



## **Community Structure And Seasonal Occurrence Of Avian Fauna In Wetthigan Wildlife Sanctuary Magway Division, Myanmar (June, 2002 to July, 2003)**

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### **Abstract**

Wetthigan Wildlife sanctuary is a small wetland in the dryzone area of Myanmar. It was established under the Department of Agricultural and Forest Notification No. 275, since 1939; although there is no conservation management at present. The study period lasted for June, 2002 to July, 2003. A total of 130 bird species and their habitat requirements have been recorded from the seasonal survey. Biological observation on the flora and fauna in the sanctuary is being studied and classified as far as possible. The physical and chemical aspects are being studied in Monsoon, Winter and Summer. And then the impact of human activities were also have been investigated around the sanctuary during the study period. In Myanmar the most publics are lack of proper awareness on importance of conservation of wildlife that is the main threat to birds and habitat. Therefore, during the study period, the Environmental Education Programme have been presented at five primary schools in the study area. Finally, discussion and recommendations for the conservation of the avian community of the Wetthigan Wildlife Sanctuary have been made based on the results of the present studies.

### **Introduction**

Wetthigan Wildlife Sanctuary was established to protect wetland birds and aquatic fauna. There is extensive disturbances such as hunting, fishing and grazing of domestic animals in or around the sanctuary since local people inhabit nearby areas. Besides, this area has an historical background and should be protected concerning the religion and cultural heritage.

Therefore, the sanctuary and its fauna, flora and other ecological information should be systematically investigated to provide guidelines for proper management, boundary demarcation and the control of disturbance and exploitation of aquatic vegetation.

The objectives of the present study are:

- to investigate the species riches and diversity of birds in the Wetthigan Wildlife Sanctuary

- to examine the community structure and seasonal occurrence of avian fauna.
- to study the impact of humans around the sanctuary on the avian fauna and their habitat.
- to propose guidelines for the proper management of the Wethigan Wildlife Sanctuary.

### **Study Area**

The Wethigan Wildlife Sanctuary is situated 1km west of Salin Town, Minbu District; some 16km west of the Ayeyarwady River and 2km east of the Salin Chaung (stream) (20° 34' N, 94° 38' E; and 50km NW of Minbu, Magway Division); the Sanctuary is bounded by cart tracks and irrigation canals. The total area of the Sanctuary is 4.53 Sq.km. The sanctuary is located on a flat plain with a mean altitude of 60m above sea level, small hills adjacent to the lake rise to 82 m. The sanctuary comprises an oval lake of approximately 2.06 sq.km, featuring minor bays and indentation, and is surrounded by associated marshland. It is a type of wetland and its water sources are rainfall and irrigation water. At the height of the rainy season, the water level rises and overflows and through and drainage by sluice gate.

### **Methodology**

1. Literature on terrestrial and aquatic birds and their ecology were studied. Topography and vegetation of the sanctuary were quantitatively investigated. Point Centered Quarter (PCQ) method was used to measure plant and shrub density. Ground cover, water quality and aquatic plants were examined. Mapping of the study area and its geographical features was carried out.
2. Line transects and blocks were set up in the Sanctuary for systematic investigation. Disturbances to avian fauna and their habitat were studied on a seasonal basis. The relation between the seasonal occurrence of avian fauna and human activities were quantitatively studied in the sanctuary and related area.
3. Bird species were recorded using a guide book and binoculars on the transects and points of the studied blocks. For transect counts, the birds were

examined during morning hours (6 a.m to 9 a.m) recording the species. Point counting and Roadside counting were made in the blocks for 10 minutes at each point and species and bird number were recorded to measure the population size of birds in different habitats.

4. Habitat requirements of the bird species (e.g, food plants and shelter) were investigated on a seasonal basis. Migratory bird species and their population size were examined. The status of the existing bird species were checked and the conservation of important species were emphasized to record their niche preferences. Human impacts on the avian fauna were also recorded.

## Results

### Biotic Communities

Flora - Terrestrial plant have been recorded 128 species. Aquatic plant have been recorded 22 species.

Fauna - Terrestrial birds have been recorded 23 families, 66 species and aquatic birds are 14 families, 64 species. Freshwater fishes have been also recorded 10 families, 18 species and other invertebrates are 11 families, 18 species.

### Population Number of bird species

Terrestrial birds - Asian Palm Swift *Cypsiurus balasiensis* was largest number in monsoon. Streak-eared Bulbul *Pycnonotus blanfordi* and Common Myna *Acridotheres tristis tristis* were largest in Winter and Summer.

Aquatic birds - In monsoon, the largest number of bird was Ferruginous pochard *Aythya nyroca*. Lesser Whistling Duck *Dendrocygna javanica* and Pheasant-tailed Jacana *Hydrophasianus chirurgus* were largest in Winter and Summer.

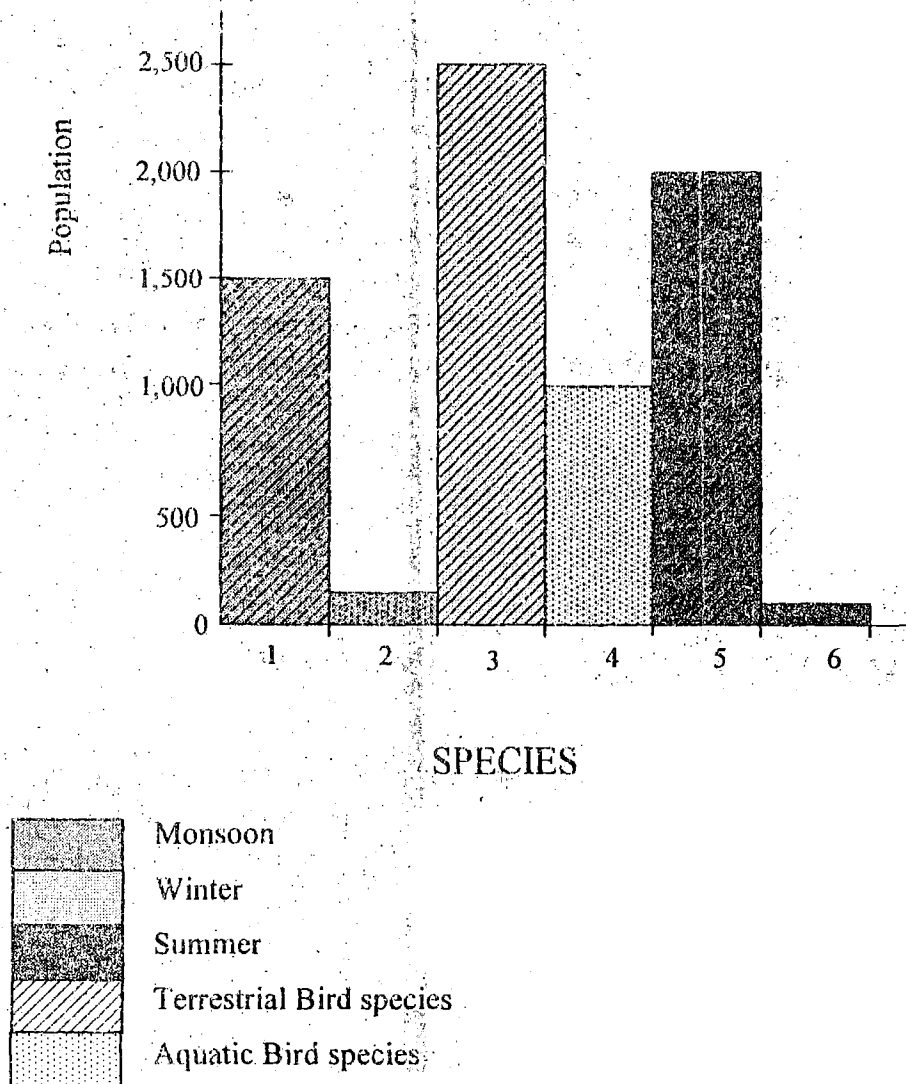


Fig. 1 Maximum population size of birds in Year I

- (1) *Cypsiurus balasiensis* J.E. Gray  
(Asian palm swift)
- (2) *Aythya nyroca* (Guldenstadt)  
(Ferruginous pochard)
- (3) *Pycnonotus blanfordi* Jerdon  
(Streak - eared bulbul)
- (4) *Dendrocygna javanica* (Horsfield)  
(Lesser Whistling Duck)

- (5) *Acridotheres tristis tristis* (Linnaeus)  
(Common Myna)
- (6) *Hydrophasianus Chirurgus* (Scpoli)  
(Pheasant tailed jacana)

**Species preferences habitat**

According to the survey, largest number of population found in water and isolated tree in the village area. Any terrestrial bird found in water area. Forest, shrub, agriculture, grassland and isolated tree in village area did not found the water birds.

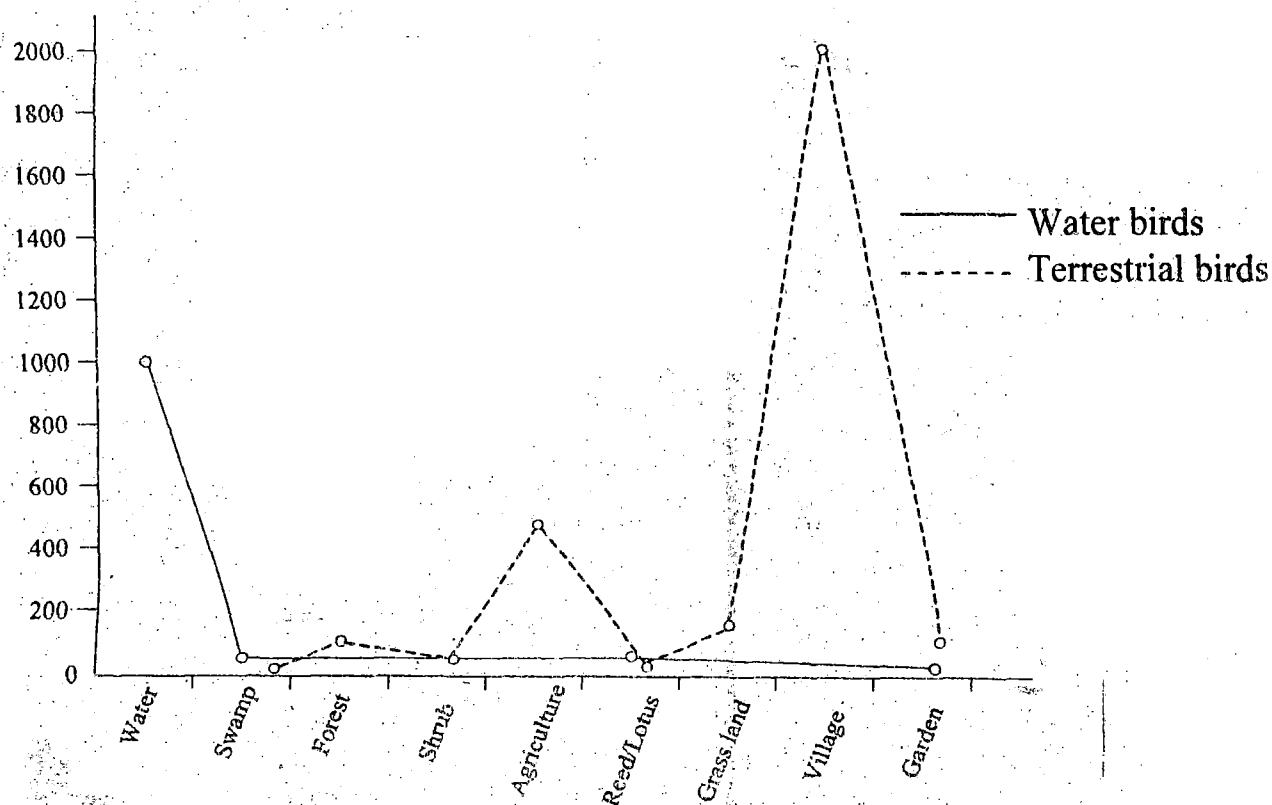


Fig. 2 Distribution of the number of population according to the ecological classification of Place

**Abiotic Communities**

Rain fall - The heaviest rainfall for the study area was from May, 2002 to November, 2002. During 2002, the heaviest rainfall recorded was 331.47

mm in September, with an annual total rainfall of 722.62 mm for 214 days. During 2003, from January to May there was no rain.

Temperature - The temperature of the surface water of Wetthigan Lake varied from a minimum 19.25°C in January to a maximum of 38.25° C in May.

Table -1 Seasonally pH, D.O and Salinity of Wetthigan Lake.

Item	Monsoon	Winter	Summer
pH	6.75 (acidity)	7.01 (neutral)	8.40 (alkalinity)
D.O	3.50 mg/l	6.20 mg/l	0.54 mg/l
Salinity	0.02 %	0.02 %	0.02%

pH - The pH of the surface water of the Lake varied from a minimum of 6.75 to a maximum of 8.40.

D.O - The dissolved oxygen (D.O) to be present in the water is one of the most important factors for aquatic life. Usually D.O in the water is obtained by direct contact of water and air, chemical reactions in the water and by photosynthesis of the aquatic plants, with the release of oxygen as by product.

Salinity - During the three seasons are the same percentage of salt concentration.

Soil Testing - Silicon has the highest percentage compared to other elements. Soil sample No. II contains 19.772 % of Sulphur. Thus, the soil in this area is mixed with soap powder.

### Human Impact

Habitat loss is the major cause of endangerment in birds in the Asia region. Most critical and Endangered bird species have restricted range and / or are specialised to a particular habitat type, and they often occur in the areas and habitats that are being most rapidly cleared and modified by human activities.

Birds Hunting - The bird hunters are mostly used noose trap and cast net for hunting. The children are mostly used catapult for shooting with clay pellets. A few local people used air gun for shooting.

The hunters are frequently shot or trapped for food, sale to markets. According to the recorded in Winter, 2002, total bird weight were 20 viss per day in the market.

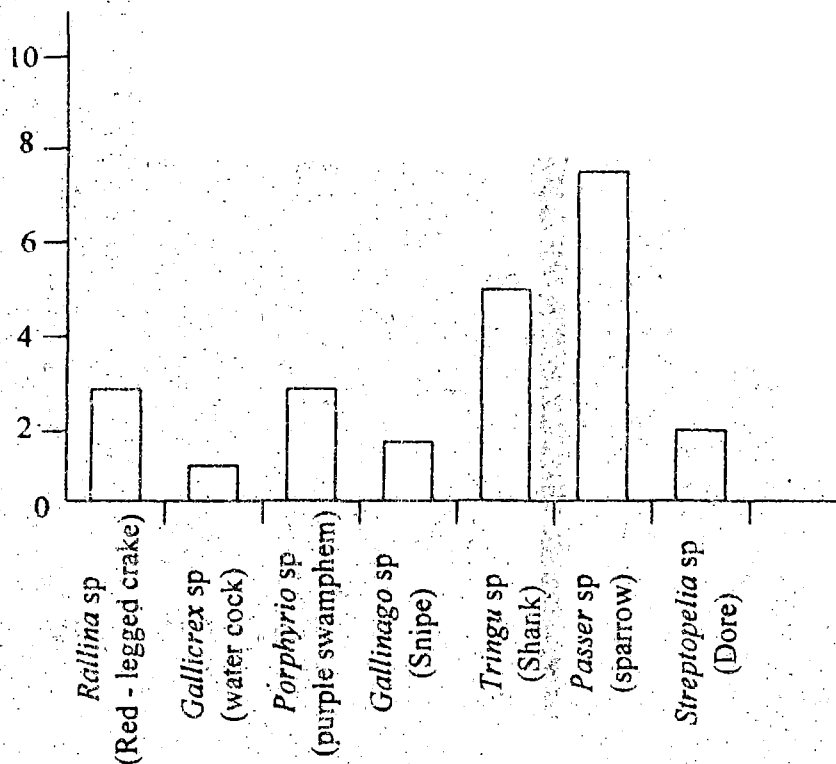


Fig 3 . Bird weight from the sellers in the market

Fishing - 80 households (from the Singyone, Shanywagone and Kanbaung village) were involved in fishing activities within the sanctuary. However, the village headmen had difficulty in deciding whether their villagers were occupied in fishing full-time or part-time, and this figure may be an underestimate. Among these households, 50 of the families utilized gill nets, ten used fish traps and the rest used bait lines within the wetland. Fishing methods used also included dip nets, while at night, harpooning by spotlight was also undertaken.

Uses of wetland plants - Wetland plants are an important food source not just for animals but also for the human that live alongside them. Local communities also use them as medicines, to thatch roofs and a good source of

building materials. Some of the wetland plants are used for decorative purpose in aquarium and ponds.

Table 2. Wetland plant and sources of species degradation

Species	Status	Source of Collection	Ratio	Remark
<i>Lotus sp.</i>	Leaves	for substitute plastic bags	500-800/day	whole year
<i>Lotus sp.</i>	Flowers	make offering to the Buddha	500/day	April-May
<i>Louts sp.</i>	Roots	for Jam	-	April-June
<i>Typha sp.</i>	Trunk	for vegetables for thin soup	10 viss/day	whole year
<i>Typha sp.</i>	Fruit stalks	for substitute silk cotton	-	whole year
<i>Sesbania sp.</i>	Leaves	for vegetables	-	whole year
<i>Eichornia sp.</i>	whole plant	food for ducks and pigs	-	whole year
<i>Boottia sp.</i>	buds	for vegetables	-	Dec-Jan

Other impacts - There was waterside washing and bathing place of the Wethigan Lake. And then the pilgrims who came to the pagodas have thrown away a lot of rubbish.

### Discussion

According to my field survey (August, 2002- May, 2003), 130 bird species have been recorded. Among these bird species, Ferruginous Duck *Aythya nyroca* is vulnerable and White-winged Duck *Cairina scutulata* is endangered specie and then White-throated Babbler *Turdoides gularis* and Hooded Treepie *Crypsirina cucullata* are endemic *Anser indicus* are migratory species. Many species of birds visit the wetland uncommonly or irregularly, and temporarily stay there.

Maximum diversity and abundance of birds occur during November to February, when Palearctic ducks and waders are dominant. Species were identified with only poor binoculars and field guides. Equipment is hard to standardise but could alter results. (e.g. a good telescope makes it possible to count more species than using poor binoculars). Besides, the birds in the study



area are wild; they are alarmed by a human approaching. So, it is not easy to photograph them.

A total of 128 plant species in the study area have been recorded. Among them, about 80 species are medicinal plants. During the study period, *Oryza* sp. was entirely absent in the lake. Because the species are one of the favourable kind of food for the water birds.

The original suggestion to notify the area as a sanctuary came from kanchaung Sayadaw, the head of the monastery situated adjacent to the lake. A number of ancient Pagodas are located in and around the lake.

The sanctuary consists of a small lake and surrounding marshland situated on a flat plain approximately oval in shape, with a simple shoreline featuring only minor bays and indentations and no permanent inflowing or out flowing streams; water is retained by a small bund at the north eastern corner. Formerly water depth appears to vary from about 2m during the monsoon to less than 0.6 m at the end of the dry season but in the recent year, permanent water depth is 2m in throughout the year. Because water levles have been monitored and, if necessary, some vegetation clearing undertaken to maintain open water habitat.

Dense stands of emergent vegetation (*Typha* sp) fringe the lakeshore. Large parts of the lake are completely covered by water lotus. Tall secondary scrub and scattered tall trees are found on those parts of the bank not taken over by cultivation or human habitation.

Many people live around the lakeshore, especially northern margin. These people fish the lake intensively, but this in itself conflicts with conservation only to the extent that it may reduce the amount of food available for fish-eating birds. A more serious problem is that people hunt birds and disturb their nest, and this is the main reason that bird populations apparently are below the carrying capacity of the habitat. Existing hunting laws need to be more strictly enforced, particularly in protected areas, through increased patrolling and removal of snares. In logged forest restrictions on hunting and trapping will have long-term economic benefits through the polination, seed dispersal and other ecological services provided by wildlife, many of which speed the recovery the degraded habitat.

### Recommendations

- (1) This Sanctuary is well planned and managed, but most lack the financial, technical and management capacity required for their protection. Given the rapid rate of deforestation in this sanctuary, there is an urgent need to preserve the integrity of the existing protected areas systems, and especially to prevent illegal logging and land clearance in this area.
- (2) Rice cultivation requires financial investment. It may be expected that some villagers, who have a family history for fishing or hunting, might be compelled to look to other activities in the future through which to sustain a living. It, therefore, would appeal to families who are poor, or have no alternative means of income generation.
- (3) Funding is needed to strengthen patrolling and enforcement, to finance participatory boundary demarcation in critical areas, to promote protected areas at local government level and among the local people. The donor community should place primary importance in preserving the integrity of the protected areas system in its lending and grant-making programmes.
- (4) Provide external experts and equipment where needed to support the promotion of training, information exchange and research.
- (5) Special management should be required for the water birds in the lake area; for example planting of wild rice (*Oryza* sp). Governmental departments responsible for habitat conservation in this area often suffer from a shortage of skills, funding and motivation. These issues need to be addressed through exchange programmes and training, supported by appropriate injections of funding.
- (6) The impact of hunting on birds is generally poorly understood, but this appears to be the principal threat to several threatened birds in this area. Protected areas need to be patrolled more effectively, to intercept hunters and remove snares, back up by firm enforcement of existing hunting law.
- (7) Finally, aquacultural development should be prohibited within existing protected areas. An education and awareness programme-managed by the Wildlife Conservation Division is needed to inform decision-making bodies and local communities about the importance of healthy wetland in maintaining water quality and preserving fish stocks.

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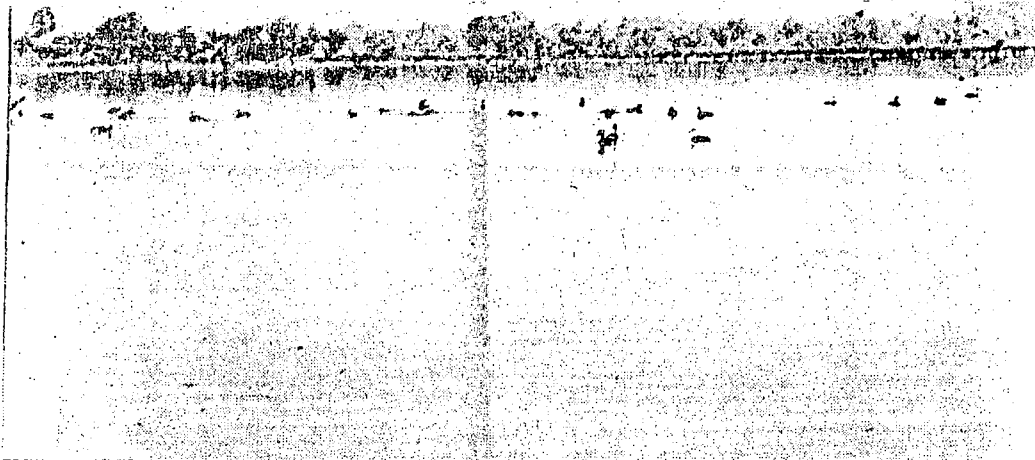
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Wethigan Wildlife Sanctuary



A flock of Lesser Whisting Duck (*Dendrocygna javanica*)



Nesting site and the Black headed Munia (*Lonchura malacca*)