Letter from the Chairman: 
MARK STANLEY PRICE

On 27 November 1992, the RSG conducted a Strategic Planning session at the African Wildlife Foundation offices in Nairobi, using the services of a professional management consultant. The five participants comprised Simon Stuart (SSC), Steven Njuguna (IUCN East Africa Regional Office), Nina Marshall (Trade Specialist Group), Minoo Rahbar (the RSG assistant) and myself. The objective of the meeting was to improve the group's productivity, effectiveness and clarity of vision by developing a strategic action plan.

The meeting was initiated by a review of our Mission and Objectives, followed by a close examination of the parties affected by the RSG and the present circumstance of the group. Thereafter, we identified the RSG's Strengths, Weaknesses, Opportunities and Threats, in a so-called SWOT analysis. Each attribute in these groups was assigned to one of the following categories: the RSG's structure, operating environment, performance, networking role and funding. At the same time, each attribute allowed us to identify an action which would promote the RSG, remove an obstacle or exploit an opportunity. The actions were then assigned priorities. These deliberations and conclusions are now being written up to form a short to medium term strategic plan for the RSG. This report will be reviewed by the Section Chairs and the SSC, after which the final version will be made available to all members.

Many significant topics arose in the course of the day-long session. Among these was the need for defining task forces composed of members, with each group addressing a single topic or issue (e.g., conservation/benign introductions, welfare aspects of releases). Also, the importance of increased collaboration and communication of the RSG with other groups within the SSC, as well as with the broader conservation community, was stressed. Nina Marshall added a strong plant flavour to this angle by emphasizing the need for strong linkage with botanic gardens. It was further agreed that lack of funds was a factor limiting the RSG's development to a higher profile, more active body. A fund-raising effort will therefore be a very crucial part of the strategic action plan. This will benefit from the SSC's own fund-raising expertise, and from the advice it has recently received on how it should raise support for its own core activities and how its specialist groups can fund-raise for themselves.

Other RSG needs discussed included improved data and literature acquisition, membership diversification, catalysis of re-introduction recommendations found in SSC Action Plans, active identification of suitable species and sites for re-introduction, and a technical manual on re-introductions. Our deliberations may have contributed in a couple of areas to the SSC's thinking on its role, especially as it is also involved in an IUCN-wide strategic planning process.

One particularly important point made during the session was the need for a more active membership. The lack of input from many members was exemplified by the extremely low volume of feedback on the Draft Guidelines for Re-introductions (RE-INTRODUCTION NEWS 4). In order to create a more proactive and effective group, we need greater participation and contribution from everyone involved in the RSG. Perhaps paradoxically, we also agreed that we need to expand our membership to beyond those involved in re-introductions, in order to improve our cover of certain areas, taxonomic groups and current events.

The day's meeting showed how significant a body of information we have now in Nairobi - and that efforts to improve the databases on re-introduction projects and literature are well worth-while. Would readers please help by filling in the enclosed data-sheet? Please don't worry about duplicating what someone else may be writing: we will sort that out! Best wishes for 1993.

We have recently received renewed financial support from a private UK-based foundation. This generous contribution will fund various RSG activities, including the publication of this newsletter.
Recent Meetings


The focus of this session was on large, on-going projects in the USA, Israel, Mauritius, Germany, France, Great Britain, Czechoslovakia, Austria, Switzerland and Spain. Among these, programs involving vultures (griffon vulture, bearded vulture, Egyptian vulture) were particularly encouraging, especially in western Europe where the success of the return of these birds is sometimes spectacular.

Re-introductions of various species were discussed. The preliminary results of the California condor (Gymnogyps californianus) programme were presented and included the release of the first two condors in January 1992. The white-tailed sea eagles (Haliaetus leucocephalus and H. albictilla) were said to be the subjects of successful efforts in California (USA) and in several European countries (Scotland, Ireland, Czechoslovakia, Germany). Variable results were presented for the grand-scale re-introductions of the peregrine falcon (Falco peregrinus) in Germany since 1978: a complete success rewarded the efforts concerning cliff-nesting falcons in western Germany, whereas a failure completely compromised the success of the peregrine falcon's re-introduction in the forests of eastern Germany, primarily due to predation by the goshawk (Accipiter gentilis).

Lastly, several other projects, such as restoration of the Mauritius kestrel (Falco punctatus) and its encouraging results, as well as the re-introduction of various species (e.g. osprey, red kite, eagle owl, burrowing owl) in Europe, the USA and Israel were described.

Michel Terrasse, Fonds D'Intervention Pour Les Rapaces (FIR).


This meeting proved to be an invaluable opportunity to review progress and opinions on botanical gardens and re-introductions. A conference entitled "Botanic Gardens in a Changing World" was organized by Botanic Gardens Conservation International (BGCI) under the patronage of the Republic of Brazil, in co-operation with the Food and Agriculture Organization of the United Nations (FAO).

The conference focused on a number of topics, namely responses to global change, collection documentation, education and integrated strategies for plant conservation incorporating re-introductions and restorations. It was apparent that the need to maintain genetically viable populations of plants ex situ will necessitate a total review of botanical garden activities at all levels, from the training of horticultural staff to management operations and strategic planning.

Papers dealing with re-introductions included one by K. Iwatsuki, Director of Tokyo Botanic Gardens, which reviewed the re-introduction of endemic plants on Bonin Island. J.P. Kluge of the Loweld National Botanic Garden in South Africa, presented a paper on cycad re-introductions. The session on re-introductions included a review paper on Australian projects by Geoff Butler and Mark Richardson. Isolde Hagemann of Berlin-Dahlem Botanic Garden spoke about a project on threatened species in the Berlin area.

A workshop on botanic gardens and re-introductions was jointly chaired by Vernon Heywood of BGCI and Mike Maunder, representing the RSG. This was attended by approximately 30 people representing some 20 institutions, and was the third in a series of discussions (the first meeting was held in Las Palmas, Islas Canarias in 1990, and the second - a joint BGCI/RBG Kew and RSG meeting - was held at Kew in September 1991). Importantly, a strong Brazilian contingency allowed a tropical perspective to be placed on re-introductions. The draft manual on re-introduction practice was circulated and discussed. It was agreed that this document, which has been designed specifically for the botanic garden community, will conform as closely as possible to terminology and protocols issued by the RSG and Society for Ecological Restoration. The manual will be published by BGCI in association with the RSG.

Considerable time was spent discussing the question of "conservation/benign" introductions. This was recognised as a valuable category of activity. Increasingly, botanic gardens are holding species where all original sites for the species have either been destroyed or are unavailable for re-introductions. The value of the exercise was acknowledged with the caveat accepted that such an introduction should be preceded by a thorough study of the conservation/ecological implications.

Also, a meeting of the RSG took place during the conference, attended by over 20 persons. The agenda included a review of RSG activities, distribution of draft guidelines, and circulation of a provisional reference list on re-introductions, restoration and recovery programmes. The informational needs for project planning and the role of re-introductions in South American plant conservation programmes were discussed. An important issue discussed was whether re-introductions are an appropriate strategy when habitat protection is the overwhelming priority. This was driven home by the example of the nearby Atlantic forests, where less than 5% of the original one million km² survives. Should a botanic garden be focusing on single species operations when faced with such a crisis?

Contributed by Mike Maunder, RSG Plants Section Chair, Royal Botanic Gardens, Kew.
Upcoming Meetings


The Directorate General of Forest Protection and Nature Conservation (PHPA) of Indonesia, in collaboration with the IUCN/SSC and its Captive Breeding Specialist Group, will conduct a Population and Habitat Viability Analysis for the orang utan (Pongo pygmaeus). While the focus of this workshop will be on wild populations, the role of rehabilitation and re-introduction of the orang utan will be briefly discussed in the context of potential contributions to boosting wild populations. Attendance will be limited to invitees.


As a collaboration of the NCWCD and the IUCN/SSC, this seminar aims to assess NCWCD programmes on the captive breeding and re-introduction of native endangered species, and will include a review of action plans on various birds, ungulates and large predators. As a prelude to the seminar, a three day workshop focusing on the Houbara bustard and other related birds (e.g. Arabian bustard, guinea fowl) will be held at the NCWCD's National Wildlife Research Centre in Taif. A limited number of specialists from abroad are invited to attend both events. For further information please contact: Prof. Abdulaziz H. Abuzinada, Secretary General, P.O. Box 61681, Riyadh 11575, Kingdom of Saudi Arabia. Tel: 966-1-441-8700. Fax: 966-1-441-0797.

Rare Plant Re-introduction Symposium. The Center for Plant Conservation, St. Louis, Missouri, USA. 20-22 April 1993.

This three day symposium will review existing rare plant re-introduction and restoration policies of various federal and state agencies, conservation organizations and private corporations, and will include topics such as ecosystem management practices, biological significance, technical feasibility, case studies and mitigation. The symposium aims to further develop, publish and distribute national guidelines on rare plant re-introductions. To register, please send your name, address and specific interest in re-introductions (i.e. policy, guidelines, techniques, mitigation, biology, case studies or other) to: Marie M. Bruegmann, Center for Plant Conservation, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO, 63166, USA. Tel: 314-577-9450. Fax: 314-664-0465.

Re-introduction Updates

Swift Fox Comeback in Canada

The Swift Fox Recovery Team, representing the Canadian Wildlife Service; Alberta Fish & Wildlife; Saskatchewan Parks, Recreation & Culture; and the University of Calgary, recently completed a three year experimental feasibility study on re-introductions of the swift fox (Vulpes velox) to the Canadian prairies.

The swift fox, a house-cat sized predator once common in the prairies of Canada, disappeared from these regions during the first half of the 20th century. In 1978, the Committee on the Status of Endangered Wildlife in Canada designated the species as extirpated, setting in motion a project involving numerous agencies. Up to 1989, it was not certain whether successful re-introductions could be achieved. Therefore, the program was restructured emphasizing an experimental approach, using both captive-raised and wild-born (United States imported) foxes. Another such approach was to compare releases in the spring with those in the fall.

Results were very revealing. After three months of release, survival rates were 5 out of 27 (19%) for captive-bred foxes, as compared to 17 out of 28 (61%) for wild-caught animals. This trend of higher survival of the wild-caught foxes continued past three months up to 12 months. Further studies revealed that animals released in the fall also had a higher chance of success than those released in the spring.

The long-term survival of the fall-released group was both enlightening and encouraging. Over the years, the foxes had spread and were documented in at least 278 sections of land in southern Alberta and southern Saskatchewan. In the winter of 1991/92, the Canadian free-roaming population was estimated at a minimum of 225 foxes. Some animals had survived for four years and produced at least two litters of young. Since the program began in 1983, a total (minimum) of 49 pairs produced an average of 3.4 young per litter. The wild, Canadian-born young had a higher survival rate than the foxes released in the experimental project. Foxes also moved south from Canadian release sites into northern Montana. From 1986 to 1992, there were 12 records of swift foxes in Montana.

Dispersal of foxes from release sites varied with the highest recorded movement being 190 km. Wild-captured animals travelled greater distances, but consistently settled down in prairie habitats. Captive-raised foxes moved shorter distances and were less consistent in their patterns, a few settling near buildings, while others settling close to brushy areas, cultivated fields, roads or human habitation.

The greatest source of mortality was predation by coyotes. Most of such deaths occurred within the first month after release. Other foxes were killed by avian predators, badgers and trappers, while a few became victims of road kills.
From its inception, this program has enjoyed a very high public profile. Formed in 1986, the Swift Fox Conservation Society has greatly contributed to the success of the project. In addition to broad urban support, there has been a core of local landowner support at the release sites. The involvement of these ranchers has been consistent, strong and important to the success of the program. Field staff have actively fostered this support by talking with local residents and keeping them informed about the project.

The work completed to date indicates that the ecological requirements for survival of the swift fox are still in place in the fragmented Canadian prairie ecosystem. However, it is not certain whether the species can survive over longer periods, if drastic short-term environmental changes such as drought, severe winters or longer term climatic changes should occur.

Contributed by Ludwig N. Carbyn, Canadian Wildlife Service.

California Condor Status Report

In 1987, during much concern and controversy, all of the remaining California condors (Gymnogyps californianus) were removed from the wild due to poorly understood, but excessive mortality.

To date, reproduction in captivity has been what was expected based on husbandry experience with Andean condors (Vultur gryphus). 21 chicks have been produced so far at the Los Angeles Zoo facility and 16 at San Diego, bringing the total to 64 condors.

Based on the California Condor Recovery Team's original criteria - calling for 96% retention of heterozygosity in captivity before allowing releases from any of the 14 families, but also considering the mean kinship values and the percent of unique genome retained in the population - it was determined that two California condors would be released in 1992. Since condors do best when released in groups and as only two California condors met the criteria, two same-aged Andean condors accompanied the release on 14 January. All four birds were raised together to fledging age of six months before release. Numbered patagial tags and radio transmitters allow us to closely monitor their activities.

Due to an unexpected change in direction and intensity of winds (correlated with "El Niño" weather pattern), the birds had a particularly rough adjustment after release. Where normally it would take about one month for condors to learn to fly well, it took these birds two months. Within three weeks, all four birds were consistently returning to the food we had placed at the release pen. After they were flying well in the area, the carcasses were put at varying distances and directions, to the point where now - eight months later - they seek food from six possible feeding sites, the farthest being 12 miles from the release pen. To date, they have explored 20 miles from the release area in various directions. During one of these flights, a California condor was shot at three times by a man with a .22 calibre rifle. The bird was unhurt, and the individual was apprehended and is now being prosecuted. The man, who was with his family and others on a picnic, claimed he did not know it was a condor. The incident points out the
need for better education about the birds and hunting laws in general.

All four birds were captured on 22 September in order to change transmitters and perform medical examinations on the California condors, and to return the Andean condors to captivity. As with the other Andean condors in the program, these two will also be re-released in either Columbia or Venezuela.

Six of the 12 condors produced this season are considered releasable this year. All six have been socialized at the Los Angeles Zoo and were moved to the field on 19 October. They are scheduled for release from the same pen as the first two, in the first week of December. So far, we are encouraged by the behaviour of the original two condors over the past eight months, and are confident that they will teach the new birds appropriate feeding, roosting and watering sites.

Since lead poisoning from hunter-killed deer and hunting may be the most important mortality factors, we hope to retain a high degree of control over their feeding behaviour and movements by managing the food supply as the population becomes established. Ultimately, we hope to establish two disjunct, 150-member populations in the wild, and one of the same size dispersed between several institutions in captivity, before down-listing the species to threatened status.

Contributed by Michael Wallace, Los Angeles Zoo.

Islands within Islands

The fauna and flora of oceanic islands are notoriously fragile and the Mascarene Islands of the Indian Ocean have been particularly devastated in a very short period of time. Humans colonized the islands less than four centuries ago, quickly clearing most of the indigenous vegetation. They also introduced alien plants and animals which provided the “coup de grace” for any native species which remained. Today, the very impoverished fauna and flora of the Mascarenes can only survive with active management, which includes re-introductions of locally extirpated species once the reasons for their disappearance have been removed. This article highlights only three of the re-introductions undertaken by the joint World Wide Fund for Nature (WWF)/Government of Mauritius plant conservation programme on the Mascarene islands of Mauritius and Rodrigues.

While the smaller an island is, the more vulnerable its plants are to extinction, small intensively managed islets can serve as refuges for plants since their introduced fauna and flora can be controlled or even eradicated. Two such examples are the offshore Mauritius islets of Round Island and Ile aux Aigrettes. Goat and rabbit eradication coupled with an on-going weeding programme on Round Island, and rat elimination plus an ambitious alien plant removal programme on Ile aux Aigrettes, have provided suitable areas for native plant re-introductions.

Dictyosperma album var. conjugatum is only known from two individuals (one standing and one fallen) in the wild on Round Island. Seeds from both these individuals have been grown and over 50 plants have been placed on Ile aux Aigrettes. While Dictyosperma has never been recorded on Ile aux Aigrettes, it most likely once occurred there, as evidenced from old maps showing the islet studded with palms. However, these plants would probably not have been the Round Island variety. So far, the planted Dictyosperma seem to be growing very well and further plantings have been planned for the future. While this new population can only be regarded as temporary (due to possible hybridization with the widely cultivated mainland variety), the creation of a second population of this very endangered palm variety will serve as an insurance policy for the two plants on Round Island, both of which may disappear in the next cyclone. Collection and planting of any seeds produced by these two palms will continue, and in an attempt to preserve as much remaining genetic material as possible, the last two remaining specimens will be ideal subjects for in vitro propagation.

Conversely, plants which are now virtually only found on Ile aux Aigrettes have been (re-)introduced to Round Island. Although the plant Dracaena concinna has never been recorded on the latter islet, it is extremely likely that it once grew there, since Round Island was only botanically explored long after most of its vegetation was destroyed. Now, restoration of lowland forest is necessary on Round Island since the islet is completely eroded and contains only two native trees (apart from palms and screwpines). The Dracaena, being one of the last survivors on Ile aux Aigrettes, was the obvious choice for the first (re-)introduction in this restoration project. Seeds were sown in December 1987, and the last census of Dracaena in April 1992 numbered 56 trees, averaging 1 meter in height with a maximum height of 2 meters.

The final case concerns the re-introduction of Dombeya rodri guesiana to Rodrigues. This endemic, and unfortunately dioecious tree, was only known from a single male individual in 1982. A female specimen was collected in 1979, but subsequently died, with no cuttings having been taken. The last male died in 1983. Fortunately however, cuttings of this plant were made and clones are presently in cultivation. Cuttings are also available from another individual discovered in 1987, although it is not yet known whether this specimen is male or female. Eight plants of both these clones cultivated in Mauritius were returned to Rodrigues in June 1992, two of which have been planted out in a safe place. So far, these plants have been doing well. However, as the last known wild tree has just been cut down by woodcutters, any further planting of this species will sadly be a true re-introduction.

Contributed by Wendy Strahm, WWF.
Arabian Oryx in Oman

The re-introduced Arabian oryx (*Oryx leucoryx*) population numbered 104 in September 1990, with a high rate of increase predicted for 1991 (RE-INTRODUCTION NEWS 1). By September 1991, the population numbered 126. However, with only very localised rainfall since early 1990, the grazing across most of the re-introduction area - the Jiddat al-Harasis - had deteriorated. Through the following months, mortality rose quickly and fecundity dropped as the oryx experienced the first drought since that of 1983-1986.

Mortality was greatest amongst the older immigrant animals and wild-born calves aged less than 12 months. Of 21 immigrants surviving in the wild six died, including the oldest surviving male (14.3 years) and female (13.9 years). These were the oldest animals to have died from natural mortality factors in the wild, and provided the first indication of maximum life expectancy in the desert. There was no suggestion of release area fidelity, as none of these immigrants returned to the release site during the drought. One female immigrant from an under-represented genetic line received supplementary feed.

During the six month period beginning September 1991, 18 desert-born oryx died, two calves were brought in for hand-rearing and two surviving hand-reared animals were brought back into captivity. Mortality of 73% was recorded for calves born during the last seven months of 1991. Most calf deaths occurred in the winter when poor physical condition was aggravated by cold dehydrating winds. A small number of oryx herds, which had located grazing resulting from the localised rains of early 1991, suffered no mortality.

Although mortality was at first restricted to the old and very young, the physical condition of most animals, particularly the females, declined quickly late in 1991. As a result, a single four year old breeding female died.

Fortunately, in late January 1992, the drought was broken by localised rain, followed by very heavy rainfall throughout the Jiddat al-Harasis in April. However, three of the oryx died through extensive flooding.

By September 1992, the population had recovered to 117 oryx, comprising 15 surviving immigrants and 102 wild born animals. There were 19 herds numbering from two to 16 individuals, ranging over an area exceeding 14,000 km². However, the latent effects of the drought were still to be seen with no births for over three months.

A herd of 10 animals, consisting of four from the Bait al-Barakah Breeding Centre near Muscat, five brought in from the wild and one born in the Yalooni enclosure, was scheduled for release in October. To enable the regular importation and release of further stock effectively screened for tuberculosis (TB), a quarantine facility is to be built in Muscat. The appropriate testing for TB will be carried out and necessary isolation arranged.

The Monitoring Programme designed in 1990 has proven to be effective, and 26 animals have been immobilised and ear-tagged for individual recognition. Work to investigate the occurrence of a chromosomal abnormality (Robertsonian translocation) in the population and any effects on the breeding success of carriers was given a boost late in 1991, when technicians in the recently equipped laboratory in Salalah successfully obtained karyotypes from both oryx skin and blood. A biopsy dart has been developed to enable the remote collection of skin tissues for both karyotyping and DNA fingerprinting.

*Contributed by Andrew Spalton, Office for the Adviser for Conservation of the Environment, Oman.*

(End note from the Chairman: By December 1992, calves conceived after the rain were being born, and the total stood at 134 oryx in the wild.)

Ultramarine Lory of French Polynesia

The ultramarine lory, *Vini ultramarina*, is one of the least known and most threatened of all the insular lory species. Known only from the Marquesas archipelago of French Polynesia, it is a species of special concern for the Marquesan islanders as well as the Office for Environment for French Polynesia (F.P.). While its past distribution included the islands of Nuka Hiva, Ua Pou, Hiva Oa and Ua Huka, it has now been extirpated from all but the latter, currently numbering between 1,000 and 1,500 individuals. Although this population is fiercely protected by the local residents, its future is of much concern due to the probable construction of a wharf on this island in 1993. Such development will allow the docking of large cargo ships, which will lead to the potential invasion of exotic rat species and further anthropogenic activities, i.e. industry, agriculture and urban development. Such factors, in addition to cats, a large goat population, possible presence of avian malaria and introduction of the common mynah and great horned owl have led to the extinction of the ultramarine lory on all of the other islands.

In accordance with the draft recommendations of the ICBP/IUCN/CBSS Parrot Action Plan for the ultramarine lory, the Zoological Society of San Diego (ZSSD) undertook the first step of an experimental translocation of this species from Ua Huka to Fatu Hiva, the most southerly of all the Marquesan Islands. This decision was based on the prehistoric evidence of the presence of the ultramarine lory in Fatu Hiva and the pristine nature of the island, having few of the threats and the environmentally negative features of Ua Huka. In addition, Fatu Hiva has many species known to be food plants for the lory, including kava, banana, coconut, coral tree, “ahaia”, mango, “tamanu” and Tahitian mango.

In August 1992, the ZSSD staff accompanied by personnel from the Office of the Environment (F.P.) and the Rural Economy Service, travelled to Ua Huka and spent 10 days
mist-netting ultramarine lories. Hampered by the unseasonable rains caused by Hurricane Omar, the total capture was seven lories, all of whom were kept for six days before being transferred by boat to Fatu Hiva. In Fatu Hiva, the inhabitants of the town of Omoa visited the caged birds and learned about the translocation program. The lories were then released in a foothill valley above Omoa, in an area rich in food plants, especially coconut and banana. All individuals were released at first light and began to feed on coconut flowers in minutes. Within one hour, their foraging activities took them high into the hills and out of contact with the human observers.

The birds will be monitored in the future by an employee of the Rural Economy Service who will make field observations and will collect data from other island residents. This translocation program will continue on an annual basis to provide enough founder birds to establish the ultramarine lory on Fatu Hiva.

*Contributed by Cyndi Kuehler and Alan Lieberman, ZSSD.*

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**Great One-horned Rhinos**

Further to our article on rhino re-introductions into the Dudhwa N.P. India (RE-INTRODUCTION NEWS 3), Dr. S.P. Sinha writes that two more calves were born in July and August 1991, to Nepalese and Assamese cows. Unfortunately, another adult female originating from Nepal died after an abortion and internal infection in September, leaving behind a 2.5 year old calf. The current population at Dudhwa comprises one bull, four cows and five calves.

Sir Christopher Lever points out that, as well as the rhinos in reserves in Assam and Bengal, India, and the Royal Chitwan N.P. Nepal, 14 rhinos have been successfully re-introduced from Chitwan to the Royal Bardia National Park in western Nepal. During a visit to Bardia on behalf of the International Trust for Nature Conservation from 30 March to 3 April 1991, he and Dr. Charles McDougall had seven separate sightings of rhino, including a pair copulating, with the male wearing a radio collar.

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**Arabian Sand Gazelle**

The three species of gazelle once native to Saudi Arabia—the Saudi gazelle (Gazella dorcas saudia), the mountain gazelle (Gazella gazella) and the sand gazelle (Gazella subgutturosa marica) - have been greatly reduced over the last fifty years. The catastrophic decline in their populations began after the Second World War, when new roads and four-wheel drive vehicles opened up areas previously inaccessible to humans. The Saudi gazelle is now probably extinct in the wild, the mountain gazelle is considered vulnerable and the sand gazelle is endangered.

The latter is widely distributed in Asia, from southern Turkey to western China. In the Arabian region, four subspecies are recognized from Iran, Baluchistan, Southern Turkistan and Sinbiang, to the Gobi desert. While the sand gazelle has historically been distributed throughout Saudi Arabia, today it only exists in two Saudi populations - one in Al Harrah, a protected area close to the Jordanian border, and the other in Al Khunfa, an area south of Al Harrah.

The general decline of the wild population of sand gazelles has led to immediate conservation measures. The last two known populations are now under protection and a captive breeding programme has been established at the King Khalid Wildlife Research Centre (KKWRC) in Thumamah, near Riyadh. With the support of the National Commission for Wildlife Conservation, these captive-bred animals have already been re-introduced into Mahazat As Said - a 2,200 km² fenced area east of Taif, where sand gazelles were apparently once very abundant.

24 gazelles (10 males, 14 females) were transported from Thumamah to Mahazat As Said in February 1990, followed by a second group of 28 animals (11 m, 17 f) one year later. In June 1991, 22 animals (14 m, 8 f) obtained from a farm in the Al Qasim region of Saudi Arabia were also moved to Mahazat As Said. Most recently, in May 1992, 23 Thumamah-bred individuals (17 m, 6 f) were transferred into this area. All animals transported to Mahazat As Said were kept quarantined in a 25 hectare enclosure for five to six months. The first three groups of the sand gazelle have already been released in the wild: 36 animals in May 1991, 35 in March 1992 and 21 in September 1992. The fourth group is currently in the pre-release enclosure.

Although most animals transported from KKWRC to the release area were born during January and March, two peaks in calving were observed in Mahazat As Said: February to April and September to October. To date, nine calves are known to have been born in the wild - five in September and October of 1991 and four in March and April of 1992, each group including a set of twins. While the availability of favourable conditions in the small pre-release pens may have influenced reproductive behaviour, current field studies will delineate reproductive synchrony in released gazelles.

So far, carcasses of two released gazelles have been recovered in the reserve, but causes of death have not yet been determined.

Plans for an intensive radio telemetry study and aerial survey are currently underway.

*Contributed by Md. Nayerul Haque,*

National Wildlife Research Center,

Taif, Saudi Arabia.
Re-introduction Briefs

The Nene Network

Since 1960, over 2,100 Hawaiian geese (Branta sandvicensis), commonly known as the nene, have been re-introduced in their former Hawaiian range. Today, with less than 500 individuals remaining in the wild, the Hawaiian goose is still dependent on the release of captive-bred stock. While re-introduction efforts have effectively prolonged the nene's extinction, they have failed to establish a self-sustaining wild population. To understand this lack of recovery and to prevent the extinction of this species, a team of specialists, headed by Dr. Jeffrey Black, is currently researching various possible limiting factors.

We invite our readers to help further this research by joining the Nene Network and sending a contribution to "Project: Save the Nene" at: P.O. Box 2545, Kamuela, HI 96743, USA or The Wildfowl & Wetlands Trust, Slimbridge, GL2 7BT, UK.

- The Healesville Sanctuary and Chicago Zoological Park are currently releasing three litters of captive-bred tuans (Brush-tailed Phascogales, Phascogale tapoatafa) in Victoria, Australia, marking the third round of re-introductions in this project.
- Plans to re-introduce captive-bred Eastern white storks (Ciconia c. boyciana) in Japan are being developed under the direction of Dr. Koichi Murata of Japan's Kobe Oji Zoo.
- Ms. Dot Eaton reports that the re-introduction of the common dormouse (Muscardinus avellanarius) has commenced in the UK, with the release of 11 dormice in Hertfordshire in September and 20 in Kent in October 1992.
- FAPAS (Fondo para La Proteccion de los Animales Salvajes) and the Spanish Superior Council of Scientific Investigation are assessing the feasibility of a captive breeding programmes for the bearded vulture (Gypaetus barbatus), with the aim of subsequent re-introductions into the Cantabrian mountains of Spain.
- In the autumn of 1993, Dr. Cinzia Garavelli will release eight captive-bred waldrapp ibis (Geronticus eremita) in Friuli, Italy - a region inhabited by the birds over three centuries ago.

- Two litters of black-footed ferret (Mustela nigripes) were born to four surviving adults in Wyoming, USA (RE-INTRODUCTION NEWS 1 & 4).
- The Duke University Primate Center and the Madagascar Fauna Group have proposed an experimental re-stocking programme of the black and white ruffed lemur (Varecia variegata variegata) in Madagascar's Betampona Natural Reserve.

New Literature


