ECONOMIC IMPACT OF THE EXOTIC WILDLIFE INDUSTRY

Scimitar-horned oryx, photo by Elizabeth Cary Mungall courtesy of Kyle Wildlife LP.

Agricultural and Food Policy Center
Texas A&M University

August 2007

AFPC

Department of Agricultural Economics
Texas Agricultural Experiment Station
Texas Cooperative Extension
Texas A&M University

College Station, Texas 77843-2124
Telephone: (979) 845-5913
Fax: (979) 845-3140
http://www.afpc.tamu.edu

Acknowledgements

In no way could the study have been completed without the outstanding efforts of the members and leadership of the Exotic Wildlife Association. We truly appreciate all of the members who took the time to complete and return the survey. In addition, we sincerely thank those who took time out of their schedules to educate us and let us see your operations first hand, specifically: Charly Seale and the staff of the EWA, Don Horrack, and Kathyrn Kyle. The exotic wildlife photographs in this report are courtesy of Elizabeth Cary Mungall. We encourage you to check out her new book, *Exotic Animal Field Guide: Nonnative Hoofed Mammals in the United States*. Ordering information is available on page 19.

ECONOMIC IMPACT OF THE EXOTIC WILDLIFE INDUSTRY

David P. Anderson
Brian J. Frosch
Joe L. Outlaw

Agricultural & Food Policy Center
Department of Agricultural Economics
Texas Agricultural Experiment Station
Texas Cooperative Extension
Texas A&M University

APFC Research Report 07-2

August 2007

College Station, Texas 77843-2124
Telephone: 979.845.5913
Fax: 979.845.3140
Web site: http://www.afpc.tamu.edu/

Executive Summary

- **The exotic wildlife industry is a growing industry in rural America.**
- **Over 500 industry participants were surveyed, with a response rate of 11 percent.**
- **This extensive survey, which asked detailed questions regarding inventory, size of operation, annual expenditures, revenue sources and production system, was performed in late 2006-early 2007.**
- **All combined, operations reported expenditures averaging $181,000 per year.**
- **The exotic wildlife industry has a direct economic impact of $679.7 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 is $1.0 billion.**
- **One of the major customers of this industry is hunters. Estimating the impact of hunting dollars spent, with hunters as the consumer of exotic wildlife breeding products, an additional $254 million is generated by the exotic wildlife industry.**
- **The total impact of the industry, combining the breeding and hunting components, is $1.3 billion annually.**
- **The economic activity of the exotic wildlife industry supports 14,383 jobs, most of which are in rural America. If this industry did not exist, those jobs would have to be supported by some other economic activity.**
- **These results highlight the fact that the exotic wildlife industry is a growing and important segment of the Texas economy, contributing to the vitality of rural areas of the state.**

Addax, photo by Christian Mungall courtesy of Kyle Wildlife LP.

Introduction

The exotic wildlife industry is a vital and growing industry, particularly in rural areas. As traditional revenue sources shift away from rural communities, their economies increasingly rely other industries such as this one. The industry is governed by a myriad of state and federal laws, regulations, and jurisdictions. Since the overwhelming majority of industry regulation is left up to the states, a large amount of variability exists from state to state. This lack of consistency in laws and regulations is a factor affecting future industry growth. The rapid growth of the industry and the array of policy issues led the industry to request this study of the size and economic importance of the exotic wildlife industry. In 2006, the Agricultural and Food Policy Center (AFPC) at Texas A&M University was requested by former Texas Congressman Henry Bonilla to undertake this study. The primary objective of this study is to determine the economic impact of the exotic wildlife industry. Secondary objectives include providing a current description of typical industry participants and cost estimates for the major categories of expenses on exotic wildlife operations.

Blackbuck antelope (dark male), photo by Christian Mungall courtesy of Kyle Wildlife LP.

The Industry

Like any industry, the exotic wildlife industry involves the production and consumption of products. In Texas alone, there are approximately 125 different species, or products, of exotic wildlife. The Texas Parks and Wildlife Department defines exotic wildlife as grass or plant eating, single or cloven-hooved mammals that are not indigenous or native to the state.[1] Africa is the native land of many of the exotic species found here in the United States, as the majority of exotics originate from continents other than North America. With some species, exotic wildlife operations in the U.S. serve to rehabilitate their populations. In some cases, species that are listed on the endangered species list are thriving within U.S. operations to the point where breeding herds may be reintroduced into their native land. Overall, the exotic wildlife industry is closely related to the national cervid farming industry, as some operations participate in both industries. As with the cervid farming industry, the production side of the industry is comprised of breeding facilities and the consumption side is represented by other breeders and trophy hunting preserves, or game ranches. Producers market breeding stock to other breeders as well as stockers to be released in game ranches.

Across the nation, the total number of exotic operations, excluding those that also participate in the cervid farming or deer breeding industries, is estimated at 3,750. Most of these are located in Texas with the rest scattered primarily across the southern states. The majority of exotic wildlife operations participate in both breeding and hunting. Hunting operations may be for private use only, corporate clientele, paying clients, or any combination of these. As the title implies, breeding operations raise and sell breeding stock to other industry breeders or the hunting industry. The trophy hunting segment only includes those operations that raise or purchase exotics for release into a hunting operation, and represents the end market for the breeding stock industry. Trophy hunting involves hunt packages that typically cover a 3-6 day period, whereas the hunter is provided lodging, meals, and a guided hunt for a set fee. In addition to this fee, a trophy fee may also apply, for either additional exotics or exotics that surpass a pre-set threshold or score. Hunter expenditures included in this study only include expenditures of hunters that are related to this industry. In other words, hunters, in the context of this study, are only those that hunt at exotic wildlife operations.

[1] Texas Parks and Wildlife Department. "2007-2008 Outdoor Annual Hunting and Fishing Regulations." Available online. http://www.tpwd.state.tx.us/publications/annual/hunt/nongame.

Axis deer (bucks showing antler shape), photo by Elizabeth Cary Mungall courtesy of Kyle Wildlife LP.

Methodology

In order to estimate the economic impact of the exotic wildlife industry, a survey instrument was developed to collect detailed operational information from industry participants. This information was then combined with the inventory of exotic wildlife operations to analyze the production side of the industry. In addition, an analysis was performed to determine the impact of hunters, but only the portion of hunters who are related to the industry. These two components were then combined to perform the economic impact analysis of the exotic wildlife industry.

Data Collection

During the late summer and early fall of 2006, background information to develop the survey was gained through site visits to exotic wildlife operations across Texas. Interviews from these visits provided a base set of information that was then utilized to develop the survey instrument. The survey was then reviewed by industry participants, revised, and sent to 500 members of the Exotic Wildlife Association (EWA) over the fall of 2006 to early 2007. Overall, the extensive survey achieved a response rate of 11 percent.

Survey Development

The actual survey instrument is outlined in the Appendix. For the purpose of the survey, the exotic wildlife 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 participate the breeding and rearing of exotics. Hunting only operations relate to only those hunting operations that purchase exotics from breeding operations as breeding stock or as stockers for release into the hunting facility. Breeding and hunting operations represent those that engage in breeding activities while also utilizing their own breeding stock, or purchased breeding stock, to populate their hunting operation. Because of the sheer number of species, exotics were categorized into common and super. Common exotics, such as axis and blackbuck, are generally found on many different operations. Super exotics are those that are more valuable or uncommon, such as the kudu and gemsbok.

The survey 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.

Figure 1: Typical Fenced Paddock.

Survey Results

General Operations

Of the respondents, 42 percent were breeding and hunting operations, 38 percent were breeding operations, and the remainder were hunting only operations. On average, survey respondents have been in business since 1993.

Table 1 contains a summary of the average annual operational costs of survey respondents. As expected, many of the differences due to the operational structure were reflected in the survey responses. Hunting operations were the largest, averaging approximately 2,400 acres. Ninety percent of breeding only operations reported purchasing an average of 380 acres of land, with 86 acres split into 7 pens. Pens, in this sense, are basically a large high fenced paddock, as shown in Figure 1. In contrast to deer breeding operations, exotic operations tend to have fewer pens as, for the most part, they are not used to separate bucks, does, fawns, or different age groups. They are generally used for herd management purposes such as separating breeding herds by species or for rotational grazing.

Overall, breeding operations reported larger expenditures for medical supplies and veterinary expenditures, suggesting a more intensive herd management practice than breeding and hunting operations. This could be expected as the only source of revenue for the operation is through the sale of breeding stock and stocker exotics to other operations. Breeding and hunting operations reported a larger herd (Table 2) and more acreage than breeding only operations. This was expected as the breeding and hunting operations tend to supply their hunting operation from their breeding operation, and are not necessarily relying solely on sales or transfers as their source of revenue.

Lodge, fencing, and improvements were the top three expenditures, in terms of the capital cost, for both breeding and hunting and hunting only operations, while breeding operations spent the most on fencing, improvements, and buildings. The category of improvements includes expenditures on land clearing, roads, tanks/ponds, and forage development among others. Large equipment, ranch vehicles, and implements were reported as the highest equipment expenditures across all three types of operations. Of all the respondents, 72 percent reported hiring labor, while 57 percent reported outsourcing labor and/or consulting needs. Breeding and hunting operations reported a slightly larger expenditure on outsourced services than breeding only operations, or $9,676 versus $6,381. Examples of outsourced services include those of operational management and/or nutritional consulting, capture services, annual herd maintenance services, and accounting services.

Figure illustrates the annual expenses for a typical breeding operation. Survey categories, such as those shown in Table 1, were combined into four primary expense categories: capital, operational, feed, and general. Across the state, breeding operations spend an average of $194,000 per year, with operational expenditures consuming the largest amount at 44 percent. These refer to annual expenditures on items such as supplies, labor, utilities, insurance, advertising, and travel. Items that are generally financed comprise the category of capital costs, such as land, improvements, fencing, buildings, breeding stock, feeding equipment, ATV's, and implements. Feed refers to the annual feed costs, including supplemental feed, hay, and bottle feeding supplies. Lastly, general costs cover the remainder, such as food plots, veterinary, and disease monitoring.

Figure 2: Annual Breeding Operation Expenditures.

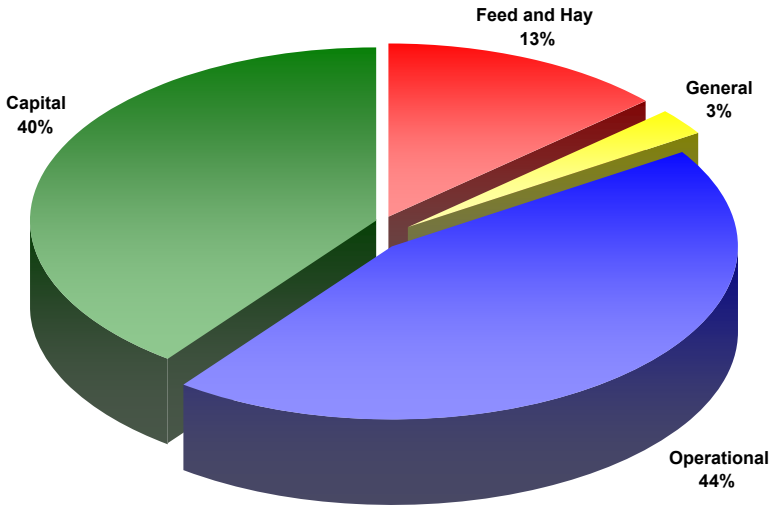


Table 1: Average Operational Costs of Exotic Wildlife Survey Respondents.

	Breeding	Breeding & Hunting	Hunting
Operation			
Year started	1991	1993	1995
Area of breeding (acres)	358	600	NA
Area of hunting (acres)	NA	887	2,405
Land purchased (acres)	380	1,199	1,277
Purchase value ($/ac)	1,417	1,010	910
Number of pens	7	4	NA
Area of pens (acres)	86	173	NA
Facilities *($)*			
Capital cost of lodge(s)	NA	148,860	123,573
Fencing	76,053	139,975	88,738
Shelters	29,456	18,833	NA
Improvements	57,014	84,280	53,885
Buildings	52,890	38,458	27,600
Working pens	20,311	19,600	NA
Percent with Handling Facility	70%	32%	NA
Cost of Handling Facility	22,473	16,000	NA
Maintenance and Repair	5,729	6,634	5,511
Equipment *($)*			
Large equipment	46,846	61,563	45,000
ATV(s)	12,042	15,898	12,434
Ranch vehicles	32,192	33,563	32,147
Implements	21,275	17,376	6,537
Trailers/crates	13,185	12,906	5,194
Bulk feed bins	8,836	9,259	5,432
Feeding equpment	6,327	11,237	7,980
Watering equipment	5,353	9,798	6,295
Video equipment	700	2,200	1,858
Rental equipment	900	4,700	2,821
Sedation equipment	1,581	1,129	NA
Veterinary & Supplies *($)*			
Operating supplies	4,127	3,073	NA
Medical supplies	2,043	963	NA
Veterinary expense	3,631	808	NA
Lodge supplies	NA	4,546	8,650
Lodge food and beverages	NA	7,711	10,463
Labor *($)*			
Employees paid salary	2	2	1
Employees paid hourly	2	4	2
Total salary wages paid	42,291	49,685	30,108
Annual salary per employee	25,049	26,524	25,975
Total hourly wage paid	49,875	49,457	22,178
Annual hourly expense per employee	10,313	14,300	12,403
Outsourced services	6,381	9,676	8,774
Utilities *($)*			
Utilities	3,331	6,070	3,156
Fuel	3,931	8,743	4,791
Miscellaneous Expenses *($)*			
Insurance	5,654	5,422	3,937
Advertising/marketing	3,070	6,309	3,873
Travel	4,329	6,681	4,135
Property tax	2,268	3,053	3,624

Table 2: Average Production Data of Exotic Wildlife Survey Respondents.

	Breeding	Breeding & Hunting	Hunting
Herd Inventory (Final 2005)			
Common exotics	180	297	NA
Super exotics	116	160	NA
Annual birth rate	0.8	0.7	NA
Mortality rate	9%	10%	NA
Feeding			
Annual supplemental feed purchase (tons)	62	101	57
Annual hay purchase (tons)	48	71	NA
Protien feed price ($/per ton)	241	228	267
Hay price ($/per ton)	209	245	NA
Area of food plots (acres)	58	79	38
Seed	3,313	2,379	2,108
Fertilizer	3,298	3,867	2,845
Hunting			
Annual number of hunters	NA	20	24
Total annual harvest	NA	29	30
Total number of common exotics	NA	378	168
Total number of super exotics	NA	141	17
Common exotics purchased for release	NA	37	19
Common expense	NA	668	893
Super exotics purchased for release	NA	13	4
Super expense	NA	1,876	2,911
Annual Common exotic harvest	NA	31	26
Receipts per common exotic	NA	1,239	1,115
Annual Super exotic harvest	NA	7	5
Receipts per super exotic	NA	3,188	4,688
Percent for taxidermy	NA	78%	60%
Taxidermy cost - common exotics	NA	492	696
Taxidermy cost - super exotics	NA	720	925

Table 2 provides a summary of production data across all respondents. Breeding only operations reported an average herd size of 296, while breeding and hunting operations reported an average herd size of 457. From Figure 2, feed represents approximately 13 percent of total annual expenditures for breeding operations. As expected, breeding and hunting operations purchased more supplemental feed and hay than breeding only or hunting operations. Hay costs were extremely high during the study period due to severe drought conditions across the southern plains. In addition to purchased feed, 64 percent of all respondents reported planting food plots on their operations. These plots were typically planted in some type of supplemental forage, such as clover, oats, or different pea varieties, and ranged from 5 acres to 300 acres in size.

Survey results indicated that 64 percent of all breeding operation respondents had some type of breeding stock purchase. For the 48 percent reporting the purchase of common exotics and the 45 percent reporting the purchase of super exotics, an average of $18,000 and $22,000 was spent, respectively.

Hunting Operations

As Table 1 indicates, operations with hunting reported other expenses in addition to those of breeding operations. Forty-two percent of all respondents of operations that reported to be involved in hunting had a lodge on the premises for their clients. In addition to the cost of the lodge, these operations also accrued expenses in maintaining and supplying the lodge for their clients. Labor costs per employee were reported to be higher than those of breeding only operations due to an overall larger operation as well as the addition of seasonal hunting guides.

From Table 2, hunting only operations reported an annual average of 24 clients, harvesting 30 exotics per year. As with the herd inventory, individual harvests and total harvest may not add up because the annual doe harvest is not shown and reporting differences existed between survey respondents. Harvesting a common exotic cost an average of $1,115, while a super exotic would cost the client an average of $4,688. For exotic wildlife hunts, each species hunted typically will have a different cost associated with it. For purposes of this study, species were separated into common and super exotics in an attempt to capture the values associated with different species. Some operations generally charge a set fee for a basic hunt package for a specific species, while offering additional species for additional costs.

Scimitar-horned oryx (breeding herd sire), photo by Elizabeth Cary Mungall courtesy of Kyle Wildlife LP.

Economic Impact

IMPLAN® (Impact Analysis for Planning), an input/output model, was used to estimate the economic impact of the exotic wildlife industry. Originally developed by the USDA 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.

According to the MIG, 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 both 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 the MIG 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.[2]

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) of 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 change in final demand, thus resulting in an estimation of the economic impact.[3]

Exotic Wildlife Industry

In determining the economic impact of the exotic wildlife 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. Categories from the extrapolated survey results, such as supplemental feed or fencing, are then assigned a sector code according to the underlying industry the category relates to. Table 3 provides an example of category inputs and their multipliers from IMPLAN, with each category belonging to a different sector. Differences between the multipliers for each category demonstrate how dollars move throughout different industries. For instance, a $1 million change in final demand for supplemental feed will generate a total of $1.77 million in total industry output, $1.06 million in value added, and will support 18.23 jobs. In this example, total industry output would include the output generated by the supplemental feed industry and those industries that supply it. Value added from this industry includes employee compensation, proprietary income, other proprietor income, and indirect business taxes that are generated.[4] The employment multiplier represents the number of jobs that are supported per million dollar change in final demand.

[2] Lindall, Scott A. and Douglas C. Olson. "The IMPLAN Input-Output System." Minnesota IMPLAN Group. Available online at http://www.implan.com/
[3] Ibid.
[4] Ibid.

Table 3: Exotic Wildlife Industry Multipliers.

	Output	Value Added	Employment
Supplemental Feed	1.77	1.06	18.23
Food plots	1.95	1.12	40.54
Veterinary	1.75	0.85	21.92
Utilities	1.59	1.00	4.51
Insurance	1.62	1.14	13.60
Maintenance and repair	1.89	1.01	17.58
Handling facility	1.87	1.07	18.91
Fencing	1.91	1.05	18.11
Large equipment	1.62	0.57	7.57
ATV's	1.80	1.11	15.90

Hunter Expenditures

An additional component in determining the economic impact of the industry is to evaluate and include the role of hunter expenditures in the consumption of industry products. Not all hunting involves exotic wildlife, but some does, therefore it is important to estimate only that which is related to this industry. In other words, the hunting product of the exotic wildlife industry is a small part of all hunting. Yet the hunting component or economic activity associated with exotic wildlife is an important part of the economic activity generated by the exotic wildlife industry. While overall hunter numbers are down, the demand for trophy hunting is increasing. Dollars spent on hunting, assorted gear, and travel, continue to grow. Time is increasingly the limiting factor for many industry participants, as they have the money to participate, but not the time to invest in the hunting of these species in their native land. The growth of this segment of the industry is expected to continue, therefore, it is important to include this aspect of the industry in this study.

In order to determine this impact, the number of hunters per operation was taken from the survey, extrapolated against all hunting operations, and combined with a report that outlines hunting expenditures on a per hunter basis. This report, entitled "The 2001 Economic Benefits of Hunting, Fishing, and Wildlife Watching in Texas,"[5] was based on the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation survey conducted by the U.S. Fish and Wildlife Service and the U.S. Census Bureau. These retail expenditures were then combined with other hunt related expenditures (trophy fees, venison processing fees, taxidermy fees, etc.) and assigned sector codes for the IMPLAN model. The number of deer hunters in Texas, from the Southwick Associates report, were used to estimate the number of exotic wildlife hunters because it is both an accurate benchmark to draw from and the majority of operations are located in Texas. Approximately 5 percent of the report's 860,000 deer hunters were estimated to participate in the exotic wildlife industry. This small percentage of hunters account for over 15 percent of the Southwick Associates report's estimated $900 million in retail, travel, and hunt related expenditures.

Results

Table 4 below provides a summary of the economic impact of the exotic wildlife industry. Exotic wildlife operations generate an estimated $679.7 million in direct economic impacts. 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 exotic wildlife industry generates an estimated $1 billion of economic activity. This value represents the total industry output generated by the exotic wildlife industry and those industries that supply it. In addition, exotic wildlife operations contribute approximately $359 million of value added in the form of employee compensation, proprietary income, other proprietor income, and indirect business taxes. Hunters supply an additional $143 million in direct economic impacts. This number represents annual retail (clothing, guns, hotels, food, fuel, etc.) and hunt related (venison processing, taxidermy services, etc.) expenditures of hunters that consume the products of this industry.

When combined, exotic wildlife industry generates $1.3 billion of economic activity. In addition, the industry provides the economic activity that supports 14,383 jobs in the economy, most of which are located in rural areas. If this industry were to disappear, these jobs would have to find support from some other sector of the economy.

[5] The 2001 Economic Benefits of Hunting, Fishing and Wildlife Watching in Texas." Produced by Southwick Associates, Inc. for the Texas Parks and Wildlife Department, March 31, 2003. Accessed August 10, 2006. http://www.southwickassociates.com/freereports/default.aspx

Table 4: Economic Impact of the Exotic Wildlife Industry.

	Direct	Output	Value Added	Employment
All Operations	679,731,120	1,062,362,908	359,088,014	11,748
Hunters	142,978,744	254,170,909	66,227,004	2,635
Total	822,709,863	1,316,533,817	425,315,018	14,383

Conclusion

With over 3,750 operations, the exotic wildlife industry has an established presence in the economy, 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. Over $822 million in direct expenditures are poured into the economy each year by the exotic wildlife operations and the sportsmen participating in this industry. In turn, this generates $1.3 billion of economic activity while supporting 14,383 jobs. All told, these results highlight the fact that the exotic wildlife industry continues to be an important and vital contributor to rural economies.

Red deer (male bred for maximum antler growth), photo by Marida Favia del Core Borromeo courtesy of Blackjack Ranch LEE, Ltd.

Appendix: Economic Impact Survey

Exotic Wildlife Industry - Economic Impact Survey

Please indicate type of operation

Exotic Wildlife: Breeding Only ☐ Breeding and Hunting ☐ Hunting only ☐

Exotic Wildlife Breeding

Instructions and clarification are provided at the end of this survey. For Hunting only operations, please skip to the hunting section. Include annualized 2005 figures where appropriate.

I. Operation

1. Year started: _____ 2. State: _____
3. Total acreage: _____ acres
4. Amount of land purchased: _____ acres 4a. Purchase value: $_____ (per acre)
5. Amount of land inherited: _____ acres 6. Area of breeding operation: _____ acres

II. Herd Inventory (Final 2005 Inventory)

1. Total number of Common Exotics: _____
2. Total number of Super Exotics: _____
3. Annual birth rate (surviving): _____ %
3. Annual herd mortality rate (including fawns/calves after weaning): _____ %
4. Annual sales (Final 2005 figures)

Number of Common Exotics:	Total receipts: $
Number of Super Exotics:	Total receipts: $

5. Annual purchases (Final 2005 figures):

Number of Common Exotics:	Total cost: $
Number of Super Exotics:	Total cost: $

III. Facilities

1. Number of pens: _____ 2. Area of pens: _____ acres
3. Capital cost of fencing: $_____ 4. Capital cost of shelters: $_____
5. Capital cost of improvements: $_____
6. Capital cost of buildings: $_____ 7. Capital cost of working pens: $_____
8. Do you have a handling facility? ☐ Yes ☐ No 8a. If yes, capital cost of handling facility: $_____
9. Approximate area of food plots: _____ acres
   9a. Annual cost of seed: $_____
   9b. Annual cost of fertilizer: $_____

IV. Equipment

1. Purchase price of all large equipment, combined (i.e. tractor + bobcat): $_____
2. Purchase price of all ATVs, combined: $_____
3. Purchase price of all ranch vehicles, combined: $_____
4. Purchase price of all implements, combined: $_____
5. Purchase price of all trailers/transport crates, combined: $_____
6. Purchase price of all bulk feed bins, combined: $_____
7. Purchase price of all feeding equipment, combined: $_____
8. Purchase price of all watering equipment, combined: $_____
9. Purchase price of all video equipment, combined: $_____
10. Annual cost of rental equipment: $_____
11. Purchase price of dart gun/sedation equipment: $_____

Exotic Wildlife Breeding, continued

V. Veterinary & Supplies

1. Annual cost of operating supplies: $_____
2. Annual cost of medical supplies: $_____
3. Annual veterinary expense: $_____
4. Average cost per sedation: $_____
5. Number of necropsies performed: _____ 5a. Average cost per necropsy: $_____
6. Number of CWD tests performed: _____ 6a. Average cost per CWD test: $_____

VI. Labor

1. Number of employees: 1a. Paid salary: _____ 1b. Paid hourly: _____
2. Total annual wages paid: 2a. Salaries: $_____ 2b. Hourly: $_____
3. Annual expense from outsourced services: $_____

VII. Utilities

1. Annual cost of utilities: $_____
2. Annual cost of fuel: $_____

VIII. Miscellaneous Expenses

1. Annual insurance expense: $_____
2. Annual advertising/marketing expense (includes taxidermy services): $_____
3. Annual travel expense: $_____
4. Annual property tax: $_____
5. Annual cost of maintenance and repair: $_____
6. Other annual miscellaneous expenses: $_____

IX. Feeding

1. Annual amount of protein or supplemental feed purchased: _____ tons
2. Protein or supplemental feed price per unit: $_____ (per ton)
3. Annual amount of hay purchased: _____ tons
4. Hay price per unit: $_____ bale/ton
   4a. Average bale weight: _____ lbs

Exotic Wildlife Hunting

Instructions and clarification are provided at the end of this survey. For combination Breeding & Hunting operations, please separate hunting expenses from breeding expenses. Include annualized 2005 figures where appropriate.

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

I. Operation

1. Year started: _____ 2. State: _____
3. Total acreage: _____ acres
4. Amount of land purchased: _____ acres 4a. Purchase value: $_____ (per acre)
5. Amount of land inherited: _____ acres 6. Area of breeding operation: _____ acres

II. Facilities

1. Capital cost of lodge(s): $_____
2. Capital cost of fencing: $_____
3. Capital cost of improvements: $_____
4. Capital cost of buildings: $_____
5. Approximate area of food plots: _____ acres
   5a. Annual cost of seed: $_____
   5b. Annual cost of fertilizer: $_____

III. Equipment

1. Purchase price of all large equipment combined (i.e. tractor + bobcat): $_____
2. Purchase price of all ATVs, combined: $_____
3. Purchase price of all ranch vehicles, combined: $_____
4. Purchase price of all implements, combined: $_____
5. Purchase price of all trailers/transport crates, combined: $_____
6. Purchase price of all bulk feed bins, combined: $_____
7. Purchase price of all feeding equipment, combined: $_____
8. Purchase price of all watering equipment, combined: $_____
9. Purchase price of all video equipment, combined: $_____
10. Annual cost of rental equipment: $_____
11. Purchase price of cooler/freezer equipment: $_____

IV. Supplies

1. Annual amount of protein feed purchased: _____ tons 1a. Protein feed unit price: $_____ (per bag/ton)
2. Annual amount of corn purchased: _____ tons 2a. Corn unit price: $_____ (per bag/ton)
3. Annual cost of operating supplies for lodge: $_____
4. Annual cost of food and beverages for lodge: $_____

V. Labor

1. Number of employees: 1a. Salary: _____ 1b. Hourly: _____
2. Total wages paid: 2a. Salaries: $_____ 2b. Hourly: $_____
3. Annual expense from outsourced services: $_____

Exotic Wildlife Hunting, continued

VI. Utilities

1. Annual cost of utilities: $_____
2. Annual cost of fuel: $_____

VII. Miscellaneous Expenses

1. Annual insurance expense: $_____
2. Annual advertising/marketing expense (includes taxidermy services): $_____
3. Annual travel expenses: $_____
4. Annual property tax: $_____
5. Annual cost of maintenance and repair: $_____
6. Other annual miscellaneous expenses: $_____

VIII. Hunters

1. Approximate number of common exotics in hunting area: _____
2. Approximate number of super exotics in hunting area: _____
3. Annual number of hunters: _____
4. Total annual exotic wildlife harvest: _____
5. Annual number of common exotics purchased for release into hunting operation: _____
   5a. Total expense: $_____
6. Annual number of super exotics purchased for release into hunting operation: _____
   6a. Total expense: $_____
7. Annual number of common exotics harvested: _____
   7a. Total receipts from common exotic hunts: $_____
8. Annual number of super exotics harvested: _____
   8a. Total receipts from super exotic hunts: $_____
9. Average processing cost for common exotics: $_____ (per animal)
10. Average processing cost for super exotics: $_____ (per animal)
11. Approximate percentage of harvested exotics seeking taxidermy services: _____%
12. Average local taxidermy cost for common exotics: $_____ (per animal)
13. Average local taxidermy cost for super exotics: $_____ (per animal)

Economic Impact Survey
Exotic Wildlife Association Members

****All information collected in this survey will remain confidential****

Survey Instructions

1. This survey is to be completed by exotic wildlife breeding operations, combination exotic wildlife breeding and hunting operations, and hunting only operations that purchase exotic wildlife for release into their hunting operation. All other industry participants may disregard this survey.
2. For the sections and categories below, please provide annualized 2005 records of actual or accurate estimates of expenditures rather than a range estimate of expenditures.
3. **For combination breeding and hunting operations, please separate breeding operation records from hunting operation records. Contact us for additional surveys if you have multiple operations.**
4. **It is important to use the provided categories for records for each section, rather than combining records from breeding and hunting operations and submitting that in a breeding or hunting category. Please provide an accurate estimate when your records do not match these categories.**
5. If a question does not apply to your operation, please indicate this with an "N/A" response.
6. Please indicate units (lbs, tons, gals, etc.) where applicable.
7. For further explanation of general and selected lines of the survey, please refer to the information below.

Exotic Wildlife Breeding

I. Operation: *Area of breeding operation* refers to the total acreage dedicated to your breeding operation. *Purchase value* refers to the cost per acre for the initial purchase of the land.

II. Herd Inventory: This category refers to your exotic herd inventory. *Annual birth rate* refers to the number of surviving fawns/calves born per year. *Annual herd mortality rate* refers to the annual mortality loss on the total breeding herd, including loss of fawns/calves after weaning.

III. Facilities: *Area of pens* refers to the total acreage enclosed by all pens combined. *Capital cost* refers to the overall cost of construction for each of the items listed, including clearing, foundation, electrical, plumbing, etc. *Capital cost of improvements* refers to land clearing, roads, forage, water (well drilling, ponds), etc.

IV. Equipment: *Purchase price* refers to the original cost of the equipment at purchase, not an annualized loan payment. *Large equipment* refers to tractors, bobcats, dozers, etc., used in your breeding operation. Please combine all applicable equipment into one figure for lines 1-9.

V. Veterinary & Supplies: *Annual cost of operating supplies* refers to the yearly expense for all operating supplies, such as office supplies, sedation supplies (darts), etc. *Annual cost of medical supplies* refers to the yearly expense for medicine, vaccines, syringes, etc. *Average cost per sedation* refers to the average expense of supplies and labor to sedate or dart an animal. *Number of necropsies performed* refers to the number of post mortality veterinary examinations performed to determine the cause of death. *Average cost per necropsy* refers to the average labor and labwork expense of performing a necropsy on a single animal. *Average cost per CWD test* refers to the average labor and labwork expense of performing a CWD test.

VI. Labor: This category refers to the labor expense for your breeding operation. Owners, spouses, and children must be accounted for in this category as an employee(s) and in total wages, if paid labor is performed by these individuals. *Total wages paid* refers to annual wages for all employees. Owner/operators must include amount allotted or withdrawn for family living for line 2a. *Annual expense from outsourced services* refers to all additional contracted labor from those not on the payroll, including consulting services, accounting services, legal services, herd survey services, etc.

VII. Utilities: This category refers to the annual utilities expense for electric, phone, water, sewage, refuse disposal, etc., and the annual fuel expense for your breeding operation.

VIII. Miscellaneous Expenses: *Annual insurance expense* refers to the yearly cost of auto, property, liability, health, etc. insurance. *Annual advertising/marketing expense* refers to the annual cost of advertising and marketing materials, which includes taxidermy services for genetic display (horn molds, shed mounts, deceased buck mounts, etc.). *Annual travel expense* refers to the annual cost of travel, such as fuel, food, lodging, airfare, etc. *Annual cost of maintenance and repair* refers to all maintenance and repair for facilities, equipment, fencing, roads, etc.

IX. Feeding: This category relates to the amount of feed and hay purchased for 2005 and the price per unit.

Exotic Wildlife Hunting

I. Operation: *Area of hunting operation* refers to the total acreage dedicated to your hunting operation. *Purchase value* refers to the cost per acre for the initial purchase of the land.

II. Facilities: *Capital cost* refers to the overall cost of construction for each of the items listed, including clearing, foundation, electrical, plumbing, etc. *Capital cost of improvements* refers to land clearing, roads, forage, water (well drilling, ponds), etc.

III. Equipment: *Purchase price* refers to the original cost of the equipment at purchase, not an annualized loan payment. *Large equipment* refers to tractors, bobcats, dozers, etc., used in your breeding operation. Please combine all applicable equipment into one figure for lines 1-9.

IV. Supplies: This category relates to supplemental feed, corn, operating, and food and beverage supplies for hunting operations on an annualized basis.

V. Labor: This category refers to the labor expense for your hunting operation. Owners, spouses, and children must be accounted for in this category as an employee(s) and in total wages, if paid labor is performed by these individuals. *Total wages paid* refers to annual wages for all employees. Owner/operators must include amount allotted or withdrawn for family living for line 2a. *Annual expense for outsourced services* refers to all additional contracted labor from those not on the payroll, including consulting services, helicopter or drop net capture services, accounting services, legal services, herd survey services, etc.

VI. Utilities: This category refers to the annual utilities expense for the electric, phone, water, sewage, refuse disposal, etc., and the annual fuel expense for your hunting operation.

VII. Miscellaneous Expenses: *Annual insurance expense* refers to the yearly cost of auto, property, liability, health, etc. insurance. *Annual advertising/marketing expense* refers to the annual cost of advertising and marketing materials, which includes taxidermy services for display. *Annual travel expense* refers to the annual cost of travel, such as fuel, food, lodging, airfare, etc. *Annual cost of maintenance and repair* refers to all maintenance and repair for facilities, equipment, fencing, roads, etc.

VIII. Hunters: *Total expense* in lines 5a & 6a refer to the cost of purchasing, sedating, and transporting an animal for release into hunting operation. *Average processing cost* refers to the cost of processing each harvested animal. If it is processed in-house, please provide an accurate estimate of this cost based on local processor costs. Line 11 relates to the percentage of harvested animals that will have some type of taxidermy service performed, such as a shoulder or full body mount. Lines 12 and 13 allow for the average per animal expense of this service for the hunter.

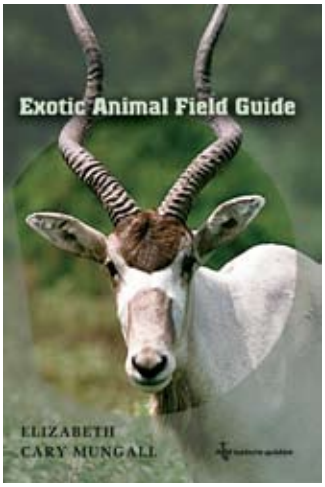
We thank you in advance for taking the time to complete this survey. Upon completion, please return the survey with the enclosed envelope. Questions or requests for additional surveys may be directed to Brian Frosch at 888-890-5663.

Fallow deer (two males showing black and white forms), photo by Christian Mungall courtesy of Kyle Wildlife LP.

Eland (bull), photo by Elizabeth Cary Mungall courtesy of Arbuckle Wilderness, Oklahoma.

Axis deer (young male nuzzles a large buck in velvet), photo by Elizabeth Cary Mungall courtesy of Kyle Wildlife LP.

NEW BOOK!



EXOTIC ANIMAL FIELD GUIDE

Nonnative Hoofed Mammals in the United States

by Elizabeth Cary Mungall

Featuring eighty different kinds of hoofed mammals, this field guide covers common exotics, such as blackbuck antelope and fallow deer, some less common species like scimitar-horned oryx and a few newer arrivals like bongo. In the introduction, author Elizabeth Cary Mungall explains how these species got here, where people can go to view them, and gives a few guidelines for responsible ownership.

The main portion of the book contains fully illustrated species accounts, with native range maps and information about food habits, habitat, temperament, breeding and birth seasons, and fencing needs. A list of exotics–related organizations and a reference section round out the text. Photographs of each species make identification easy and, in a chapter on photographing exotics, Christian Mungall shows readers how to take their own great pictures of these animals.

This book is for anyone, from park visitor and zoo goer to rancher and wildlife biologist, who wants to identify and learn about exotic wildlife in the United States.

Natural Bridge Wildlife Ranch

"Anyone with exotics … will require *Exotic Animal Field Guide*." James G. Teer

"…fills a vacant niche." Richard D. Estes

Flexbound with flaps, 312 pages, with 234 color photographs, 82 maps, 2 black-and-white illustrations, and 4 tables.
ISBN nos. 987-1-58544-555-4 and 1-58544-555-X. $23.

To order, contact Texas A&M University Press, (800)826-8911.