Recent Developments in Captive-breeding and Reintroduction of the Arabian Oryx in Saudi Arabia

The Arabian oryx (Oryx leucoryx) has become one of the most illustrative symbols of the recovery of a species extinct in the wild by ex situ conservation measures. After its successful reintroduction during a pilot project in Oman in the 1980’s (Stanley-Price, 1989), the reintroduction of the species over a wide range also seems promising in Saudi Arabia.

The captive breeding of the Arabian oryx began in the Kingdom of Saudi Arabia in April 1986, when 57 animals were transported from the late King Khalid farm in Thumamah to the National Wildlife Research Center (NWRC) at Taif. Unfortunately, a severe outbreak of tuberculosis drastically reduced the number to 37 individuals in October, 1986. The implementation of a strategy based on (1) drastic sanitary measures, (2) a systematic nine-month antibiotic treatment, (3) annual checks for the evidence of the infection and (4) the hand-rearing of calves from infected animals, allowed the breeding of tuberculosis-free animals. The founder population, called A generation, is now kept isolated to avoid any risk of tuberculosis transmission. The second generation, called B generation, is comprised of the hand-reared tuberculosis-free oryx. This group will become the main herd for the production of suitable animals for reintroduction. Animals of the third generation, called C generation, are reared by their mother in large enclosures and transported to the reintroduction site when 9–15 months old.

After the eradication of tuberculosis, efforts were directed towards a rapid growth of the captive population, as well as genetic research and management. In a survey of allozyme variation in 61 individuals from Taif, it was found that three out of 18 loci were polymorphic (P = 16.7%) and that the mean heterozygosity (H = 0.052) was relatively high compared to other species of artiodactyls (Vassart et al., 1991). A chromosomal Robertsonian translocation was discovered in Taif (Cribiu et al., 1990), resulting of the fusion of chromosomes of the acrocentric pairs 17 and 19. The same translocation was then described in Jordanian, Omani, and Qatari individuals. After a meeting of the International Wild Arabian Oryx Advisory Panel in 1990, it was decided to leave translocation carriers in wild populations but to reintroduce only individuals with normal karyotype (2n = 58). It was decided to remove the three carriers in Mahazat As Said because the situation was still under control.

According to the strategy of the oryx reintroduction program in Saudi Arabia, sustainable wild populations should be built up in 50–100 years. Therefore, the goal for the genetic management program was the maintenance of 90% of the genetic variation of the original population over a period of 100 years. As a satisfactory growth rate is attained at the NWRC, it was calculated (Ballou, 1990) that we will reach this goal with a minimum viable population size of 200 B generation oryx, actively managed for genetic purposes. Although the pedigree of the founders was unknown, a genetic management program was constructed using a reasonable hypothesis about the history of the herd, possible relatedness between founder individuals, and multilocus DNA fingerprinting data (Greth et al., 1992).

To increase the genetic variability, exchanges have been developed with other Middle Eastern herds. Animals from Bahrain, Qatar, Abu Dhabi, and the U.S. were introduced within the A generation and considered as unrelated founders. Because the herds of Abu Dhabi, Qatar, and Bahrain have different founder origins with few contacts with the “World Herd”, the NWRC herd is now the most genetically diverse oryx herd in the world having identified blood lineages.

On 15 December 1992, the NWRC herd numbered 146 (73.73) animals. Considering the success over the past five years and the expertise gained in the breeding of the Arabian oryx, a herd of 200 B generation animals by 1998 seems realistic assuming that no stochastic events happen. The B generation group should be maintained at this level. More than 100 oryx suitable for reintroduction should then be produced each year. Twenty-two NWRC C generation oryx have already been successfully reintroduced.

The protected 2,200 km² area of Mahazat As Said, located about 150 km northeast of Taif, was chosen as the first potential reintroduction site for Arabian oryx and it was fenced off against hunting to allow recovery of the vegetation. On 1 March 1990, the first herd of 17 captive-bred Arabian oryx was released. The Mahazat As Said population has shown a rapid constant growth with an increase of more than 900% in four years. As of 31 December 1992, the oryx numbered 84 with 60 free-ranging animals within the reserve and 24 animals in the pre-release area scheduled for release in January, 1993. Overall, 47 oryx have been born in Mahazat and 55 were immigrants. The sex and age structure of the population reflects a good future reproduction potential with a high percentage of females being young animals. Natural mortality among adult individuals was predominantly caused by injuries received in dominance fights. Five males have died in this manner.

All animals adapted swiftly and integrally to their new environment with the requirement for supplemented food or water. Also, the remarkable recovery of the habitat in terms of plant recolonization and production gives a good perspective for the successful re-establishment of a self-sustaining population in Mahazat As Said. A strategy for a countrywide re-establishment of the Arabian oryx has been developed by the NWRC and the National Commission for Wildlife Conservation and Development. This way, the successful return of the Arabian oryx, as a flagship species for conservation, will hopefully continue to provide one of the primary stimuli for the development and establishment of further conservation programs in Saudi Arabia.
References

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Proposal to Expand the Red Wolf Reintroduction Project

The red wolf reintroduction experiment which began in 1987 and concluded in September 1992. During the five years, 42 wolves were released in the Alligator River National Wildlife Refuge (ARNWR). Additionally, at least 23 wolves were born in the wild during that period. As of 31 January 1993, the population included 30 to 35 wolves.

By almost every measure the experiment was a success and generated benefits that extended beyond the immediate preservation of red wolves to positively affect local citizens and communities, larger conservation efforts, and other imperiled species. During the last five years four important points surfaced:

1. Since every management problem that arose was solved without inflicting long-term damage to animals and with little inconvenience to residents of the area, it was learned that wolves can be restored in a controlled manner.

2. Significant land-use restrictions were not necessary in order for wolves to survive. Indeed, hunting and trapping regulations for ARNWR remained unchanged or were further relaxed during the experiment.

3. The annual budget for the project was about $200,000. Assuming a multiplier effect of about 3.0, the project generated about $600,000 of "money movement" annually. Since most of this money moved through eastern North Carolina, the experiment significantly stimulated the local economy.

4. The reintroduction area, which encompasses about 250,000 acres, probably cannot support 29 wolves for an extended period of time. Indeed, dispersal has taken place and will continue as 17 wolves (60% of the population) are two-years-old or younger. During 1991, two wolves dispersed to lands west of Alligator River. In addition to dispersal, the future of the wolf population is threatened by its smallness; many events (e.g., disease outbreaks) can cause small populations to go extinct.

Threats to the wolf population can be minimized by increasing its size. The size of the reintroduction area limits the size of the wolf population. Fortunately, the reintroduction area can be enlarged by integrating federal, state, and private lands to the south and west of Alligator River into the program. For example, Pocosin Lakes National Wildlife Refuge is an ideal addition because of its remoteness, proximity to Alligator River NWR, and healthy prey populations. Inclusion of Pocosin Lakes NWR would provide the U.S. Fish and Wildlife Service (USFWS) the impetus and justification to query citizens about allowing wolves to inhabit remote private land adjacent to or near Pocosin Lakes NWR. Additionally, the North Carolina Wildlife Resources Commission could be queried about allowing wolves to inhabit State land in the three counties (e.g., Gull Rock State Game Lands).

Through inclusion of Pocosin Lakes NWR, and with cooperation from private citizens and the North Carolina Wildlife Resources Commission, the reintroduction area could encompass over 500,000 acres of ideal wolf habitat. With adequate funding (approximately $250,000 per year), it is reasonable to expect that 50-100 wolves could be restored to such an area within 5-10 years.

The significance of such a population is threefold. First, an important objective of the Red Wolf Recovery Plan is to maintain 225 animals in the wild. The "northeastern North Carolina red wolf project" could single-handedly assume responsibility for 25% to 50% of that objective. Since such a project would utilize the infrastructure that the USFWS created for the Alligator River reintroduction, a significant monetary savings would be realized over a five- to ten-year period compared with the cost of developing a similar population elsewhere in the southeast. Second, at the species level a population of 50 to 100 wolves would provide significant protection to the red wolf's already limited genetic diversity. Third, at the population level a group of 50 to 100 wolves would be able to withstand many stochastic events that threaten smaller populations.

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