

Amazon Turtles

Learn about common turtle species along the Amazon.

By Matt Russell

The herpetofauna of the Iquitos region, Peru, has received increased attention in recent years through scientific study and tourism. Before traveling to this area, I was looking for the best of both worlds: an experience that involved a strong taste of herpetology while traveling with an authority of the region. I packed my bags in November of 1996 and joined Bill Lamar of Greentracks and additional wildlife enthusiasts for what would be one of the greatest tropical field sessions I've ever experienced. Little did I know I would develop a passion for this area and make multiple return visits.

Iquitos, Peru, is the capital of the Department of Loreto and a port city nearly 3,000 miles (4827 kilometers) up the Amazon River from the Atlantic Ocean. It lies just three degrees south of the equator in the northeastern fragment of the country. The city rests at approximately 300 feet (91.4 meters) above sea level. The Iquitos region is said to be one of the most diverse areas for plant and animal life worldwide (Rodríguez and Duellman, 1994). The mighty Amazon River is the dominant waterway through this region. Numerous tributaries, however, feed into the Amazon, making this system quite complex. Some of the main branches include the Río Marañón, Río Ucayali, Río Nanay, Río Napo, Río Mazan and the Río Tigre. The Iquitos region receives an average annual rainfall of about 122 inches (310 centimeters). The wet season is strongest from December through May. The drier months are July and August, each averaging only 6.2 inches (15.7 centimeters) of rainfall. Temperatures throughout most of the year fall in the mid-80s (Fahrenheit) during the day, but will drop 10 to 20 degrees at night. Temperatures can drop into the low 60s (Fahrenheit) range at night during cooler months. Humidity during most of the year remains close to 100 percent (Dixon and Soini, 1986).

Although rainfall plays a large role in the water levels of Iquitos' rivers and seasonally flooded forests, the majority of the area's water is melted snow from the Andes Mountains. This process combined with rain creates one of the richest habitats in the area: flooded forests. Natives use the terms Tahuampa or Bajial to describe these seasonally flooded plots. These expanses of land border large rivers or oxbow lakes. Unfortunately, areas of flooded forest are being destroyed through logging and land-clearing for agricultural sites. Numerous turtle species frequent these areas during the wet season.

Turtles of the Iquitos Region

Eleven confirmed chelonian species comprising four families (Chelidae, Pelomedusidae, Kinosternidae, Testudinidae) can be found in this area. Aquatic turtles ranging from the morphologically bizarre matamata (*Chelus fimbriatus*) to the exceedingly large and apparently rare (in the Iquitos Region) South American River Turtle (*Podocnemis expansa*) call this tropical paradise home.

The majority of my field experiences around Iquitos have occurred along areas of the Río Momon and the Río Nanay. These two rivers join just outside Iquitos before terminating at the Amazon. I have also observed turtles collected along the Río Orosa, which flows into the Amazon about six hours downriver from Iquitos. On all of my trips to this region, I have seen various turtles in the field, in marketplaces within Iquitos and in one zoo. All captured turtles or those purchased in the market for photographs were returned to their appropriate habitat.

The Chelidae (*Chelus*, *Platemys*, *Phrynops*)

Members of the chelidae occur on South America and Australia. All forms inhabit freshwater and some may even estivate during dry spells. South American chelids differ from pelomedusids in their possession of nuchal scutes, enlarged first vertebral scutes, long necks, an absence of neural bones and a tendency toward carnivory (Pritchard and Trebbau, 1984).

Amazon Matamata (*Chelus fimbriatus*)

The genus *Chelus* includes one extant species, but additional members are known from fossil records. Geographic variation has been noted in *Chelus fimbriatus*. The Amazon population of this species can be distinguished from Orinoco specimens by carapace shape and the coloration of the neck and plastron (Sanchez-Vilagra et. al., 1995). This species is a favorite of turtle hobbyists because of its striking appearance.

Chelus fimbriatus is found throughout much of northern and central South America (Iverson, 1992). It is known to be widespread in the Amazon region of Peru and is common around Iquitos (Dixon and Soini, 1986; Pritchard and Trebbau, 1984). Although common, this turtle can be difficult to find because of its cryptic nature.

Chelus fimbriatus is virtually impossible to misidentify. These turtles possess large, flat, triangular heads with long snorkel-like snouts. The head and neck are lined with cutaneous fringes that aid in prey capture. The carapace is normally tan or brown with a straight anterior rim. The posterior rim is serrated and rounded. Rows of longitudinal knobs cover the carapace and growth annuli are present on each scute. These annuli often harbor algae growth (Ernst and Barbour, 1989).

This species attains carapace lengths up to 45 centimeters, making it the largest of the South American chelids. Although gender size differences have not been confirmed, Pritchard and Trebbau (1984) stated that they believed males remain slightly smaller than females. It has been documented that males have concave plastrons and thicker tails when compared to females (Ernst and Barbour, 1989). This species is strictly aquatic and spends most of its time in shallow water on the bottom of oxbow lakes, ponds, inlets, and slow moving creeks. To breathe, these turtles extend their head to the surface of the water allowing only their snout to penetrate. Although this turtle has not been observed to bask out of the water, Lamar and Medem have seen specimens "basking" just below the surface with their limbs extended (Lamar, 1986).

Chelus fimbriatus are said to be poor swimmers. It is, therefore, likely that prey capture is primarily done by ambush. Prey consists of a variety of small fish. The numerous fringes and flaps on the head of these turtles act as detectors to sense vibration. When a fish is detected, the turtle extends its neck and opens its mouth creating a strong vacuum. When the prey item is sucked in, the turtle closes its mouth and expels any excess water (Pritchard and Trebbau, 1984). An alternate feeding method called prey herding has also been noted in this species (Holmstrom, 1978, 1991).

Chelus fimbriatus nest from October through December. Little information is available on reproductive behavior in this species. It has been noted, however, that male courtship consists of swift forward movements of the head toward the female while simultaneously opening and closing the mouth. Males also extend their legs toward the female during courtship (Carpenter and Ferguson, 1977). Females nest in close proximity to water from October through December. Nest excavation occurs on sandy banks that are mixed with leaf litter. These turtles will often ascend these banks sideways. Twelve to 28 spherical and brittle eggs can be laid in one clutch. Hatchlings tend to be more colorful than adults (Ernst and Barbour, 1989). Clutches produced in captivity have been incubated from 28 to 29 degrees Celsius for a period of approximately 280 days (Rosscoe and Holmstrom, 1996).

This turtle is well known to natives in the Iquitos Region, but is not a primary food source (Dixon and Soini, 1986).

Western Twist-Necked Turtle (*Platemys platycephala melanonota*)

Throughout South America, five species are currently recognized in the genus *Platemys*. Perhaps the best known species, *Platemys platycephala*, occurs throughout much of Northern South America (Iverson, 1992). *Platemys p. melanonota* is the form recognized in the Iquitos Region (Dixon and Soini, 1986). However, Ernst (1983) states that this subspecies may intergrade with the nominate race (*P. p. platycephala*) in the Río Ucayali.

Platemys p. melanonota is a small turtle bearing a flat, yellow-orange head. Carapace lengths up to 17 centimeters have been recorded. The carapace is brown with some yellow pigmentation and is characterized by a distinct median groove. The plastron is black or brown and is bordered in yellow (Ernst, 1983). These turtles can be found in marshes, creeks and ponds within rain forest situations (Pritchard and Trebbau, 1984). In Iquitos, they have been documented from small streams and swamps in primary forest (Dixon and Soini, 1986). Unlike its relative, *C. fimbriatus*, this species can be found crossing land.

Little is known about the natural diet of this rain forest denizen. Captives have accepted a variety of invertebrates, amphibians, fish and, occasionally, vegetation (Ernst and Barbour, 1989).

Medem (1983) states that courtship behavior occurs during the rainy season (March to December) in Colombia. Males actively pursue females in shallow water with a combination of behaviors. Mounting occurs from the rear, and the male frequently brushes his head across the female and expels a jet of water over her head (Harding, 1983; Medem, 1983). Oviposition occurs from August to February in Colombia when one egg is deposited in a shallow groove in the ground, normally under rotten leaves. Hatchlings emerge after an incubation period of approximately 150 days. They are morphologically similar to the adults and measure 43 to 57 millimeters in carapace length (Medem, 1983). Little reproductive data have been collected for *P. p. melanonota* in the Iquitos Region, but Dixon and Soini (1986) have observed a pair copulating in a shallow water stream. This species is a food source of locals around Iquitos.

Toad-Headed Turtles (*Phrynops*)

Two members of the genus *Phrynops* are known to occur in the Iquitos region. They include *Phrynops gibbus* and *Phrynops raniceps*. Two additional species (*Phrynops rufipes* and *Phrynops geoffroanus tuberosus*) have been speculated to occur in the region, but neither have been confirmed (Lamar, 1997A).

Lesser Toad-Headed Turtle (*Phrynops gibbus*)

Phrynops gibbus can be found in Trinidad, Suriname, Guyana, French Guiana, Peru, eastern Ecuador, northeastern Venezuela, parts of Colombia and northeastern Brazil (Mittermeier et. al., 1978; Iverson, 1992). This turtle is said to be rare in the Iquitos Region, where it is found in closed canopy forests in streams, rivers and small ponds. It has been taken from the Río Marañón, Río Itaya, and the Río Momon (Dixon and Soini, 1986).

Phrynops gibbus sports a small reddish brown to gray head with soft, granular skin. This is a small species that rarely attains carapace lengths over 23 centimeters. The carapace is dark brown to black and possesses a medial keel. The plastron is reddish brown to yellow with brown blotches on the scutes. The bridge and bottom of the marginal scutes are either brown or yellow (Ernst and Barbour, 1989).

This nocturnal chelonian inhabits muddy streams and isolated pools of closed canopy forest around Iquitos. During dry spells, *P. gibbus* may experience periods of inactivity known as estivation (Mittermeier et. al, 1978).

Few notes are available on the natural prey of *P. gibbus*. Lamar (1986), however, mentions that this turtle feeds heavily on anuran larvae in rain forest pools. In captivity, it consumes fish, rodents, various invertebrates, dog food and, occasionally, vegetation (Mittermeier et. al., 1978).

Information concerning courtship and copulation of this turtle is not available. This species is known to deposit eggs in a variety of sites in the field, but all tend to be close to water. One clutch deposited at a locality in Colombia was found in a vegetable garden. The eggs are hard-shelled, elliptical, white or rose colored, and approximately 32 by 44 millimeters in measurement. Eggs gathered from a captive female collected from the Río Momon (Iquitos) completed incubation in 200 days. Hatchlings of Peruvian locality have black carapaces, yellow marginal scutes and black plastrons with some yellow spotting. Hatchling morphology of this species varies widely throughout its range (Mittermeier et. al., 1978).

Greater Toad-Headed Turtle (*Phrynops raniceps*)

This turtle was formerly synonymized with *P. nasutus* and is called *P. wermuthi* by some authorities. It occurs in the upper Orinoco and Amazon river basins in eastern Colombia, southern Venezuela, Peru, Brazil and Bolivia (Iverson, 1992). *Phrynops raniceps* is not uncommon in the Iquitos region and is typically encountered in small forest streams. Specimens have been observed crossing forest trails as well (Dixon and Soini, 1986).

Phrynops raniceps attains carapace lengths up to 32 centimeters, making it a medium-sized chelid. The flat and oval carapace is typically olive to gray in color. The plastron is yellow with or without brown markings, and the head is brown and yellow. This species bears a striking resemblance to *P. gibbus*. It can be distinguished most easily from its close relative by a larger adult size and uniformly yellow or tan jaws (Pritchard and Trebbau, 1984).

Little is known about the wild diet, but captives will accept fish and meat (Pritchard and Trebbau, 1984).

The eggs of this species are spherical, and six to eight are deposited per clutch in the banks of streams. The incubation period is unknown, but a 3-week-old neonate that hatched from a clutch deposited by a wild caught female (Suriname) measured 6cm in carapace length.

This species is commonly caught on fishing lines around Iquitos and is a primary food source of humans (Dixon and Soini, 1986).

The Pelomedusidae (*Peltocephalus*, *Podocnemis*)

This ancient family had relatives occurring throughout the world at one time. Now, there are five freshwater genera and two dozen species in all of South America, Africa, Madagascar and the Seychelles. The largest turtle known to man (*Stupendemys geographicus*) belongs to this family, but only exists as a fossil today.

Big-Headed River Turtle (*Peltocephalus dumerilianus*)

The genus *Peltocephalus* is monotypic, containing only *P. dumerilianus*. This turtle occurs from the Orinoco to Amazon river basins in Venezuela, eastern Colombia, eastern Ecuador, northeastern Peru, French Guiana and Brazil (Iverson, 1992). Deep pools in creeks and lakes are the preferred habitat for *P. dumerilianus*. These turtles appear to prefer blackwater rivers throughout their range (Pritchard and Trebbau, 1984). It is a rare species in the Iquitos region. As its name suggests, *P. dumerilianus* possesses a large retractile head with a single chin barbel. The head is normally gray to olive and the jaws are tan. The carapace is domed and can grow up to 68 centimeters. Its coloration is either olive, brown, gray or black. Growth annuli are present on carapacial scutes of younger specimens. The plastron is either yellow or brown (Ernst and Barbour, 1989; Pritchard and Trebbau, 1984).

Little information is available about the natural diet of this species. A recent study conducted with specimens from the Venezuelan Amazon revealed additional information about preferred food types. It is now known that *P. dumerilianus* will feed on various seeds, fruits, aquatic plants and fish (Perez-Eman and Paolillo O. 1997). Other animals that have been examined revealed palm seeds in their stomach (Lamar, 1998; pers. comm.). Although captives are quite shy, they have accepted meat and fish.

Unlike its close relatives the *Podocnemis*, this turtle prefers nesting anywhere on dry land except for sandy beaches. However, *P. dumerilianus* will nest on beaches where the sand is mixed with leaf litter. Seven to 25 large eggs (5.5 centimeters by 3.6 centimeters) are produced per clutch. Hatchlings emerge from the eggs after approximately 100 days of incubation and are 5 centimeters long and weigh 25 to 30 grams. The neonates of this species seem to be more reclusive compared to *Podocnemis* (Pritchard and Trebbau, 1984).

River Turtles (*Podocnemis*)

This genus of pelomedusid turtle consists of six neotropical species occurring mainly in rivers. Three species are known from the Iquitos region, including the largest of the pleurodira (sidenecks), *Podocnemis expansa* (Dixon and Soini, 1986).

South American River Turtle (*Podocnemis expansa*)

Podocnemis expansa occurs in the Orinoco and Essequibo to Amazon River drainages of Colombia, Venezuela, Guyana, eastern Ecuador, northeastern Peru, northern Brazil and northern Bolivia (Iverson, 1992). Specimens have also washed up on Trinidad after flooding of the Orinoco River occurs (Carr, 1956). In the Iquitos region, this species is rare and could even be facing extinction. It has been taken from the larger rivers such as the Amazon, Rio Napo, Rio Ucayali and the Rio Marañon (Dixon and Soini, 1986). This turtle is primarily aquatic and only females leave the water to nest during the dry season. It appears that *P. expansa* is restricted to large river systems.

Although this massive species is not the largest chelonian in the world, it certainly ranks near the top. Females easily attain lengths up to 70 centimeters, but a specimen that reached 107 centimeters has been recorded. The large oval carapace is smooth and broadest towards the rear with an olive to dark gray or brown coloration. The plastron is broader anteriorly and is yellow in color. The wide head is gray or brown with an extended snout. Yellow markings are present on the head and a pair of yellow spots occur on the interparietal scutes. However, these normally fade with age. The yellow chin sports a pair of barbels and the jaw is normally tan (Pritchard and Trebbau, 1984; Ernst and Barbour, 1989).

Males tend to have thicker tails and rounder heads compared to females. Males also maintain the yellow head markings throughout life (Ernst and Barbour, 1989). *Podocnemis expansa* is primarily herbivorous. This species feeds on a variety of fruits, leaves and even freshwater sponges. Insects have also been taken, but these items may have been ingested from consumed vegetation. During the wet season, this turtle frequents areas of flooded forest to feed on various fruits that fall from trees. The reproductive biology of *Podocnemis expansa* is unique and has been studied extensively (Roze, 1964; Neill, 1965; Ojasti, 1967, 1971; Vanzolini, 1967; Alho et. al., 1979, 1982; Pritchard and Trebbau, 1984). Females of this migratory species are known to congregate on a limited number of nesting beaches during the dry season. These gatherings are one of the greatest natural shows in South America. At one time, hundreds of thousands of *P. expansa* would gather on a single beach. Unfortunately, due to hunting of this species for meat and egg harvesting, that number has declined to perhaps thousands at one time.

All four limbs are used by females in nest excavation. The nests can be a meter in diameter and about 60 centimeters in depth. Anywhere from 50 to 86 eggs can be deposited depending on the age of the female. Roze (1964) reported a clutch size of 150 eggs. The eggs are almost spherical and measure approximately 4 by 4 centimeters. On beaches that are open to more sunlight, the incubation temperatures are 31 to 32 degrees Celsius and eggs typically hatch after 50 days. In rain forest areas where ambient temperatures remain lower, the incubation period may take longer (Pritchard and Trebbau, 1984).

After hatching, neonate *P. expansa* begin digging their way out of the nest. This process may take a few days, but is normally completed during the night. Hatchlings emerge from the nest and immediately head for the water (Pritchard and Trebbau, 1984).

This species has been hunted ruthlessly throughout its range and is officially considered endangered. This is the main reason for its scarcity in Iquitos. The meat and eggs from *P. expansa* have been seen in local markets (Dixon and Soini, 1986).

Yellow-Spotted River Turtle (*Podocnemis unifilis*)

This *Podocnemis* can be found in the Orinoco to Amazon River drainages of Venezuela, eastern Colombia, eastern

Ecuador, northeastern Peru, the Guianas, Brazil and northern Bolivia (Iverson, 1992). *Podocnemis unifilis* is highly aquatic and inhabits rivers, swamps, floodplain pools, lakes and ponds throughout its range. Unlike its large relative, *P. expansa*, *P. unifilis* spends more time in smaller tributaries and is known to bask outside of the water (Pritchard and Trebbau, 1984). In the Iquitos region, this species is abundant (Dixon and Soini, 1986).

Podocnemis unifilis may be smaller than its congener *P. expansa*, but it does achieve carapace lengths up to 68 centimeters. The dark gray or brown carapace is oval and slightly domed. The plastron and bridge are yellow, but may develop darker blotches as the animals mature. The brown or gray head is characterized by lemon-yellow spots above the snout. The jaws are brown or black and two chin barbels are present in Amazonian specimens (Pritchard and Trebbau, 1984; Ernst and Barbour, 1989).

While females are larger overall, males tend to have longer and thicker tails (Ernst and Barbour, 1989).

The diet of this species consists largely of vegetation, but meat also is consumed. A variety of fruits, water hyacinths, laurels and grasses are eaten. A unique feeding mechanism is employed by *P. unifilis* that allows these turtles to feed on fine matter at the water's surface. This process is termed neustophagia (Belkin and Gans, 1968). Molluscs, fish and insects may also be accepted.

The nesting and reproductive behavior of this species have been extensively studied (Medem, 1964; Foote, 1978; Pritchard and Trebbau, 1984; Dixon and Soini, 1986; Thorbjarnarson et al., 1993). Female *P. unifilis* nest alone on beaches, or in soil composed of loam or clay on river banks (Pritchard and Trebbau, 1984). In Iquitos, these turtles emigrate from lakes and ponds to the rivers between July and September. Many females may have to cross several hundred meters of land to reach the rivers where they will nest (Dixon and Soini, 1986).

Nests are constructed at night and can measure 18 to 20 centimeters in depth and have a basal diameter of 11 to 15 centimeters. The eggs are hard-shelled and elongate with anywhere from four to 49 deposited per clutch (Pritchard and Trebbau, 1984). *Podocnemis unifilis* in Peru can deposit from 14 to 49 eggs per clutch, depending on the age of the female. An incubation period from 2.5 to 3 months has been reported (Medem, 1964). Juveniles are morphologically similar to the adults, but tend to be paler in color.

This species is a primary food source in Iquitos. Live and butchered specimens along with their eggs are seen commonly in marketplaces (Dixon and Soini, 1986).

Amazon River Turtle (*Podocnemis sextuberculata*)

Podocnemis sextuberculata is found in the Amazon river drainages of Peru, Colombia and Brazil (Iverson, 1992). Like its relative *P. unifilis*, this species inhabits rivers, lakes, ponds and swamps. It is common in the Iquitos region (Dixon and Soini, 1986).

This turtle attains a carapace length of approximately 30 centimeters and is among the smaller *Podocnemis*. Its head is reddish brown with tan jaws and a pair of chin barbels. The gray or brown carapace is domed and broadens towards the posterior half of the shell. The plastron is yellow, gray or brown.

This carnivorous species feeds readily on fish and insects. Some aquatic vegetation also is consumed.

In Iquitos, this species nests on the banks of rivers from July to September. Clutches consist of eight to 19 ellipsoidal eggs (mean = 39 by 27 millimeters) (Ernst and Barbour, 1989). Dixon and Soini (1986) have observed neonates around Iquitos in November.

This species is a major food source in Iquitos. It is frequently captured on fishing lines and in nets. Live and butchered specimens, along with their eggs, are seen in marketplaces (Dixon and Soini, 1986).

Kinosternidae (Kinosternon)

To date, there are approximately 19 species of *Kinosternon* recognized in the New World. This genus ranges from New England (U.S.) all the way to northern Argentina. Only a few species are known to occur in South America.

Amazon Mud Turtle (*Kinosternon scorpioides scorpioides*)

There are currently six recognized subspecies in the *Kinosternon scorpioides* group. The nominate race, *K. s. scorpioides*, occurs in Iquitos. This species ranges from Tamaulipas, Mexico, to northern Argentina and Brazil. *Kinosternon s. scorpioides* is found from Panama to northern Peru and Brazil. Although this turtle is widespread and common throughout much of its range, it is considered rare in Iquitos. During an eight-year study, Dixon and Soini (1986) were able to find only

six specimens. When encountered, however, it resides in flooded forests, swamps and ponds.

Kinosternon s. scorpioides possess a highly domed black or brown carapace with three keels that run the length of the shell. The grayish brown head is medium-sized, and the chin has three or four pairs of barbels. The jaw is normally yellow, but may have some dark streaking. The plastron is brown (Pritchard and Trebbau, 1984; Ernst and Barbour, 1989).

This species is largely carnivorous, but does practice omnivory throughout its range. It actively forages for a variety of invertebrate life, fish, amphibians, snails, algae and, occasionally, other vegetation. Captive specimens will readily consume red meat, fish, mice and dog food.

During courtship, males *K. s. scorpioides* will chase females while trying to bite at the rump and hind legs of their prospective mates. When the female becomes submissive, the male will normally circle while biting at her marginal scutes. He will then mount his mate from the rear. Long claws are used to grasp the underside of the female's carapace for support (Ernst and Barbour, 1989). During copulation, males rub their chin barbels against the females' head.

Little data is available for nesting and incubation for this subspecies. Egg deposition probably occurs in the dry season when females deposit their clutch in shallow nests. The eggs are elongate and measure approximately 40 by 18 millimeters for other members of this species. Incubation is completed after about three months, and hatchlings measure roughly 3 centimeters in carapace length (Ernst and Barbour, 1989; Pritchard and Trebbau, 1984).

Although this species is rare in Iquitos, it makes for a tasty meal for locals when found (Dixon and Soini, 1986). In other areas of its range, *K. s. scorpioides* is prized for its appetizing flesh and its supposed ability to cure diseases of the chest. The latter properties are more than likely false (Pritchard and Trebbau, 1984).

Comments

The chelonian life of this biologically diverse area demands additional study. Throughout South America and within Iquitos, turtles are still plagued by hunting. These animals are prized as food items, for their supposed curative properties and also for the pet trade. Even those species considered unpalatable are killed so their shells can be used to craft ornaments. All of these factors add to the decline of not only turtles, but most fauna existing in the neotropics. These problems, coupled with habitat destruction, portend a sure decline for the turtles and the areas where they still survive.

It is vital that currently existing captive populations be bred and offspring used as subjects to learn more about the biology of these animals. The days of 100,000 South American river turtles congregating on a single beach at one time have passed. Perhaps, though, with further study, intense conservation programs and organized efforts with captive subjects, we may all be able to enjoy these fascinating creatures for years to come.

Acknowledgments

Special thanks go to William W. Lamar and George Ledvina of Greentracks, and Thomas J. Russell and Tim Walsh of the Central Florida Zoo for help with the preparation of the manuscript. Additional gratitude is owed to William W. Lamar, Danté Fenolio and Peter Pritchard for providing photographs.

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