CATTLE MANAGEMENT TO ENHANCE WILDLIFE HABITAT IN SOUTH TEXAS

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***Abstract*: For cattle ranching operations in South Texas, wildlife recreation can be a very important source of income for those who choose to diversify. In many cases, income from wildlife such as hunting leases is higher than the income obtained from cattle. Range, cattle, and wildlife management practices need to be adjusted to achieve rangeland sustainability, fulfill the requirements of multiple animal species, and optimize economic output. Under the climatic conditions of South Texas, specific strategies to adjust cattle stocking rates at the first signs of drought are required if valuable range plants and wildlife productivity are to be maintained. We discuss strategies of cattle grazing, including rates of use, grazing systems, stocking rate adjustments based on range condition, calculation of correct stocking rate, and guidelines to adjust livestock numbers based on spring and fall moisture availability. In South Texas, all wildlife species are important to consider in the context of total ranch management. We offer these guidelines to those who are interested in fostering compatible cattle and wildlife operations while protecting the integrity of rangeland, watershed, habitat, and soil resources. We use South Texas as a model to encourage the development of similar strategies and prescriptions for other arid and semiarid regions to help preserve rangeland habitat integrity and optimize biological and economic output.**

INTRODUCTION

Rangelands are the most important resource of ranching operations. The habitats they sustain can also support a wide array of wildlife species with the correct approach to management. Variation in soil, climate, elevation, topography, and other factors cause variations in the type of native plants found on rangelands. The combination of different plants affects the capacity of rangelands to provide different levels of cattle stocking rates and types of habitats for wild animals. Wildlife populations are largely determined by harvest rates and the amount and configuration of habitat characteristics that supply food, cover, and water as well as space; whereas, populations of domestic animals are determined by the ranch manager. In many cases, domestic animal populations are affected by the need for increasing economic returns, or simply by using the traditional stocking rate that has been used on a ranch.

Cattle and white-tailed deer co-exist in many South Texas ranch operations.

In the past, range management practices have focused on providing forage for cattle and other domestic animals that at one time represented the most important economic output. Today, ranchers in South Texas and elsewhere are working to survive in an increasingly competitive and complex market (Hanselka et al., 1991; Genho et al., 2003). The need for additional income from wildlife, which in many situations is greater than that obtained from cattle, requires modifications in traditional grazing management philosophies and practices to create, maintain, and enhance wildlife habitat. We provide specific guidelines for cattle and wildlife operations in South Texas as a model for other arid and semiarid regions to preserve rangeland habitat integrity and optimize biological and economic output.

CATTLE AND WILDLIFE: ARE THEY COMPATIBLE?

Cattle grazing is one of the most affordable tools to enhance habitat or manipulate vegetation characteristics. However, cattle grazing may be destructive or beneficial to wildlife, depending on the particular needs of wildlife species and how the cattle are managed. White-tailed deer (*Odocoileus virginianus*) and northern bobwhite quail (*Colinus virginianus*) are the primary species

that allow ranch income diversification in South Texas. Because wildlife and livestock cannot be maximized simultaneously, any management strategy should consider adjustments to fulfill the requirements of both cattle and wildlife (Hanselka, 1998; Lyons and Ginnett, 1998; Drawe, 2003).

Combinations of beef cattle and wildlife enterprises should be considered both in terms of trade-offs and synergies. Bobwhites need a combination of bunchgrasses for nesting cover, moderate brush for escape cover, and brooding areas with ample supply of forbs and insects. Bobwhite habitat needs have been discussed by Hernández and Radomski (1999) and Hellickson and Radomski (1999). In a survey of over 20 ranches, Brennan and Hardin (2003) found that bobwhite reproduction was linked to healthy stands of native bunchgrasses. Ranches with native bunchgrasses had been lightly grazed or not grazed at all over the past 2–4 years. Mosaics of plant community structure and diversity are best.

Fulbright and Taylor (2001) suggested that habitat for deer should include openings not larger than 10–40 acres surrounded by brush that provides screening and thermal cover and areas that support browse, pricklypear (*Opuntia* spp.), forbs, and mast producing plant species. Habitat requirements for deer, quail, and wild turkey (*Meleagris gallopavo*) have been discussed by Lyons and Ginnett (1998).

When prioritizing the importance of cattle and wildlife in the ranching business, is it better to have only wildlife? Or, is there a place for cattle in a wildlife operation? Deer seem to benefit from cattle grazing. In a survey of South Texas landowners from 187 ranches or leases representing 1.6 million acres of white-tailed deer habitat in South Texas, 80% of the respondents reported that they grazed livestock in the past 3 years (Bryant et al., 1999). In this survey, cattle grazing positively affected the average weight of the heaviest bucks harvested. In western South Texas, the largest bucks were 20 pounds heavier on ranches with cattle compared to ranches with no cattle (Bryant et al., 1999).

Thus, maintaining and/or improving habitat quality for different species should be the most important consideration of any management program. This bulletin offers some options and guidelines to have cattle and still maintain quality wildlife habitat.

THE CORRECT STOCKING RATE

The **correct stocking rate** varies from ranch to ranch. There is no regional average. This is true because each ranch is limited by (1) site potential, (2) current forage species present, and (3) the amount of brush cover.

Positive Impacts of Conservative Cattle Grazing

- ➢ Delay plant maturation
- ➢ Stimulate growth or regrowth by pruning effect
- ➢ Maintain optimum leaf area index
- ➢ Enhance nutritive value of the forage by increasing new growth
- ➢ Reduce accumulation of old material
- ➢ Accelerate nutrient recycling
- ➢ Fertilize soils via dung and urine deposition
- ➢ Reduce water stress, increase stomatal conductance and conserve soil moisture by reducing transpiration
- ➢ Manipulate botanical composition through selective grazing and trampling
- ➢ Trample seeds into the soil

Because cattle primarily consume grass, each of the factors mentioned above directly affects how one calculates stocking rate based upon how much grass is produced. Each site varies in its ability to produce vegetation. Second, past grazing history affects the forage species currently present. Third, some of the plant species are more desirable or productive than others. Last, brush density and cover influences the amount of grass present. Thus, all these factors directly affect how we calculate a **correct stocking rate**.

With that said, **correct stocking rate** also varies annually and seasonally because of the amount and distribution of rainfall each ranch receives. Therefore, a **correct stocking rate** this year may be totally inappropriate next year. Furthermore, a correct stocking rate for a 6-month grazing period from October to May, may be totally different than a correct stocking rate from June to October, because it depends on the rainfall received during times of the year that are critical to plant growth.

When attempting to determine the **correct stocking rate**, monitoring and estimating forage availability throughout the year is often difficult. Interactions of climate, sites, and vegetation make timely adjustments in stocking rate difficult because the interactions are complex and no "cookbook recipes" apply.

There is no justifiable reason to stock heavily and jeopardize long term productivity of the land for short term economic gains. This is especially true in today's financial climate given the value of wildlife recreation and hunting.

Concerns About the "Take Half–Leave Half" Guideline

The policy of "take half–leave half" to enhance wildlife habitat and range sustainability has been questioned by Payne and Bryant (1998). Hanselka et al. (2001) also indicated that utilization levels of 50% in South Texas result in overgrazing, which substantially increases the

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The bobwhite is an important species in South Texas, which benefits from proper cattle grazing management.

risk of range degradation. If half of the annual production is left ungrazed, approximately one-half of this vegetation will be lost to trampling, insects, other herbivores, and weathering. Thus, only about 25% is actually consumed by livestock (Hanselka et al., 2002).

Therefore, the calculation of **correct cattle stocking rate** should be based on residual cover left for ground nesting birds or at the very least, utilization that does not exceed 25% of the total forage production of the year, if wildlife is a consideration. We suggest that residual cover left on the land for nesting birds is more important than the old principle of "take half–leave half."

Furthermore, **correct stocking rates** for wildlife should consider "usable forage" instead of total forage production. Moderate utilization under these guidelines would be to remove 45% of the usable forage, which would be equivalent to utilizing only 22.5% of the standing crop. This allows for a buffer for forage losses as a result of trampling, insect consumption, etc., and to some extent, a buffer to ameliorate the variability in forage productivity as a result of seasonal rainfall and subsequent forage production patterns or abnormal climatic conditions such as drought (Payne and Bryant, 1998). Monitoring forage availability throughout the year is difficult, yet basic, in order to make timely decisions.

Range Condition as a Guide to Determining Correct Stocking Rates

Calculation of the **correct stocking rate** should also consider **range condition**. A value or correction factor is given for the presence of better grasses on a ranch or in a pasture. Our definition of "better" grasses takes into account ground cover, nesting cover, forage production, root depth, and native versus introduced plants. The following range condition factors are suggested as a multiplier when determining the **correct stocking rate**.

Poor condition	= 0.8
Fair condition	= 1.0
Good condition	= 1.2
Excellent condition	= 1.4

Range condition categories for your land can be assessed by contacting the local office of the USDA Natural Resources Conservation Service.

Grazing Systems

Grazing systems can benefit wildlife populations as well as cattle performance and range condition when stocking rate is correct. Rotational grazing systems may be used to vacate and afford rest to pastures. Various rotational grazing systems are available, and selection depends, among other factors, on the number and size of the pastures on the ranch. This approach utilizes the existing infrastructure and should minimize costs. In a rotational grazing system, rested or vacated pastures usually provide screening cover and nesting cover to grassland birds and minimizes the interaction between wildlife and domestic animals. Bryant et al. (1999) reported that in South Texas weights of the heaviest bucks were higher under cattle rotational grazing programs, by at least 13 pounds, than were the heaviest bucks under continuous grazing programs.

Rotational grazing systems can provide flexibility for applying other range management practices, such as prescribed burning, by facilitating pre-burn deferments to develop fuel loads and post-burn deferments for vegetation recovery. Applying the correct stocking rate is much more important than applying a particular kind of grazing system. However, any kind of grazing system or planned rest is better than none at all.

Strategies for Adjusting Livestock Numbers

The importance of timely rainfall to wildlife

It is very important to note that the time and amount of rainfall strongly influences the size of wildlife populations in South Texas, specifically northern bobwhites and wild turkeys. Kiel (1976), in a 6-year study of bobwhites in South Texas, reported that precipitation less than 4 inches from May to July was associated with age ratios of less than 3 young per adult; whereas, rainfall above 10 inches for the same period was correlated with age ratios of 5 or more young per adult.

Through the phenomenon of late summer/fall nesting, bobwhites in South Texas have the ability to rebound if adequate precipitation occurs from August to October. Cooler temperatures, abundant nesting cover, ample

insects, and moderate forb response combine to encourage late summer and fall nesting activity. Since 1998, bobwhites have had fall hatchings in 6 of the past 7 years in spite of low spring rainfall. Some nests hatched as late as December 3 (Hernández, 2003). The autumn of 2000 was the only year fall nesting did not occur, and August to October rainfall was the lowest of all the years from 1998 to 2004. In another example illustrating the impact of late summer/fall rains, juvenile to adult ratios across 20 ranches in South Texas rebounded from 1.5 juveniles per adult during the 2001–2002 hunting season to 3 juveniles per adult during the 2002–2003 hunting season (Brennan and Hardin, 2003). Abundant summer/fall rains in 2002 contributed to late hatches, thereby increasing productivity even though nesting success was depressed earlier in the year by one of the driest springs on record.

Antler growth of white-tailed deer also is affected by precipitation. Bryant et al. (1999) reported that, across South Texas, bucks that scored over 140 B&C points were harvested at a rate of 1 per 11,829 acres in a dry year (1996) versus 1 per 6,245 in a wet year (1997). Stedman (1994) reported that rainfall of 2.1 inches in March and 2 inches in April, positively affected antler growth.

Fawn survival can be positively affected by spring and summer rains. In 2002, one of the driest springs on record, expectations were that fawn crops would be poor. Yet, timely summer rain in July set the stage for excellent nutrition for lactating females and ample fawning cover for the newborns to hide from coyotes. Fawn survival was good to excellent. Based on this information, careful consideration of cattle stocking rate adjustments should be made when the first signs of drought are detected.

Destocking in response to spring and fall drought

Total or partial destocking in the face of inadequate spring and fall moisture is a hardship that is not easily addressed by ranchers in their annual management plans. This is particularly true for working ranches that are economically driven. For ranches that are driven more by wildlife recreation or where absentee landowners are the norm, destocking should be easier to manage. Under the climatic conditions of South Texas, destocking should be an important consideration if valuable range plants and wildlife productivity are to be maintained. In the South Texas environment, the possibility of having a late start to the rainfall period is not uncommon. Delayed spring rainfall can have a very strong negative effect on forage production even when the annual average precipitation may be normal.

Grazingland Management Systems, Inc. (1995) reported that in Kenedy County 43% of annual herbage production occurs during April, May, and June, and 26% occurs during September and October. Only 31% of the growth occurs during the other 7 months of the year. Furthermore, ranchers should not "hold on" hoping for rain or count on deep soil moisture to carry them. Therefore, in a drought-prone environment, management programs should consider cattle management criteria such as destocking to overcome these situations and to minimize effects of cattle grazing on range condition, individual plant vigor, and wildlife habitat.

Planning for grazing management in South Texas must be based on the most critical times of the year, January through June and August to October. These time periods have the most profound biological effects on the reproductive cycle of native wildlife, especially birds. Important considerations include the following: (1) January to May precipitation drives deer, quail, and turkey population size; (2) weather/climate is highly variable, which results in about 35% of the years getting less than 86% of the median rainfall; and (3) overgrazing during drought does more long term damage to range plants and wildlife habitats than any other time (Table 1).

Norwine and Bingham (1985) defined moderate drought as 80–90% of the median rainfall, and extreme drought as less than 80% of the median rainfall. We develop the following drought categories, based on percent median rainfall, to determine the extent to which destocking should occur. Using the following guidelines, target dates for destocking are June and October. Categories include the following:

- **Moderate drought**: 55–86% of median January to May and August and September rainfall and would require cattle ranchers to **cut stocking rate by 25%**.
- **Severe drought**: 39–55% of median January to May and August and September rainfall and would require

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Proper stocking rate of cattle and adequate densities of deer and other wildlife species need to be considered to maintain and/or improve habitat quality.

Table 1. Impacts of heavy grazing or overgrazing on wildlife habitat and subsequent effects on animal performance at different times of the year.

Optimum Habitat Conditions	Consequences of Heavy Grazing or Overgrazing
January to May	
➢ Stimulates nesting and renesting activity for bobwhites and other birds	➢ Reduces nesting cover and nesting success
➢ Produces cool season forbs of many kinds and varieties, which in turn produce a wide array and abundance of insects; eruptions of insects drive chick survival for bobwhites and turkeys	➢ Reduces food sources for birds
➢ Helps bucks to recover after the rut	➢ Reduces recovery rate of bucks after rut and affects antler growth
➢ Stimulates the early stages of antler growth	➢ Retards antler development
➢ Nurtures pregnant females through early to mid-gestation	➢ Lowers fetal birth weights
➢ Enhances adult bobwhite survival to April and May nesting	➢ Lowers nesting attempts and survival
August to October	
➢ Stimulates late summer and fall nesting as well as nesting cover for the following spring	➢ Reduces bobwhite nesting cover in late summer and fall
➢ Provides good nutrition for lactating deer and javelina	➢ Reduces forbs important to nutrition
➢ Produces hiding cover for young fawns	➢ Reduces hiding cover
➢ Facilitates greater carry-over of adult birds from fall to spring breeding	➢ Reduces potential for carry-over of adult birds

cattle ranchers to **cut stocking rate by 50%**.

- **Extreme drought**: <39% of median January to May and August and September rainfall and would require cattle ranchers to consider dramatic reductions in stocking rate up to total destocking.

Table 2 presents the rainfall amounts that fall into our various drought categories. An analysis of precipitation from January to May over the last 31 to 97 years at 18 locations in South Texas indicates that 2 to 7 years would be classified as extreme drought because the average precipitation was less than 39% of the median value (Table 3). Furthermore, 2 to 9 years would also be classified as severe drought (Table 3). Table 4 shows the rainfall amounts and drought categories from August and September. The number of years that required stocking rate adjustment because of fall droughts is similar to that found for spring droughts (Tables 3 and 5).

In years of moderate to extreme drought, partial and even total cattle destocking should be considered as part of the grazing management plan. A destocking plan should consider 25, 50, or up to 100% cattle stocking rate reduction depending on the amount of rainfall received from January to May and from August and September (Tables 2 and 4). Destocking decisions should be made in June and October and reductions executed between June 1 and June 30 after the spring drought and between October 1 and October 31 after late summer/fall drought in order to prevent range deterioration and loss of habitat

Table 2. Spring drought guidelines for selected locations in South Texas.

Location	Moderate	Severe	Extreme
Alice (Jim Wells)	4.7–7.3*	3.3–4.7	<3.3
Aransas (Aransas)	6.8–10.7	4.8–6.8	<4.8
Beeville (Bee)	6.1–9.5	4.3–6.1	<4.3
Brownsville (Cameron)	3.9–6.2	2.8–3.9	<2.8
Carrizo Springs (Dimmit)	4.1–6.5	2.9–4.1	<2.9
Corpus Christi (Nueces)	5.2–8.2	3.7–5.2	<3.7
Cotulla (LaSalle)	4.5–7.1	3.2–4.5	<3.2
Encinal (LaSalle)	4.2–6.5	2.9–4.2	<2.9
Falfurrias (Brooks)	4.2–6.5	3.0–4.2	<3.0
Harlingen (Cameron)	4.2–6.6	3.0–4.2	<3.0
Hebbronville (Jim Hogg)	4.1–6.4	2.9–4.1	<2.9
Kingsville (Kleberg)	4.4–6.9	3.1–4.4	<3.1
Laredo (Webb)	3.8–6.0	2.7–3.8	<2.7
Raymondville (Willacy)	4.7–7.4	3.4–4.7	<3.4
Rio Grande City (Starr)	3.0–4.7	2.1–3.0	<2.1
Sarita (Kenedy)	4.4–6.9	3.1–4.4	<3.1
Sinton (San Patricio)	6.4–10.0	4.5–6.4	<4.5
Uvalde (Uvalde)	4.7–7.3	3.3–4.7	<3.3

* Inches of rainfall (January to May)
Note: Precipitation records were obtained from NOAA

quality. Even though selling cattle at this time may be complicated because of the prices and the season, saving bunchgrasses for nesting cover for bobwhites, turkeys, and other grassland birds would be a very important consideration for wildlife habitat management. A total destocking decision is very difficult, but in drought-prone environments the losses in range condition and habitat quality are magnified if grazing management plans do not consider this practice. Recovery of rangelands that are not appropriately destocked during drought can be a slow and expensive process, while rangelands that are conservatively stocked during drought have a higher potential for rapid post-drought recovery and restocking.

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The wild turkey is an important game bird that will benefit from good cattle management operations in South Texas.

Use of Stockers

Flexibility is a very important management tool when wildlife is the highest priority. As previously indicated, cattle stocking rate reduction as a result of decreased forage availability caused by drought should be considered to maintain or increase range condition and habitat quality. A 100% stocker operation offers the best flexibility for rapid manipulation of stocking rate (increase stockers when forage availability is high and reduce stockers when forage is scarce). Another advantage of having only stockers is that during the hunting season the rancher may be able to remove stockers more easily than cows, thus allowing better access to pastures for wildlife enthusiasts and having fewer problems if interior gates are inadvertently left open. If it is not possible for a rancher

Table 3. Number of years when cattle destocking would have been recommended in response to spring drought categories found in Table 2 for selected locations in South Texas.

Location	Period	Rainfall Records	Number of Years Destocking Would be Recommended			Percent of Years Destocking Should Have Occurred
Town (County)	Span of Years	No. Years	By 25%	By 50%	Up to 100%	
Alice (Jim Wells)	1919–1995	73*	15**	9	4	38
Aransas (Aransas)	1941–1997	55	11	4	3	33
Beeville (Bee)	1905–1997	92	25	6	3	37
Brownsville (Cameron)	1950–1997	48	11	5	5	44
Carrizo Springs (Dimmit)	1931–1997	62	15	5	5	40
Corpus Christi (Nueces)	1900–1997	97	26	6	7	40
Cotulla (LaSalle)	1931–1997	63	16	3	5	38
Encinal (LaSalle)	1908–1989	77	15	6	5	34
Falfurrias (Brooks)	1908–1997	88	18	9	3	34
Harlingen (Cameron)	1931–1997	60	13	4	3	33
Hebbronville (Jim Hogg)	1932–1997	56	15	4	3	39
Kingsville (Kleberg)	1950–1997	42	12	2	2	38
Laredo (Webb)	1966–1997	31	8	3	2	42
Raymondville (Willacy)	1931–1997	62	15	4	5	39
Rio Grande City (Starr)	1931–1997	65	12	3	4	29
Sarita (Kenedy)	1931–1997	62	17	4	3	39
Sinton (San Patricio)	1925–1997	58	7	6	6	33
Uvalde (Uvalde)	1931–1997	74	18	6	5	39

* Number of years records were available
**Number of years

Table 4. Fall drought guidelines for selected locations in South Texas.

Location	Moderate	Severe	Extreme
Alice (Jim Wells)	3.1–4.8*	2.2–3.1	<2.2
Aransas (Aransas)	4.5–7.0	3.2–4.5	<3.2
Beeville (Bee)	3.1–4.9	2.2–3.1	<2.2
Brownsville (Cameron)	4.0–6.3	2.9–4.0	<2.9
Carrizo Springs (Dimmit)	2.5–3.9	1.8–2.5	<1.8
Corpus Christi (Nueces)	3.5–5.5	2.5–3.5	<2.5
Cotulla (LaSalle)	2.2–3.4	1.6–2.2	<1.6
Encinal (LaSalle)	2.5–3.9	1.8–2.5	<1.8
Falfurrias (Brooks)	2.8–4.3	2.0–2.8	<2.0
Harlingen (Cameron)	4.0–6.2	2.8–4.0	<2.8
Hebbronville (Jim Hogg)	2.6–4.1	1.8–2.6	<1.8
Kingsville (Kleberg)	2.8–4.3	2.0–2.8	<2.0
Laredo (Webb)	3.0–4.7	2.1–3.0	<2.1
Raymondville (Willacy)	4.1–6.4	2.9–4.1	<2.9
Rio Grande City (Starr)	2.8–4.4	2.0–2.8	<2.0
Sarita (Kenedy)	3.7–5.8	2.6–3.7	<2.6
Sinton (San Patricio)	3.8–5.9	2.7–3.8	<2.7
Uvalde (Uvalde)	2.6–4.1	1.9–2.6	<1.9

* Inches of rainfall (August and September)
Note: Precipitation records were obtained from NOAA

to operate with 100% stockers, then a combination of mother cows and stockers is appropriate.

In areas where droughts are common, Hart and Carpenter (1999) suggested that the breeding herds should constitute no more than 50–70% of the total carrying capacity of the ranch during normal years, with the remainder of the herd composed of yearlings or stockers. For South Texas, we suggest that breeding herds should never exceed 50% of the total carrying capacity, based on the correct stocking rate.

When drought occurs and forage is limiting, livestock numbers can be reduced by (1) selling the stockers, (2) shipping stockers to a feedyard, (3) moving stockers to a "reserve" pasture (see next section), or (4) moving stockers to leased pasture or forage crops. This provides an option that does not destroy the integrity of the breeding herd. Reduction of stockers during drought may decrease short-term profits, but improve potential for rapid post-drought recovery, reduce range degradation, and maintain quality of wildlife habitat.

Reserve pastures

Another strategy to reduce livestock numbers and improve habitat is to create reserve pastures. Every ranch

Table 5. Number of years when cattle destocking would have been recommended in response to fall drought categories found in Table 4 for selected locations in South Texas.

Location	Period	Rainfall Records	Number of Years Destocking Would be Recommended			Percent of Years Destocking Should Have Occurred
Town (County)	Span of Years	No. Years	By 25%	By 50%	Up to 100%	
Alice (Jim Wells)	1911–1997	78*	15**	2	4	27
Aransas (Aransas)	1940–1997	51	15	4	5	47
Beeville (Bee)	1900–1997	92	14	13	13	43
Brownsville (Cameron)	1950–1997	47	11	4	4	40
Carrizo Springs (Dimmit)	1931–1997	62	12	1	12	43
Corpus Christi (Nueces)	1900–1997	97	23	3	13	40
Cotulla (LaSalle)	1931–1997	63	18	4	5	44
Encinal (LaSalle)	1908–1996	77	16	6	12	45
Falfurrias (Brooks)	1907–1997	88	16	10	10	42
Harlingen (Cameron)	1931–1997	60	14	5	8	42
Hebbronville (Jim Hogg)	1933–1997	56	14	6	5	45
Kingsville (Kleberg)	1931–1997	42	6	2	5	30
Laredo (Webb)	1947–1997	31	6	2	6	42
Raymondville (Willacy)	1931–1997	62	10	7	7	38
Rio Grande City (Starr)	1931–1996	65	12	3	8	40
Sarita (Kenedy)	1931–1997	62	21	2	5	47
Sinton (San Patricio)	1925–1997	58	13	5	6	40
Uvalde (Uvalde)	1931–1997	74	12	8	12	41

* Number of years records were available
**Number of years

can benefit from resting pastures and holding them in reserve. Where wildlife is a primary concern at least 1 pasture every year should be set aside and left ungrazed for 12 months.

The carrying capacity of reserve pastures should be subtracted from the total area of the ranch to calculate the **correct stocking rate**. Under no circumstances should including reserve pastures on the ranch result in overuse of other pastures and habitat deterioration. Similar to rotational grazing systems, the use of reserve pastures may give the opportunity to apply other management practices such as prescribed burning. Advantages of reserve pastures include the following:

- Moving cattle to reserve pastures when drought occurs takes pressure off the rest of the ranch.
- Wildlife are afforded undisturbed areas.
- Range plants are given a complete year of rest.
- Management practices such as prescribed burning can be implemented if reserve forage is not needed to carry livestock through drought periods.

A hypothetical example of a grazing system incorporating reserve pastures is shown in Figure 1.

After the initial determination of **correct stocking rate**, we recommend the following:

Herd Composition

Option 1: "Stockers Only"
Stockers weigh 600 pounds live weight or 0.6 AU equivalent

$$116\ \text{AU} = \frac{116\ \text{AU}}{0.6\ \text{Stockers/AU}} = 193\ \text{stockers}$$

Option 2: "50% Stockers and 50% Mother Cows"

116 AU = 58 AU mother cows plus 97 stockers
(58 AU stockers/0.6)

Examples of Destocking in Response to Spring Drought in Kenedy County

According to Table 2, destocking decisions in response to January to May precipitation should be made and executed between June 1 and June 30 at the following rates:

Option 1: Stockers Only

Moderate Drought (4.4–6.9 inches), 25% destocking = removal of 48 stockers

Severe Drought (3.1–4.4 inches), 50% destocking = removal of 97 stockers

Extreme Drought (<3.1 inches), up to 100% destocking = removal of all the 193 stockers

Option 2: 50% Stockers and 50% Mother Cows

Moderate Drought (4.4–6.9 inches), 25% destocking = removal of 48 stockers

Correct Stocking Rate Calculation

The following example calculates the correct stocking rate (CSR) for enhancing wildlife, and considers the concepts discussed in this paper.

Basic Information
Location: Kenedy County
Ranch size: 5,000 ac
Heavy brush cover: 35%
Range site: Sandy
Range condition: Poor
Forage production potential: 2,000 lb/ac
Reserve pasture: 500 ac
Grazeable area: 4,500 ac

The following formula can be used to calculate CSR:

$$\textbf{CSR} = \frac{(\text{GF} \times \text{GA})}{\text{FCAU}} \times \text{RCF}$$

Grazeable Forage (GF) = (forage production potential) (25% utilization/100 or 0.25)

Grazeable Area (GA) = (ranch size – reserve pastures) – (ranch size x heavy brush cover/100)

Forage Consumption per AU per Year (FCAU) = 9,490 lb

Range Condition Factor (RCF) =
0.8 if poor condition
1.0 if fair condition
1.2 if good condition
1.4 if excellent condition

GF = (2,000 lb/ac) (0.25) = 500 lb/ac
GA = (5,000 ac – 500 ac) – (5,000 x 0.35) = 2,750 ac
GF x GA = 500 lb/ac x 2,750 ac = 1,375,000 lb

$$\textbf{CSR} = \frac{(1{,}375{,}000\ \text{lb})}{9{,}490\ \text{lb/year}} \times 0.8 = 116\ \text{AU per 5,000 ac or 43 ac/AU}$$

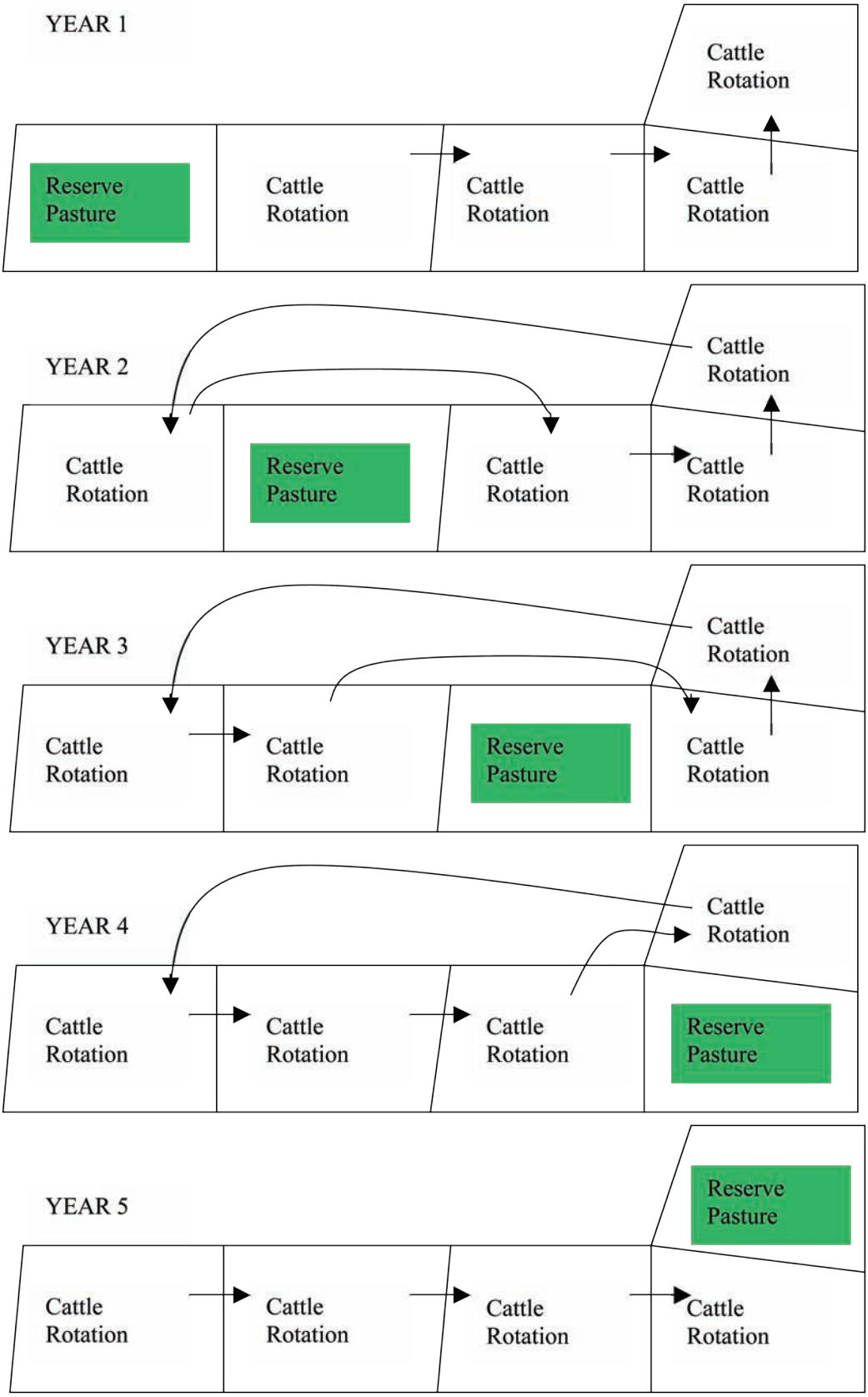
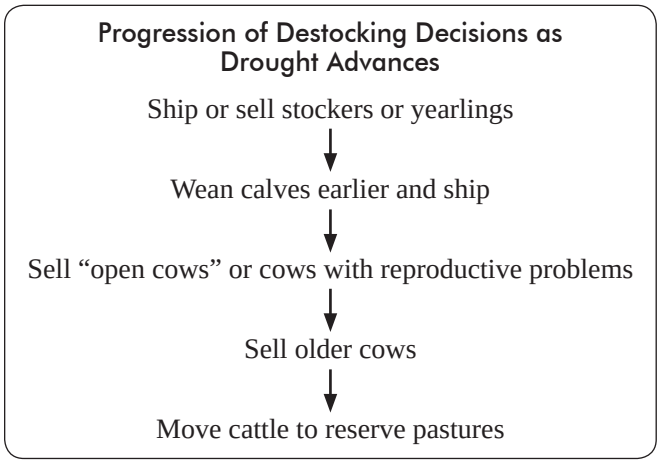


Figure 1. Hypothetical example of a grazing system incorporating reserve pastures.

Severe Drought (3.1–4.4 inches), 50% destocking = removal of all the 97 stockers

Extreme Drought (<3.1 inches), up to 100% destocking = removal of all the stockers and mother cows



CONCLUSION

In South Texas, all wildlife species are important to consider in a total ranch management context. We offer these guidelines to those landowners who are interested in fostering compatible cattle and wildlife operations while protecting the integrity of rangeland, watershed, habitat, and soil resources. We provide specific guidelines for cattle and wildlife operations in South Texas, which can be used as a model to develop appropriate strategies and prescriptions for other arid and semiarid regions with the ultimate goal of preserving rangeland habitat integrity and optimizing biological and economic output.

Forage demands for wild and domestic animals must be considered in order to avoid habitat deterioration.

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