



Population Trends and Habitat Preferences of Pink and Grey River Dolphins in the Peruvian Amazon

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The pink (*Inia geoffrensis*) and grey (*Sotalia fluviatilis*) river dolphins are endemic to the Amazon River and its tributaries. Although these species are sympatric, they show notable differences in habitat preferences. Both species have been found to have the highest densities within 200m from the river banks, confluences and lakes (Vidal et al., 1997), but grey river dolphins prefer more open waters in the main river and where the channels are wider (Martin et al., 2004). This preference is likely due to the higher concentration of schooling fish in wider channels, which is the preferred food of this species (McGuire, 2010). Pink river dolphins show marked sex differences in habitat preferences, with females showing a preference for oxbow lakes and flooded forest whereas males are more commonly found in open rivers (Martin & da Silva, 2003). Both species also show seasonal variation in habitat preferences as fluctuating water levels affect food availability in different habitats (Martin et al., 2004). The two species also have very different feeding behaviour, with the grey dolphin often feeding in communal pods that ambush fish along river banks. In contrast, pink dolphins are more solitary fishers that dive and stun fish with blasts of sonar.

The wildlife of the Samiria River lives in an ecosystem that is driven by the large seasonal fluctuations occurring between high and low water seasons. Each year the Amazon River goes through seasonal changes between the flooding period from December to June and the low water period between July and November. During the flooded periods the fish enter the water laden forests and feed on the abundance of vegetative and animal production, especially the abundance of fruits, invertebrates and other living organisms trapped in the annual floods. Indeed, many tree species fruit during this season and rely on the fish as their primary means of seed dispersal. During the flooded period many fish populations reproduce within the inundated forests. When the waters recede during the dry months, fish populations become condensed in the reduced lakes, rivers and channels with ever increasing competition and predation. During this period many fish populations migrate out of the smaller rivers and into the larger rivers.

As dolphins feed on fish, dolphin abundance and habitat preferences are expected to vary in relation to water levels. However, these normal seasonal changes are now becoming more intense, which is impacting the wildlife and local people (Davidson et al., 2012). Since neither the pink nor the grey river dolphins are hunted by the local people that populate the Amazon, their abundance (as a calculated density) is directly related to the water quality and food supplies – making them great ‘indicator species’ for the condition of the Samiria River and any other rivers in the Amazon that they populate (Aliaga-Rossel, 2002). Moreover, river dolphins are easy to count and are extremely mobile, meaning that if either human induced changes (such as pollution or overfishing) or natural changes (such as effects of climate change) occur in the aquatic system, dolphins would likely move out of the affected areas (Gomez et al., 2012).

Long-term population monitoring of the river dolphins in the Pacaya Samiria National Reserve in Peru will determine how the ever increasing climatic changes are impacting their ecology, behaviour and abundance. The research aims to monitor the dolphins at several river sites and understand the ecology and habitat use of the species. Data collected during high and low water seasons may be used to investigate seasonal variation in habitat use. Yearly abundance estimates may be used to investigate changes to dolphin population dynamics over time, which provide insights into the health of the river ecosystem. Dolphin abundance data may also be added to the long-term fish abundance data set as a means of investigating how the human population of Pacaya Samiria is impacting on the dolphin population.

Methods

The project is located within the Pacaya Samiria Reserve, which is the largest protected area in Peru. It lies within the confines of the Marañón and Ucayali Rivers, spanning over 20,000km² of ecologically rich Amazon Rainforest. Both the pink and grey river dolphins are common throughout the various rivers, tributaries and lakes in the reserve, but each species has different habitat preferences. Data will be collected each day between 9am and 2pm along river transects of 5km and within oxbow lakes attached to the river. For each dolphin sighting the time of day, GPS location, distance travelled along the transect, species, group size, and habitat type will be recorded. For each survey the start and finish time will be recorded as a means of calculating survey effort.

Dolphin abundance will be calculated as density:

Where: D = Density
 N = Number of individuals
 A = River width
 L = Distance travelled
 2 = Number of margins sampled

$$D = \frac{N}{2AL}$$

Statistical analyses will compare differences in abundance and habitat use of the different species (comparisons of abundance across lakes, channels and the main river). In addition, data from previous years will allow for a longitudinal analysis between years to measure trends in the dolphin population as indicators of river health. Trends in dolphin population ecology may also be compared to trends in fish abundance using the fisheries data set.

Suggested Reading

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