

JOB PROGRESS REPORT RESEARCH PROJECT SEGMENT

STATE: Territory of Guam

PROJECT NO.: W-1R-7
SUBPROJECT NO.: W-3
STUDY NO.: 1
JOB NO.: 1

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

PERIOD COVERED: October 1, 1998 to September 30, 1999

SUMMARY

Counts of feral water buffalo at Naval Ordnance Annex (NOA) showed no significant changes ($P > 0.10$) in the number of animals recorded per km during FY99.

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 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 1980-1998). 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 on NOA and adjacent lands along Routes 17 and 5.

3. Monitor calving by female carabao treated with the porcine zona pellucida (PZP) vaccine.

RESULTS

Spotlight Count Trends

Nine counts were made on NOA in FY99. The number of water buffalo seen per kilometer showed no change (Mann-Whitney *U*-Test, $U = 38$, $P > 0.10$) from last year, with an average of 2.3 animals/km seen this year (Table 1; DAWR 1998). A mean of 50.6 animals was recorded per count this year. The largest number of buffalo recorded on a monthly count decreased from 92 animals in FY98 to 76 animals in FY99.

Table 1. Results of monthly spotlight counts of feral water buffalo at Naval Ordnance Annex, FY99.

Month	No. animals observed	Km traveled	Animals/ km	Miles traveled	Animals/ mile
Oct	76	22.5	3.8	14.0	5.4
Nov	56	22.5	2.5	14.0	4.0
Jan	61	22.5	2.7	14.0	4.4
Feb	39	24.2	1.6	15.0	2.6
Apr	45	22.5	2.0	14.0	3.2
May	22	22.5	0.9	14.0	1.6
Jun	41	23.3	1.8	14.5	2.8
Jul	52	22.5	2.3	14.0	3.7
Aug	63	22.5	2.8	14.0	4.5
Total	455	-	20.4	-	35.2
Ave	50.6	22.8	2.3	14.2	3.6
SD	15.9	0.6	0.8	0.4	1.2

Immunocontraception of Water Buffalo

A survey of treated animals in March-April 1999 revealed that at least 4 females were nursing calves. Only 14 of the 19 treated females were located. After further investigation, it was concluded that 2 females were pregnant at the time of the initial inoculations. The remaining 2 females with calves were considered contraceptive failures. Therefore, the vaccine had an 85.7% success rate. Most species treated with this vaccine have had a 90% success rate of inhibiting pregnancy (J. Kirkpatrick, pers. comm.).

After consulting with J. Kirkpatrick, it was concluded that PZP vaccine could successfully be used as a long-term management tool to control water buffalo populations. Preliminary discussions with the Navy and U.S. Fish and Wildlife Service were held in September concerning the implementation of a long-term control plan. A plan should be finalized by FY00.

Other Activities

Early-morning roadside sightings of water buffalo on Route 17 in FY98 prompted an investigation into the movements of these animals in the area. One herd of 18-20 animals used the jeep trail on Firebreak 3 to travel back and forth between Group 14 on NOA and the Tarzan Falls area north of Route 17. Carabao dung and tracks indicated another herd was accessing Route 17 from Firebreak 4. Residents and farmers in the area are convinced that these animals venture off NOA through the firebreaks and continue to travel east along

Route 17. Interestingly, many felt that these movements only occur during the dry season. Further investigations must be conducted to corroborate these movements.

RECOMMENDATIONS

Continue spotlight counts on NOA. Collect data concerning the movements of these animals, especially along Routes 17 and 5.

PROGRAM COST

The estimated cost of the wild Asiatic water buffalo project under W-1 R-7 is \$4,000.

LITERATURE CITED

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