

- Speake, D. W., L. H. Barwick, H. O. Hillestad, and W. Stickney. 1969. Some characteristics of an expanding turkey population. Proc. Annu. Conf. Southeastern Assoc. Game and Fish Commissioners. 23:46-58.
- Wheeler, R. J., Jr. 1948. The wild turkey in Alabama. Ala. Dept. Conservation, Montgomery. 92 pp.
- Williams, L. E., Jr. 1966. Capturing wild turkeys with alpha-chloralose. J. Wildl. Mgmt. 30(1):50-56.
- _____, and D. H. Austin. 1970. Complete post-juvenal (Pre-basic) primary molt in Florida turkeys. J. Wildl. Mgmt. 34(1):231-233.
- _____, _____, N. F. Eichholz, T. E. Peoples, and R. W. Phillips. 1969 (1968). A Study of nesting turkeys in southern Florida. Proc. Annu. Conf. Southeastern Assoc. Game and Fish Commissioners. 22:16-30.
- _____, _____, T. E. Peoples, and R. W. Phillips. 1972. Capturing turkeys with oral drugs. In G. C. Sanderson and Helen C. Schultz, [Editors], Proc. Natl. Wild Turkey Symposium 2. (In press.)
- _____, _____, _____, and _____. 1972. Observations on movement, behavior, and development of turkey broods. In G. C. Sanderson and Helen C. Schultz, [Editors], Proc. Natl. Wild Turkey Symposium 2. (In press.)

PROPAGATION OF THE AMERICAN ALLIGATOR IN CAPTIVITY

By TED JOANEN

*Louisiana Wild Life and Fisheries Commission
Grand Chenier, Louisiana*

and

LARRY McNEASE

*Louisiana Wild Life and Fisheries Commission
Grand Chenier, Louisiana*

ABSTRACT

Wild caught, captive alligators (*Alligator mississippiensis*) over a seven-year period exhibited a successful nesting rate of 48 percent in six pens maintained on Rockefeller Refuge. Hatching success in pens (56 percent) closely correlated the 58 percent determined for wild alligators inhabiting natural marsh.

Pen construction methods, stocking rates, and maintenance techniques were implemented to simulate natural marsh conditions, thereby encouraging breeding and contributing to the well being of the alligators.

Diseases posed no problem during this investigation although fighting did cause some concern during the early stages of the study.

Courtship activities, nest construction techniques and maternal duties following egg laying were highly variable among the various alligators under study. Also, courtship behavior was highly ritualized.

Behavior of pen reared alligators as compared to wild captured adult alligators were compared. Stocking rates were found to differ greatly. Pen reared adult animals could be maintained in much closer confinement and under less stress when compared to wild captured adults.

INTRODUCTION

Alligators have been kept in captivity throughout Louisiana for many years. However, only on rare occasions do they reproduce under captive conditions. As alligators are easily maintained in captivity and fairly disease free, in the past they were sold by the thousands in Louisiana as pets. Also, alligator hunters would capture young alligators at a nest site and return home to confine them to some type of make shift pen under the pretense of starting an "alligator farm".

Many of the alligators in captivity in Louisiana today (10 licensed alligator farms) originated from either of these two methods and rarely if ever produce any offspring. The majority of the captive alligators were held in very unnatural conditions which were not conducive to reproduction.

The pens were usually too small for the number of alligators maintained, poorly fed, and rarely cleaned. Under these conditions fighting usually resulted causing mutilation and in some cases death. Malnutrition, and bacterial infections were common ailments encountered under such poor maintenance conditions.

With the decline in the wild population in the mid-1950's and early 1960's, interest turned to alligator farming as a possible source of hides which would augment the rapidly declining wild population. When the alligator season was closed in 1963, more and more people turned to the Louisiana Wild Life and Fisheries Commission for information concerning the propagation of alligators in captivity.

As a result of these inquiries, a study was initiated on Rockefeller Refuge in 1964 in order to investigate the possibilities of raising alligators in captivity. The objectives were:

- (1) To develop proper methods of maintaining alligators under captive conditions; such as stocking rates, pen sizes, and feeding rates.
- (2) To relate propagation techniques to reproductive success.
- (3) To study behavior, particularly reproductive oriented activities, of alligators under penned conditions.
- (4) To determine problems, especially diseases and ailments, which effect the well being of the breeding stock.

METHODS AND MATERIALS

Pen Design

Construction was begun in 1964 on five one-fourth acre pens (Figure 1). Pens were designed so as to maintain a 70 percent water: 30 percent land ratio. The pens were constructed by digging a rectangular shaped pond, approximately 7-8 feet deep, with a small island (15-foot diameter) in the center of the water area. Spoil from the pond was used to construct the 16-foot crowned levee.

Actual construction of pens consisted of fencing in 8 feet of the levee, the 15 foot berm and pond with 2" x 4" x 6' welded wire. A two foot poultry wire retainer was added at the top of the fence and angled in slightly to prevent the alligators from escaping. Heavy creosoted boards (1" thick by 6" wide) were installed flush with the ground to serve as an anchoring point for the fencing and also for an added degree of strength. As these pens were constructed in the marsh proper and were subjected to periodic flooding, the portion of the levee on the outside of the pen was used as an access road.

Vegetation was allowed to invade the pens naturally, providing cover, nesting material, and shade. This vegetation consisted primarily of buckbrush, *Baccharis halimifolia*; cutgrass, *Zizaniopsis* sp.; bullwhip, *Scirpus californicus*; broomsedge, *Andropoga* sp.; various annual plants; wiregrass, *Spartina patens*; and *Pluchea purpurascens*. At the onset of this study, vegetation was sparse in the newly constructed pens and several bales of hay were placed in each pen in order to provide nesting material. This hay was loosely placed near each newly constructed nest site just prior to egg laying.

An additional 1.54 acre pen was constructed in 1967, using the same techniques of levee and pond construction as for the one-fourth acre pens (Figure 2). This pen provided a 40 percent water: 60 percent land ratio.

Stocking Rates

One eleven-foot bull and a seven-foot female were stocked into the 1½ acre pen in 1967. These alligators were raised in captivity from hatchlings by a private individual. (He related that several nesting attempts were made but due to his small pen and shallow water no

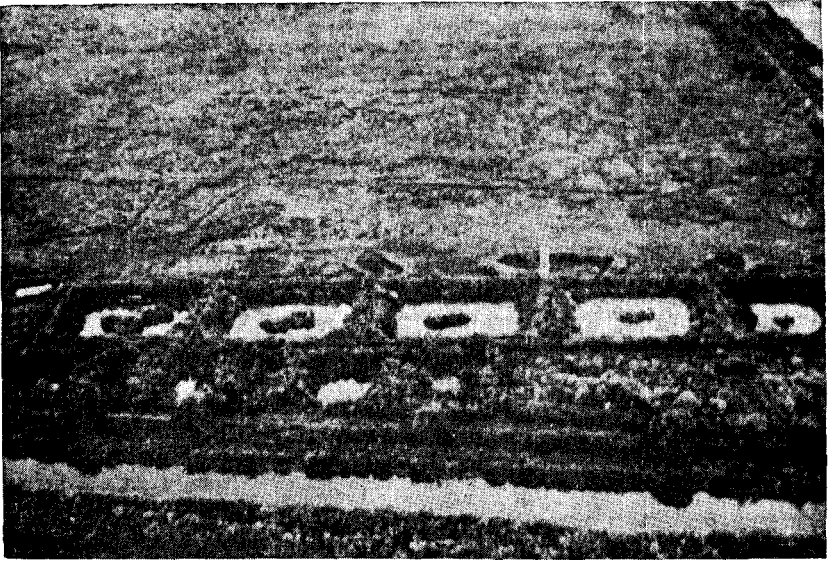


FIGURE 1. Five, $\frac{1}{4}$ acre breeding pens. Note that considerably more pond area than land area was available in these enclosures.

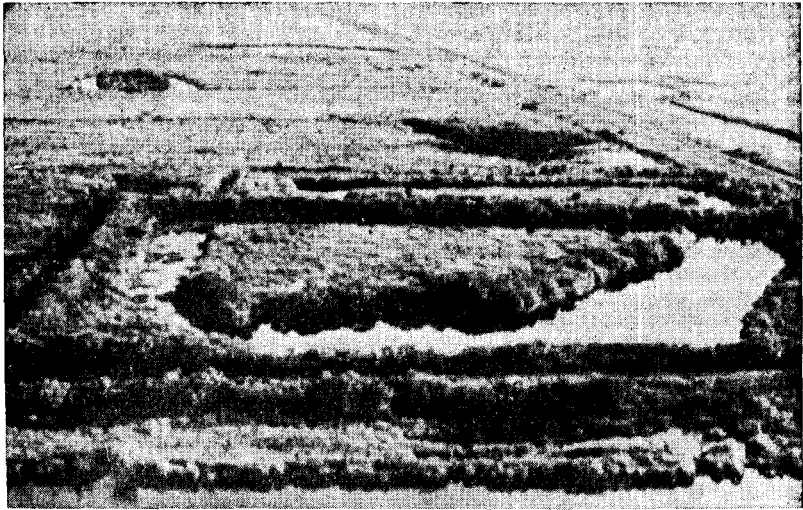


FIGURE 2. 1.54 acre alligator breeding pen. Note that size of vegetated area exceeded water area.

young were produced.) As these alligators grew larger, maintenance became a problem and they were later donated to the refuge in the summer of 1960. Another wild caught seven-foot female was introduced into this pen in the spring of 1967.

Stocking rates for the five one-fourth acre pens are presented in Table I.

TABLE 1. Alligators held in experimental nesting pens, Rockefeller Refuge, 1964-1971.

Pen Number	Pen Size (Acres)	MALES				FEMALES			
		Size (Inches)	Weight (Pounds)	Date Captured	Location Captured	Size (Inches)	Weight (Pounds)	Date Captured	Location Captured
1 and 2	¼	*72	...	5- 1-65	x	84	100	6-15-64	o
		*78	...	5-15-65	x
		120	270	5-20-65	x
3	¼	101	183	6-27-67	o	80	77	6-15-67	x
						**78½	66	6-15-67	x
						**73	59	6-15-67	x
						**85	102	10-11-67	xx
4	¼	114	240	6-27-67	o	95	123	6-16-67	x
						**93	117	6-16-67	x
5	¼	111	230	5- 5-67	o	75	65	5- 5-67	xx
		Lake 14	1½	132	4-67	o	84	100	4-67
						84	100	5-67	xx

* Killed by female.

** Stocking rates maintained for a very brief period; fighting eventually resulted in death of females, and escape from the pens until a stocking ratio of one male to one female was achieved.

x Wild captured at nest site.

o Pen reared.

xx Wild captured—non-proven nesters.

Two pens were stocked at the rate of one male to one female, one pen received one male and two females, and one very happy male was stocked with four females. However, these stocking rates with multiple females were maintained only briefly as fighting and escape from the pens resulted eventually in a stocking ratio of 1 male: 1 female in all five pens.

The majority of the females used in the one-fourth acre pens were proven nesters, having been either captured from the wild or after having made nesting attempts in the display pens at the refuge headquarters site. The bulls were either caught or pen reared animals; however, none were proven breeders prior to the initiation of this study.

No efforts were made to remove the small alligators from the pens of successful nesters each year.

Feeding Methods and Rations

During the first two years of this investigation only two adults were fed at any one time, so obtaining food for them didn't pose any problem. Fresh road killed nutria (*Myocastor coypus*), rabbits (*Sylvilagus aquaticus*), opossums (*Didelphis virginiana*), and raccoons (*Procyon lotor*), along with freshly caught fish and fish remnants were fed.

Beef livers, hearts, lungs, and spleens (20¢ per pound) from a commercial beef packing house made up the main food items from 1965 through 1969. Nuisance red-winged blackbirds (*Agelaius phoeniceus*) were trapped and fed as a food supplement.

Beginning in the spring of 1970 through the present time a 50 percent mixture of croaker mix (travel remnant fish at 3½¢ per pound) to 50 percent beef liver was fed twice weekly (Table II).

TABLE 2. Percent of occurrence by species of croaker mix used as alligator feed, Rockefeller Refuge, 1970-71.

Fish Feed	Percent of Occurrence
Sciaenidae	
<i>Micropogon undulatus</i> (Atlantic Croaker)	80
<i>Leiostomus xanthurus</i> (Spot)	4
<i>Bairdiella chrysura</i> (Silver Perch)	2
<i>Cynoscion arenarius</i> (Sand Seatrout)	2
<i>Menticirrhus americanus</i> (Southern Kingfish)	2
Polynemidae	
<i>Polydactylus octonemus</i> (Atlantic Threadfin)	7
Stromateidae	
<i>Poronotus triacanthus</i> (Butterfish)	2
Trichiuridae	
<i>Trichiurus lepturus</i> (Atlantic Cutlassfish)	Tr.*
Clupeidae	
<i>Brevoortia patronus</i> (Largemouth Menhaden)	Tr.
Carangidae	
<i>Chloroscombrus chrysurus</i> (Bumper)	Tr.
Ephippidae	
<i>Chaetodipterus faber</i> (Atlantic Spadefish)	Tr.
Engraulidae	
<i>Anchoa sp.</i> (Anchovy)	Tr.
Lutjanidae	
<i>Lutjanus synagris</i> (Lane Snapper)	Tr.

* Trace—less than 1 percent.

Feeding was initiated in March of each year and terminated in late October. However, special winter feeding trials were conducted over a two-year period during this study. These feeding trials involved alligators ranging in size from three to eleven feet long.

DISCUSSION OF RESULTS

Behavior and Courtship

One of the most striking changes in general behavioral patterns observed during this investigation was the extreme aggressiveness demonstrated by 3 out of 5 of the big males under study. This was brought about by their dependence upon man for their up keep and also their state of semi-domestication. This contrasts sharply with the timid nature (regarding humans), of large alligators in the wild. Aggressive behavior was demonstrated by only one female and this occurred solely during the incubation period in years when she nested.

The aggressiveness, in the males, was a progressive thing, with the degree of aggressiveness being directly related to the length of time in captivity.

The majority of the alligators' activities, excluding reproductive oriented duties, consisted of denning, sunning, loafing and feeding. A considerable portion of their time was invested in den preparation, involving enlargement and actually living in the den sites. This was done primarily in the late summer and early fall.

Denning posed problems in several of the pens. The continuous digging done primarily by the bulls caused numerous cave-ins in the levee system. These dens at times were excavated to some 20-25 feet into the levee bank. The inside of the den would usually begin caving in, causing the roof of the cave to collapse.

When this occurred in the levee surrounding the pens it was quickly patched preventing any escape. However, denning on the levees between the ponds were not as easily detected and this resulted in several exchanges by bulls from one pen to the other.

In order to prevent this digging, artificial shade was provided by constructing an 8' x 12' shed at the base of the levee and extending it out over the water in each pond. The alligators used these sheds to some extent; however, it did not eliminate tunneling completely.

The majority of the females were extremely timid and were rarely seen except during the courtship and nesting periods. From early June on through winter dormancy the females' activities were practically 100 percent centered around the den site.

Basking was a common occurrence during the spring and fall when air temperature was suitable. Also, during the summer sunning was occasionally practiced during the early morning and late evening hours when air temperatures were cool.

The activities of the male and female in Pen 1 and 2 where they were free to move to either pen were particularly interesting. Generally, from mid-April through mid-May the alligators were seen together, although there was considerable shifting between pens. From mid-May until early June the female tended to settle down and remain in one pen. Also, during this time the male devoted a considerable amount of his intentions to the female as this period occupied the apex of the courting and breeding period. Once the female started nest construction (early June), the male generally segregated himself from the female to go about his leisurely way of living.

Each year's hatch was allowed to remain in their respective pens. They generally spent their first two years in the pond around the nest site. After two years, the majority of the young tended to move out into the natural marsh, going out of the enclosures through small mammal trails under the fencing. We are unable at present to determine if cannibalism was exhibited by the parents.

Courtship activities played an extremely strong and dramatic role in the life of these animals—it seemed as if the entire year's activities revolved about this small but most important segment of the alligator's life history.

Bellowing, by far the most demonstrative activity associated with courtship, occurred with the most frequency from mid to late April (depending upon late winter and spring temperatures) through early June. Bellowing tended to peak out in late May.

Bellowing was most generally heard during the first two hours after sunrise, with the actual periods of bellowing occupying about a 10-minute interval within this period. Vocal displays were heard quite often at night but not with the regularity and definitive timing as the early morning displays. Sporadic bellowing was occasionally heard during the day during the breeding season and infrequently during the non-breeding season; however, this was the exception rather than the rule.

The positions of the alligators during the process of bellowing appeared to be the same for all of the ones observed. The following notes were made on a 10-foot bull bellowing in the display pens at the headquarters site at Rockefeller Refuge.

Step No. 1—The alligator swam with its head above water and its body and tail beneath the surface for several minutes.

Step No. 2—The head and anterior portion of the body became inflated and he continued swimming in this fashion.

Step No. 3—The body inflated with air, a portion of the tail was arched, with the tip of the tail remaining in the water. Movement at this time began to slow down.

Step No. 4—The alligator's head remained flat on the surface of the water with the body partially submerged and filled with air. Approximately 50 to 60 percent of the tail rose above the surface of the water and moved freely from side to side.

Step No. 5—During the process of bellowing, the alligator raised his head to a 30 to 40 degree angle with the surface of the water, the body still remained submerged and the tail arched. At times the tip of the tail may touch the surface or go beneath the surface of the water. This position was held for the entire bellowing period and was commonly observed when bellowing was done in deep water. In shallow water it was observed that the head and at times half the body would come out of the water while raising up on the front legs with each bellow. It was observed that the mouth was partially opened during this bellowing period. It seems as though air was forced through the nostrils and through the partially opened mouth. Water was thrown outward from the throat region apparently by the "vibrations of the throat muscles". After the bellowing had ceased, the alligator resumed the position described in Step No. 1.

There was a noticeable difference in the sound made by the male and female. This was especially noticeable in Pens 1 and 2 where the breeders were occasionally separated when bellowing occurred. The males' bellow was much more bass and vocal than that of the female. The female was much higher pitched with not nearly so much percussion. The bellowing position was found to be the same for both sexes.

The height of the courtship period (mid-May through early June) was when we observed the greatest amount of movement in the pens, the most frequent attempts to either break in or out of the enclosures, and the attraction of wild alligators to the pens. Also, the only time any appreciable attempts for individuals to exchange pen positions was during courtship.

All documented breakins thus far have resulted in death to the intruder. The two recorded breakins have involved the intrusion of a smaller bull into the domain of a larger male.

Tracking around the levees was most evident during the courtship period and for about a week to 10 days preceding the initiation of nest construction. It was quite commonplace to see 2-inch diameter *Baccharis* bushes broken down by alligators during their movements, especially during the courtship period.

The acceptance of a mate by a particular female seems most important in the pen rearing of wild caught adult alligators. On one occasion a seven-foot female killed two bulls which evidently were not acceptable to her before a wild 10-foot, 270 pound male was caught and introduced into her pen. Copulation took place approximately 20 minutes after this bull was released. On several occasions this female and particular bull

were heard calling to one another although they were separated by a fence 200 yards distance from her pen.

A female initially stocked in Pen 3 with an 8½ foot male refused to nest for three consecutive years. At the beginning of her fourth year of confinement the bull in her pen and the bull from the adjacent pen exchanged positions and she accepted this new bull and presently has produced a nest for two consecutive years.

Fighting proved to be much more detrimental to the well being of the alligators than did diseases or any of the other common ailments of alligators. Four wild caught females were either killed or fled the one-fourth acre pens (they are quite adapt at climbing the fencing) where more than one female was initially stocked. Two males were killed by larger bulls and another ten foot male would have surely been destroyed by an eleven footer if personnel conducting this study had not separated them and returned them to their respective pens. Two males were killed by a female before she finally accepted a large male that was captured and placed in her pen.

Pen reared females were found to be much more compatible as compared to the wild captured adult females during the courtship period. Territorialism was found to be almost completely eliminated. This was demonstrated at a private alligator farm owned by the Kliebert Brothers located near Ponchatoula, Louisiana. Their pen measured approximately four acres in size and was constructed similar to the 1½ acre pen described earlier in this report.

Approximately 150-170 adult alligators were maintained in this four-acre pen. It was interesting to note that all alligators in this pen were approximately of the same age and size class. The bulls were in the 8'-9" size class and females were approximately 6'-7" long. Nesting activities for the past two years produced in the neighborhood of 60 good nests each year. However, several nests were destroyed by the females due to the crowded conditions. Nests were as close as 2-3 feet apart and nesting material was at a minimum. Several nests were torn apart by other females in their search for nesting material. Also, several nests were used as sunning platforms by a neighboring female and also by the bulls. However, the total lack of combat among bulls, and the absence of territorial displays by the females to other females were quite obvious.

Copulation was witnessed on several occasions during this investigation. The actual dates of this response varied slightly from year to year depending upon temperatures experienced preceding the breeding season. Generally speaking, the heaviest courting occurred between the third week in May and the first week of June.

Unpublished reproductive physiological data collected on Rockefeller Refuge indicated that in 1969 ovulation in the bulk of the wild population occurred between May 29th and the first few days of June. This data lends credibility to our field data involving copulation.

The majority of courtship and copulation was observed just after sunrise. However, on several occasions copulation was witnessed during midday. To what extent nocturnal courtship and copulation takes place remains unknown. However, it was determined in this study that all of the activities centering around nest selection, nest construction, and egg laying took place at night.

Observations involving courtship and copulation were as follows:

Activities of the male and female were much accelerated; vigorous swimming about the pond, especially by the male, and quite often with the tail arched out of the water. Ritualistic biting of the water by the male was observed only on a few occasions. Bellowing by both sexes usually follows. Again both were found to engage in vigorous swimming; here the male may enter the bellowing position; that is head up and tail arched. Body contact was observed with the male swimming up to the female and both touching heads together and at times he was observed to softly touch or rub the neck region, shoulder, and side of the female. The female at this time usually swam out to deep water closely

pursued by the male. The male would then overtake her from behind riding up and over her body. The male appeared to wrap his tail under the female's tail remaining in this position for approximately 3-4 minutes, while slowly treading water. They then submerge in this position, surface in approximately 2-3 minutes with the male and female being separated. After a 2-3 minute separation, copulation was repeated. Copulation has been observed as many as three times in succession. A time of approximately 45 minutes elapsed from the beginning of precopulatory displays to the end of the first copulation.

Nest Construction, Incubation, and Hatching

The types of materials used in nest construction and maternal duties following egg laying were highly variable among the various alligators under study. Individual alligators were also found to vary their nest construction techniques from year to year.

There was a noticeable increase in activity along the pond levees in the week to 10 days preceding the onset of nest construction. Occasionally false nests or decoy nests were begun before the female settled down to constructing the nest in which she deposited the eggs.

The bulk of the nesting activity for captive animals closely correlated that determined for alligators inhabiting natural marsh, primarily June 12 through June 30, directly relating to temperature (Joanen, 1969).

The overall successful nesting rate totaled 48 percent for the period 1964 through 1970. Hatching success under captive conditions (56%) closely correlated the 58 percent determined by Joanen (1969) for wild alligators inhabiting natural marsh. The incubation period (67.3 days) and clutch size (36.6) likewise approximated that reported by Joanen (1969) for a wild population.

The majority of the nesters used natural vegetation for nesting material. This consisted of bullwhip, wiregrass, broomsedge, cutgrass, various annual plants, artificially furnished hay, and amounts of soil. One female, except for her last nesting effort, consistently on four successive years built her nests of soil. The incubation period of the soil constructed nests extended up to 91 days. The hatching rate was also lower presumably as a result of the extended incubation period.

One female out of six actively defended her nest and she did this religiously from the time eggs were deposited until they hatched. The other females under study made periodic visits to the nest but none ever attempted to drive us away from their nest site.

Each female under study showed a cyclic trend in their nesting efforts. Individuals will be discussed below, according to their pen number, in order to bring this out.

Pen 5—Female nested for five consecutive years (1967 through 1971).

Pen 1—Nested in three-year intervals, skipping 1967 and 1971.

Pen 3—First nested in 1970 when she accepted bull which moved into her pen from an adjacent pen.

Pen 4—Nested only in 1968.

Gator A—Lake 14—Nested only in 1968.

Gator B—Lake 14—Nested every other year.

Nest predation was nil for all of the nests followed during this investigation.

Feeding and Diets

The methods used in feeding the animals was very important. During the early stages of this study, feed was put directly into the water. However, some of the food would sink and inadvertently be lost. Also, if all of the available food was not eaten, it led to unsanitary conditions in the water.

The animals were fed twice weekly on Tuesdays and Fridays, preferably in the cool early morning hours. A feeding rate of 7 to 8 percent per week of the body weight was adhered to during the periods of the summer when the most food was consumed. Feeding rates during the

fall and early spring were adjusted below this figure so that food would not be wasted.

The method used in feeding was to establish a pattern of feeding stations throughout the pens, usually on a gently sloping bank near the animal's well (Chabreck, 1967). When using this method, uneaten food could be cleared away the following day. Also, food consumption could be accurately determined and feeding rates adjusted accordingly.

The growth rates of three males (8-9' size class) and two females (6-7' size class) were checked after a year and three months in captivity. The males averaged a gain of 28 pounds in body weight and 1¼ inches in total length. The average gain in total length for the females was ¾ inch with a 9 pound increase in body weight.

Winter feeding trials conducted over a two-year period indicated that no feeding occurred when the water temperature was 60° F. or less or when the air temperature was 54° F. or below. Large alligators (6' through 11' size classes) refused food from mid-October through the end of February. Smaller alligators (3', 4', and 5' size classes) fed actively later than did the larger ones, and also fed periodically through the period of partial hibernation providing the water temperature was above 60° F. All the alligators began actively feeding again with the warmer temperatures recorded in early March. Pooley (1971) also noted young crocodiles will refuse food when air and water temperatures fall below 60° F. (15.6° C.).

Recommendations for Pen Design and Maintenance of Brood Stock

As a result of this investigation it has been determined that alligators can be propagated under captive conditions; however, careful considerations must be given to (a) source of the alligators (wild captured or pen reared), (b) size and shape of the pens, (c) stocking rates. The need for a reliable freshwater source cannot be over emphasized. If a ready supply is unavailable the installation of a water well should be considered. Also, a means of removing excess water should be incorporated into the original pen design.

In earlier studies it was determined that the majority of the courtship and copulation takes place in open water. Then at the onset of nest construction the females tend to seek out secluded wells in the marsh proper (Joanen and McNease, 1970). In order to encourage pen nesting in wild captured alligators, pens which provide at least 30' or 40' x 20' of open water for each pair of alligators with isolated dens separated from this open water area should be considered. However, it was found that pen reared semi-domesticated animals do not require this degree of spacing.

The multiple stocking of wild captured animals should be held to a minimum, with no more than four females and two males per acre of pen. Some fighting will probably occur, even at this low stocking rate. Also, the task of record keeping for pens with low stocking rates is not nearly so complex as in pens with high population densities.

Adult males were easily checked for the presence of live semen during the month of May. This was done by inserting the tip of a solid glass stirring rod into the groove of the penis and moving it down the entire length of the organ. The fluid from the stirring rod was then smeared on a microscope slide. The presence of sperm cells were easily detected under a microscope using 300X magnification. If nesting was not obtained, it was our experience that the problems were with the females rather than the males being infertile.

Vegetation was found to be an important facet in the selection of a nesting site. In this study, pens were allowed to grow up in natural vegetation which appeared adequate and fulfilled the cover requirements.

Several different types of wire fencing were used in this study. The most efficient and practical wire used was the 2" x 4" x 6' and 1" x 2" x 6' welded wire. Field fencing was used on several pens; however, alligators were found to climb and push through this type fence very easily, even with the 24" poultry netting installed at 90° angles on the

top of the fences. In order to prevent escape at the bottom of the fence, 1" x 6" x 16' boards were installed along the base of the entire fence line. No problems were encountered during this study with alligators trying to escape from under the fence.

Fencing should be installed no closer than 30' to the nearest water area. An all weather access road should be provided. This was found to be essential in the daily observations and maintenance of the pens and alligators. Also, a system of walkways to each water area should be made. This would allow a more efficient method of feeding and also record keeping. A light application of Bromacil weed killer, a soil sterilant, was effective in eliminating perennial grasses and most annual and perennial weeds and providing ready access in all pens. In some cases trails were kept open with a mowing machine and by hand cutting.

A supply of fresh food should be available at all times. In some cases this would involve a large freezer unit, depending on the availability of the supply and the number of alligators on hand. Several dried dog food supplements were tried; however, this resulted in only limited success. It was found that young alligators could be trained to take a floating catfish pellet or dog food pellet as a supplement when other feeds were unavailable. Both the catfish and dog pellets are high in protein and make excellent food substitutes. However, these feeds may be cost prohibitive for a steady diet.

SUMMARY AND CONCLUSION

A study was conducted on Rockefeller Refuge from 1964 through 1971 to gather information on the factors associated with alligators nesting under captive conditions. Various facets of the alligator's life history were studied such as courtship, copulation, vocalization, and territorialism. As a result of this investigation it was determined alligators can be propagated under captive conditions; however, careful consideration must be given to the source of the alligators (wild or pen reared), size and shape of the pens, source of water supply, size and depth of water holes, and stocking rates. Also, methods of feeding and diets were described. A feeding rate of 7-8 percent of the body weight was fed to each alligator on a weekly basis. Feeding was done twice weekly and all unused food was removed from the feeding sites on the day following feeding. Nesting and hatching success in pens closely correlated that determined for wild alligators in previous studies.

ACKNOWLEDGMENTS

The writers gratefully acknowledge the valuable assistance of Mr. Howard Dupuie and Mr. Robert Faulk in gathering portions of the data included in this report and also for their care and maintenance of the alligators under study.

We would like to extend our appreciation to the field crew on Rockefeller Refuge for their assistance in the construction of the ponds and fences.

SELECTED BIBLIOGRAPHY

- Chabreck, Robert H. 1967. Alligator farming hints. La. Wild life and Fisheries Comm. 21 pp.
- Joanen, Ted. 1969. Nesting ecology of alligators in Louisiana. Proc. S. E. Assoc. Game and Fish Comm. 23:141-151.
- Joanen, Ted and Larry McNease. 1970. A telemetric study of nesting female alligators on Rockefeller Refuge, Louisiana. Proc. 24th Ann. Conf. S. E. Assoc. of Game and Fish Comm. (In print).
- Pooley, A. C. 1971. Conservation of the Nile crocodile (*Crocodylus niloticus*). Natal Parks, Game and Fish Preservation Board. 29 pp.