

Care and Maintenance of Hatchling Box Turtles

Helping Tiny Box Turtles Grow Into Small Box Turtles

181 days and counting . . .

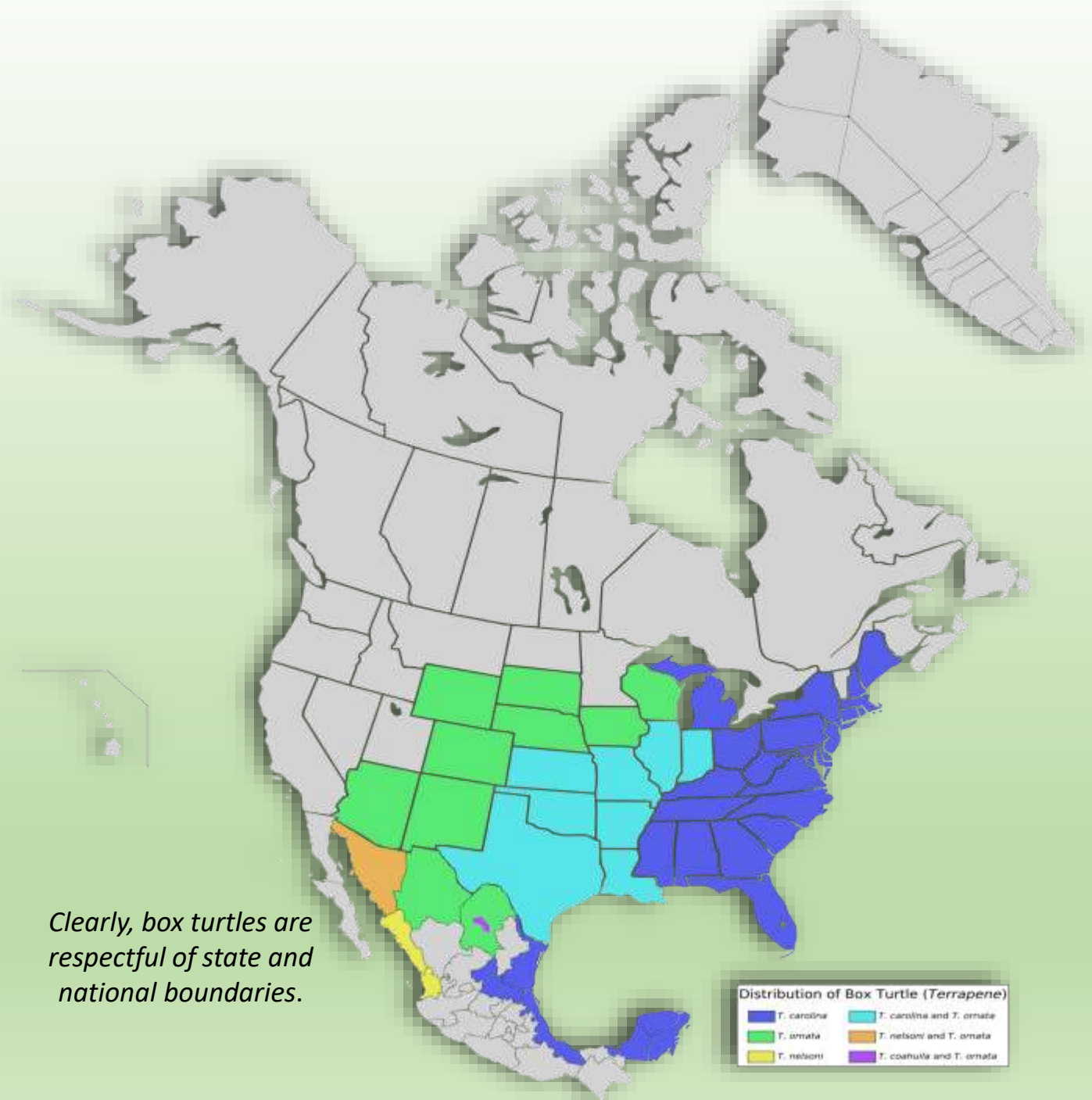
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A simplified map of the distribution of North American box turtles

- *T. carolina* in the east
- *T. ornata* in the west
- Both species share the center.
- *T. Carolina* contains five subspecies (more on that later) while *T. ornata* consists of two subspecies.
- Little research has been done on the Mexican species, *T. nelsoni* and *T. coahuila*.



Clearly, box turtles are respectful of state and national boundaries.

Kingdom: Animalia
Phylum: Chordata
Class: Reptilia
Order: Testudines
Suborder: Cryptodira
Superfamily: Testudinoidea
Family: Emydidae

Genus: Terrapene—the common box turtle

**Species
and subspecies**

1. Eastern box turtle	<i>T. carolina</i>
1.1 Eastern box turtle	<i>T. c. carolina</i>
1.2 Three-toed box turtle*	<i>T. c. triunguis</i>
1.3 Florida box turtle	<i>T. c. bauri</i>
1.4 Gulf coast box turtle	<i>T. c. major</i>
1.5 Mexican box turtle	<i>T. c. mexicana</i>
2. Coahuila box turtle	<i>T. coahuilan</i>
3. Spotted box turtle	<i>T. nelsoni</i>
3.1 Southern spotted box turtle	<i>T. n. nelsoni</i>
3.2 Northern spotted box turtle	<i>T. n. klauberi</i>
4. Ornate box turtle	<i>T. ornata</i>
4.1 Ornate box turtle*	<i>T. o. ornata</i>
4.2 Desert box turtle	<i>T. o. luetola</i>

*Found in DFW area



Three toed box turtle



Ornate box turtle

Head-starting Box Turtles

- There is a very high first-year mortality rate for box turtle hatchlings, reaching 80%.
- Little is known about activities of box turtles during their first year.
- Predation seems to be the main source of first-year mortality: all carnivores and many omnivores will readily snack on the bite-sized hatchlings.
- Key to survival seems to be the size/weight of a box turtle—bigger (to a point) is better. From a study done in Michigan:

“Body mass was positively associated with daily survival probability . Our findings suggest attaining larger body sizes from longer captive-rearing periods to enable greater movement and alleviate susceptibility to predation (the primary cause of death) could be more effective than environmental enrichment alone in chelonian head-starting programs where substantial predation could hinder success.”

Tetzlaff, Sasha J., Sperry, Jinelle H., Kingsbury, Bruce A., DeGregorio, Brett A. “Captive-rearing duration may be more important than environmental enrichment for enhancing turtle head-starting success” [Global Ecology and Conservation](#), 2019.

- There is an on-going box turtle head-starting project in progress at Lewisville Lake Environmental Learning Area (LLELA) run by UNT graduate student Sara Van Der Leek (saravanderleek@my.unt.edu) and this batch of hatchlings will be introduced into this program once appropriate size and weight are reached.



Facilities Used for Raising Three-toed Box Turtle Hatchlings

Eight three toed box turtles (*Terrapene carolina triunguis*) were obtained from a source in Pilot Point TX, where they hatched sometime in late September or early October 2020. They were transported to my house just outside Cross Roads, TX on Friday, October 16 and placed in an enclosure in my home office.

Enclosure

- ❑ Made of interior-grade $\frac{3}{4}$ inch plywood.
- ❑ The enclosure measures approximately 29" long by 24" wide by 12" tall (696 in²) or 74 cm x 61 cm x 30 cm (4490 cm²), open at the top but capable of being covered by one of two lids, one transparent acrylic and one $\frac{1}{4}$ " wire mesh .
- ❑ The wood inside was neither painted nor stained while the outside was finished with a light coat of transparent stain.

Housing Tubs

- ❑ Four plastic tubs (6-quart) approximately 6 x 12 inches (72 in²) or 15 x 30 cm (450 cm²) with two hatchlings housed in each tub
- ❑ Ground coconut fiber (coir) as substrate (replaced monthly)
- ❑ Sphagnum moss for cover (replaced monthly)
- ❑ These four containers are placed in the wooden enclosure.

Humidity

- ❑ Kept between above 60% at all times
- ❑ Humidifier operating continuously (using distilled water)
- ❑ Misting several times each day (using rainwater)

Temperature

- ❑ Room temperature between 64 and 72 degrees maintained at all times
- ❑ Lights used to increase enclosure temperature to about 75 degrees during the day

Lighting

- ❑ Three types of bulbs used
 - 125 watt full spectrum incandescent bulb (heat and UVA/UVB)
 - 75 watt incandescent bulb (red light, heat only)
 - 26 watt 5.0 fluorescent UVA/UVB bulb (little heat)
- ❑ From 8:00 a.m. until 8:00 p.m., 125 watt full spectrum bulb used; from 8:00 p.m. until 8:00 a.m., 75 watt bulb used for night heat; 26 watt fluorescent bulb used in addition to 125 watt bulb when turtles are soaking before and after feedings.





6.56 g.



8.19 g.



8.52 g.



9.39 g.

Photographs of the hatchlings taken on December 6, 2020 with the weight of each listed underneath the pictures.



11.37 g.



11.96 g.



13.27 g.



12.05 g.

Feeding Considerations

- "Good" foods vs. "bad" foods
 - Turtles in the wild avoid difficulties that could arise from some of the so-called "bad" foods by eating them sparingly, as part of the natural variety around them.
 - By avoiding offering foods on the "bad" lists, we cheat our animals of many nutritious menu items.
- Some foods are indeed harmful to box turtles and should be always be avoided
 - All dairy products
 - Processed meats
 - Leaves of rhubarb, potato, tomato, and tobacco plants
 - Poison ivy
 - Avocados
 - Candy, chocolate, marshmallows, and similar items containing refined sugars
- While box turtles are truly omnivorous, the nutritional needs of hatchlings are different from those of adults.
 - Adults need a diet containing <50% protein (by weight of food)
 - Hatchlings need a diet of between 50% and 75% protein
- Hatchlings need to have access to food more frequently than juveniles or adults, at least every other day.
- Food for hatchlings must be cut into much smaller pieces than food for juveniles and adult box turtles



Materials and equipment used in preparing food for the hatchlings.

Hatchling Box Turtle Weekly Feeding Menu

- First feeding of the week
 - Boiled white-meat chicken, etc.
 - Meatballs
 - Vegetables
 - Calcium supplement (w/D3)
- Second feeding of the week
 - Boiled white-meat chicken, etc.
 - Turtle chow
 - Vegetables
 - Vitamin supplement
- Third feeding of the week
 - Live food (earthworms, insects, isopods, mealworms, etc.)
 - Meatballs
 - Vegetables
 - Fruits
 - Calcium supplement (w/D3)



Regarding earthworms . . .

I have found these hatchling turtles do not particularly like red wigglers (*Eisenia fetida*) but will readily eat nightcrawlers (*Lumbricus terrestris*). There is also concern expressed in the literature regarding a toxicity problem with red wigglers when fed to reptiles. Further, since the mouths of the hatchlings are quite small, it is necessary to cut or chop the earthworms into smaller pieces, not the most pleasant of culinary tasks.



6 tbsp protein (select two or more)

- chicken, boiled and cooled
- earthworms
- crickets, etc.
- superworms (*Zophobas morio*, a species of darkling beetle larva)
- mealworms (*Tenebrio molitor*, another species of darkling beetle larva)

1 tbsp fruit (select two or more)

- raspberries
- strawberries
- blueberries
- apples
- red grapes
- stone fruit (peaches, apricots, plums, pits removed)
- mango
- cantaloupe
- prickly pear tunas (all spines, large and small, removed)

2 tbsp vegetables (select two or more)

- greens (turnip, collard, mustard, dandelion, romaine lettuce, red leaf lettuce)
- yellow squash
- carrots
- sweet potato

2 tbsp box turtle/tortoise chow (Mazuri, Reptomin, ZooMed, Omega One, or other reputable brands)

1 whole boiled egg (including the shell)

2 tbsp calcium supplement powder (with vitamin D3 if turtles are kept inside)

1 tbsp vitamin supplement powder (Fluker's)

Blend (do not puree) all ingredients in a food processor then roll into balls the size of a small marble (about .25 inches in diameter). Spread balls across a cookie sheet and freeze overnight. Transfer to an airtight container and return to freezer for storage.

Thaw and offer ½ ball per turtle every other day.

Makes about 125 balls or about 250 hatchling feedings.

Typical Feeding Regimen

Every two days, usually early afternoon, the following procedure is used to feed and hydrate the hatchlings.

1. Remove turtles from their housing tubs and place them all together in a tub of water (I use only rainwater) heated to approximately 80 degrees. This serves to clean them off, provides hydration, and stimulates their appetite. Plus, turtles seem to like to “poop” while in this warm water. This tub is placed under the lights in the enclosure where it remains for about 30 minutes. This is a good time to closely inspect each turtle, looking for any indication of problems or concerns.
2. Turtles are removed from water, lightly dried, and then placed in individually prepared feeding tubs with their food of the day. These tubs are placed in a relatively warm, well lit, quiet place.
3. Turtles are allowed to eat undisturbed for as long as it takes each turtle to eat his/her fill; this can be as short as 10 minutes or as long as an hour.
4. As each turtle clearly finishes eating, it is placed in a new tub of water heated to about 80 degrees. This tub is placed back in the enclosure under the lights.
5. After all turtles are back in the soaking tub, they are allowed to soak for an additional 30 minutes or so. This further hydrates them and rinses off any bits of food remaining from their meal (they are messy eaters). Additional “pooping” can occur during this soak. While the turtles are soaking, the substrate and sphagnum moss in the housing tubs is rearranged.
6. Turtles are removed from the soaking tub and placed them in the housing tubs, two turtles per tub. These tubs are placed back under the lights.



Original Feeding Containers



Current feeding containers

The typical rowdy post-prandial soak . . .

Notice the bits of uneaten food in the water and the piece of poop in the left corner of the tub.



Sometimes, the big kids ignore the little kid.



Weight Changes of Hatchlings Over Time

All data in grams

Turtle	11/28/2020	12/20/2020	1/24/2021	3/14/2021	4/14/2021	D weight	%D
#1	6.65	6.41	5.77	5.14	---	---	---
#2	8.19	8.00	9.38	10.79	11.95	3.76	45.90
#3	8.52	8.00	8.00	8.91	9.85	1.33	15.61
#4	9.39	9.57	10.53	11.91	12.59	3.20	34.08
#5	11.37	11.87	14.21	18.36	21.64	10.27	90.33
#6	11.96	13.06	15.41	18.70	21.67	9.71	81.19
#7	13.27	14.66	16.37	18.03	21.47	8.20	61.79
#8	12.05	12.38	14.06	17.73	20.90	8.85	73.44

The Story of Tiny Turtle #1

The runt of the “litter” I received, Tiny Turtle #1 (TT1) would eat nothing for the first three months, regardless of what was offered and how it was presented. All sorts of worms, beetles, isopods, larva, boiled white meat chicken, turtle chow, turtle meatballs, a variety of vegetables, all kinds of fruit, various types of turtle chow, baby food—nothing interested TT1. Then, on January 19, the little guy began to eat but only sparingly and inconsistently. A wide variety of food was offered in many different forms and additional time for eating was allowed, all to no avail. On April 6, TT1 died.



TT1 demonstrating how not to eat a mealworm.

Observations

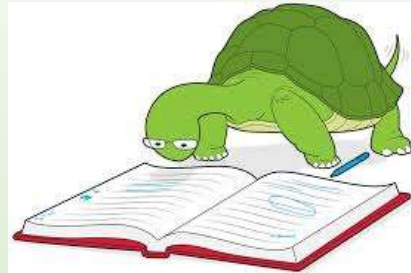
1. Accurate information regarding box turtle hatchlings is much more limited than information about juveniles and adults.
2. Much more information is available and much more attention is given to aquatic turtles (specifically, sea turtles) than for box turtles.
3. From the initial differences in weights of the hatchlings, they likely came from at least two and possibly three clutches of eggs and their ages may differ by as much as several weeks.
4. Care and maintenance of hatchlings is different than for juvenile and adult box turtles.
5. Humidity and water access is more critical for hatchlings than is the case with juveniles and adults.
6. Hatchlings, like adults, demonstrate individual preferences regarding food.
7. Daily attention is required.
8. Even when attention is given to all aspects of care, the mortality rate for hatchlings is reported to approach 30%.
9. They occasionally “squeak”.



References

Online Sources

Regarding References: When researching box turtle care and feeding, more specifically, the care and feeding of hatchling box turtles, a great deal of confusing, contradictory and even erroneous information can be found. Consequently, it is strongly recommended that you do not rely on information from a single source but rather an amalgamation of information from a variety of sources.



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Animal Hub: Baby Box Turtle Care

<https://www.animalhub.com/baby-box-turtle-care/>

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What Do Box Turtles Eat?

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What Should I Feed My Turtle?

<http://www.turtlepuddle.org/health/turtlefood.html>



*Zen and the Art of Box Turtle
Maintenance*

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