Annual property taxes: \$ _____
6. TPWD/TAHC permit costs: \$ _____
7. Other costs (specify): \$ _____

IX. Feeding

Fawns

1. Do you bottle feed? All ____ Some ____ No ____ (skip to # d.)
- a. Annual cost of milk replacer: \$ _____
- b. Annual cost of fawn supplement feed: \$ _____
- c. Annual cost of fawn care products: \$ _____
- d. Annual cost for outside fawn care services if No above: \$ _____
2. Annual cost of protein feed for breeder penned animals: \$ _____
3. Annual cost for textured/treat feed for breeder penned animals: \$ _____
4. Annual cost for alfalfa hay for breeder penned animals: \$ _____

X. Other Expenses

Please list and explain any other costs not previously covered for breeder animals:

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Hunting

Instructions are provided at the end of this survey. For combination Breeding and Hunting operations, please separate hunting expenses from breeding expenses. Use annualized 2014 figures where appropriate.

What is the purpose of your hunting operation? ____ Personal use; ____ Corporate clients, no fee; ____ Paying clients

I. Operation

1. Year started: _____ (acres)
2. Land purchased: _____ (acres)
3. Area of hunting operation: _____ (acres)
4. Land inherited: _____ (acres)
5. Total land valuation: \$ _____

II. Facilities

1. Capital cost of lodge(s) or guest facilities: \$ _____
2. Capital cost of peripheral fencing: \$ _____
3. Capital cost of habitat, roads, water improvements, guest conveniences (combined): \$ _____
4. Capital cost of other buildings: \$ _____
5. Annual cost of maintenance and repairs: \$ _____
6. Approximate area of food plots: _____ (acres)
7. Estimated cost of labor to maintain food plots: \$ _____
8. Annual cost of seed and fertilizer for food plots: \$ _____

III. Equipment (Note if equipment is shared between breeding and hunting operations, use proportioned \$\$)

1. Purchase price of all large equipment, combined (i.e. tractor or bobcat): \$ _____
2. Purchase price of all farm implements, combined: \$ _____
3. Purchase price of all ATV(s), combined: \$ _____
4. Purchase price of all ranch vehicle(s), combined: \$ _____
5. Purchase price of all trailer(s)/transport crate(s), combined: \$ _____
6. Purchase price of bulk feed bin(s)/all feeding and watering equipment: \$ _____
7. Purchase price of all video/game camcorder equipment, combined: \$ _____
8. Purchase price of all dart gun/darts/sedation equipment: \$ _____
9. Annual cost of all rental equipment: \$ _____
10. Purchase price of cooler/freezer equipment: \$ _____
11. Purchase price for all hunting blinds: \$ _____
12. Purchase price of all other equipment: \$ _____

IV. Supplies

1. Annual cost of operating supplies for guest accommodations: \$ _____
2. Annual cost of food and beverages for guest operations: \$ _____
3. Annual cost for protein feed for pasture animals: \$ _____
4. Annual cost for corn/bait food for pasture animals: \$ _____

V. Labor

1. Number of employees: Salaried _____ Hourly _____ Part-time _____
2. Total wages paid: Salaried _____ Hourly _____ Part-time _____
3. Annual expense for outsourced services: _____

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VI. Utilities

1. Annual cost for utilities: \$ _____
2. Annual cost for fuel/diesel/etc.: \$ _____

VII. Miscellaneous Expenses

1. Annual insurance expense: \$ _____
2. Annual advertising/marketing expense (include booths/sponsorships/ads/web): \$ _____
3. Annual taxidermy expenses: \$ _____
4. Annual travel/meeting attendance expense: \$ _____
5. Annual property taxes: \$ _____
6. TPWD (DNR) licenses and permit costs: \$ _____
7. Hunting lease costs (for non-owned lands): \$ _____
8. Other costs (specify): \$ _____

VII. Other Expenses

Please list and explain any other costs not previously covered for hunting operations:

VIII. Hunters (Guests)

1. Annual number of hunters: _____
2. Annual number of non-hunters: _____
3. Annual deer hunter income: \$ _____
4. Annual exotic hunter income: \$ _____
5. Annual non-hunter income: \$ _____
6. Total number of deer harvested: _____
7. Total number of exotics harvested: _____
8. Annual number of stocker deer released into the hunting area(s): _____
9. Annual cost for stocker deer released for hunting: \$ _____
10. Annual number of exotic animals released into the hunting area(s): _____
11. Annual cost for exotic animals released for hunting: \$ _____
12. Approximate percentage of harvested animals sent to taxidermists: _____ %
13. Average taxidermy cost per animal: \$ _____
14. Average meat processing cost per animal: \$ _____
15. Are other game species harvested in your hunting area(s)? ____ Yes ____ No
16. Annual income from other game species (if charged for separately): \$ _____
17. Other outdoor enthusiasts' income derived from hunting property: \$ _____
Specify _____

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