

Long-Term Financial Impacts of Cattle and Wildlife Management Strategies in South Texas

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ABSTRACT

Wildlife management is becoming the principal, as opposed to a supplemental, enterprise in many ranches. Specifically in South Texas, forage and brush control considerations for wildlife habitat have become an integral, if not the predominant, management issue for some ranch operations. In this time of shifting away from range management dominated by livestock needs, this paper illustrates the financial implications of alternative management strategies targeted toward optimizing wildlife habitat and the profitability of ranching/hunting operations.

KEYWORDS: wildlife, ranching, management strategies, financial, profitability

INTRODUCTION

Over the past 25 years, wildlife management involving deer and bird hunting has become a key component of a typical ranch operation. This has largely resulted from the growth in the number of hunting enthusiasts living in major metropolitan areas acquiring ownership or leasing ranches for hunting purposes. Over the past decade, many land owners and cattle producers have reduced or eliminated their cattle herds to concentrate more on deer and bird hunting recreation or lease opportunities.

Completely eliminating the livestock enterprise could be going one step too far. Range management experts, emphasizing that the same tools that destroyed habitat such as the axe, the plow, fire, the cow, and the rifle (Leopold, 1933), can be used to enhance and maintain wildlife populations. There is a need to maintain grazing at adequate livestock stocking rates to help manage proper forage and brush conditions for wildlife. If done properly, livestock grazing can be an income producing habitat management strategy. Mechanical and/or chemical brush control can also be used to manage and enhance native wildlife habitat.

Ranchers in South Texas have three basic livestock enterprise options available, including cow-calf, stockers or a mix of the two. All three options have benefits and consequences which may not fully be recognized in the short term. However, a mix of cow-calf and stockers is not a common practice in the South Texas area. The long-term

implications of each option make management analysis and decisions difficult, particularly when cattle prices are expected to cyclically decline over the next few years.

REVIEW OF LITERATURE

Various authors have discussed the need of good management of grazing animals as a tool in enhancing wildlife habitat or keeping grasses from getting too dense or too tall. This in turn improves overall income possibilities from livestock and wildlife enterprises. Fulbright and Ortega (2006) explain that livestock is an integral part of managing the dry-land ranching habitat of Oklahoma, Texas and Northern Mexico. Range and wildlife managers should have a greater appreciation of the synergy between range and wild management, particularly in deer management. Guthery (1986) makes a simple point that quail and cattle can coexist with excellent production from both. Guthery shows that grazing, properly managed, is one of the simplest and most encouraging tools for providing a diversity of cover types for bobwhite quail. Fuhlendorf, et al, (2006) recognize grassland ecosystems are dependent on periodic disturbance, such as grazing by native herbivores, periodic burning, and/or mowing/haying, for habitat maintenance. The authors emphasize that the habitat mosaic is probably best maintained through some type of rotational management system involving herbivores in which grassland areas receive management on a regular schedule.

From an economic perspective, the portfolio effects of enterprise diversification are well known. In the case of wildlife and livestock, the synergistic impacts on habitat can be complemented by the financial risk reducing benefits of diversification. Mishra and El Osta (2002) clearly illustrate the risk management value of enterprise diversification as they study the likelihood of managers to use the technique. The value of hunting and other recreational enterprises are continually growing and becoming an ever more significant factor contributing to the market value of land (Henderson and Moore, 2006). With the increasing demand for leasing hunting rights, it is important for the ranch manager to find an appropriate mix of traditional livestock enterprises with recreational activities without overemphasizing a single enterprise.

MATERIALS AND METHODS

The Financial And Risk Management (FARM) Assistance financial planning model was used to evaluate and illustrate the individual financial impacts of various management strategies on a representative ranch in South Texas. FARM Assistance is a farm-level stochastic simulation model and is the basis of an outreach program by Texas AgriLife Extension. It is a decision support system (DSS) available to any Texas producer which addresses the decision steps of formulating strategic business alternatives and evaluating their likely financial impact. As a DSS, FARM Assistance simplifies the evaluation process, increasing the likelihood that farm managers will more accurately evaluate alternative strategies (Klose and Outlaw, 2005). Kaase, et al (2003) describe the FARM Assistance process as a unique combination of a state-of-the-art decision-support system with an extension risk management specialist working one-on-one with a producer to provide individualized economic and risk assessment evaluations. Klose and Outlaw (2005) describe the technical simulation methodology and the philosophy of

providing information to help producers choose among long-term strategic business alternatives. To accomplish that objective, a baseline is created representing the current strategic plan for moving the operation through a ten-year planning horizon. The baseline serves as a benchmark for comparing the long-term financial implications of alternative plans (Kaase, et al, 2007). The FARM Assistance stochastic financial forecast methodology serves as the basis for analyzing the potential impacts a producer might expect from common wildlife habitat management strategies in South Texas.

The FARM Assistance model is used to develop financial projections for a model ranch under four distinct management scenarios. The projected financial position and performance was evaluated across five major categories including profitability, liquidity, repayment capacity, solvency, and financial efficiency. Representative measures were chosen for each of these categories to assess the financial implications of each scenario. The stochastic nature of the model provides information with respect to the projected variability in the ranch's financial position and performance. When taken as a whole, the analysis provides insight into the risk and return expectations of the ranch throughout the planning horizon under each management strategy.

This case study was based on the expert knowledge and input of area management, range, and livestock specialists. It analyzes four possible scenarios: 1) a 200 head cow-calf operation (1 animal unit to 10 acre stocking rate), 2) a 100 head cow-calf operation (1 animal unit to 20 acre stocking rate), 3) hunting only with no cattle, and 4) hunting with stocker leasing income (250 head stockers grazed March-August).

The ranch is assumed to be 2,000 acres and the basic assumptions and characteristics for each scenario are given in Table 1. Off-farm income is another diversified source of income that contributes to the overall financial picture of the typical landowner/decision-maker in the region. Off-farm operator and spouse income were included in the study as a typical 2,000 acre ranch in South Texas would normally not be a full-time business with the ability to sustain a positive cash flow independently. In all four scenarios, the ranch was assumed fully owned with no royalty income. Across South Texas, royalty income is not common in most ranches. Hunting income was included in the four scenarios as it is a common practice.

Production yields and costs, estimates for overhead charges, and hunting and stocker lease rates were based on representative or typical rates for the region (Table 1). It was assumed that hunting income was based on three-year leases with rate appreciation each renewal. Herbicide costs for weed and brush control varied by management strategy according to typical application rates for South Texas. Stocker grazing and hunting lease rates were held constant for the ten-year planning horizon. The assets, debts, machinery inventory, and scheduled equipment replacements for the projection period were the same in the two cow-calf scenarios. In the hunting only and hunting with stockers scenarios, no cattle or hay trailers were included. Moreover, the hunting with stockers scenario assumed the grass was leased out with no cattle ownership. It is assumed the ranch has only intermediate term debt in all scenarios.

Initially, local cattle prices were obtained from the Live Oak Livestock Commission Company auction report in Three Rivers, Texas, for September 10, 2007. The base year for the ten-year analysis of the representative ranch is 2007 and projections are carried through 2016. Commodity and livestock price trends follow projections provided by the Food and Agricultural Policy Research Institute (FAPRI, University of Missouri), with costs adjusted for inflation over the planning horizon.

Table 1: Representative South Texas Ranch Assumptions

<u>Selected Parameter</u>	<u>Scenarios</u>			
	<u>1</u> Hunting & Cow-Calf (200 Cows)¹	<u>2</u> Hunting & Cow-Calf (100 Cows)²	<u>3</u> Hunting Only	<u>4</u> Hunting & Stockers
Operator Off-Farm Income/Year	\$24,000	\$24,000	\$24,000	\$24,000
Spouse Off-Farm Income/Year	\$35,000	\$35,000	\$35,000	\$35,000
Family Living Expense/Year	\$30,000	\$30,000	\$30,000	\$30,000
Ownership Tenure	100%	100%	100%	100%
Royalty Income	None	None	None	None
Stocker Leasing Income/Year (March-August)	N/A	N/A	N/A	\$8/head/mo. (6 months)
Hunting Income/Acre/Year	\$7	\$7	\$10	\$10
Deer Stands, Feeders, Feed	Hunters Provide	Hunters Provide	Hunters Provide	Hunters Provide
Herbicide Costs/Acre	\$1.50	\$3	\$4	\$1.50
Herd Size	200 cows, 8 bulls	100 cows, 4 bulls	N/A	250 head
Calf Weaning Rate	85%	85%	N/A	N/A
Cow Herd Replacement	Bred cows	Bred cows	N/A	N/A
Salt/Mineral blocks/Year	\$15/cow	\$15/cow	N/A	\$10.50/head
Hay Fed/Cow/Year	1.5 tons	1.0 tons	N/A	N/A
Protein Cubes Fed/Cow/Year	150 lbs.	100 lbs.	N/A	N/A
Cow Culling Rate/Year	7.50%	7.50%	N/A	N/A
Steer Weaning Weights	525 lbs.	525 lbs.	N/A	N/A
Heifer Weaning Weights	475 lbs.	475 lbs.	N/A	N/A
Steer Prices (2007)	\$1.20/lb.	\$1.20/lb.	N/A	N/A
Heifer Prices (2007)	\$1.10/lb.	\$1.10/lb.	N/A	N/A
Cull Cow Prices (2007)	\$.50/lb.	\$.50/lb.	N/A	N/A
Cull Bull Prices (2007)	\$.60/lb.	\$.60/lb.	N/A	N/A
Bred Cow Prices	\$1,100/head	\$1,100/head	N/A	N/A
Replacement Bull Prices	\$2,000/head	\$2,000/head	N/A	N/A
Hay Prices (2007)	\$100/ton	\$100/ton	N/A	N/A
Range Cube Prices	\$.142/lb.	\$.142/lb.	N/A	N/A

¹ One animal unit to 10 acres stocking rate.

² One animal unit to 20 acres stocking rate.

RESULTS

A comprehensive financial projection, including price and weaning weight risk for the two cow-calf scenarios, is illustrated in Table 2 and Figures 1-3. Table 2 presents the average outcomes for selected financial projections, while the graphical presentations illustrate the range of possibilities for the selected variable. Total cash receipts averaged \$113,250 over the ten-year period for scenario 1 (cow-calf, 1-10 stocking rate), which is significantly more than the other three scenarios. Average cash costs were \$97,740 for Scenario 1. Variations in cash costs for the four scenarios largely reflect differences in operating costs such as labor, herbicides, feed and cattle purchased, and other production costs.

Profitability measures the extent to which a farm or ranch generates income from the use of its resources. One measure of profitability is net cash farm income (NCFI), which is the total of all operating cash inflows and outflows. NCFI is expected to be the lowest over the ten-year planning horizon in Scenario 3 (hunting only). Net cash farm income is projected to be -\$12,470 in 2007, compared to positive NCFI in the two cow-calf scenarios and -\$100 in the hunting with stockers scenario (Table 2 and Figures 1-3). For 2007-2016, it is expected to average -\$12,850 in Scenario 3, \$15,510 for Scenario 1, -\$1,580 for Scenario 2 (cow-calf, 1-20 stocking rate), and -\$920 for Scenario 4 (hunting with stockers). Over the ten-year period, cash receipts in all four scenarios will generally decline along with projected cattle prices, while operating expenses trend upward with inflation (Figures 1-3). Figure 1 also illustrates the risk in NCFI, with the range indicating profit levels from approximately -\$6,000 to \$48,000 in Scenario 1 and -\$10,000 to \$20,000 in Scenario 2 are possible. These ranges suggest that there is significant risk of operating losses over the projected period. The shaded area of the graph suggests that the operation is expected to have a 50% chance of realizing a \$1,000 to \$34,000 profit level in Scenario 1 and -\$6,000 to \$12,000 in Scenario 2. Figures 2 & 3 illustrate the NCFI for Scenarios 3 and 4 compared to Scenario 1. Projected hunting income per acre was increased every three years in both scenarios. Stocker lease rates were not changed in the hunting with stocker scenario, reflecting a stable history of lease rates in the area. As a result, expected increases in operating expenses lead to a decline in NCFI over the ten-year period for both scenarios. Figure 2 reflects no risk in projected NCFI due to hunting lease rates contractually increasing every three years. Figure 3 illustrates possible profit levels from -\$9,000 to \$7,000 in the hunting with stocker scenario, with a 50% chance of realizing a -\$4,000 to \$2,000 profit level.

Liquidity measures the ability of a farm or ranch to meet its short-term financial obligations without disrupting the normal operations of the business. The liquidity of the operation may be measured by the ending cash balance (Table 2). In all four scenarios, no cash flow problems are expected as cash reserves are projected to grow over the planning horizon. The growth in cash reserves is largely dependent on off-farm income, which is common for a typical ranch. Growth in cash reserves in Scenario 1 is projected to be 36.2% more than Scenario 2, 126% more than Scenario 3 and 46.9% more than Scenario 4.

Table 2: Financial Projections - Selected Indicators

<u>Scenarios</u>	<u>2007</u>	<u>2010</u>	<u>2013</u>	<u>2016</u>	<u>Avg.</u>
Total Cash Receipts (\$1,000)					
1-Hunting & Cow-Calf (200 Cows) ¹	121.55	112.75	109.46	110.98	113.25
2-Hunting & Cow-Calf (100 Cows) ²	68.06	64.18	63.01	64.26	64.50
3-Hunting Only	20.00	21.40	22.80	24.20	21.68
4-Hunting & Stockers	32.00	33.38	34.81	36.22	33.68
Total Cash Costs (\$1,000)					
1-Hunting & Cow-Calf (200 Cows) ¹	97.86	97.47	97.50	99.60	97.74
2-Hunting & Cow-Calf (100 Cows) ²	61.07	62.20	63.45	65.75	62.92
3-Hunting Only	32.47	33.79	35.24	36.80	34.53
4-Hunting & Stockers	32.10	33.63	35.52	37.39	34.60
Net Cash Farm Income (\$1,000)					
1-Hunting & Cow-Calf (200 Cows) ¹	23.69	15.28	11.96	11.38	15.51
2-Hunting & Cow-Calf (100 Cows) ²	6.99	1.97	-0.44	-1.49	-1.58
3-Hunting Only	-12.47	-12.39	-12.44	-12.60	-12.85
4-Hunting & Stockers	-0.10	-0.25	-0.71	-1.17	-0.92
Ending Cash Reserves (\$1,000)					
1-Hunting & Cow-Calf (200 Cows) ¹	47.40	147.69	257.40	373.69	
2-Hunting & Cow-Calf (100 Cows) ²	36.46	105.70	186.35	274.30	
3-Hunting Only	20.58	52.71	103.99	165.37	
4-Hunting & Stockers	31.10	89.47	167.07	254.47	
Probability of Ending Cash Reserves < Zero (%)					
1-Hunting & Cow-Calf (200 Cows) ¹	1	1	1	1	1
2-Hunting & Cow-Calf (100 Cows) ²	1	1	1	1	1
3-Hunting Only	1	1	1	1	1
4-Hunting & Stockers	1	1	1	1	1
Real Net Worth (\$1,000)					
1-Hunting & Cow-Calf (200 Cows) ¹	2,056.76	2,337.48	2,457.12	2,554.94	
2-Hunting & Cow-Calf (100 Cows) ²	1,967.16	2,223.01	2,332.83	2,416.44	
3-Hunting Only	1,864.11	2,091.42	2,192.81	2,265.22	
4-Hunting & Stockers	1,874.41	2,125.60	2,247.69	2,337.49	
Average Annual Operating Expense/Receipts					
1-Hunting & Cow-Calf (200 Cows) ¹	0.81	0.87	0.90	0.91	0.87
2-Hunting & Cow-Calf (100 Cows) ²	0.90	0.98	1.01	1.03	0.98
3-Hunting Only	1.58	1.57	1.53	1.52	1.58
4-Hunting & Stockers	1.00	1.02	1.03	1.05	1.04

¹One animal unit to 10 acres stocking rate.

²One animal unit to 20 acres stocking rate.

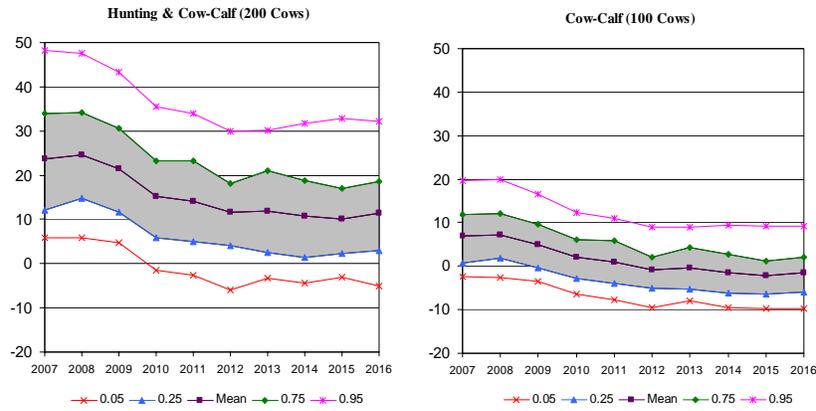


Figure 1. Projected Variability in Net Cash Farm Income for the Hunting & Cow-Calf Scenarios: 200 Cows (1 A.U. to 10 Ac. Stocking Rate) and 100 Cows (1 A. U. to 20 Ac. Stocking Rate).

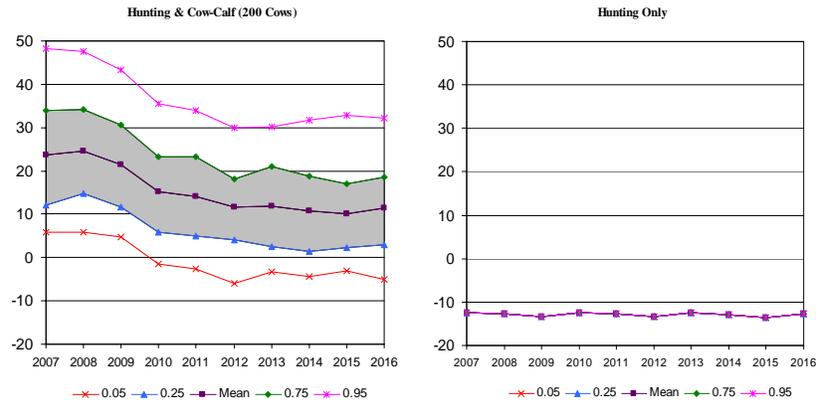


Figure 2. Projected Variability in Net Cash Farm Income for the 200-Cow Hunting & Cow-Calf (1 A.U. to 10 Ac. Stocking Rate) and Hunting Only Scenarios.

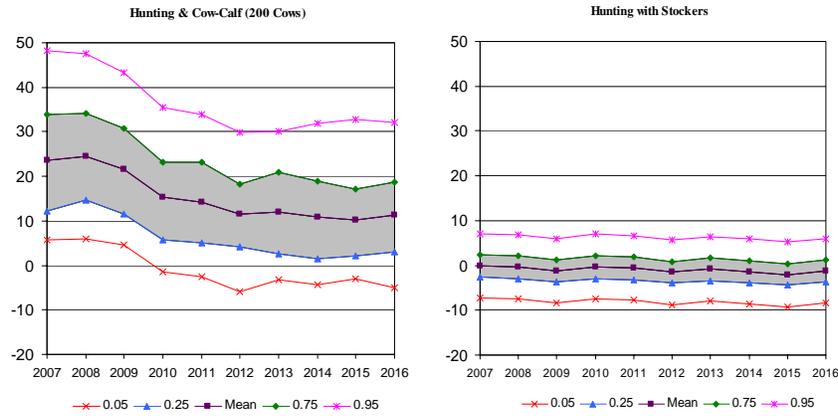


Figure 3. Projected Variability in Net Cash Farm Income for the 200-Cow Hunting & Cow-Calf (1 A.U. to 10 Ac. Stocking Rate) and hunting with Stockers Scenarios.

Repayment capacity measures the ability of a borrower to repay debt. Probability of refinancing measures the likelihood that an individual or business will not be able to meet all financial obligations in a particular year and thus be forced to refinance or roll over operating debt. Table 2 depicts the risk associated with the ending cash balance by showing the probability of refinancing or carryover operating debt. Due to off-farm income, all scenarios have a low probability of cash shortages as cash reserves are expected to grow. The probability of carryover debt is 1% or less over the projection period for all four scenarios.

Solvency is a comparison of the value of owned assets to the amount of debts owed, and real net worth is a measure of the owner’s interest or equity adjusted for inflation. Growth in cash reserves and real estate assets translates into a projected increase in real net worth in all scenarios. However, in Scenario 1, real net worth reaches \$2,554,940, 5.7% more than Scenario 2, 12.8% more than Scenario 3, and 9.3% more than Scenario 4 (Table 2).

Financial efficiency measures the intensity with which various assets or parts of the business are used to generate revenues. Operating expense-to-receipts ratio indicates what percentage of revenues went for operating expenses (Table 2). Scenario 1 is the most efficient of the four scenarios. The operating expense-to-receipts ratio is projected to average .87 for Scenario 1, .98 for Scenario 2, 1.58 for Scenario 3 and 1.04 for Scenario 4 over the ten-year period.

DISCUSSION

Currently, there is a tendency to charge all ranch expenses to the cattle operation making the wildlife operation look extremely profitable. Whether this tendency is carried out on paper or simply the perception of the rancher, it can lead to ill-informed decisions to shift the hunting/livestock enterprise mix. When expenses are allocated fairly across

all enterprises and the ranching operation is analyzed as a whole unit, it is obvious that no one enterprise can stand on its own.

Wildlife management will continue to add to the bottom line of a South Texas ranch and be an integral part of overall operations. Nevertheless, results show that cattle enterprises will likely continue to contribute most significantly to the financial well-being of the typical ranching business. The results of this study also depict that utilizing cattle to manage forage and brush conditions is a preferable alternative for ensuring business profitability and financial condition. The type of cattle operation and stocking rates will be dependent on location, forage, and weather conditions and management preference or business limitations.

Stocker operations may be attractive to some since the cattle are only on the ranch part of the year and can be gone during the hunting season. Ranch managers can still attain the objectives of excess grass removal, stimulation of forbs, and general habitat improvement. Stockers provide flexibility in that the ranch can easily be de-stocked in case of drought or fully stocked in case of excess forage.

Management options have varying opportunities, challenges and benefits ranging from immediate cash flow survival to long-term production and equity retention. While the analysis does not suggest a best management practice in all situations, it provides increased insight into the multi-year impacts of managing cattle and hunting enterprises in concert. More specifically the study illustrates the need for ranch managers to formally analyze their combined financial performance relative to the specific capacities and opportunities associated with the land.

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