

# **Progress Report for projects conducted on the Ouachita National Forest by Dr. Tim Patton, 2008 – 2010**

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**Abstract-** During the time period 2008 – 2010, I have been involved with two primary projects on the ONF, specifically, on Red Slough Wildlife Management Area (RSWMA), as follows: (1) assisting USFS and Oklahoma Department of Wildlife Conservation (ODWC) personnel with annual spotlight surveys for American alligators, and (2) conducting research on survival and movement of juvenile American alligators raised in captivity and released into the wild. Following is a brief description of objectives, methods, progress, and recommendations for each of these projects:

## **1. Spotlight Surveys for American Alligators**

### Objectives:

- a. Assist USFS and ODWC with annual spotlight surveys for alligators for the purpose of identifying trends in abundance and relative importance of each wetland unit, based on detection rates (catch per unit effort- CPUE)
- b. Provide recommendations on protocols used for alligator surveys
- c. Provide a ranking of importance among wetland units, based on frequency of use by alligators

### Methods:

Spotlight surveys have been conducted annually by personnel from the USFS, ODWC, and SOSU. Three surveys were conducted in 2004, and a single survey/year was conducted in 2005 – 2010. During all but 2004, surveys were conducted between April 26 and May 5. The 2004 survey was repeated over 3 nights between June 24 and July 22, a time during which visual surveys are greatly impeded by emergent vegetation. Further, the number of personnel used and the number of alligators detected during the 2004 was appreciably lower than that of subsequent years, so 2004 data are not used for this assessment and all subsequent discussion is based on 2005 – 2010 surveys.

Each survey effort included 10 – 13 personnel, all surveys began between 8:30 and 9:00 pm, and all but one ended between 11:30 pm and 1:00 am (the 2005 survey ended at 3:00 am). Mean effort/survey was 43 person-hours (range = 25 – 72). Each survey involved driving vehicles (trucks or ATV's) along the levees of wetland units throughout the WMA, and boating several of them, while one or more persons/vehicle searched for alligators with a spotlight (usually initially detected by eye-shine). Once an alligator was sighted, and effort was made to get as close as necessary to confirm it was an alligator and to estimate length. Location and estimated length were recorded.

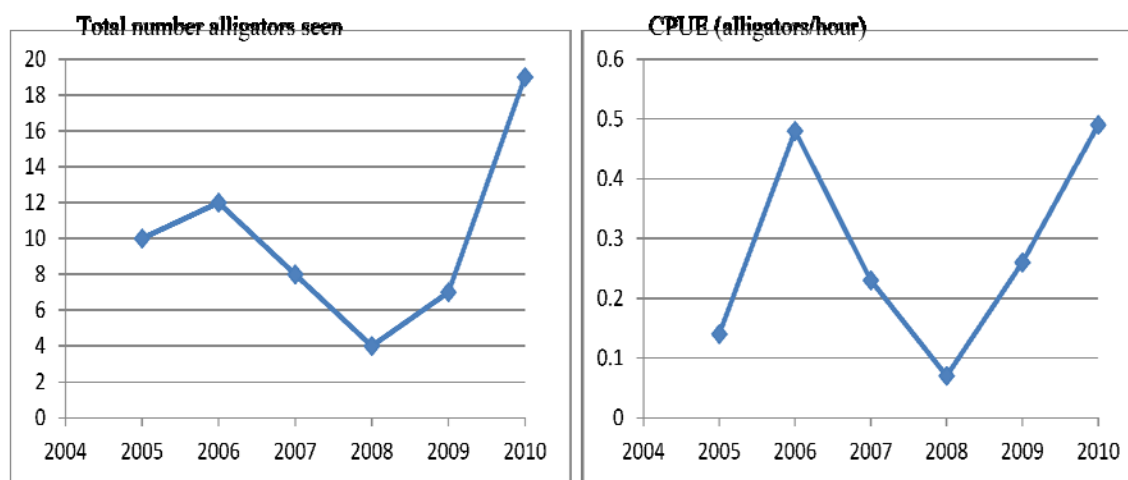
### Preliminary Results:

A total of 60 detections were made among all years combined. A total of 10 (range 4-19) alligators were seen each year (Table 1, Figure 1); this includes 0-8 juvenile (arbitrarily defined as those less than 4'), and 4-11 adults each year (Table 1). Mean catch per unit effort (CPUE) was 0.28 alligators/hour (range 0.7 – 0.49) (Table 1, Figure 1). Total number seen/year and CPUE both indicate that the detection rates vary widely, and peaks in detection occurred in 2006 and 2010 (Figure 1). It should be noted that a large number, and portion of the total, seen in 2010 was of juveniles (total = 19, juveniles = 8). Lows in total detections and CPUE occurred in 2005 and 2008 (Figure 1). During 2005, a substantially longer amount of time was spent searching (72 person-hours, compared to an average of 42 person-hours). This could account for the low CPUE in 2008, but not for the low number of total detections during the same year.

Table 1. Results of alligator spotlight surveys at red Slough WMA, 2005 - 2010

Year	Number of personnel	Number of hours	person-hours	Number of Juveniles (<4')	Number of Adults (≥4')	Total Number of Alligators	CPUE (#/hr)
2010	11	3.5	38.5	8	11	19	0.49
2009	11	2.5	27.5	0	7	7	0.25
2008	13	4.5	58.5	0	4	4	0.07
2007	10	3.5	35	2	6	8	0.23
2006	10	2.5	25	2	10	12	0.48
2005	12	6	72	1	9	10	0.14
<b>Total:</b>				13	47	60	
<b>Mean:</b>	11.2	3.75	42.75	2.2	7.8	10	0.28

Figure 1. Number of alligators seen (left) and CPUE (right)



**Recommendations:**

My results indicate the following: (1) detection rates are highly variable, (2) because detection rates are so variable, it is difficult to identify a trend in the population, (3) and very few juvenile alligators are detected. Because environmental conditions can vary widely and affect detection rates, I recommend that more than a single survey/year be conducted. I suggest that 3-4 surveys conducted between Mid-April – Early June, while alligators are active but before emergent vegetation impedes detection. With multiple surveys/year, detection of any population trends, if they occur, are more likely to be seen. That so few juvenile and small alligators are seen may indicate that reproduction is limited. I recommend conducting research that addresses reproduction, recruitment, and other metrics important to understanding the dynamics of this population. This is especially important given the results of our work with survival of released one-year-old alligators during 2009-2010. Radio tracking of these individuals indicated that winter mortality of juveniles is very high (see next section of this report). Also notable is the importance of Ward Lake. Of the 60 total detections, 22 (37%) were in Ward Lake; of the 13 total juveniles detected, 8 (62%) were in Ward Lake. It should be noted that much of Ward Lake is on private property, and these data suggest that Ward Lake is an important habitat.

## 2. Survival and movement of juvenile American Alligators

### Objectives:

- a. Raise a clutch of orphaned alligators in captivity, to be released at RSWMA
- b. Use radio telemetry to track released juvenile alligators for the purpose of monitoring survival and movement.

### Methods:

In 2008, a clutch of 20 alligators at RSWMA stopped receiving visits/guarding by the mother, and it was assumed that she abandoned the nest or died. Upon hatching (as detected by audible yelps), the hatchlings were removed from the nest by USFS personnel and transferred to SOSU. At SOSU, they were raised in captivity for 1-2 years, and eventually released back at RSWMA. One alligator was died in captivity, and another was provided to the Durant State Fish Hatchery to be used for their educational program. In September 2009 and June 2010, we released 9 and 8 alligators, respectively, all affixed with radio transmitters. Locations of each alligator were obtained monthly, and, upon locating, we noted the GPS coordinates, habitat features, and condition of the alligator if it was seen or captured (including mortality).

### Preliminary Results:

During the first year of monitoring, all 9 alligators were alive from the time of release (September 2009) until winter. A single individual died in December, 4 died in January, and by April, only 2 remained alive (Table 2). Among these, we found the transmitter from one in June, and we believe it became detached. The second year of monitoring started in June 2010, so we are only three months into this effort at this time. Among these, one appears to have lost a transmitter, and the remaining 7 are all alive (Table 2). We have not yet begun to analyze movement data, but movement among the different wetland units on RSWMA appears to be common during warm months.

Table 2. Survival of captive-reared alligators after release back into the wild at RSWMA, as per results of monthly radio tracking efforts.

Date	Alive	Dead (cumulative)	Unknown (found transmitter only)
<b>Year 1 (first 9 individuals released, 1 year old)</b>			
Sep-09	9	0	0
Oct-09	9	0	0
Nov-09	9	0	0
Dec-09	8	1	0
Jan-10	4	5	0
Feb-10	4	5	0
Mar-10	3	6	0
Apr-10	2	7	0
May-10	2	7	0
Jun-10	1	7	1
<b>Year 2 (8 individuals released, almost 2 years old, plus remaining individual from previous year)</b>			
Jun-10	9	7	1
Jul-10	9	7	1
Aug-10	7	7	3

### Recommendations:

Given the uncertainty of the size of the population of alligators at RSWMA (see section 1 of this report), and the high level of winter mortality seen in this study, I strongly believe additional research on reproduction, recruitment, and other population dynamics parameters is needed. Regardless of any desire to see this population smaller, larger, or remain the same, additional data on population dynamics and structure is needed to make management decisions.