



# Norteak: A Profitable Ecosystem Project

By Kevin Gauthier

## What does Norteak do?

Norteak Nicaragua S.A. establishes and maintains forest plantations in Nicaraguan rural areas with the goal of realizing both economically profitable work and sustainable business. Norteak primarily works with the exotic Teak tree and the native Coyote tree. Its plantations are established in open areas intensely affected by cattle farming and surrounded by secondary forests. By reverting grazing land to tree covered land and through environmentally conscious management practices, Norteak helps improve the overall ecological quality of its territory. Norteak takes pride in protecting natural forests present on their properties and participating in conservation efforts through education and sustainable management.



## An Ecological Community

As a part of Norteak’s sustainable management initiatives for 2018, a general study of the environmental quality of Norteak’s managed farms in

Boaco and Matagalpa was mandated. The study showed that more than 215 animal species from 10 taxonomic classes were present on Norteak’s farms. That list includes three species that are threatened at a global scale according to the International Union for Conservation of Nature: the Spider Monkey (*Ateles geoffroyi*), the Margay (*Leopardus wiedii*) and the American Crocodile (*Crocodylus acutus*). Moreover, the list includes 27 species that are legally protected because of potential threats in Nicaragua. Those include species like the Mantled Howler

Monkey (*Alouatta palliata*), the Brown-throated Sloth (*Bradypus variegatus*), the Crimson-fronted Parakeet (*Aratinga finschi*), the Olive-throated Parakeet (*Eupsittula nana*), the Collared

Aracari (*Pteroglossus torquatus*) and the Keel-billed Toucan (*Ramphastos sulfuratus*). This clearly shows some of the conservational benefits of Norteak’s protection policies and education efforts.

The main factor favouring the establishment of a diverse ecological community on Norteak's farms is the availability and protection of diverse habitats. Secondary forests, wetlands, riverine forests and dense shrublands are the most common protected habitats found on Norteak's farms.



These habitats play key roles in maintaining biodiversity. As described in the study, secondary forests, riverine forests and shrublands are considered very productive habitats, generating high quantities of food sources such as young leaves, flowers, fruits and seeds (Bongers and al., 2015; Granados-Sánchez and al., 2006). They also offer dense vegetation cover creating optimal nesting and breeding territories (Gilbart, 2012). Additionally, riverine forests and wetlands offer an important diversity of microhabitats and gradients of ecological conditions, which has a vital role for local biodiversity (Granados-Sánchez and al., 2006). Riverine forests also play an important role as biological corridors between natural habitats for birds and mammals because of the protection they offer, the abundance of



food they harbour and their linear characteristics (Granados-Sánchez and al., 2006).

### **Teak Plantations: an Exotic Home?**

It was noted that 92 of the species identified were observed inside teak plantations. This comes to quite a surprise considering that teak plantations are still exotic monocultures. Of course, many of these observations are the result of the proximity with Norteak's protected areas, but nonetheless, teak plantations were considered useful to a significant ecological community. Many animals were observed finding food inside the plantations, nesting or even just using the vegetation cover to safely cross to neighbouring protected forests.

The quality of the plantation's understory, resulting from good management practices, was considered a determining factor for habitat quality. At least 5 species of lizards, 2 species of toads and 2 species of frogs were found to actively utilize the plantations as a major habitat component. The Roadside Hawk (*Buteo magnirostris*) and the Gray Hawk (*Buteo plagiatus*) were found to regularly hunt inside the plantations as well as various species of Flycatchers (Tyrannidae). Tanagers were observed regularly using teak trees to safely cross over to different protected habitats on the farms and grain eaters from the same family (Thraupidae) were observed eating grains from grasses present in young

plantations. Agreeing with another study conducted in Panama in 2012 by Méndez-Carvajal, the study found that the Nine-banded Armadillo (*Dasypus novemcinctus*) and the Common Opossum (*Didelphis marsupialis*) could satisfy their vital needs inside properly managed teak plantations.

The study also revealed some noteworthy behavioral observations such as a female Common Opossum (*Didelphis marsupialis*) giving milk to her furless babies inside of teak plantations, anuran eggs layed inside temporary puddles in the plantations and a male and female Yellow-headed Gecko (*Gonatodes albogularis*) doing a copulatory ritual at the base of a teak trunk. Hummingbird nests were observed on the branches of teak trees as well as other bird nests inside the plantations. Additionally, various animals such as the Speckled Racer (*Drymobius margaritiferus*), Pewee birds (*Contopus sp*), the Black-striped Sparrow (*Arremonops conirostris*), the Summer Tanager (*Piranga rubra*), the House Wren (*Troglodytes aedon*) and the Yellow-faced Grassquit (*Tiaris olivaceus*) were observed using the plantations to find food. This goes to show how some animals will adapt to different forest structures if given the chance, even if the dominant tree species is exotic. Good management practices and native understory vegetation create a vital space for native animals and help increase the habitat quality of teak plantations.



### How Norteak is Helping

Teak trees on their own are rarely said to have much conservational benefits in Central America. Teak is often considered to enhance erosion risks due to its large leaves forming large erosive drops when it rains (Calder, 2001, in Fernández-Moya and al., 2014). To gain real ecological value, these plantations depend on proper management techniques.

The study of the general environmental quality of Norteak's managed farms found that although the company has space to improve its management practices, many of its internal policies are already quite environmentally friendly. Norteak follows various management practices that favour the

ecological enhancement of its plantations such as:

- The protection of all mahogany (*Swietenia macrophylla*) and cedar trees (*Cedrela odorata*);
- The protection of healthy individuals from 9 other tree species inside Norteak's plantations;
- The protection of half of fruit stands in their plantations in terms of fruit production;
- The protection of rivers and wetlands;
- Only planting teak in open or semi-open grazing land;
- Leaving fallen trunks and various litter elements in young plantations;

- Reducing management of established plantations to favour the development of understory vegetation;
- The selection of less intensive weed management practices when possible in young plantations.

These practices help ensure better biological activity inside Nortek's farms by improving natural connectivity between habitats, protecting food sources, creating important microhabitats, protecting aquatic ecosystems, favouring a healthy vegetation structure and reducing soil degradation.



### **Nature Giving Back**

The study has found that Nortek benefits from biological control agents helping to protect the plantations from potential plagues in return for its good management practices. In fact, many species were found to help control populations of destructive ants such as the Túngara Frog (*Engystomops pustulosus*), the American White Lipped Frog (*Leptodactylus fragilis*), the Golden-olive Woodpecker (*Piculus rubiginosus*) and the Nine-banded Armadillo (*Dasyus novemcinctus*). The Roadside Hawk (*Buteo magnirostris*) was found to be an important agent in the control of rodent populations and some species were found to be of potential help controlling harmful grasshopper populations such as the Groove-billed Ani (*Crotophaga sulcirostris*) and the Striped Cuckoo (*Tapera naevia*). Dozens more were found to participate in the regulation of the

populations of potentially harmful species leading to the overall health and stability of Nortek's plantations.

### **The Future for Nortek**

Considering how Nortek has taken environmental protection seriously so far and how management practices protecting the environment have often resulted in enhanced plantation productivity through better soil quality and biological control of potential plagues, it only makes sense for the company to continue to strive for better and greener management practices.

Nortek should continue its conservation efforts parallel to its wood production objectives. Some important actions that Nortek should take in the future according to the study include wider

protection of riverine lands, using local fruit producing trees to attract animals in the plantations and leaving dead trees standing in the clearing stage of semi-open grazing lands. Nortek should also investigate the feasibility of using Pelibuey sheep, which were demonstrated to be efficient biological weed controllers in coffee plantations in Mexico and in Douglas fir tree plantations in the United-States (Dávila-Solarte and al., 2017; Popay and al., 1996), to reduce the use of Glyphosate herbicides.

## **Bibliography**

### *Main study of this article:*

Gauthier Kevin (2019), "Evaluación de la calidad ambiental y de la diversidad faunística de las fincas con plantaciones de teca (*Tectona grandis*) de Norteak Nicaragua S.A. en la región de los municipios de Boaco, Camoapa y de Matiguás", Norteak Nicaragua S. A., 93p.

### *Other citations:*

Bongers, Frans & Chazdon, Robin & Poorter, Lourens & Peña-Claros, M. (2015). The potential of secondary forests. *Science* (New York, N.Y.). 348. 642-3. 10.1126/science.348.6235.642-c.

Dávila-Solarte, P., Sanginés-García, L., Amezcua, T., & Solano, L. (2017). Productive performance and economic evaluation of sheep grazing on weeds in coffee plantations compared to pastures with or without supplementation. *Agroforestry Systems*. doi:10.1007/s10457-017-0165-7

Fernández-Moya, Jesús & Alvarado-Hernandez, Alfredo & Forsythe, W & Ramírez, L & Algeet Abarquero, Nur & Marchamalo, Miguel. (2014). Soil erosion under teak (*Tectona grandis* L.f.) plantations: General patterns, assumptions and controversies. *CATENA*. 123. 236–242. 10.1016/j.catena.2014.08.010.

Gilbart, Meghan. 2012. *Under Cover: Wildlife of Shrublands and Young Forest*. Wildlife Management Institute. Cabot VT. 87 pages.

Granados-Sánchez D.; M. Á. Hernández-García; G. F. López-Ríos (2006), ECOLOGÍA DE LAS ZONAS RIBEREÑAS, *Revista Chapingo Serie Ciencias Forestales y del Ambiente* 12(1): 55-69, Recibido: 10 octubre, 2005

Mendez-Carvajal, Pedro. (2012). Estudio de diversidad de mamíferos en cuatro hábitats de transición asociados a una plantación de teca (*Tectona grandis*) dentro de la Cuenca del Canal de Panamá, Las Pavas, Chorrera, Panamá. *Tecnociencia*. 14. 55-83.

Popay Ian y Roger Field (1996), *Grazing Animals as Weed Control Agents*. *Weed Technology*, 10(1), 217-231. Retrieved from <http://www.jstor.org/stable/3987805>