

# Citizen science supporting Andean bear (*Tremarctos ornatus*) conservation in the tropical dry forest of NW Peru

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## Context

Most Andean bear habitat in Peru is unprotected, so effective bear conservation must involve and be supported by local citizens.

## Introduction



In the tropical dry forest of NW Peru we see dramatic annual variation in body condition of Andean bears. The same individual may be skeletal in December and in good condition in April.

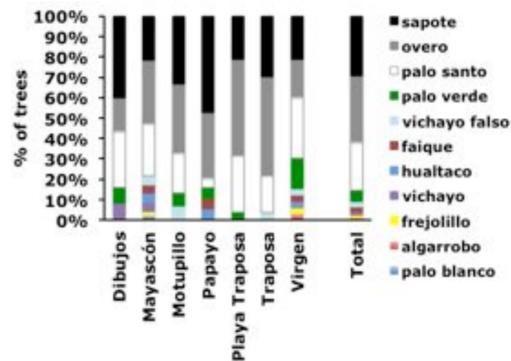


The most obvious environmental correlates of these body conditions are the seasonal presence of the fruit of sapote (*Colicodendron scabridum*), which is considered Critically Endangered by Peru (Toledo et al. 2006), and the destructive consumption of the wood of pasallo (*Eriotheca ruizii*) when sapote fruit is unavailable. The latter may have implications for the Globally Endangered white-winged guan (*Penelope albipennis*), for which pasallo is a key habitat component (Serván Mori and Angulo Pratolongo 2006).

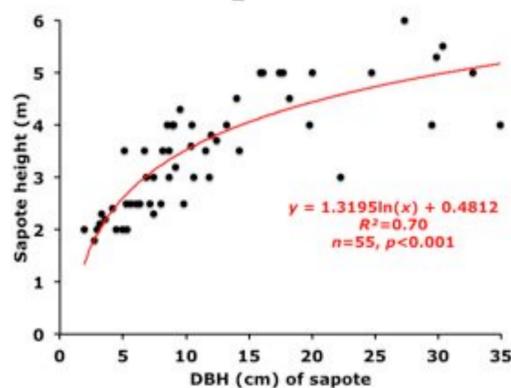
## Objectives

We seek to characterize the sapote within the watershed of the Rio La Leche and monitor sapote phenology to better understand sapote's reproductive ecology, incorporating citizen scientists whenever possible.

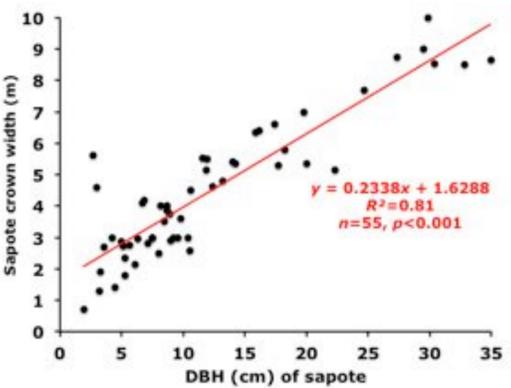
## Results



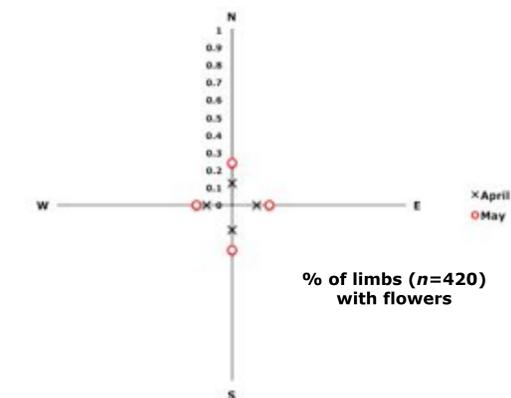
Sapote grew at elevations up to 428m, and there were 55 sapote within the transects. Although it was not the most common tree in the transects, there were an average of 11.22 sapote/ha ( $\pm 2.79$  SD, range 7.14-14.29 sapote/ha).



The average Diameter at Breast Height (DBH) of the sapotes was 12.12cm ( $\pm 8.42$ ), ranging from 1.9-34.9cm. The average height of the sapotes was 3.47m ( $\pm 1.1$ , range 1.8-6m). Sapote height and DBH were correlated.



The average maximum crown width of the sapotes was 4.46m ( $\pm 2.19$ , range 0.7-10m). Maximum crown width and DBH were correlated.



At the end of April 2013, 7 (3.3%) of sapote trees ( $n=105$ ) still retained a few fruit from the last season, but by the end of May 2013 only 1 tree (0.9%) still bore fruit. The average proportion of trees with flowers increased from 25% ( $\pm 44$ , range 6.7-40%) at the end of April to 35.6% ( $\pm 48.1$ , range 20-46.7%). This was reflected in the % of limbs with flowers, which showed an apparently symmetrical distribution of flowers in the 4 cardinal directions; from April to May 2013 the average proportion of limbs with flowers increased from 13.9% ( $\pm 27.6$ , range 6.7-20%,  $n=420$ ) to 23.1 ( $\pm 38.4$ , range 11.7-38.3%)

## Methods



At 7 locations within our study site we installed transects of 2m x 350m down the long axis of side valleys. Within these transects citizen scientists collected data on the characteristics of all woody plants with a DBH  $\geq 1.5$ cm. Along each of these transects they also selected 15 sapote trees at 25m intervals, for monthly monitoring. Within each of these trees, one limb in each of the cardinal directions was selected for long-term monitoring.

## Conclusions

Citizen scientists are capable of collecting informative data on tree characteristics and phenology, revealing that sapote density varies by a factor of 2 across this landscape, that DBH could function as an index of sapote size, and that the abundance of sapote flowers varies widely among side valleys.

## Future plans

Monthly monitoring of sapote will continue for at least 12 months, and we plan similar work on pasallo. Pilot analyses of the nutritional value of both food sources are underway.

## Literature cited

Serván Mori, A., and F. Angulo Pratolongo. 2006. Caracterización florística y análisis de diversidad en el área de distribución de la Pava Aliblanca (*Penelope albipennis* Taczanowski). Zonas Áridas 10:84-101.

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## Acknowledgments

Permission to conduct this research was granted by various local communities and the government of Peru. Financial support was provided by San Diego Zoo Global, the Disney Worldwide Conservation Fund, and anonymous donors.



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