CONSERVATION OF WADER HABITATS IN EAST ASIA

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The wader populations migrating through East Asia are threatened by several activities, especially very heavy hunting for food, and land-claim and the destruction of mangroves. Until recently, little attention has been focussed on the conservation of waders and wetlands. Survey work conducted by INTERWADER since 1983 is identifying key sites, and providing the information on wader populations vital for promoting conservation of their sites. Bilateral migratory bird agreements, education and the enforcement of hunting controls, offer hope for the future safeguarding of waders and their wetland habitats in East Asia.

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INTRODUCTION

The East Asia/Australasia flyway population of waders is probably the smallest and most threatened in the world. Migrating birds have to run the gauntlet of hunters from China to Indonesia. Coastal development which leads to habitat destruction is occurring at probably a faster rate here than anywhere else in the world. The world population of some species on the flyway is very small. For example there are though to be less than 1 000 Nordmann's Greenshanks *Tringa guttifer*, under 5 000 Spoon-billed Sandpipers *Eurynorhynchus pygmaeus*, and under 10 000 Asian Dowitchers *Limnodromus semipalmatus*. The most abundant species for which the populations are known are Red-necked Stint *Calidris ruficollis*, Great Knot *Calidris tenuirostris* and Curlew Sandpiper *Calidris ferruginea*, with flyway populations estimated at 250 000-300 000 birds each. These are still small in comparison with other flyways. The estimated total flyway population is only 4 - 6 million birds of over 70 species, *i.e.* a mean population size of about 60 000 birds/species.

One of the major direct threats to waders in Asia is hunting for food. Parish (1985) estimated that the annual harvest was between 250 000 - 1 500 000 waders/annum, or 5 - 30% of the estimated flyway population. There are insufficient data collected yet to confirm these figures, but the catch at one site in Java is in excess of 100 000 birds/annum (Milton and Marhadi in prep.), and studies at a small site in southern Thailand showed that 10 000 birds were captured each year, three times more than the maximum count of live waders at the site (Ruttanadakul and Arsdeungurn 1986). Hunting pressure in the Phillipines and Vietnam is also quite high. However, it is thought that most waders are trapped in China, since the rate of reporting of ringed waders by hunters is ten times higher than in any other country. Such a high harvest rate could have serious effects on the population size of waders, especially those breeding in the arctic, whose breeding success varies substantially from year to year.

The other major threat is that of habitat degredation and destruction. The mangrove/mudflat ecosystem is the most important habitat for waders in tropical Asia. But in the Phillipines, for example, 70% of mangroves have been cleared, principally for conversion to fish ponds (Zamora 1984). In other countries such as Indonesia, Singapore and India, mangrove loss is also very high (Hegerl 1984). Other than fish pond creation, mangroves are threatened also by mining, wood-cutting and agricultural schemes such as rice growing. Not only have these developments directly destroyed some wader habitat, but they have also removed a major nutrient source to the adjacent mudflats used by waders. In countries such as South Korea, Japan and Singapore, large areas of mudflats have been lost to land-claim, and there are plans to claim a further 345 500 ha of mudflats in South Korea (Schultz 1984). Elsewhere, pollution has reduced mudflat productivity, and hence their attractiveness to waders. During migration, waders need undisturbed feeding at high productivity sites so as to accumulate rapidly the fat reserves needed for onward migration. Such sites are becoming fewer.

Threats from hunting and habitat destruction to waders on their breeding grounds and Australasian non-breeding areas are not so great (but see also Lane and Sagar this volume). The main threats exist in central and southern Asia, which have high densities of human population in coastal areas.

HISTORY OF CONSERVATION MEASURES

Until recently there has been litle attention focussed on the conservation of waders and wetlands. Virtually no totally protected areas have been created for migratory waders. One of the main reasons for this is a lack of accurate data on the relative importance of different sites, combined with the heavy human usage of the coastal areas.

Most countries in the region do have species protection legislation for the control of hunting. However, relatively few species of wader are fully protected: most can be hunted under licence. The enforcement of hunting regulations is very poor in most countries, partly as a result of the lack of resources of the enforcement agencies. Education of the general public, and in some cases enforcement officers, on wildlife protection laws is also inadequate or non-existent.

CURRENT CONSERVATION EFFORTS

In 1983, The East Asian/Pacific Shorebird Study Programme (INTERWADER) began working to promote the conservation of waders in the region. The first major step was a survey programme to identify key sites. Between 1983 and 1986, INTERWADER conducted joint surveys with governmental and non-governmantal conservation agencies in Thailand, Peninsular Malaysia, Singapore, Sabah, Sarawak, Brunei, Phillipines, Sumatra, Java, Sulawesi and Sri Lanka (Parish and Wells 1984, 1985, Parish *et al.* 1986, 1987). These surveys covered over 10 000 km of coastline, and identified over 30 key sites for waders.

A number of stages are involved in getting such sites protected. For example, in Sarawak, East Malaysia, INTERWADER began a joint programme with the National Parks and Wildlife Office (NPWO) of the Sarawak Forest Department in 1985 to identify important wader sites on the state's coastline. Until this time there was no information available on wader distribution in the state. The first stage involved examination of topographical maps and aerial photographs to identify regions along Sarawak's 1 050 km coastline with potential wader habitats. Two areas were identified: one in Brunei Bay, and the other a 300 km length of coastline to the east of Kuching. This second area was the subject of a major study in 1985 (Edwards *et al.* 1986). Brunei Bay was studied later (Howes and NPWO 1986b). The coastal area was divided into subsectors, and these were examined by both helicopter and boat surveys. These surveys revealed the distribution of waders in different sectors. They showed that most species were concentrated at one site, Pulau Bruit, where over 18 000 waders of 34 species, including 470 Asian Dowitchers, were found (Figure 1). Preliminary ground surveys were made there in October 1985, and more detailed studies in April 1986 (Howes and NPWO 1986a). Reports on these studies were then presented to the Sarawak State Government. In early 1987 a specific proposal was prepared by NPWO for formal gazettment of the area as a Wildlife Sanctuary. It is hoped that a Commission of Inquiry will be set up later in 1987, and that the area will be fully protected by 1988.

However, not all such recommendations have been accepted by governments. Serangoon Estuary in Singapore was identified during 1983 surveys as being of geat regional importance. This site, which was probably used by 10 000-20 000 waders, was one of the most important in the Malay Peninsula. It was reclaimed in 1984/85 for the creation of a public park, despite interventions from the International Council for Bird Preservation and other bodies.

Another study by INTERWADER to promote interest in wader conservation has been the Migration Monitoring Project. Each year INTERWADER co-ordinates wader counts in eight East Asian countries. These studies give information on timing and routing of migration, providing information for migratory bird agreements and wetland management.

INTERWADER has also conducted studies on hunting in Thailland in conjunction with the Prince of Songkhla University (Ruttanadakul and Ardseungnurn 1986), and in Indonesia in conjunction with the Department of Nature Conservation and the World Wildlife Fund (Milton and Marhadi in prep.). The studies have acurately determined the level of hunting pressure and have recommended management or

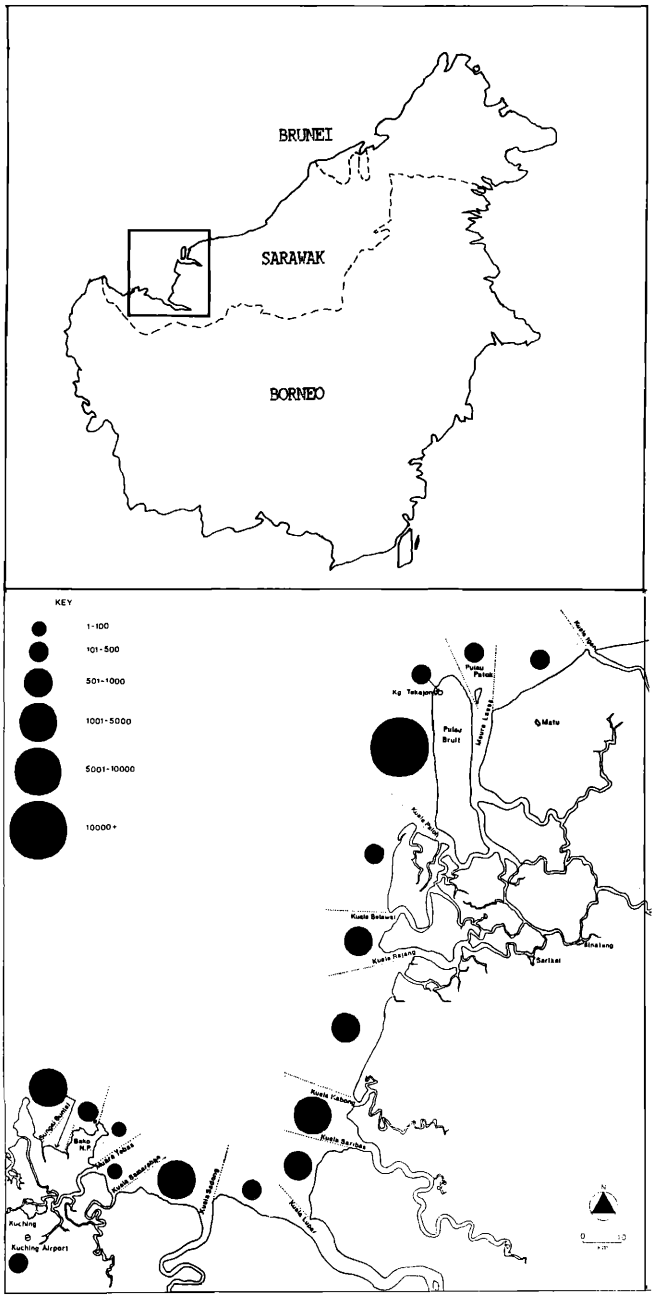

Figure 1. The number of waders recorded in each survey sector in western Sarawak during aerial and ground surveys in September-November 1985 (from Edwards *et al.* 1986).

protection measures. For example, in Thailand an education programme is being run to discourage the hunting of waders. In addition, the Royal Thai Forest Department has been successful in establishing non-hunting reserves at important wader sites and plans to create more in the future. In China, the Ministry of Forestry has introduced tough wildlife protection legislation and appears to be successful in enforcing it, at least in some areas. The hunting pressure at Chongming Island in the Yangtze Delta, where more than 10 foreign wader rings have been recovered by hunters, has dramatically declined since 1984 (Lui Jin pers. comm.).

More bilateral migratory bird agreements have

been signed in Asia than in any other part of the world, and waders are considered an important component of these agreements. Japan has current agreements with China, USA and Australia; China with Australia and Japan; and India with the USSR. Such agreements encourage parties to give better protection to migratory species and protect their habitats. These agreements have resulted in hunting bans, creation of new sanctuaries and co-operation on research projects.

There has been an increase in bird ringing schemes in recent years, some of which have concentrated on waders. Wader ringing projects were conducted in Malaysia from 1972-1980 and 1983-1986, in Singapore in 1976 and 1983/84, in China from 1984, in Thailand in 1980 and 1984-86, and in the Phillipines, Taiwan and Hong Kong from 1986, and in Japan from 1982. These ringing projects help to demonstrate the international value of protecting wader sites and are sometimes useful in applying political pressure for conservation.

Another project which has focussed attention on conservation of wader habitats in Asia is the Asian Wetland Inventory of the World Wildlife Fund - International (Scott 1985). This project aims to identify all wetlands of international importance thoughout the region. The project has stimulated many local studies on wetlands, and the Asian Wetland Directory will undoubtedly be valuable in promoting conservation of wetland sites important for waders.

FUTURE PROSPECTS

The level of wader hunting may well continue in Asia, with the rapid human population growth, but in some countries increased law enforcement, new legislation and education and management programmes may reduce the level of hunting.

Habitat destruction will certainly continue in the region, but the creation of more protected areas may help to buffer the effects on waders. The proposed establishment of a Mangrove Green Belt, or protected mangrove zone, along the entire Indonesian coastline will offer considerable long-term protection to waders of it is effectively implemented. Other countries like the Philippines have a coastal zone task force, and it is to be hoped that such bodies will be able to slow the rate of coastal habitat destruction in the future.

There are good chances for the establishment of more migratory bird agreements, especially between members of the Association of South East Asian Nations (ASEAN) and Australia or Japan. Such agreements will undoubtedly lead to closer co-operation and hopefully to more protected areas, and better enforcement of hunting legislation.

More studies need to be carried out to identify key wader sites in China, the Phillipines, Indochina and parts of Indonesia. INTERWADER is developing plans to conduct these surveys with local agencies, but substantial funding will be required. In addition to these major surveys, studies need to be carried out at key sites, and on rare species, to provide sufficient accurate scientific data to support the conservation cause.

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Editors' Note: Further information on the current status and future plans for wetland conservation in Asia can be found in the *Report of the Conference on Wetland Conservation in Asia, 23rd-28th February 1987, Malacca,* organised by the International Waterfowl Research Bureau (IWRB) and INTERWADER, and hosted by the Department of Wildlife and National parks, Peninsula Malaysia.

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