

SNAPPING TURTLES (*Chelydra serpentina*) FROM HATCHING TO RELEASE

Natural History and Husbandry of Snapping Turtles

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Living Fossils

- These turtles have been around for 60 million years and look the same today as they did 60 million years ago.
- Ohio's largest turtle species.
- The most widely distributed turtle species in NA.

Range

- Across the eastern US.
- From southern Canada to the Gulf of Mexico.



Habitat

- Almost entirely aquatic.
- Habitat generalists and very adaptable. They can be found in a variety of fresh water habitats.
- Hatchlings and young juveniles use shallow areas near shorelines.
 - Likely because of increase food availability, fewer predators and warmer water for faster growth rate.
- Move to deeper water as they get older.
- They can even tolerate brackish water (sea water and fresh water mix) for a period of time but must return to fresh water to rehydrate.
- Prefer slow moving water with soft muddy or sandy bottom and submerged logs or tree trunks.

Diet

- Omnivores that will eat anything from algae to mammals.
- They will eat living and dead prey items.
- Hatchlings and juveniles are primarily carnivores.
- Adults are omnivores but they eat more plant material in southern part of their range, more carnivorous in northern part.
- Dietary items: plants, fruit, insects, worms, fish, frogs, smaller turtles, snakes, crayfish, birds, small mammals, and carrion.

Winter -Hibernation

- Snappers start to hibernate when water temperatures reach 41 F (Usually October in Ohio).
- Some hibernate outside their home ranges.
 - Travel up to 2.4 miles to get there.
- They hibernate in groups in the mud under shallow water in places where water does not freeze to the bottom.
- Their body temperature falls to about 34 F, just above freezing.
- During hibernation they do not breath air. They get oxygen by having their head out of the mud and gas exchange takes place through membranes of their mouth and throat (extrapulmonary respiration).

Spring

- They emerge from hibernation in the spring when water temperature reaches 45 F.
- When water temp reaches 60 F the turtles will begin to eat.
- Males begin establishing their home ranges by driving out the smaller less dominate males and begin breeding with the females.
- Large males often keep the same territory every year.
- Smaller less dominate males move around more in search of females to mate with but usually stay in the same body of water.

Early Summer - Nesting

- In May or June the females will leave the water and may travel great distance to find an acceptable place to build a nest and lay her eggs.
- Once there she will dig a shallow nest in a sunny well-drained location and deposit her eggs, cover them with dirt, then return to the water.
- She can travel up to a mile/day and can take up to 15 days to reach her nesting site and return.
- Ideally nests are located near small streams.
- Because the females can travel so far and return home they must have some complex navigational abilities but they are not well understood.

Nesting

- The larger the female the more eggs she will lay.
- Clutch size can be 4 – 109 eggs (average 28-33).
- Timing of nesting is dependent on spring temperatures.
- In Ohio, nesting season typically occurs May 17 – June 9.
- Cooler the spring the later the nesting season.
- Nesting usually takes place in the evening or morning.
- Incubation period 55-125 days (most common 75-100 days)

Late Summer / Early Fall - Hatching

- Hatchlings emerge Aug – Oct.
- Primarily synchronous hatching (all hatchlings emerge on the same day).
 - Possible that movement of clutch mates in the nest stimulate synchronous hatching.
- Occasionally hatching is asynchronous (occurs over 2-3 days time period).
- From pipping to final exit from the egg shell can take from several minutes to several hours or even several days.
 - Pipping – when hatchling first breaks through the shell.
- After the young hatch they either dig themselves out of the nest and instinctively go to shallow water with dense vegetation or may stay and overwinter in their nests and move to water the following spring.
 - Staying in their nest the first winter is not a viable option in the northern most part of their range. Most will not survive because freezing temps extend below the depth of the nest.

Yolk Sac

- At hatching, many will have appreciable amounts of yolk still in their yolk sac.
- Amount of yolk in the yolk sac at hatching may have to do with a variety of factors including size of the egg, amount of moisture in the substrate of the incubating eggs, temperature of the incubating eggs
- Eventually yolk sac is absorbed into the abdominal cavity.
 - Duration of this is highly variable: can take hours, days or weeks to fully retract the yolk sac.
- They will live off their yolk after hatching.
- Some do not eat prior to hibernating after they hatch.
 - If they eat or not depends on climate and amt. of time between hatching and hibernation.
 - In captive situations hatchlings begin feeding 2-4 weeks after hatching.

Juveniles

- Hatchlings / juveniles will spend their first year or two in shallow streams and bodies of water. As they mature and grow they will migrate to ponds, rivers, marshes, and lakes to establish their adult territory. Adults avoid the shallow juvenile and hatchling habitat.
- They are fairly predator proof once their carapace is over 3 inches long.
- They reach sexual maturity when their carapace is around 8 inches in length.
 - Time frame varies by region/temperature.
 - In Ohio 10-12 years of age
 - In Canada can take as long as 19 years.
 - In the Southern part of the US it's around 7 years.

Life Expectancy

- Very high mortality of eggs and hatchlings.
- Many nests are destroyed by predators or flooding.
- Of those nests that survive only about 20% – 45% of hatchlings will successfully make it out of the nest.
- Chance for predation in the first three years is high.
- If they reach adult size survivorship is 93-97% each year.
- Probability of survival - egg to adult is 1 in 1445 individuals.
- Probability of survival from hatchling to adult is 1 in 133
- One adult female nesting for 13 years would lay approx 364 eggs. Of those only about 2 would be expected to reach sexual maturity.

Longevity

- Two snapping turtles were caught and marked in 1968 and 1973. They were later recaptured and were a minimum age of 53 and 55 years old.
- May be longer in human care with good husbandry and veterinary attention.

Males v/s Females

- Cloacal opening of females is near the outer edge of the carapace (upper part of the shell).
- Cloacal opening of males is significantly beyond the outer edge of the carapace.



Photo by Greg Lipps Jr.

Temperature Dependent Sex Determination.

- The temperature which the eggs are incubated will determine the sex of the hatchlings.
- Cooler temps (below 71) or warmer temps (above 83) will produce females.
- Moderate temp (between 71-83) produce males.
- Temperature sensitive period for determining the sex is 2-5 weeks after eggs are laid.
- Some nests produce all males or all females.
- Many produce a mix of the two. In the nest there are temperature ranges.
 - Eggs at the top of the nest are exposed to warmer temps than those at the bottom.
 - Eggs in the middle may be warmer than those at the edges.

Caring for Hatchling Snappers



Initial Set Up

- Hatchlings are placed in a plastic shoe box with shallow water.
- A small folded towel under one end with heat pad (reptile pad) between shoe box and towel.
 - Shallow and deep end
- Deep end about 1 inch deep. Shallow end about $\frac{1}{4}$ inch deep.
 - Need to be able to completely submerge under water.
- Reptisun 10.0 UVB over middle and basking light over shallow corner.
- Something to hide under.
 - Can be something that floats on top of the water.
- No rocks small enough that they could ingest.



Water

- Snapper hatchling should always be in water.
- Higher water loss rate than other aquatic turtle species.
- Become dehydrated if out of water too long, especially small hatchlings.
- Use distilled water if hatchling still has yolk sac.
- If yolk sac is absorbed non-chlorinated water is fine.



Water Temperature for Hatchling

- During the day:
 - Shallow end 82F / warm corner 85F
 - Deep end 76F
- At night:
 - Shallow end 75F
 - Deep end 70 F
- Can NOT tolerate high temps: start having neurological problems and can die if water temp reaches 102 degrees.

Hatchlings

- Emerge late summer /early fall.
- Weigh 5-14 g. at hatching (average 10 g).
- After hatching they live off their yolk sac for the first few days – weeks.
 - Amount of yolk sac left at hatching depends on incubation conditions.
 - Yolk at hatching can be 0-20% of their body mass.
 - Retraction of yolk sac can take hours to weeks.
- As the yolk sac is absorbed the hatchling will loose weigh.
 - A 10 g hatchling may end up weighing 6-7 g.
 - Usually won't eat until yolk sac is absorbed.

- Hatchling with yolk sac.



Feeding

- Start offering food when yolk sac is almost fully absorbed or if no yolk sac is present.
- Movement of live food (ie mealworms) may stimulate feeding.
- The warmer they are the sooner they will eat.
 - Will not eat or grow if water temperature is below 60 F.
- Initially should be fed twice a day.
- Once they reach ~75g. can cut back to once a day feeds.
- Over wintered hatchling snappers should weigh around 100 - 150 gram when released in the spring (mid-May).
- After their first feeding season in the wild they weigh ~145 g.
- They are typically good hardy eaters and will eat more than they need.
- Do not over feed. These guys will often beg for food.
- If allowed to eat as much as they want they can easily become obese and can weigh 300 – 400g by spring.
 - Gaining too much weight too fast can cause shell deformities.

Diet

- Initially feeding twice a day:
 - AM: pinch of Mini Aquatic Turtle Pellets – ZooMed hatchling formula.
 - PM: Rotate between a variety of items including – mealworms, crickets, waxworms, pieces of smelt or trout, cut up earthworms, krill, red worms, mouse organs / pieces. (Rotate in as many of these items in as possible)
- For once a day feedings:
 - Turtle pellets two days a week.
 - Other protein rotated in the rest of the week.

Growing Hatchlings

- As they grow - graduate them to larger containers and deeper water.
 - Water should never be deeper than their shell is long.
- As they grow they will shed their skin.
 - Sometimes they have almost a fuzz appearance when shedding.
- They may also grow algae on their shell.
 - Shells can be cleaned off with on old toothbrush.
 - In the wild snappers often have algae on their shells.

Release

- Snappers should always be released back to the same location where they were found when possible.
- Releases should be mid-May or later when all chance of freezing night time low temperatures have passed.
- Release during the day.

Poaching of Turtles

- Poaching is not just a problem in Africa and Asia and other far away places. It's not just the big mammals like tigers and elephants that are poached.
- Turtle poaching is a big problem in this part of the US including in Ohio.
- Snapping turtles (along with many other species) are illegally taken and sent to China for food.
- Some species like Box and Spotted turtles are taken and sold here in the US.

What Can I Do?

- Just be aware that the problem exists here in Ohio.
- When releasing turtles back into the wild be aware of your surroundings and report any suspicious behavior to your county wildlife officer.
- Be careful what information you share and post on line.
 - Poachers will attend wildlife conferences and follow rehab centers on social media hoping to get information.
 - Don't give out specific information where turtle populations are found.
- Support organizations like PARC – TNT and CCITT that work to stop illegal trafficking of turtles.

Turtle Resources

- TSA - Turtle Survival Alliance
 - Worldwide turtle conservation.
- IUCN – International Union for Conservation of Nature
 - Tortoise and Fresh Water Turtle Specialist Group.
 - Worldwide turtle conservation
- Tortoise Trust
 - Good information on care of turtles and tortoises.
- AZA SAFE – American Zoological Association – Saving Animals From Extinction
 - American Turtle Program
 - Work with spotted, Blandings, bog, wood and box turtles
- PARC – TNT - Partners in Amphibian and Reptile Conservation – Turtle Network Team.
 - Conservation of North American Turtle Species
- CCITT - Collaborative to Combat the Illegal Trade in Turtles
 - Stop wildlife trafficking of North American turtles.

Resources

