Podocnemis expansa (Arrau Sideneck Turtle)

Family: Podocnemididae (Side-necked Turtles)
Order: Testudines (Turtles and Tortoises)
Class: Reptilia (Reptiles)

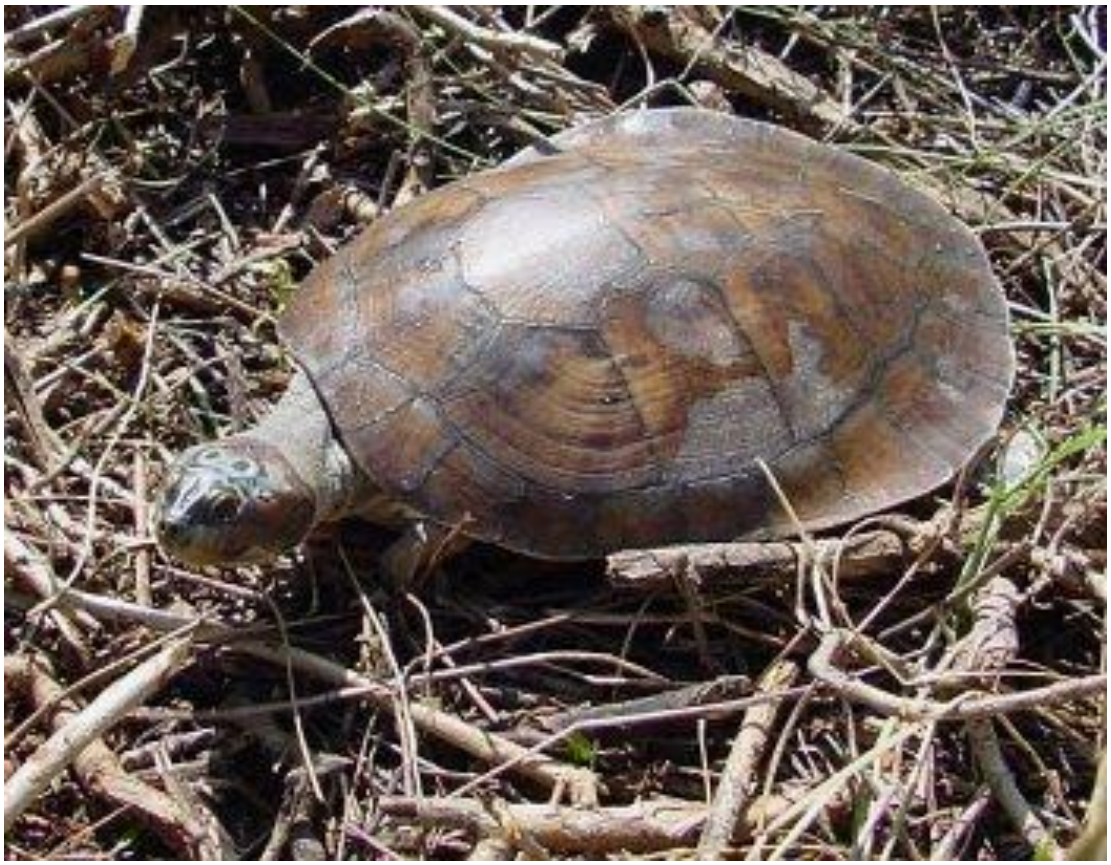

Fig. 1. Arrau sideneck turtle, *Podocnemis expansa*.
[http://www.tc.umn.edu/~gambl007/amazon.html, downloaded 18 March 2015]

TRAITS. Podocnemis expansa is the largest river turtle in Latin America or South America. It has a domed and broad carapace (that is the dorsal section of the shell) for active swimming in moderate river currents. The colour is usually olive green or brown; however, it is thought that the colour is influenced by algae attached to it. *P. expansa* has strong sexual dimorphism in respect to size; the female is relatively larger than the male. The length of the adult female carapace has an average of 64-71 cm and a width of 43-55 cm. The adult male carapace has an average length of 40-50 cm and width of 30-38 cm (Ojasti, 1996). These turtles have long necks which can withdraw horizontally into the shells (part of the head is exposed) as opposed to the vertical retraction or 'S' bend of many other turtles.

DISTRIBUTION. *Podocnemis expansa* is found in the Amazon Basin and the Orinoco River. Some countries where it is found include: Bolivia, Ecuador, Colombia, Brazil, Peru, Guyana and Venezuela. After heavy rain fall and increased flooding *P. expansa* is sometimes found in Trinidad.

HABITAT AND ACTIVITY. *P. expansa* is found in deep portions of fresh water rivers, ponds, lagoons and the flooded forest. However, with seasonal changes they are found in different areas. In the rainy season where water levels are high they are concentrated in the flooded forests, swamp and adjacent lagoons, whereas during dry season they are concentrated on the riverbeds (Amazon and Orinoco). *P. expansa* is diurnal in its aquatic medium; most of their activities are carried out in the mid morning and afternoon. However, females lay their eggs at night and therefore nest at this period. In contrast feeding is done during the day.

FOOD AND FEEDING. Flooding has a major influence on the feeding pattern of *P. expansa*. They are predominantly herbivores; during high waters they feed primarily on vegetation in the lagoons and swamps and flooded forest. *P. expansa* feeds on fruits and seeds from trees found on the flooded forest floor, they also feed on legumes and green leaves. However, they feed on freshwater sponges, eggs and scavenge on dead fish and other animal materials. Further, during breeding periods female *P. expansa* consume little food or none at all; their stomachs are either empty or contained filamentous algae. Some studies noted that hatchlings feed on fish and vegetables while recent studies showed that the enzymes present in the hatchling are herbivorous.

POPULATION ECOLOGY. *Podocnemis expansa* also known as the Arrau river turtle (or the giant South American river turtle) is the largest Latin American river turtle. They are social animals, during the nesting period adult females as well as males are seen migrating in groups from the flooded forest to nesting beaches. Males and females are seen basking on the beaches (Fig. 2); after the hatchlings emerge they all migrate back to the flooded forest. Currently, there is no accurate estimation of the population size of *P. expansa* but over the past 200 plus years the population decreased dramatically. It is estimated that females reach breeding size around 4-5 years or can even take up to 8 years. Their life span in the wild is estimated to be greater than 20 years however, in captivity it is about 25 years (Rosamond Gifford Zoo Education Volunteers, 2006). Historical records showed that during the 17th century the population of *P. expansa* were in the millions, and were found throughout the Amazon basin and Orinoco River. However due to the slaughter of females and taking of eggs caused the decreased in its population. It was recorded that in 1963 there were 34,000 nests on the main nesting beaches but in 1981 there were only 4,700 nests (Ojasti, 1996). These observations showed that the species have become rare and this drastic decreased in population sized caused concern to the IUCN.

BEHAVIOUR. Juvenile behaviour: females migrate in groups to nesting beaches to lay their leathery eggs as it is thought that this action reduces loss to predators. The sex of *P. expansa* is determined by the temperature at which they are incubated; females develop at higher temperatures while males develop at a lower temperature. The offspring are hatched when the river levels have already risen. The hatchlings are about 5 cm long. As soon as they climb out of their nest they immediately race to the water. However recent studies have shown that the mothers produce unique sounds when waiting for their hatchlings to emerge (National Geographic, 2014). The mothers accompany their young back to the flooded forest. It is not known how long the mothers stay with their young.

Communication: Most information on communication is associated with reproductive activities. During migration and basking the *P. expansa* produced lower

pitched sounds frequencies. It is suggested that lower frequencies were used to assemble groups from distant location to migrate to nesting beaches. During nesting, higher frequencies are used, because females are congregated in the shallow waters in front of the nesting beaches. Further, hatchlings of *P. expansa* also emit sounds; the embryo begins to vocalize 3-36 hours before hatching (Witzany, 2014).

Anti-predator behaviour: *P. expansa* are shy out of water, they dive back in at the first sign of disturbance while on land. Basically they are easily startled on land.

REPRODUCTION. *P. expansa* lay eggs on the banks of sandy beaches, and reproductive actives are dependent on the hydrological cycle, that is when water levels are low or during the dry season. Females deposit an average of 78-132 eggs in the nests that are about 60-80 cm deep. The number of eggs produced depends on the female size. The eggs are about 40g in weight and their shells have elastic properties. They incubate for 45-48 days, and then hatchlings emerge when rain begins and rivers are flooded. About 95% of the eggs produce are viable; there are more females produced than males (Ojasti, 1996).

APPLIED ECOLOGY. *P. expansa* is considered an endangered species by the IUCN and is listed in the CITES Appendix II. The adult turtles, mainly the females are hunted (for their meat and trade) and eggs are taken by humans. In breeding season, hunters track the turtles' nests and rapidly capture and carry a large number of them to awaiting boats. While out of breeding season the turtles are caught in rivers using hooks and lines baited with fruits (Ojasti, 1996). In addition, due to the increase in human population the flooded forest is being destroyed to create homes, or for farming (cattle farms) and pollution. It is important to note that since the population of *P. expansa* have dwindled, harvesting and commercial trade have shifted to smaller species such as *P. unifilis*. However the CITES (Convention on International Trade in Endangered Species) Appendix II stated "that commercial trade is allowed if a permit from the country of export is obtained." This is used to monitor the amount of trading that is carried out and protect *P. expansa* from exploitation (Honegger, 1979). Countries such as Venezuela, Brazil, Colombia and Peru have implemented laws to protect *P. expansa*; for example Venezuela has banned egg-taking and capturing of turtles in 1946 and 1962. Also Brazil has place laws protecting 54 turtle beaches (Ojasti, 1996).

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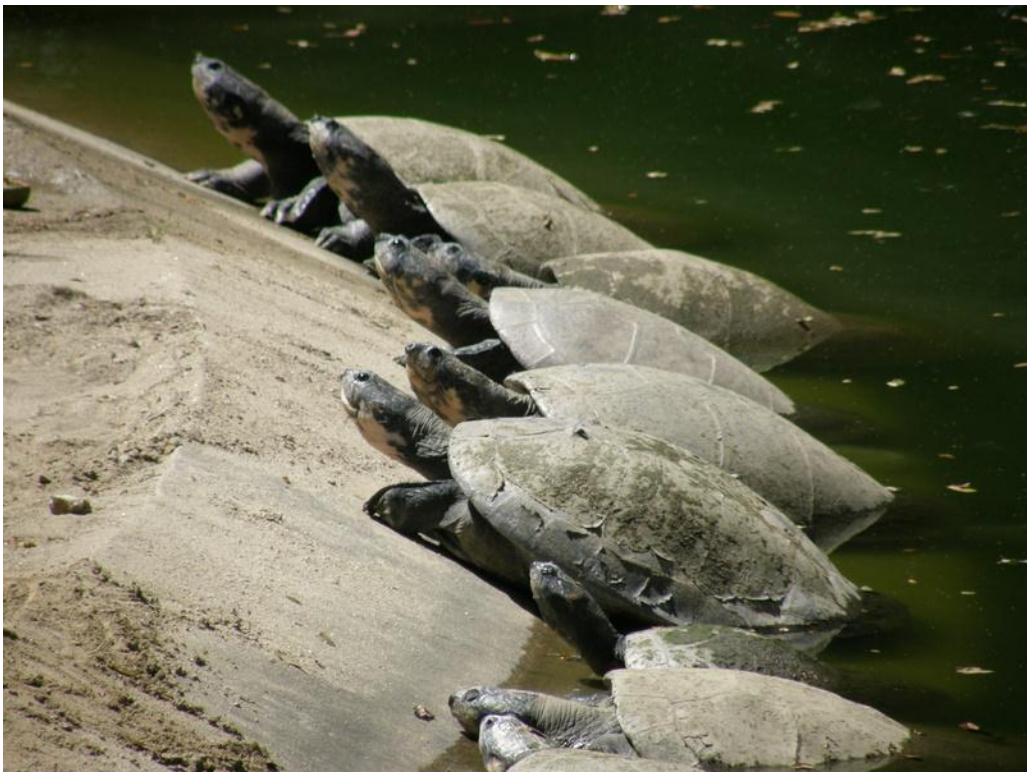

Fig. 2. Basking in the Arrau sideneck turtle (*Podocnemis expansa*).

[http://www.llanosdevenezuela.com/apps/photos/photo?photoid=116976887, downloaded 18 March 2015]