A Study of the Nesting Behavior of the Red-bellied Turtle (*Pseudemys rubriventris*)

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A Technical Report of the Jug Bay Wetlands Sanctuary, Lothian, Maryland

Abstract:
The nesting behavior of the female Red-bellied turtle *(Pseudemys rubriventris rubriventris)* was documented through direct observation of the nesting act on the grounds of the Jug Bay Wetlands Sanctuary in Lothian, Maryland (Latitude 38° 46'; Longitude 76° 42') throughout the summer of 2001. The sanctuary is a freshwater tidal wetland park along the Patuxent River, which has been frequented by female Red-bellied turtles each nesting season for many years. Bushnell® binoculars were used as observational tools in the field. All behavioral traits were recorded with both the time, and duration for which the behavior was observed. A comparison between the observed behavior and behavior of related turtle species documented by other scientists was made to show that the characteristics displayed by the Red-bellied turtle throughout the act of nesting were similar to other related turtle species.

Introduction:
The Red-bellied turtle, *(Pseudemys rubriventris rubriventris)*, is a large, freshwater turtle with a reddish plastron, elongated carapace, olive to black colored skin with yellow stripes, and large webbed hind feet (Ernst, Lovich, and Barbour et. al, 1994). These turtles spend the majority of their time in the waters of lakes, ponds, fast streams and creeks, and slow murky rivers (Carr, 1952). Red-bellies can be seen basking on various logs and rocks in close proximity to the water but are very easily disturbed by human presence (Ernst et. al, 1994). These turtles are rarely seen on dry land, and usually it is only the females who are seen since they must come ashore to nest (Carr, 1952). The nesting season is from late May to early July each year with the majority of nesting occurring throughout the month of June (Ernst et. al, 1994).
It is observing these turtles out of the water that is a special treat, and since the grounds of the Jug Bay Wetlands Sanctuary have been frequented by nesting females for many years, it was a perfect study area (Swarth, 1998). The freshwater tidal wetlands of the sanctuary provide a uniquely rich and diverse area for both animals and plants to live. The bay's location on the Patuxent River allows the Red-bellied turtles to live close to the river channel, yet still have the opportunity to use shallower water along the bay to feed and bask.
It is proposed by David Ehrenfeld (1979) that turtles exhibit four phases of nesting behavior. In stage one, the turtle prepares its nesting site by scraping the soil in the area with its forelimbs or by creating a body pit which allows the turtle to become closer to the ground. Ehrenfeld has observed that only some species of turtles actually exhibit this stage of behavior into their nesting. In stage two the egg cavity is excavated by the hind feet, and in stage three the eggs are deposited into the freshly dug cavity. The fourth and final stage of nesting is the back-filling of the nest cavity. In this phase the turtle uses its hind feet to pull the soil back into the egg filled cavity, and then compacts the soil into a hard plug on top of the nest.
Since turtles lay their eggs in the ground and then abandon the nest site, a few researchers think that parental investment of the turtle is in the selection of the proper nesting site (Ehrenfeld, 1979 and Gotte, 1982). It is true that the placement of the nest can effect whether or not the clutch is successful in reaching hatchling maturity and the sex ratio of the hatchlings. However the actual methods of excavation by the adult turtle and placement of eggs in the nest also plays a large role in the success of the nest hatchlings (Wilhoft, Hotaling, and Franks, 1983).
My project was carried out as part of an on going research project conducted on turtle populations at the Jug Bay Wetlands Sanctuary (Swarth, 1998). Many papers have been published addressing nest site selection issues in various turtle species, however the nesting behavior of the Red-bellied turtle has never been formally studied. Whether or not the common nesting behavior of other aquatic species also applies to the Red-bellied turtle, has yet to be documented. My study aims to accomplish that task.

Study Site and Methods:

All of the nesting females I studied were nesting in agricultural fields, warm season grass habitat management fields, and a two acre organic garden. These areas are located in the southern part of the Sanctuary grounds. The land there is bordered by the tidal Patuxent River. The soil in this area is of a sandy gravel mixture (Kuff, 1976) which is thought to be preferred by many species of turtle for its moisture holding capacity, compactability, and other properties (Gotte, 1982).

When a Red-bellied turtle was sighted on dry land, I followed and watched the turtle, its' movements, and nesting behavior. I observed from a safe distance away with the aid of Bushnell® (7x) binoculars to not disturb the natural behavioral patterns of the turtle. The turtle movements were timed and each different movement observed was described in detail next to its time duration notation.

When nesting was complete, the turtle was brought into the lab to obtain turtle weight, plastron length, carapace length, carapace width, and maximum height measurements. The turtle was assigned and given a notch code for future identification (if it did not already have one) and then returned to its nesting site for release.

I excavated each nest by hand to determine exact position of the egg cavity. The eggs were never removed or repositioned. The soil was dug just to the level of the top egg to confirm actual nesting and then the nest was resealed. The precise site of the egg cavity was marked and a nest enclosure box measuring 82cm in length, 80cm in width, and 18cm in height was placed upon the nest to deter predation. (For information on turtle nest predation see Capps, 2001) The enclosure boxes are wooden boxes with a screened lid which still allow environmental elements into the nest, but keeps possible predators away from the nest (Pictures 1&2). These nest boxes also allows the collection of the Red-bellied hatchlings when they emerge from the nests. Data collected from emergent hatchlings is part of an on going research project conducted by Chris Swarth and Elaine Friebele. Their study aims to gather a history on each Red-bellied adult female turtle, her nesting microhabitat, the weather factors affecting the nests, and the size and weight of her emergent hatchlings.

The behavior of each nesting female was compared among all Red-bellied turtles observed, and then compared with related turtle species.

The straight-line distance from the nesting site to the river was measured with a 100 meter long surveying tape to determine the minimum distance the turtle may have traveled to the nesting site. This was done for the Red-bellied nests I observed and the other known Red-bellied nests of the season for a larger comparison group.

Results:

No previously marked turtles were sighted nesting on the sanctuary grounds this summer. All turtles observed were unmarked but were assigned notch codes and serial numbers before their release. The nesting sites for the summer of 2001 can be seen on Figure 1.

The total nesting time of each turtle for this season and for last season were recorded and compared graphically on Chart 1. The times ranged from 63-91 minutes with an average of 73 minutes.

The total straight-line distance from this seasons nests to the river was measured and compared graphically on Chart 2. It was found that the turtles traveled anywhere from 65 meters to 276 meters to their nesting sites. The average distance traveled was 147.5 meters.

The individual turtle nesting behavioral field notes can be found in Appendices A-D. A summary of the accounts follows.

It was observed that the Red-bellied turtle occasionally scratched the surface of the ground with her forefeet as she was searching for a nesting site. This action, observed in two different turtles, caused soil to fly up from the ground and scatter over a wide radius, including the back of the

turtle shell. The head was usually lowered to the ground for a few second and then the turtle either continued to search, or settled down to excavate a nest.

All Red-bellied turtles observed used their hind legs for excavating the nest cavity. The females used their front legs as stabilizers and shifted their weight from left front foot to right front foot, as she used her opposite hind foot to dig the hole. The carapace of the turtle was seen moving back and forth as the hind legs were alternately used for digging.

When the excavation was complete, a large amount of soil had piled up behind the turtle. The egg laying process was then begun which could be seen by the observer as a "push-up" behavioral display. The turtle became still and then all four legs lifted up the body for a few moments, and then was set back down on the ground. This was done five to six times. The dropping of the eggs into the cavity was observed in one turtle, although the actual number of eggs deposited was not able to be determined.

After a few moments, the turtle began back filling the nest. She moved her hind feet out behind her, reached as far out from the body as they could, cupped the toes into a small scoop, and pulled the piled up soil from behind her, towards the hole. The entire body of the turtle moved and rotated in a half circle motion as the female moved all of the soil in towards the hole.

As there became less and less soil to move towards the hole, compaction of the soil became necessary. There were two observed methods used to accomplish this task. One was the "lift and fall" method, and the other was the "punching bag" method.

Lift and Fall Method:

With the lift and fall method, the turtle lifted its body high up on all four legs, and then dropped down upon the nest with force. This differed from the pushup nesting action (previously described) because the support of the legs was immediately taken away, whereas during the nesting pushup, the support of the legs was taken away gradually, actually allowing the body to slowly lower to the ground. The main soil compacting tool associated with this lift and fall behavior is the plastron combined with the turtles' body weight. Turtles were observed lifting and falling three to four times before stopping to pull more soil onto the nest cavity. The turtles then proceeded to lift and fall three to four more times to compact the new soil.

Punching Bag Method:

The punching bag method is different still. The hind legs of the turtle were used as compaction tools, while the front legs provide stabilization. Each foot was pounded repeatedly on top of the loose soil in an alternate fashion, like one would do with fists into a punching bag. The movement of the shell was a bobbing action similar to that of a plate spinning on a floor.

One turtle was observed using strictly the punching bag method, and another turtle used only the lift and fall method. Other turtles were observed using a combination of both methods when compacting the soil.

When the back filling of the nest was complete, some turtles were observed to move immediately from the nesting site towards the nearest water body when finished, while others were content to sit and rest a few minutes before getting on their way.

Discussion:

Turtle nesting phases were first described by David Ehrenfeld (1979). He divides the nesting act into four distinct phases: (1) preparation of the nest site, (2) excavation of the nest cavity, (3) oviposition, and (4) filling in the nest cavity.

Stage 1: Nest Site Preparation

All turtles observed nesting at the Sanctuary displayed each of the four nesting phases. Preparation of a body pit or of the digging site by scraping the surface of the soil in the area has been observed in various marine, aquatic, and terrestrial turtles, but is usually not done by most turtles (Kuchling, 1993).

It is thought by some researchers (Cagle, 1937 and Kuchling, 1993) feet scraping is a nest site selection process that allows the turtle to determine whether or not the soil is suitable for digging. Some instances of forelimb digging have been documented in the Yellow Mud Turtle, *Kinosternon flavencens*, (Iverson, 1990), the Eastern Mud Turtle, *Kinosternon subrubrum subrubrum* (Richmond, 1945), and the Amazon Turtle, *Podocnemis expansa* (Alho and Padua, 1981), as nest preparing activity, which allows the turtles to become closer to the ground level. I do think that with the Red-bellied turtles the forelimb digging is a nest preparation activity in which testing the soil takes place to see if it is a suitable area in which to dig. I also think that they may be using their nose to smell the soil, or using the underside of their chin to feel the soil since turtles were observed putting their heads to the ground after scraping the topsoil off of an area. Whether or not they can actually feel the grain size through their skin or get a sense of temperature from the soil is unknown.

Stage 2: Nest Cavity Excavation

It has been well documented that most aquatic turtles; the Western Painted Turtle, *Chrysemys picta bellii* (Legler, 1954), the Yellow Mud Turtle, *Kinosternon flavencens*, (Iverson, 1990), the Eastern Mud Turtle, *Kinosternon subrubrum subrubrum* (Richmond, 1945), and the Slider Turtle, *Pseudemys troostii* (Cagle, 1937) use their hind legs for excavating the nest cavity. There is the unusual documentation of the *Pseudemydura umbrina,* the Western Swamp Tortoise of Australia, using her forelimbs to excavate the entire nest cavity (Kuchling, 1993). But the turtles observed in this study support the findings of most nesting turtles, the actual excavation of the nest cavity was done entirely by the hind feet.

The nest cavity is characteristically the shape of a flask, narrow at the top and becoming gradually wider towards the bottom (Ernst et. al, 1994). The cavity is usually about 10cm deep and 10cm wide at its widest point (Ernst et. al, 1994). The top portion of the cavity is excavated using alternating half circle movements, which remove small portions of soil with each scrape (Ehrenfeld, 1979). The lower portion of the cavity is hollowed out with alternating scooping movements of the hind feet. The right hind foot hollows out the right side of the cavity while the left foot is used to enlarge the left side (Ehrenfeld, 1979).

Stage 3: Oviposition

After the nest cavity has been excavated, the eggs are laid. Eggs of the Red-bellied turtle are elliptical in shape, smooth, white shelled, 24-37mm in length, 19-24mm in width, and vary in weight and size dependant upon the size of the laying female (Ernst et. al, 1994). The usual clutch size for Red-bellied turtles is 4-18 eggs (Swarth, personal observation.).

It is thought by some researchers that at this stage the female become oblivious to any disturbance going on around her and is completely focused upon laying eggs (Ehrenfeld, 1979). Nothing is thought to be able to disturb the female during this time. Some researchers have tried running towards the turtle, hitting the carapace and head of the turtle with a stick, and various other scare tactics (Ehrenfeld, 1979). The author does not agree with any of these scare tactics and thus did not attempt to encroach upon the nesting turtles.

The topic of parental investment does come up when one considers this oblivion to disturbing stimulants. Considering its placement within the nesting stages it seems to suggest that there is an investment in succession and protection of her gene pool (Ehrenfeld, 1979). The female is able to leave her nest excavation at anytime throughout its developmental stages, but once the eggs are placed into the cavity, her duty is bound to that spot until the eggs are safely covered and disguised.

In observations of the Yellow Mud Turtle, *Kinosternon flavescens*, we find the only evidence of turtle parental investment. The turtle begins digging down into the soil using her forelimbs to push the soil away. After she has reached a sufficient depth she turns around so that her head is just sticking above ground level. At this point her eggs are laid beneath her and she remains in

that position, over her clutch of eggs, for at least 38 days (Iverson, 1990). There is no evidence that suggests that the mother turtles' presence close to the nest increases the survival of her clutch, but it draws a question as to why she would stay on the nest for such a long period of time despite her own nutritional needs (Iverson, 1990).

Another phenomenon associated with egg laying is the process of depositing the eggs into the cavity. It has been observed that all sea turtles and some painted and slider turtles use their hind feet to break the fall of the egg into the cavity, or use their foot to rearrange the egg placement within the cavity (Ehrenfeld, 1979, Cagle, 1937 and Legler, 1954). A species that has been observed on the grounds of the sanctuary using its hind feet to place the egg into the excavated cavity, is *Malaclemys terrapin,* the Diamondback Terrapin (Sage, 2001). Although the eggs were observed dropping into the cavity in one Red-bellied nesting account, it is indeterminable whether or not the turtle used its' hind legs to place eggs into the nest cavity. It was not possible to be close enough to the turtle to observe this act.

Stage 4: Back Filling the Nest Cavity

Sometimes the nest cavities of turtles aren't covered over at all. Some Eastern Mud Turtles, *Kinosternon subrubrum subrubrum*, crawl out of the cavities they have laid their eggs in and simply walk away leaving a large disturbed area of soil (Richmond, 1945). In the Eastern Musk Turtle, *Sternotherus odoratus*, a very small effort is put into creating a nest (Cagle, 1937). The turtle pays little attention to where eggs are laid and even less attention to concealing the nest location (Cagle, 1937).

The hind legs are used to bring excavated soil back towards the nest cavity (Ehrenfeld, 1979). This is done by fully extending the hind legs from the body and using the hind feet to drag the soil into the hole (Legler, 1954). There are some accounts of Western Painted turtles starting to fill with the soil closest to the cavity and working their way out to the soil furthest away (Mahmoud, 1968), but this was not observed to be true of the Red-bellied turtles. There was no observed preference in which soil filled the cavity first.

As the filled in soil began to mound over the egg cavity, compaction was used by the turtle to allow the rest of the dirt to fill the hole. Most turtles use their plastron as the compacting device by raising itself up on all four legs and then dropping itself down upon the nest site (Ehrenfeld, 1979). The weight of the body dropping repeatedly upon the soil, compacts it tightly into the hole. The plastron is also used to smooth out the nesting site and conceal the actual location of the nest cavity (Ehrenfeld, 1979).

Another method observed in the Western Painted Turtle, *Chrysemys picta bellii*, was the use of the hind feet to tamp down the soil pushed into the nest (Mahmoud, 1968). This is done using the stabilization of the forefeet as a pivot to rotate the outstretched hind feet in an alternating pattern over the nest cavity (Mahmoud, 1968). The nails of the hind feet were upturned to provide a flat surface for tamping, and the carapace was also used in conjunction with the tamping for compression of the soil (Mahmoud, 1968).

The diamondback terrapin uses a similar technique involving the hind feet for soil compaction. However instead of outstretching the toes to provide a flat surface, the terrapin constricts her toes into small fists and alternately uses her fisted feet to tamp the nesting soil down (Sage, 2001). For the Red-bellied turtles it seems to be a toss up as to which method to use. One turtle was observed using the hind feet to compact its nest, while two others were observed using their plastrons. Another turtle was situated in a way that made it impossible to view the method by which it was compacting the nest. The deviation in an instinctive behavioral pattern is odd and suggests possible stylistic preference by some turtles to complete the same task in different ways. However it may also be a combination of both techniques to accomplish the task of filling in the nest as has been observed in the slider turtle (Cagle, 1950).

Duration of Nesting Act

The process of digging a nest, its duration, depth, and length depends entirely upon the female involved since she cannot dig the nest cavity deeper than her hind legs can reach (Legler, 1954). The amount of time it takes to start and complete a Red-bellied turtle nest was found to range from 63-91 minutes, with an average of 73 minutes (Chart 1). When comparing the average time of Red-bellied turtle nesting to the average time it takes for the painted turtle, *Chrysemys picta marginata*, (85 minutes: Christens and Bider, 1987), the slider turtle, *Pseudemys scripta troostii*, (106.5 minutes: Cagle, 1950), and the swamp tortoise *P. umbrina*, (207 minutes: Kuchling, 1993), we find that the Red-bellied turtle nested faster than the other turtles. This could be due to the fact that the Red-bellied turtle is larger than the other turtles (Ernst et. al, 1994) and may be able to complete the task of nesting faster than the smaller turtles. Another possibility could be that the Red-bellied turtles are faster because of their skittish nature (Ernst et. al, 1994) and hurry through the task to make it back to the water as soon as the can.

Distance From Nest Site to Water

It was found that the straight-line distance from the various nests laid throughout the summer varies from 65-277 meters. The mean straight line distance traveled by the turtles is 147.5 meters, but having watched many of the females search for a nest site, I know that the actual distance that they travel is much greater than what was measured (Chart 2).

The Western Painted Turtle travels anywhere from 21-47.7 meters from the water to nest (Legler, 1954). The average distance traveled was 35.89 meters which is a bit less than the distance traveled by the Red-bellied turtle however it is mentioned that there were other turtles within Legler's study that traveled 229 meters and even 459 meters to a suitable nest site (Legler, 1954). Cagle (1950) documents some *P. scripta troostii* slider turtles traveled 53.34 meters up a bluff from the water and then another 367meters to a suitable nesting site, a total of 420 meters.

Summary:

The Red-bellied turtle does not exhibit any behavior that has not been documented in other nesting turtle species. The duration of nesting and the distance the turtle traveled to the nesting site varies within the species and among related turtle species.

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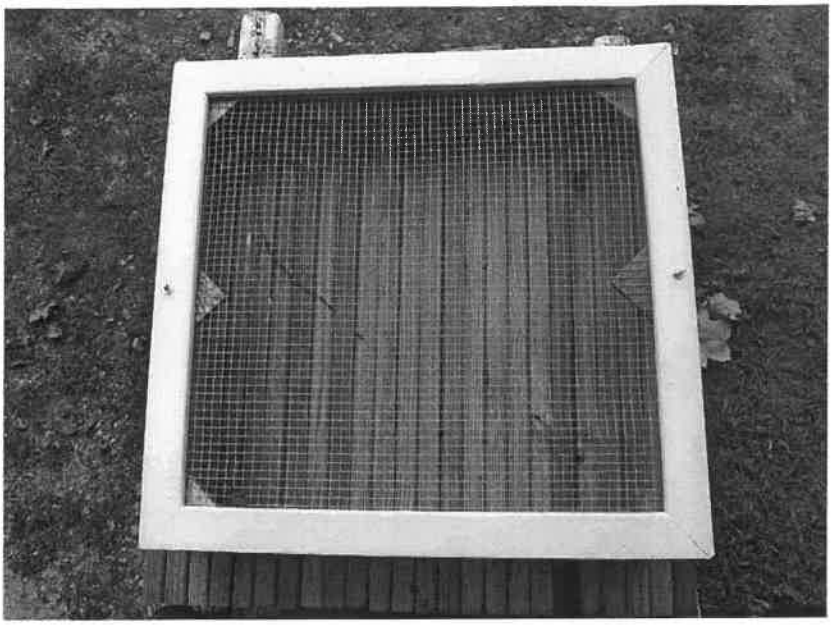


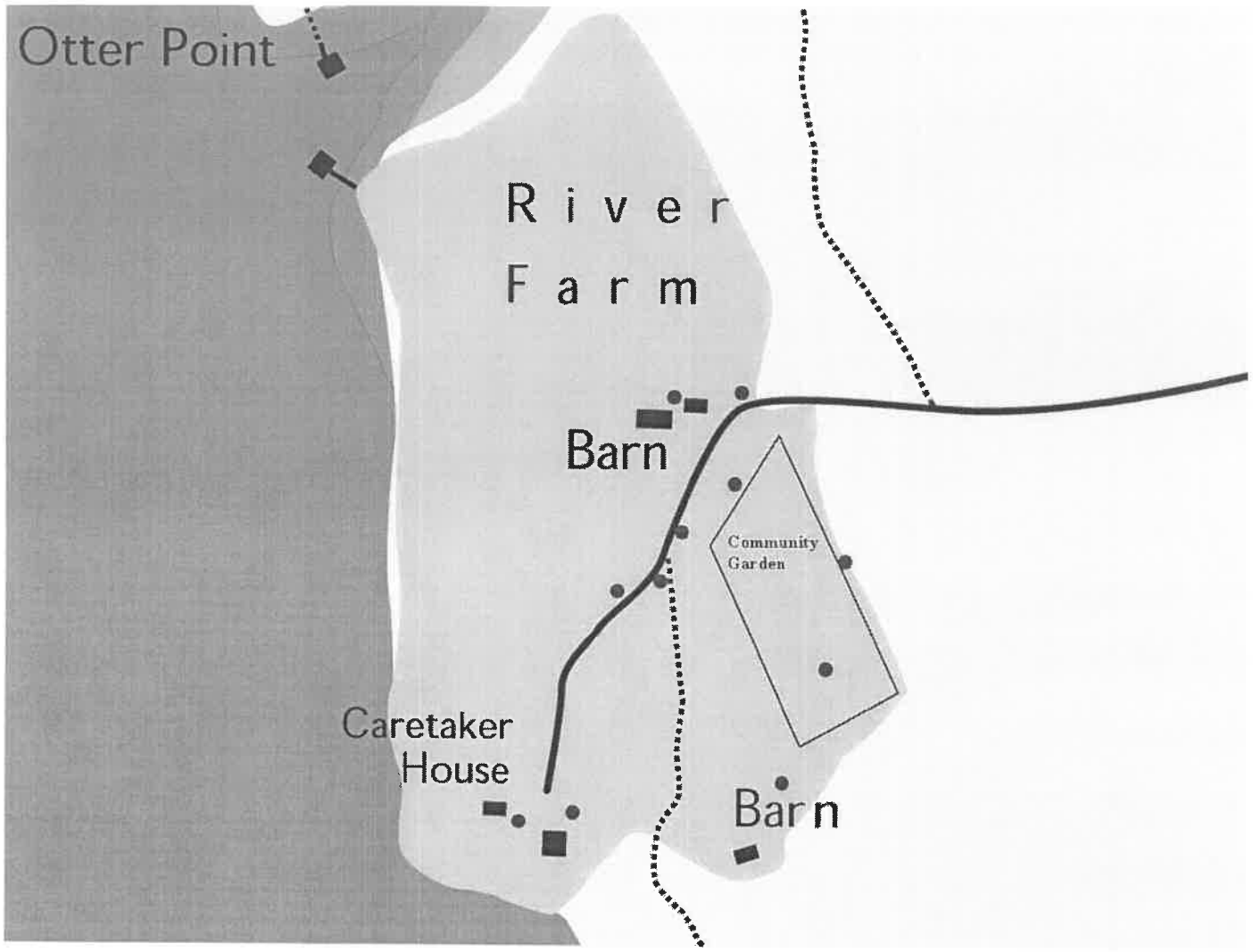
Picture 1: Nesting enclosure box.

Picture 2: Nesting Enclosure Box

Figure 1:

Red-bellied turtle 2001 nests.

● = nest



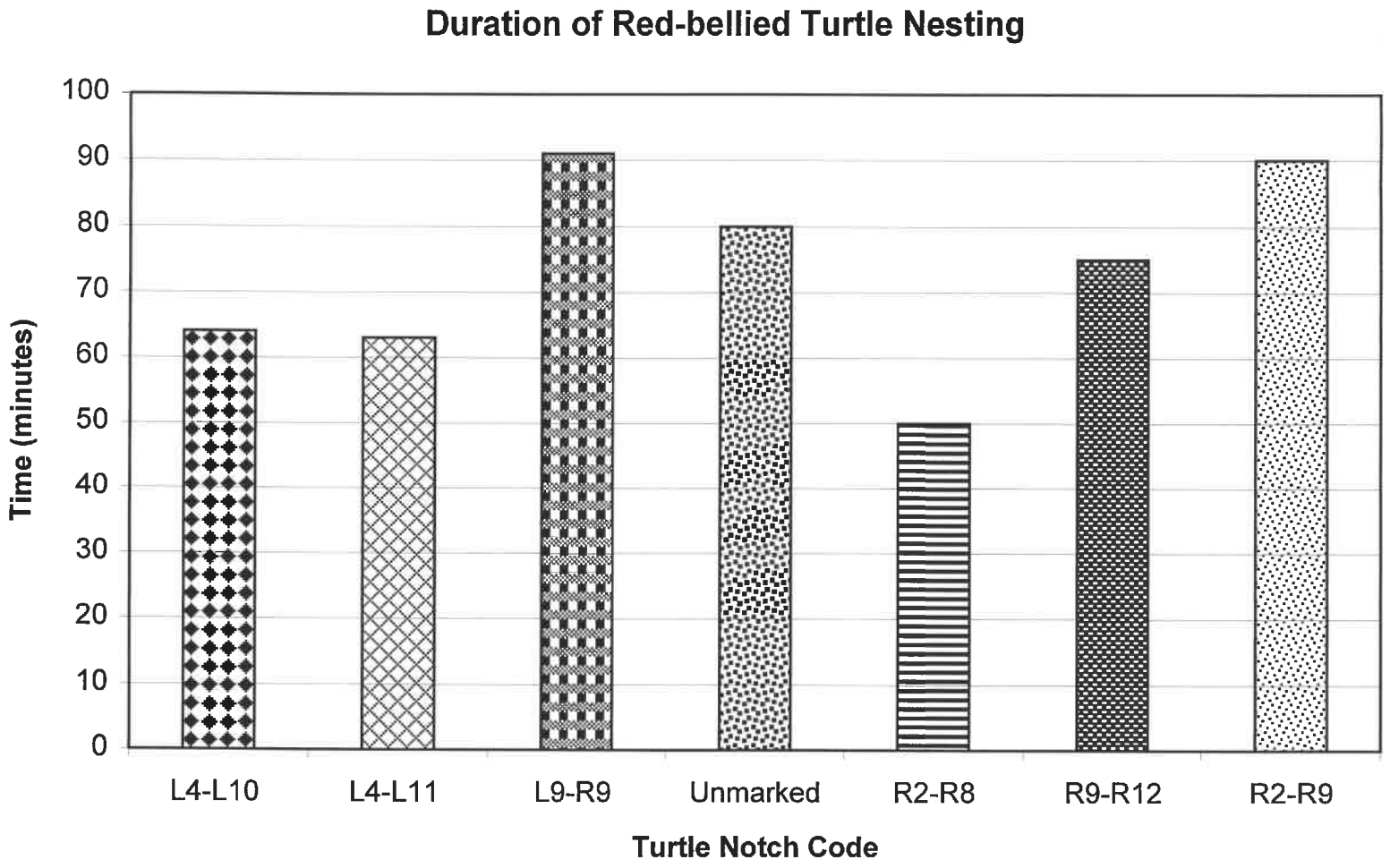


Chart 1: Turtle nesting duration graphed for by turtle versus time.

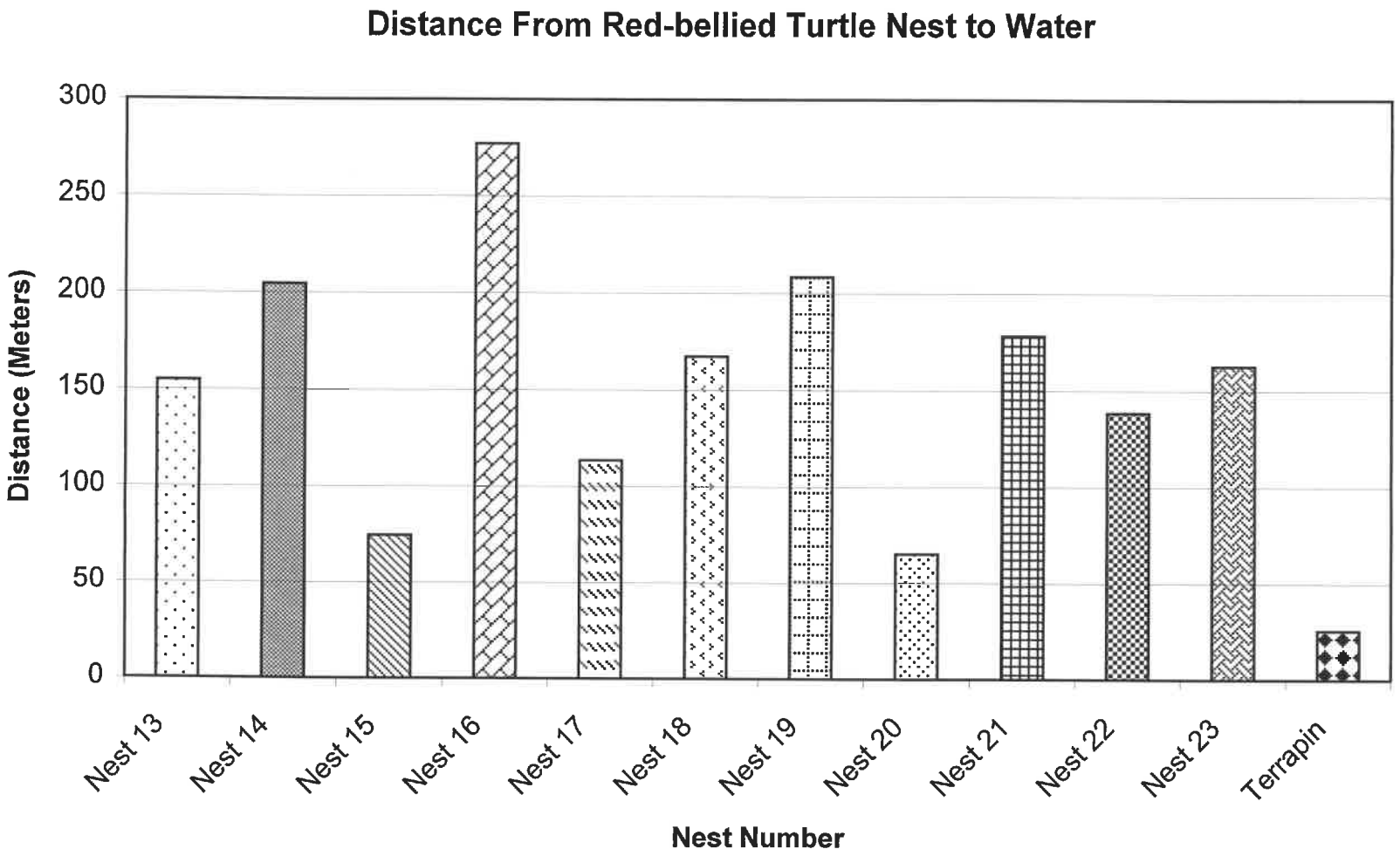


Chart 2: The distance between the Red-bellied Turtle nests and the Patuxent River was measured with a 100 meter measuring tape. The Diamondback Terrapin nest is also on the chart for comparison.

14 June 2001

L4, L10 Nesting Red Belly Female at Farm

7:45 am – Turtle is spotted sitting with head up sitting on grassy area between farm road and community garden, close to planted millet fields. She is facing the garden and is looking around.

7:56 am – She begins to move towards the garden, taking a few steps, pausing, puts her head to the ground for a moment (perhaps sniffing the ground?), picks her head up and then takes a few more steps and repeats.

8:03 am – She has reached the base of the garden fence, lowers her head for a moment, picks her head up, and then turns around so her head is pointed towards the river and her back end is next to the tall grass at the base of the fence.

8:04 am – Excavation of the nest begins. Hind legs can be seen extending past the rear of the shell and dirt can be seen as it is moved by the hind leg movements. Her front legs are out of the shell on the ground anchoring the front portion of her body as her rear portion swings from side to side with her alternate hind leg digging pattern.

8:22 am – Her head is shaking a bit from side to side, almost the same action dogs do when shaking a fly from the head.

8:25 am – Digging stops, the front legs are brought into the shell a bit as the plastron is brought in contact with the ground. Head jerking continues with the frequent opening and closing of the mouth.

8:28 am – "Push-ups" begin. Front legs are extended and then relaxed as the turtle again lowers itself to the ground. This occurs about five times while the head jerking and mouth opening and closing continues.

8:31 am – Hind leg movement begins again. The swaying of the hind end of the turtle is greater than the first swinging motion. She moves to the side, to the middle, and then to the other side, indicative of back-filling.

8:45 am – All movements stop. Turtle head is up and looking around.

8:49 am – Nest is completed, turtle begins to move away from nesting area.

- She is captured and brought into the lab for marking. Her nails and shell were clipped for stable isotope analysis, and then she was released. An nesting enclosure box was placed upon her nesting site to protect her eggs from predators.

15 June 2001

R4, R10 Nesting Red Belly Female at Farm

9:28am – Turtle is seen well into the digging process in grassy section between the Farm Road and the planted millet field as we drove into the farm. Side to side motion of rear of shell continues as dirt is flung by hind legs.

9:36am – Digging stops and "push-ups" begin. These push-ups are different than the push ups observed by a different turtle the day before. These are push ups that originate from the hind end of the turtle rather than the front end of the turtle.

9:41am – Back-filling begins with the side to side movement of the hind end of the shell.

9:43am – A young fox approaches the turtle from the path. The turtle is disturbed by a possible predator presence. She stops her movement and waits a few minutes while the young fox chews on a dead rabbit close by. The turtle then continues back filling her nest as the fox wanders away.

9:50am – The fox is back and back filling stops again.

9:52am – Back filling continues.

9:56 am – The nest is complete and the turtle begins to move away.

- She was approached and it was found that she had already been given a notch code and sampled for stable isotope analysis. She had been collected the previous day when she was disturbed from her nest and released her bladder water, so she was not brought into the lab for further processing. She was released at the river and her nest was protected with a nesting box.

19 June 2001

L4, L11 Female Red Belly Nesting at Farm

8:06am – Turtle seen on edge of farm entrance road headed towards the small red shed next to the large banding shed. She stops in the grassy section close to the edge of the forest and the edge of the farm road. She is observed putting her head down close to the dirt and dragging her fore feet through the dirt. She then begins digging with her back feet. She props herself up on her front left foot while using her back right foot to dig. She then shifts to her weight to her front right foot while using her back left foot to dig. It's a weight shifting dance she does to excavate.

8:44am – Digging stops and she begins to lift her body up on all four legs and I can see the sun light shining through from underneath and behind her. As she lifts up her body, I can see eggs being dropped from her body into the freshly dug nest. She lowers her body and rests a few moments and then lifts her body up again to drop another bunch of eggs. She does this described action four times.

8:53am – Back filling begins with the extension of her long hind legs into the dirt that she has piled up around her nesting site. She cups her feet into little shovels and pushes the dirt back into the hole. She rocks her weight a bit using her body to pack down the dirt.

9:09am – The back-filling is complete and the turtle moves away from the nest.

- She is captured and brought into the center for processing. She is unmarked so she is weighed, measured, and assigned a notch code. A few of her nails were clipped and a small part of her L12 scute was taken for the isotope analysis study. She was released into the river channel at Otter Point and a nest enclosure box was placed upon her nest.

28 June 2001

L9,R9 Female Red Belly Nesting at Farm

8:01am – The turtle is sighted sitting on the driveway between the intern house and the caretakers house. She begins to move slowly up the driveway and then heads into the section of taller grass between the driveway and the wood chip piles. She meanders her way through the grasses to the section of warm season grasses among the wood chip piles. She is sighted again in the low grass between the warm season grass and the millet field. She is headed towards the garden.

8:45am – I continued watching the turtle as she crossed the millet field and went into the garden. She spent a good while in the garden crawling through the straw mulch which overlays the pumpkin patch. She continued to wander through the garden taking her time to look around every once and awhile. Finally she crossed the wire gate on the opposite side of the fence and began walking along the edge of the mowed path that surrounds the back edge of the garden. She stopped five times here and there along the edge of the taller grass to lower her head to the ground, scratch the dirt with her fore feet a few times, and then continued to move on. Her sixth attempt proved to be good enough for the digging to begin. She began her nesting in the middle of the mowed path on the back edge of the garden in the low grass. Her digging behavior was much like that of other observed turtles. The weight shifting on the front feet while using the opposite hind leg to scoop out a symmetrical hole.

9:12am – Movement at the nest stops. I am very close to the turtle and can see her alternately using her hind legs making a slight shift movement of her shell. I cannot see the eggs dropping because the grass is in my way, but this leg shifting could be indicative of the red-bellied using it's hind feet to actually place the eggs into the nest cavity.

9:20am – Movement at the nest begins again. The hind feet are alternately outstretched to their limits, then dragged back towards the nest cavity pulling a large portion of dirt with it. As this continues to the point where the cavity is mostly filled in, I observe an odd behavior that I have never seen. The front feet are firmly planted while the back feet are used to stop up and down on the filled in hole. I have seen other turtles use their plastrons to compact the dirt, but never such a crazy display of hind feet usage. The bobbing of the shell while this movement was occurring was similar to that of a spinning dinner plate on the floor.

9:32am – Back filling is complete and the turtle begins to move away.

- The turtle is captured and the actual laying of eggs confirmed by digging into the area of nesting till the eggs are reached. The turtle was brought back to the center for processing and toe nail sampling for the isotope analysis. She was not marked, so she was assigned and given a notch code. She was then released into the river at Otter Point.