

**BROWN TREESNAKE CONTROL**

ANNUAL PROGRESS REPORT

For

GUAM POWER AUTHORITY

Fiscal Year 2005

prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE  
WILDLIFE SERVICES

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## **BACKGROUND**

The inadvertent introduction of the brown treesnake (BTS; *Boiga irregularis*) to the island of Guam has resulted in significant environmental and ecological damages. The BTS is responsible for the extirpation of most native birds and lizards on the island and has become an agricultural pest. In addition, the BTS has been implicated in hundreds of power outages throughout the island, resulting in millions of dollars in structural damage and lost revenue.

In response to concerns about continued snake-caused power outages on Guam, the Guam Power Authority (GPA) enlisted the services of the United States Department of Agriculture, Wildlife Services (WS) program to help reduce snake-related damages. Beginning in November 1998, WS initiated BTS removal efforts at seven GPA substations around Guam. The program became annually funded in February 1999. Control efforts were expanded in October 1999, October 2000, and October 2001. Beginning October 2003, WS added control efforts to the Marbo and Macheche facilities, bringing the total number of substations under contract to fifteen (see Table 1 for a complete list of substations under contract).

## **CURRENT CONTROL PROGRAM**

WS employs one full-time Wildlife Specialist, working 40 hours per week, to conduct control efforts at GPA substations. Oversight for the program is provided by a field supervisor working out of the WS office in Barrigada Heights. A wildlife biologist inputs and maintains snake capture data generated by the control program. Currently, 245 snake traps, which are activated 24 hours per day, seven days per week, are in use at the targeted substations. In addition to snake trapping, WS conducts nighttime spotlight searches at each substation, twice weekly.

## **CONTROL PROGRAM RESULTS**

Between October 1, 2004 and September 30, 2005, WS removed 710 BTS from the fifteen targeted substations. Since the inception of the program in 1998, WS has removed 5,223 snakes. Traps have accounted for approximately 74% (n =3,872) of the total snakes removed, while approximately 26% (n =1,351) were hand captured. Table 1 summarizes traps currently in use by WS and snake captures by method and substation.

Wildlife Services has been documenting the size of every snake captured since the start of this project. To date, snakes removed by trapping have averaged smaller than snakes removed by hand (1025 mm snout-vent length vs. 998 mm snout-vent length), a significant difference. When evaluated over time, the average size of all snakes captured appears to be declining. These combined control efforts are used to ensure all size classes of snakes are targeted by the control program, as different control methods may capture differing classes of snakes. This is important to program success, as smaller snakes may be more likely to cause power outages.

Table 1. Brown treesnake captures, reported by substation, by USDA, Wildlife Services.

Substation	# Traps	Snake Captures by Method			
		FY 2005		Total <sup>1</sup>	
		Traps	Hand	Traps	Hand
Airport	8	2	0	52	1
Apra Heights	14	19	8	166	47
Cabras/Piti <sup>2</sup>	23	16	11	174	86
Harmon	18	82	29	601	196
Macheche	12	11	9	21	11
Marbo	20	106	31	286	60
Mongmong	25	17	14	228	95
Orote	29	11	3	28	14
Talofofo	12	50	7	284	56
Tamuning	16	19	14	136	109
Tanguisson	20	65	29	755	293
Tenjo Vista	9	38	5	301	23
Yigo	28	37	5	243	87
Yona (Pulantat)	11	34	38	597	273
<b>Subtotals</b>	245	507	203	3872	1351
<b>Total snake removals</b>					<b>5223</b>

<sup>1</sup>Total snakes include all snakes removed by WS between 11/1/98 and 9/30/05

<sup>2</sup>Data for the Cabras and Piti substations has been pooled for this report

## RECOMMENDATIONS

### *1) Continue control at key substations that are integral to power generation and distribution*

Snake capture rates are highest at the Tanguisson, Talofofo, Tenjo Vista, Harmon, Marbo, and Yona substations. These stations are located near large blocks of forest where surrounding snake populations are high; snake densities surrounding these substations have likely not been significantly impacted by ongoing control efforts. As a result, snake captures will remain high in these areas for the foreseeable future, and snake-caused outages would likely increase if control efforts cease. Other substations that are further removed from large blocks of forest (such as Cabras or Tamuning) have lower snake capture rates; however, all substations tend to attract a variety of potential snake prey, including introduced birds and rats, which in turn may attract snakes. For this reason, some level of continuing control at each substation is advisable.

### *2) Consider the use of additional control measures to further exclude snakes*

The use of snake-proof barriers, a developing control technique, may have some applicability at several substations, especially those that are situated in areas with surrounding forest. Additionally, a BTS oral toxicant (acetaminophen) is now registered for general field use on Guam, and may incrementally improve control capabilities. Wildlife Services will discuss with

the potential addition of toxicants to the existing agreement with GPA.

*3) Consider activities to reduce the abundance of snake prey*

The presence of potential snake prey, especially introduced birds and rodents, may greatly increase the attractiveness of an individual substation to snakes. GPA should consider control of rats (*Rattus* spp.), Eurasian tree sparrows (*Passer montanus*), feral pigeons (*Columba livia*), and black drongos (*Dicrurus macrocercus*) from substations as part of the ongoing effort to reduce snake-caused outages.

*4) Document the reduction in snake-caused outages at the targeted substations*

Information provided by GPA indicates snake-caused outages are occurring infrequently at substations currently under contract with WS. However, this information does not provide any baseline data on outage rates prior to the inception of snake control. It would be beneficial for both GPA and WS to obtain outage information at the targeted substations prior to the initiation of the current control contract. Such information would allow a comparison of outage rates before and after the initiation of snake control. While not a scientific test of the efficacy of control efforts, GPA management could use this information to provide positive program feedback to the general public.

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