Introduction
The National Wildlife Research Center (NWRC), Taif, is an integral part of the National Commission for Wildlife Conservation and Development (NCWCD), based in Riyadh. NWRC was established in winter 1985/86, primarily as a Houbara Chlamydotis undulata captive breeding unit. The remit of the Center was soon expanded to include breeding programmes of Arabian Oryx, Ostrich, Ibex and gazelles. The current remit of NWRC remains focused on the captive breeding of these species, but the task of management of protected areas and reintroduction is now also an integral part of its programme.

The Center is situated on the interior plateau at 1400m above sea level, just inland of the northern Asir mountains, approximately 200km from Jeddah and the Red Sea coast, and 800km from Riyadh. During summer 1991, the Center was expanded considerably. A new Field Research Department was created to monitor wildlife in protected areas, to undertake pre- and post-release surveys of introduced species and to initiate and support other NCWCD projects and surveys on endangered or poorly known species and habitats outwith the protected area network in the Kingdom.

NWRC, Taif
A large breeding flock (200+ birds) of Houbara of both the North African subspecies Chlamydotis undulata undulata and the Asian subspecies C. m. macqueenii are maintained for research (former) and reintroduction purposes (latter). The species is notoriously difficult to breed in captivity. Only 121 chicks were reared in three breeding seasons (1989-91). After considerable research and investment in artificial insemination and artificial incubation and using the technique of egg-pulling, around 150 chicks were reared from 60 laying females in 1992. This level of production enables the breeding stock to be maintained at current levels and frees birds for reintroduction experiments. A small number of Red-necked Ostriches Struthio camelus is maintained at the Center and in the near future the breeding stock will be increased and a reintroduction programme will be started.
The location of NWRC was not chosen on conservation grounds - the initial area being intrinsically uninteresting, flat, overgrazed sandy semi-desert. However, the exclusion of domestic livestock has resulted in excellent recovery of the original vegetation and the site is now attractive to a wide variety of migrants and winter visitors. The breeding densities of resident species such as Black-crowned Finch Larks *Eremopterix nigriceps* are considerably greater than those recorded outside. However, in spring and summer 1991, groups of up to 15 Bald Ibises *Geronticus eremita* were regularly present in an area immediately adjacent to NWRC. The birds foraged on rather degraded desert for beetles and roosted in mature *Acacia* trees. The origin of these birds is rather puzzling, since none bore rings of breeding programmes in Israel or Turkey, and it can only be inferred that they are non-breeding subadults wandering about their former range. Unfortunately, there has been no similar recurrence to date in 1992, though up to two were seen briefly in early spring.

**Harrat al-Harrah**

This enormous reserve in the extreme north of the Kingdom, adjacent to the Jordan border, is protected by a large vehicle-based ranger force backed up by aerial reconnaissance. Bedu camps and their associated flocks of sheep and goats are excluded, although camels are still allowed to graze. The habitat comprises undulating black lava desert, including abundant extinct volcanic cones, cut by very shallow, though better-vegetated wadis. The site is renowned as the last stronghold of the Houbara in Saudi Arabia, with a small, resident breeding population which is augmented by overwintering birds from other breeding sites farther to the north. Sand Gazelles are still present in reasonable numbers. A long-term field research programme on the Houbara has been started in which flock size, distribution, movements, habitat use and feeding ecology will be examined. Ground and aerial surveys are undertaken to assess population levels by some telemetry, both conventional and satellite-based.

**Mahazat as Said**

This is a large fenced desert/central plateau 200km north of the sand and gravel plains, though richly wooded, with *Acacia* and *Mahazat* well after good rains and protected by the focal site in Saudi for the rehabilitation of both Arabian Oryx and Sand Gazelle, breeding successfully in the reserve, which has reintroduction trials with Houbara bustard. Up to only small numbers of birds have been seen in the breeding year at NWRC in spring, and fly out on release and follow-up work is summer 1992 onwards. The site will continue to be monitored, and studies and subsequent reintroduction efforts are planned.

Perhaps the most important bird is the golden-shouldered Vulture *Torgos tracheliotus*, the last stronghold in the safety of the reserve, both for the Houbara and for smaller numbers of Griffon Vulture *Gypaetus barbatus*. They forage mostly on the reserve. About 10 pairs of nesting material were monitored in detail, and it has been found that a few pairs to December and fledged young in the postgraduate study has just been completed. The behaviour of the scavenging birds, including the White-tailed Raven *Corvus ruficollis*. Also, the passerine community is being studied, with Dunn's *Eremalauda dunni* and Greater Short-toed Lark *Galerida cristata* being considerable numbers.

**Wadi Turabah/Jebel Ibra**

The wadi and jebel are situated approximately 100km south of the site, as yet, but we hope this will be used, and the narrow valley approximately 5km long, running water course flowing through a lush, well-vegetated habitats, *Acacia* woodland and spectacular montane scenery, of up to 2600m. The domes and cliffs of the intervening slopes are relatively...
under taken to assess population size, and future work should include some telemetry, both conventional and satellite.

**Mahazat as Said**

This is a large fenced desert/semi-desert reserve (c. 2200km²) on the central plateau 200km northeast of Taif. Habitats are predominantly sand and gravel plains, though in places the area now resembles African savannah, with *Acacia* and *Maerua* trees, shrubs and grasses recovering well after good rains and protection from domestic livestock. Mahazat is the focal site in Saudi for the reintroduction of native ungulates - so far both Arabian Oryx and Sand Gazelles have been re-established and are breeding successfully in the reserve. The site has also been used for some reintroduction trials with Houbara, though the habitat is not ideal and only small numbers of birds have been used. However, the successful breeding year at NWRC in spring 1992 means that more comprehensive releases and follow-up work on Houbara will be undertaken from summer 1992 onwards. The site will probably feature strongly in feasibility studies and subsequent reintroduction of Red-necked Ostriches.

Perhaps the most important bird species utilizing Mahazat is the Lappet-faced Vulture *Torgos tracheliotus*. At least 100 have been recorded roosting in the safety of the reserve, both in trees and on the ground, together with smaller numbers of Griffon *Gyps fulvus* and Egyptian Vultures *Neophron percnopterus*. They forage mostly on carrion (domestic livestock) outside the reserve. About 10 pairs of Lappets breed in the reserve; in 1992 six nests were monitored in detail, from which four chicks fledged. Eggs are laid in December and fledging does not take place until June. A postgraduate study has just begun on the feeding ecology and ranging behaviour of the scavenging bird community (including Brown-necked Raven *Corvus ruficollis*). Also, a monitoring programme of the small passerine community is being established. Hoopoe Lark *Alaemon alaudipes*, Dunn's *Eremalauda dunni* and other typical “desert” larks breed in considerable numbers.

**Wadi Turabah/Jebel Ibrahim**

The wadi and jebel are situated in the northern Asir mountains approximately 100km south of NWRC. The site has no formal protection as yet, but we hope this will be achieved soon. Wadi Turabah is a fairly narrow valley approximately 55km long, with a fairly major, perennially running, water course flowing inland. Thus, a wide variety of relatively lush, well-vegetated habitats are present, including reedbeds, grassy terraces, *Acacia* woodland and palm groves. Jebel Ibrahim is an area of spectacular montane scenery, centred around a granite plateau rising to 2600m. The domes and cliffs are reminiscent of Yosemite and the intervening slopes are relatively well wooded.
The overall area supports a high proportion of the Arabian endemics. It is perhaps best known for its wetland birds, including breeding Hamerkop *Scopus umbretta* and Grey-headed Kingfisher *Halcyon leucocephala*, plus a wintering flock of Black Storks *Ciconia nigra*, and as the first proven breeding site for Verreaux's Eagle *Aquila verreauxii* in Arabia. The *Acacia* woodlands also support a healthy population of Arabian Woodpeckers *Dendrocopos dorae*, which is receiving special attention by NWRC. The distribution, habitat selection and breeding status of all species is monitored regularly and a draft management plan is being developed for presentation to NCWCD and the Government for ratification.

**Raydah**

This is a small reserve (9km²) situated approximately 20km west of the city of Abha at the southern end of the Asir mountains. The site extends from approximately 1200-2700m on the southwest facing escarpment, and is probably the best-preserved area of montane juniper woodland in Arabia. Virtually all the terrestrial endemic bird species occur in the reserve (except the Accentor), together with other scarce species such as the Shikra *Accipiter badius*. The ornithological monitoring at this critical site is centred on gaining a much fuller understanding of distribution, movements, habitat requirements, breeding ecology and survival rates of relatively common forest species. Thus, the following are receiving particular attention: Yemen Thrush *Turdus menachensis*, Yemen Linnet *Carduelis yemenensis*, Arabian Serin *Serinus rothschildi*, Dusky Turtle Dove *Streptopelia lugens*, Palestine Sunbird *Nectarinia osea*, Little Rock Thrush *Monticola rufozona*, Yemen Warbler *Parisoma buryi*, Brown Woodland Warbler *Phylloscopus umbroviens* and White-breasted White-eye *Zosterops abyssinicus*. Methods used include constant-effort mist-netting, colour-ringing and point counts; radio telemetry of some species is planned for the future. Recently, we have discovered a healthy population of the Mountain Nightjar *Caprimulgus poliocephalus*, a species new for Arabia. This African species is probably resident and widespread in the forests of southwestern Saudi Arabia. It may have been overlooked because it whistles rather than churrs.

**Tihama**

The Tihama coastal plain is well described Jeddah and the Yemen border. Several surveys are underway at three fairly widely dispersed sites: *Ardeotis arabs* survives very tenuously in the vicinity of Qunfudhah, and it is hoped that the population may persist in areas across the Red Sea where perch populations are abundant. The breeding biology and feeding ecology of this species is studied on some small mangrove islands, where approximately 35 pairs are monitored irregularly over the last 10 years. During summer/early autumn 1991 we discovered a population of this species at Al-Hilah, which may have escaped from captured populations in the vicinity of Qunfudhah. After this, the overall population of this species was monitored irregularly over the last 10 years. We are only now beginning to appreciate the threats to this endangered population.

**Other Surveys**

Many projects could be listed in this brief report. It has long been known that the population of the Demoiselle Crane *Anthropoides virgo* migrates through Saudi Arabia on migration in north-central Saudi Arabia in spring and autumn. In spring 1992 a survey team found approximately 4,500 Demoiselle Cranes. Observations indicated that they descend at dusk and roost on the Red Sea. Observations suggest that the species is widespread in the Kingdom. To date, only two sites have been monitored for reasonable lengths of time: Al-Hilah in spring 1991, and Hail in spring 1992. Further surveys are anticipated. Finally, recent events in the Kingdom suggest that knowledge of seabird breeding sites in the Red Sea are very poorly known NCWCD has been establishing a marine ornithological monitoring network in the region.
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. Thus, the following are receiving
Turdis menachensis, Yemen Linnet
Serinus rothschildi, Dusky Turtle

Tihama

The Tihama coastal plain is well developed in Saudia Arabia between
Jeddah and the Yemen border. Several species-specific NWRC projects
are underway at three fairly widely separated sites. The Arabian Bustard
Ardeotis arabs survives very tenuously and a protected area is being
established in the vicinity of Qunfudah. Given habitat protection, it is
hoped that the population may partially recover by recolonisation from
areas across the Red Sea where persecution is perhaps not so intense. The
breeding biology and feeding ecology of the Sooty Falcon Falco concolor
is studied on some small mangrove-fringed nearshore islands near Al
Lith, where approximately 35 pairs nest semi-colonially on the ground.
During summer/early autumn 1992 an attempt is being made to survey
most other islands in the Saudi sector of the Red Sea to estimate the
overall population of this species. Within Saudi Arabia, the Helmeted
Guineafowl Numida meleagris is confined to a single wadi system in the
extreme south west corner of the country. Although numbers have been
monitored irregularly over the last five years and almost certainly exceed
1,000, we are only now beginning to investigate their ecology and the
threats to this endangered population.

Other Surveys

Many projects could be listed in this section, but I will mention only three
briefly. It has long been known that the majority of the African wintering
population of the Demoiselle Crane Anthropoides virgo probably passes
through Saudi Arabia on migration. However, almost nothing is known
of numbers involved, route taken and whether or not any staging posts
are used. In spring 1992 a survey team visited the Hail/Jebel Aja' region
in north-central Saudi to investigate crane migration. In two weeks,
approximately 4,500 Demoiselle Cranes were counted. Preliminary
observations indicated that they probably pass through the Kingdom
rapidly without utilizing any feeding/staging posts although they do
descend at dusk and roost on the ground in the vicinity of the Nafud
Desert. More comprehensive coverage is planned from 1993. Casual
observations suggest that substantial numbers of raptors migrate through
the Kingdom. To date, only two sites have been covered systematically
for reasonable lengths of time: Al Hada escarpment near Taif in autumn
1991, and Hail in spring 1992. Future monitoring of these and other sites
is anticipated. Finally, recent events in the Arabian Gulf have shown how
important it is to have baseline waterfowl counts from coastal areas and
knowledge of seabird breeding sites. As yet, waterbird populations of
the Red Sea are very poorly known and over the last couple of years
NCWCD has been establishing a mid-winter survey protocol for the area
as part of the Asian Waterfowl Census. From 1993, NWRC will be fully
involved in this project.

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