

**Raptor Nest Monitoring on the  
Los Banos Wildlife Area Complex, 2006-2007**



**Prepared By:** Matthew A. Schaap  
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**For additional copies, contact:** Resource Assessment Program  
Ca Department of Fish & Game  
18110 W. Henry Miller Rd.  
Los Banos, CA 93635  
Phone: (209) 826-0463  
Fax: (209) 826-1761

## Abstract

During the 2006 and 2007 breeding seasons raptor nests were monitored on the Los Banos Wildlife Area Complex and on nearby private lands in Merced County, California. The survey focused on the nesting success of three primary raptor species: Red-tailed Hawk (*Buteo jamaicensis*), Swainson's Hawk (*Buteo swainsoni*), and Great Horned Owl (*Bubo virginianus*). Nests of these species were monitored to determine breeding success and productivity on Department of Fish & Game lands. Extra attention was given to nesting Swainson's Hawks due its listing as a California threatened species. Monitoring of the Swainson's Hawk, as well as all nesting raptors, has occurred on the Los Banos Wildlife Area Complex since 2001. There were 59 monitored raptor nests in 2006 and 54 monitored raptor nests in 2007. Though there were similar numbers of Swainson's Hawk nests monitored, the nesting success was much higher in 2006 (59%) than in 2007 (39%). Climatic conditions early in the Swainson's Hawks' breeding season are suspected as the primary cause for the reduction in nesting success. It is indeterminable if nesting success is higher on the surrounding public land than on the Los Banos Wildlife Area Complex based on the collected data.

*Keywords:* Swainson's Hawk, Nests, Raptor, California, Productivity

## Introduction

Historically Swainson's Hawks were common breeders throughout California's San Joaquin Valley. As late as the 1900's Swainson's Hawk populations were estimated to be as high as 17,000 breeding pairs (CDFG 2000). With the drastic increase in the amount of agricultural land, increase in the use of pesticides, and the reduction in the amount of mature trees within riparian corridors the Swainson's Hawk population was drastically reduced (Bloom 1980). A survey conducted in the 1970's estimated the population to be at 110 breeding pairs throughout the entire Central Valley (Bloom 1980). With only small, isolated pockets of riparian corridors remaining, Swainson's Hawks have begun to use isolated trees along roads or mature trees in agricultural fields (Schmutz 1989).

The California Department of Fish and Game began monitoring raptor nests on the Los Banos Wildlife Area Complex in 2001. The goal of the study was to monitor nesting Swainson's Hawks, as well as other tree-nesting raptors that may compete for nesting locations. During the 2006 and 2007 breeding seasons, nests of four raptor species were monitored. These species included Red-shouldered Hawk (*Bueto lineatus*), Red-tailed Hawk, Swainson's Hawk, and Great Horned Owl. However the

primary focus of monitoring was the Red-tailed Hawk, Swainson's Hawk, and Great Horned Owl. To better determine the size of the local population of breeding Swainson's Hawks in Merced County, surveys were conducted on the Los Banos Wildlife Area Complex and nearby private lands in order to locate as many raptor nests as possible. Monitoring Red-tailed Hawk and Great Horned Owl nests will allow us to document nesting competition and to see how Swainson's Hawk nesting is influenced by other species of raptors.

## **Study Area**

The study was conducted on the Los Banos Wildlife Area Complex, which included the Los Banos Wildlife Area and Mud Slough Unit, the Volta Wildlife Area, and the O'Neill Forebay Wildlife Area, as well as surrounding private lands. This area is composed of scattered areas of managed wetlands and grasslands located within the Grasslands Ecological Area, Merced County, in the San Joaquin Valley of central California. The Los Banos Wildlife Area is comprised of approximately 5,600 acres of seasonal wetlands, California annual grasslands, mixed willow riparian habitat, and shrublands. Meandering through the wildlife area are Salt and Mud Sloughs. The Mud Slough Unit encompasses 600 acres of seasonal wetlands. The 3,900 acre Volta Wildlife Area is comprised of seasonal wetlands and is bisected by the Volta Wasteway. Located next to the O'Neill Forebay, with approximately 700 acres of riparian habitat and annual grasslands, is the O'Neill Forebay Wildlife Area. The predominant trees used by nesting raptors on the wildlife areas are mature Fremont Cottonwood (*Populus fremontii*) and Black Willow (*Salix nigra*) which are greater than 10 meters in height. The private property surrounding the wildlife areas surveyed included agricultural fields with single mature trees along the perimeter of the field.

## **Methods**

Nest searching for Great Horned Owls and Red-tailed Hawks began in late January of 2006 and 2007. As Swainson's Hawks arrived from wintering grounds, nest searching of this species began. Nest searching was conducted by driving down all accessible roads and levees on the Los Banos, Volta, Mud Slough, and O'Neill Forebay

Wildlife Areas. Public roads located in close proximity to the Los Banos Wildlife Area Complex were driven in order to locate Swainson's Hawk nests. Areas where birds were known to nest in previous years were also searched for any possible nesting activity. Once it was confirmed that a raptor pair was nesting, the nests were monitored once every one to two weeks until the final fate of each nest had been determined. In 2007, due to staffing limitations, Red-tailed Hawk and Great Horned Owl nests were not monitored after March, thus a final fate of all nests was not determined. Monitoring was done by using either a pair of binoculars or a spotting scope. The observer monitored the nests from a distance in order to reduce disturbance to the nest. When nesting was completed, the location of each raptor nest was marked with a GPS unit to compare the nest locations between years.

## **Results**

### Nest Distribution

In the 2006 breeding season a total of 58 raptor nests were monitored (Table 1). The most abundant raptor species nesting on the Los Banos Wildlife Area Complex were Red-tailed Hawks and Great Horned Owls. Swainson's Hawks were not as abundant, but were a common breeder on the complex. In 2007, a total of 54 nests were found on the Los Banos Wildlife Area Complex (Table 2). Once again the most abundant species of raptors nesting on the wildlife areas were Red-tailed Hawks and Great Horned Owls. The Swainson's Hawks remained a common breeder on the wildlife complex, though not as abundant as the Red-tailed Hawks and Great Horned Owls. One Red-shouldered Hawk nest was found during the 2006 breeding season, however none were observed nesting on the complex in 2007. The distribution of raptor nests appear to be uniformly dispersed across all of the wildlife areas (see Figures 1, 2, and 3). There does not appear to be a concentration of nests on any one particular area of the wildlife areas.

Table 1. Distribution of monitored raptor nests on the Los Banos Wildlife Area Complex and surrounding lands, 2006.

<b>Species</b>	<b>Los Banos</b>	<b>Mud Slough</b>	<b>Volta</b>	<b>O'Neill</b>	<b>Private</b>
Red-shouldered Hawk	0	0	0	1	–
Red-tailed Hawk	16	0	1	8	–
Swainson's Hawk	8	1	1	1	4
Great Horned Owl	16	0	2	2	–

Table 2. Distribution of monitored raptor nests on the Los Banos Wildlife Area Complex and surrounding lands, 2007.

<b>Species</b>	<b>Los Banos</b>	<b>Mud Slough</b>	<b>Volta</b>	<b>O'Neill</b>	<b>Private</b>
Red-tailed Hawk	13	1	2	7	–
Swainson's Hawk	8	1	1	3	1
Great Horned Owl	12	0	1	4	–

### Nest Productivity

A total of 25 Red-tailed Hawk nests were monitored during the 2006 breeding season. These had a success rate of 68% and fledged an average of 2.1 young per nest (Table 3). Twenty Great Horned Owl nests were monitored and had a success rate of 80% with an average of 2.2 fledglings per nest (Table 3). A total of 17 Swainson's Hawk nests were monitored on all areas combined during 2006, with a success rate of 59% and an average of 1.5 young fledged per nest (Table 4). Four of the 17 nests were located on nearby private lands with a success rate of 75% and an average of 2.0 young per nest fledged (Table 4). There were 13 Swainson's Hawk nests monitored on the Los Banos Wildlife Area Complex alone. These nests had a success rate of 54%, and fledged an average of 1.5 young per nest.

Table 3. Fates of raptor nests monitored on the Los Banos Wildlife Area Complex in 2006. The average number of young fledged for each species is in parentheses.

<b>Species</b>	<b>Fledged</b>	<b>Abandoned</b>	<b>Unknown</b>
Red-shouldered Hawk	1 (1.0)	0	0
Red-tailed Hawk	17 (2.1)	6	2
Great Horned Owl	16 (2.2)	1	3

During the 2007 breeding season, a total of 14 Swainson's Hawk nests were monitored. Only one nest was monitored on private land; this nest was unsuccessful and did not fledge any young (Table 4). On the Los Banos Wildlife Area Complex there

were a total of 13 monitored Swainson’s Hawk nests. These nests had a success rate of 38%, and fledged an average of 1.0 young per nest (Table 4).

Table 4. Swainson’s Hawk nest fates on the Los Banos Wildlife Area Complex and nearby private properties. The average number of young fledged for each species is in parentheses.

Species	2006			2007		
	Fledged	Abandoned	Unknown	Fledged	Abandoned	Unknown
LBWA Complex	7 (1.5)	3	3	5 (1.0)	7	1
Private Property	3 (2.0)	1	0	0	1	0

## Discussion

By monitoring nesting raptors in and around the Los Banos Wildlife Area Complex we noticed that the total number of raptor nests found in 2006 was similar to the number found in 2007. The collected data show that there was a higher concentration of Great Horned Owls and Red-tailed Hawks than of Swainson’s Hawks nesting on the wildlife areas. Though there seems to be competition between Red-tailed and Swainson’s Hawks for nesting areas, without directly monitoring interactions between the species we are unable to determine if competition was the greatest influencing factor. Recent studies on the competition between Swainson’s Hawks and Red-tailed Hawks suggest that Swainson’s Hawks will often be the aggressor toward Red-tailed Hawks because of a decrease in the amount of possible nesting habitat (Janes1994). In order to confirm these interactions in our area, and to determine if there are any other influences on nesting Swainson’s Hawks, additional monitoring would need to be done.

We were not able to accurately determine the nesting success of Great Horned Owls or Red-tailed Hawks for the 2007 breeding season, and thus cannot compare the productivity of these species between 2006 and 2007. This was due to a reduction in personnel in the middle of the 2007 season, which caused the focus of monitoring efforts on the Los Banos Wildlife Area Complex to be shifted solely to Swainson’s Hawks.

The Swainson’s Hawk data showed that there was a drastic decrease in the nesting success rate from 2006 to 2007. The reduced rate of nesting success on, and around, the Los Banos Wildlife Area Complex during the 2007 season was a result of a

combination of climatic conditions. In the early part of May there was a wind storm that passed through the area and destroyed, or partially destroyed, three nests. The wind, combined with drought-like conditions may have negatively influenced the breeding success and may have caused the birds to be more likely to abandon their nests. The number of Swainson's Hawk nests monitored showed little variation between 2006 and 2007, which would tend to indicate that the population is relatively stable. This data coincides well with work compiled by Smallwood (2003) in the western United States, in which he suggests that the populations of western Swainson's Hawks are stable, or increasing throughout much of its western range.

All of the Swainson's Hawk nests found on private properties were located in single large trees which were surrounded by agricultural fields. However, a majority of the nests on the Los Banos Wildlife Area Complex were located in trees which were in riparian corridors or in close proximity to agricultural and managed wetland fields. It has been found that cultivated fields are the preferred hunting areas compared to that of undisturbed grasslands (Schmutz 1989, Smallwood 1995). It is uncertain from our data whether nesting success was influenced by nesting location. More information on Swainson's Hawk nest site selection and habitat use is needed before any conclusions can be drawn.

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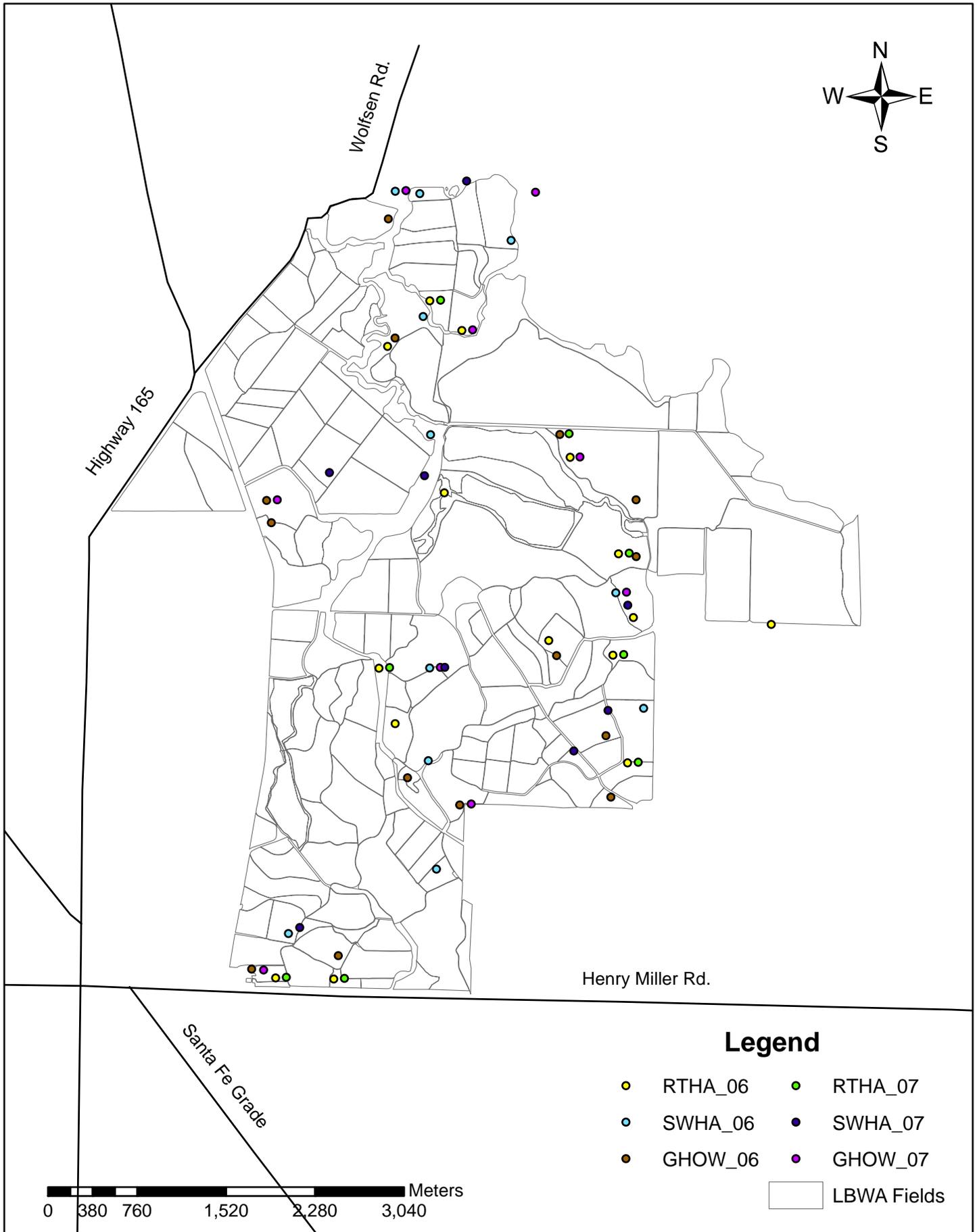


Figure 1. Raptor nest distribution on Los Banos Wildlife Area 2006-2007

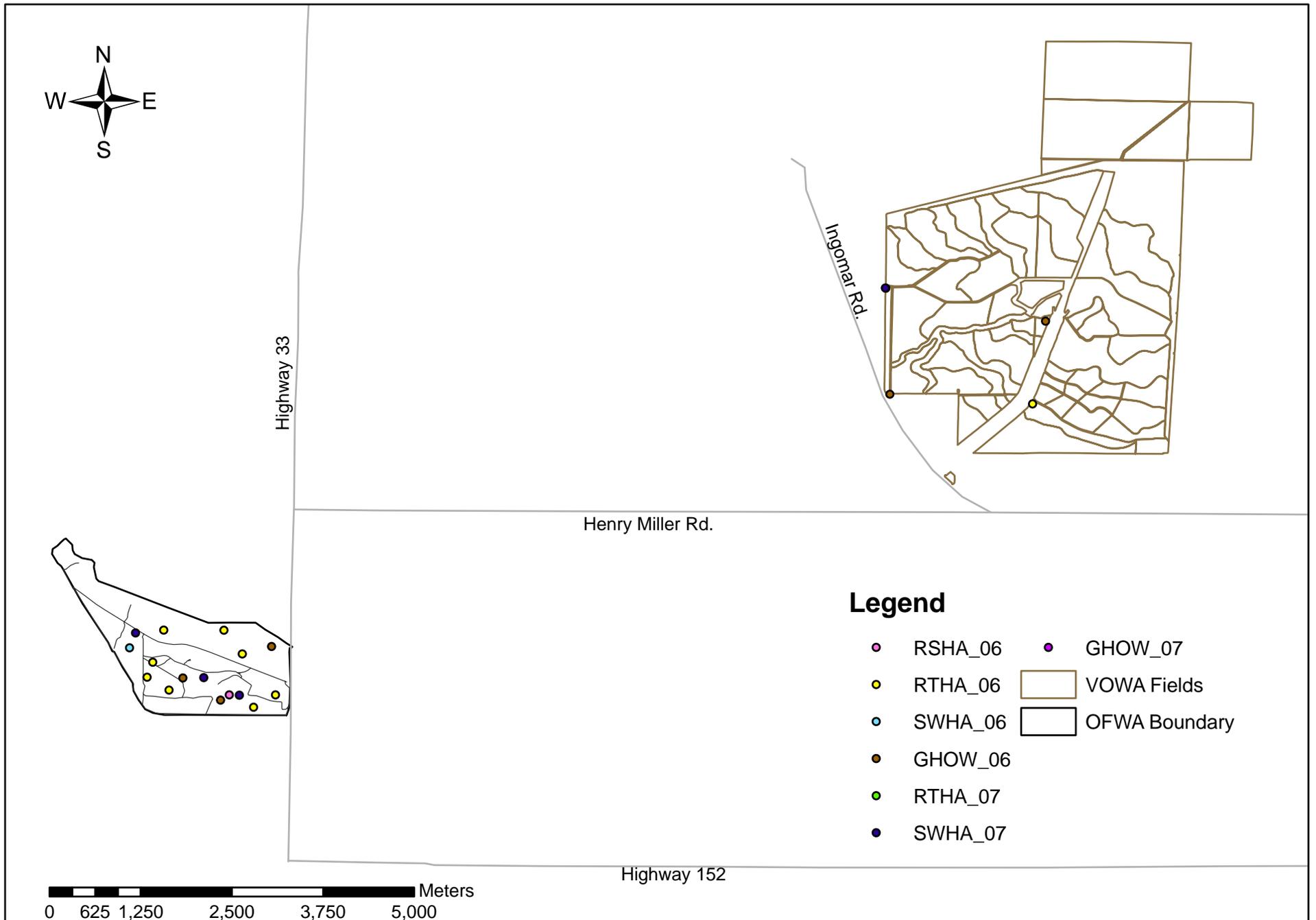


Figure 2. Raptor nest distribution on Volta Wildlife Area and O' Neill Forbay Wildlife Areas. 2006-2007

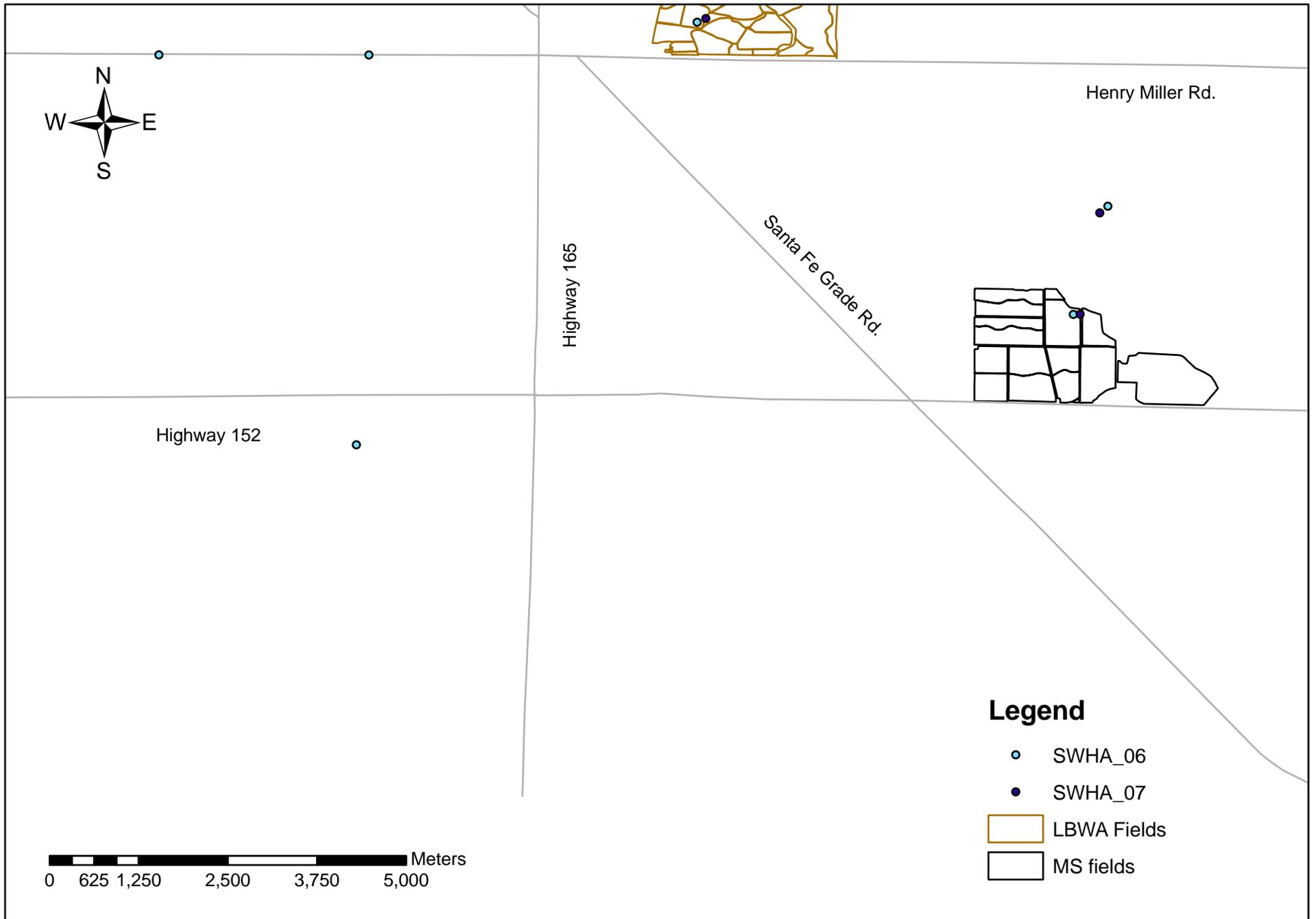


Figure 3. Raptor nest distribution on Mud Slough Wildlife Area and nearby Private properties. 2006-2007