

## **JOB PROGRESS REPORT RESEARCH PROJECT SEGMENT**

**STATE:** Territory of Guam

**PROJECT NO.:** W-1R-6  
**SUBPROJECT NO.:** W-3  
**STUDY NO.:** 1  
**JOB NO.:** 1

**JOB TITLE:** Population Size and Distribution of Wild Asiatic Water Buffalo on Guam

**PERIOD COVERED:** October 1, 1997 to September 30, 1998

### **SUMMARY**

Counts of feral water buffalo at Naval Ordnance Annex (NOA) showed no significant changes ( $P > 0.05$ ) in number of animals recorded per km during FY98. The buffalo population on the base has shown a general increasing trend since the late 1970s.

### **BACKGROUND**

Asiatic water buffalo (*Bubalus bubalis*) were introduced to Guam in the 1600s from the Philippines for use as beasts of burden (Wiles 1990). A population of about 2,000 water buffalo inhabited Guam prior to World War II. Many of these animals, known locally as carabao, were apparently let loose during the Japanese occupation, resulting in the creation of feral herds in the interior region of south central Guam. The Division of Aquatic and Wildlife Resources (DAWR) began conducting spotlight counts of carabao on Naval Ordnance Annex (formerly Naval Magazine) in 1966 in conjunction with Philippine deer (*Cervus mariannus*) surveys (Wiles 1990). DAWR staff recorded an average of 0.6-0.8 animals/km on NOA between 1966 and 1978 (Anderson 1980). Carabao numbers fluctuated thereafter, with a peak in 1996 when an average of 2.8 animals/km traveled was recorded (DAWR 1980-1997). Biosystems Analysis Inc. (1989) estimated the buffalo population on NOA to be 75-150 animals in 1987. More recently, 200-300 animals have been estimated to be present (Walker et al. 1996, Lujan and Wiles 1997). Illegal hunting has been a major cause of mortality in the population (Conry 1988), but expanded anti-poaching efforts on NOA by DAWR conservation officers and the Navy since the 1980s may be responsible for allowing the population to show steady growth. High buffalo densities have resulted in localized habitat damage on the base (Conry 1988, Biosystems Analysis Inc. 1989).

### **OBJECTIVES**

To monitor the status of the feral Asiatic water buffalo on Guam and to determine if control measures are necessary to maintain the population at a level compatible with the available resources.

### **PROCEDURES**

1. Conduct monthly spotlight counts on NOA. Analyze count data and compare with past data to estimate population trends.
2. Monitor carabao movements.

## RESULTS

### Spotlight Count Trends and Other Survey Results

Eight spotlight counts for water buffalo were made on NOA in FY98. The number of animals seen per kilometer showed no significant change (Mann-Whitney *U*-Test,  $U = 24.5$ ,  $P > 0.10$ ) from last year (Lujan and Wiles 1997), with an average of 2.3 animals/km seen this year (Table 1). A mean of 50.9 animals was recorded per count this year. The largest number of buffalo recorded on a monthly count decreased from 108 animals in FY97 to 92 animals in FY98.

Table 1. Results of monthly spotlight counts of feral water buffalo at Naval Ordnance Annex, FY98.

<b>Month</b>	No. animals observed	Km traveled	Animals/ km	Miles traveled	Animals/ mile
Oct	92	22.5	4.1	14.0	6.6
Dec	48	21.7	2.2	13.5	3.6
Feb	58	24.2	2.4	15.0	3.9
Apr	43	17.7	2.4	11.0	3.9
Jun	53	22.5	2.4	14.0	3.8
Jul	38	22.5	1.7	14.0	2.7
Aug	43	22.4	1.9	13.9	3.1
Sep	32	25.0	1.3	15.5	2.1
<b>Total</b>	407	178.5	-	110.9	-
<b>Ave</b>	50.9	22.3	2.3	13.9	3.7
<b>SD</b>	18.5	2.2	0.8	1.3	1.3

### Immunocontraception of Water Buffalo

Booster vaccinations were administered by Navy, U.S. Fish and Wildlife Service, and DAWR staff to 19 of the 24 females initially treated in FY97. Five females were not vaccinated because they were either not seen or an optimal shot did not present itself. Personnel experienced an abnormally high incidence of dart malfunction. Several animals were darted twice to ensure proper vaccination. A reduction in manpower in May combined with dart malfunctions led to a lengthy darting period (March-September). Monitoring of calving by treated females continued.

### Other Activities

Early-morning roadside sightings of carabao were reported from May to September in the Cotal, Canuon, and Laguina areas of Route 17. Witnesses noted herds of 4-10 animals grazing on the northern and southern sides of Route 17. Two auto-carabao collisions were reported in June. A "Carabao Crossing" sign was posted along Route 17 in July to decrease the potential for future automobile and carabao collisions. Investigations into the origin of these herds were started in late September.

## RECOMMENDATIONS

Continue spotlight counts on NOA. Collect data concerning the movements of these animals, especially along Route 17.

## **PROGRAM COST**

The estimated cost of the wild Asiatic water buffalo project under W-1R-6 is \$4,000.

## **LITERATURE CITED**

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