

EXOTICS —At Home on the Range in Texas

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Man has always had the compelling desire to "improve" nature. European man (himself an exotic in North America) eliminated the primary native grazing animal (bison) and replaced it with European cattle. In many areas, the native bluestem prairies have been overgrazed and replaced with exotic "improved" blue-stems. Man, especially in the last century, seems to derive great satisfaction in reshuffling the plant and animal communities of the world.

With seven species of native ungulates (hoofed mammals), and three major kinds of domestic livestock, landowners in Texas have now introduced 68 other species of exotic ungulates into the rangeland ecosystems of the state. Interestingly, three of the seven indigenous species no longer have viable native populations. The increasing number of exotic ungulates, dependent upon the range resources of Texas demand the application of innovative range management techniques.

History and Recent Trends

The introduction of wild exotic herbivores on Texas rangeland began in about 1930 when ranchers released nilgai antelope in south Texas. By 1932, four more species of deer or antelope were introduced. During the 1950's, four more species of deer and sheep were released. By the time of the first statewide exotic survey in 1963, there were 13 species totaling about 13,000 animals on 178 ranches (Ramsey 1969). Twenty-five years later in 1988, 68 species and 164,000 animals were present on about 468 ranches, according to a Texas Parks

and Wildlife Department survey (Tra-week 1989).

These animals range in size from the 75-pound blackbuck antelope that eats about three pounds of forage per day (dry weight) to the 1,500-pound eland that consumes about 30 pounds per day. More typical are the 150-pound axis deer and the 350-



Fallow deer, a common rangeland exotic, are also being "farmed" for meat production in New York and Texas.

pound nilgai antelope. Of these 68 species, six comprise 87% of the total number. These six species are: axis deer; nilgai antelope; blackbuck antelope; auodad sheep; fallow deer; and sika deer. Not included are domestic

livestock such as cattle, sheep, and goats, which are no less exotic in origin. Neither are feral hogs included for which no reliable population estimates exist.

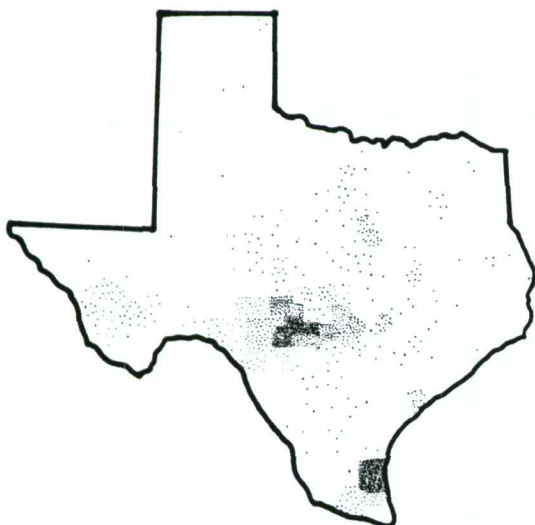
Why More Exotics

In the early days of exotic wildlife introductions, they represented little more than an interesting curiosity. During the period of the 1960's and 1970's, fee hunting of exotic big game became a motivation. The economic incentive for raising exotics in recent years has evolved into a combination of hunting, meat production, sale of brood animals, and some non-consumptive uses such as photo safaris.

With the exception of auodad sheep in the Palo Duro Canyon, exotics are not considered game animals in Texas, and are not subject to state regulated seasons and bag limits. Hunting can occur throughout the year. Trophy hunting fees generally range from \$800 to \$1,200 for mature horned or antlered males of the common species.

Ranchers may also sell surplus animals for meat, and receive \$1.00 to \$2.25 per pound dressed carcass weight, depending on the species and the efficiency of harvest by shooting. This translates to \$0.50 to \$1.24 per pound live weight. The killing and processing of meat animals for sale is subject to USDA inspection requirements. Retail prices to the consumer range from \$4.00 to over \$7.00 per pound. Meat from exotic deer and antelope is low in fat, cholesterol and calories. In addition, these animals generally subsist on a diet free from medication and growth stimulants. With the trend toward more healthy diets, this segment of the

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The distribution of exotics in Texas. Each dot represents 100 animals.

exotic industry appears destined to grow.

Even though an economic motivation exists for raising and marketing exotics, there also exists a strong aesthetic motivation to having exotics. A 1988 survey revealed that about 42% of landowners with exotics did not allow them to be harvested either for trophy or meat.

Confined or Escaped

With the economic investment involved in purchasing exotics, most landowners intend to keep their animals on their property. Although some species are contained by traditional net-wire livestock fences, most exotics require a high fence for confinement. Despite the best efforts at maintaining fences, many escapes have occurred, and as of 1988, almost 74,000 exotic animals or 45% of the statewide total are now free-ranging animals (Traweek 1989).

The traditional ecological fears of escaped exotics are a legitimate concern in Texas. The New Zealand experience of severe resource deterioration caused by exotic deer overpopulations is well known. Several authorities in Texas have conceded that the free-ranging population of exotics are nearly impossible to control.

Range Management Concerns

One of the primary concerns in range management is the balance of

forage consumption with forage supply. This balance mandates that the long-term health of the plant community be maintained or improved. Realizing that different animals have different feeding habits, proponents of the exotic industry point out that it makes good ecological and economic sense to fill unoccupied niches. For example, if the browse resource on a given range was being under utilized, it may be prudent to introduce the proper number of browsing animals into the system. The problem is that on many ranches, espe-



Large numbers of auoudad sheep are free-ranging in the mountains of west Texas.

cially in the central part of Texas, there are no unfilled niches with regard to plant utilization.

If an exotic species were found that preferred to feed on mesquite, juniper, algerita, creosote bush or other such invasive plants, then there might be a legitimate ecological need to stock such animals. A long history of multi-species grazing involving cattle, sheep, goats and whitetail deer has left no surplus of any desirable kinds of forage on many ranches. In too many cases, it is on these already depleted ranges where many exotics are being raised.

In attempts to justify heavy stocking of exotics, it has been pointed out



There are over 12,000 sika deer in Texas.

that some operations rely heavily on supplemental feeding, thereby reducing impacts to the range. Experienced observers have noted that like livestock, exotics have the foraging instinct to utilize natural vegetation in preference to feeds. When exotics are making heavy use of supplemental feeds, the range already shows excessive use.

Even when the kinds and numbers of animals are balanced to the carrying capacity of the range, there is another problem with exotics. With yearlong continuous grazing, the selective feeding habits of herbivores generally lead to overutilization of preferred species. Grazing systems can overcome this problem when properly executed. However, very few



Multiple species of exotics often exist with native whitetail deer. Mature axis buck in center.

exotic ranches are set up to allow such herd management. In most cases, exotic populations consist of wild animals not easily moved like livestock from pasture to pasture. The expense of building suitable interior, cross-fencing to accommodate grazing systems is not easily justified in the eyes of most exotic ranchers. The current cost of high fencing is about \$10,000 per mile.

Wildlife Management Concerns

One of the most often voiced concerns about exotic wildlife in Texas is their impacts upon native wildlife and wildlife habitat. Much of the concern revolves around forage competition with native deer, both white-tail and mule deer. Other legitimate concerns include the impact upon herbaceous and woody cover for deer, turkey, quail, numerous non-game species, and the endangered black-capped vireo.

The degree to which various exotic wildlife species compete with native wildlife has been debated and researched. Certain researchers have

stated that diet overlap does not necessarily mean competition. Competition only exists when the resource is limited and there is great demand for it. The implication is that considerable diet overlap can occur without competition or resource deterioration. While this may be theoretically true, in the real world diet overlap between species most often results in competition and resource abuse.

It must also be noted that intraspecific competition among over-abundant whitetail deer is often severe. In many cases, this deer to deer competition is more critical than interspecific competition between deer, livestock and exotics. Management of excessive native deer populations should be no less a resource concern than management of exotic livestock and wildlife.



Badly deteriorated rangeland in central Texas, subjected to long years of abusive management with exotics, livestock and whitetail deer.



Compare the vigor and productivity of orange zexmenia, a common forb from well-managed rangeland on left and over-populated exotic range on the right.



Desirable browse species such as bumelia are first stunted, then killed by excessive browsing of exotics.

Research Summarized

Several studies have been conducted that verify the concerns regarding the mismanagement of exotics. In two separate nine-year studies, axis and sika deer were placed in rangeland exclosures with whitetail deer. In both studies, the exotic deer population increased while the whitetail population declined to non-reproductive levels or was eliminated (Armstrong and Harmel 1982). This demonstrated that exotic deer can alter the habitat to the point where whitetail cannot reproduce.

In a food habitat study (Butts et al. 1982), axis, sika and fallow deer demonstrated a definite preference for browse and forbs. As the preferred forages became less available, these animals switched to a diet of grass. Based on this study, these three species of exotic deer were found to be severe competitors with whitetail deer.

Another study, partially funded by the exotic industry, found that axis, sika and fallow deer consumed a

large amount of grass and lesser amounts of browse and forbs. The researchers concluded that exotic deer may potentially compete with whitetail deer. (Demarais et al. 1991). The study sites in poor range condition lacked the more preferred forbs and browse species. It is to be no surprise that these exotics, capable of digesting lignified forages, would eat large amounts of grass when the more desirable forbs and browse are gone. This "potential" competition is unfortunately a sad reality on most exotic-stocked ranges.

Despite evidence to the contrary, some exotic ranchers emphatically maintain that exotics are grass eaters and are not competing with native deer, but instead are merely making "more efficient" use of existing forages. Other exotic ranchers are truly concerned about land stewardship ethics and are managing the kinds and numbers of exotics to maintain the range resource and minimize conflicts with native wildlife.

Conclusions

Exotic wildlife consume a significant and expanding portion of the total forage on some Texas rangelands. When their numbers are not managed, they have the same detrimental effects on rangeland as any other herbivore. Research, surveys, and field observation have presented the following considerations:

1. The products provided by exotics (aesthetic pleasure, recreation, and lean red meat) are important to consumers.
2. Exotics can be a valuable economic asset to landowners.
3. If the growth rate of exotics in Texas continues, the number will exceed one million within 15 years.
4. A large percentage of exotics are free-ranging and difficult to manage.
5. On many "managed" exotic ranches numbers have exceeded the carrying capacity causing range abuse.
6. Exotics, especially deer species, compete with and can displace native deer.
7. It is possible to apply modern range management techniques to exotic populations thereby providing for the conservation of the range resource.
8. It is the integrity and land management ethics of landowners and resource professionals that will determine if the future of exotics will harmonize or clash with the natural resources of Texas.

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