Illegal Logging In The Chiquibul
Combating Illegal Logging in the Chiquibul Forest

A Stakeholder’s Final Project Report

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Illegal logging has been identified as one of the primary threats and challenges facing the Chiquibul National Park and the greater Chiquibul forest. As a result, the Chiquibul National Park Management Plan identifies critical steps in addressing the problem. More recently, the Chiquibul Cave System Management Plan also recommends strategies to address illegal logging. FCD has developed both plans in consultation with the Forest Department, the Institute of Archaeology and many other stakeholders; and has the responsibility of implementing the recommendations within the next 3-4 years with multi-stakeholder participation. The plans recommend a robust and consistent monitoring program on all hotspot areas including logging zones; creation of an information database to assist with an adaptive management program, development of in-house skills in database, liaising with concession holders, improvement of intelligence gathering capabilities, increase of bi-national communication systems and strengthening of multi-agency cooperation.

With this in mind, FCD with the endorsement of the Forest Department developed and submitted a proposal to the Food and Agriculture Organization/Forest Law Enforcement, Governance and Trade Support Programme for African, Caribbean and Pacific Countries (FAO/FLEGT) in May, 2010; and sought additional support from The Nature Conservancy and the Protected Areas Conservation Trust.

**Problem Statement**

Illegal logging and illegal timber trade has for years been documented in the southern region of the Chiquibul forest, namely the Columbia River Forest Reserve (CRFR). In one multi-agency operation conducted in 2007 with governmental agencies and other NGO’s, FCD documented the high logging impact occurring inside the CRFR and got a glimpse of how intricate the illegal activities were. At the time, the Chiquibul National Park and the Caracol Archaeological Reserve demonstrated some illegal logging and trade taking place but was not widespread. The primary targets at the time were more focused in reducing the harvest and trade of xate palms (*Chamaedorea ernesti augustii*) and containing the expansion of the agricultural frontier along the boundaries of the Chiquibul National Park and Caracol Archaeological Reserve.
In 2009, the Government of Guatemala passed a new legislation providing for the sustainable harvest and export of xate in that country. Xate activity, therefore, became better regulated and a decline in the illegal extraction of this palm from the Chiquibul forest was expected. As this occurred a significant increase of illegal logging activity along the border and spreading into Belize became visible. The forest crime included the following: logging in a core protected area, logging tree species (mahogany and cedar) protected by the laws and regulations of Belize, logging without authorization, export of trees listed by CITES without appropriate permits, unauthorized movement of logs across national borders, operating without a processing licence and the use of chainsaws without the necessary permits. Other impacts created by Guatemalans operating inside Belize included: poaching, looting, camping in a protected area and carrying of firearms.

**PROJECT CONTEXT**

The primary objective of the FAO/FLEGT programme was to reduce the illegal trans-border logging operations in the Chiquibul forest. To achieve this, FCD sought a two-fold approach:

1. To increase FCD’s law enforcement capacity and capability in the Chiquibul forest involving key stakeholders.
2. To strengthen partnerships and reporting to support monitoring and enforcement.

**DEFINITION OF ILLEGAL LOGGING**

The European Union Action Plan for Forest Law Enforcement, Governance and Trade (EU/FLEGT), defines illegal logging as a condition when timber is harvested in violation of national laws (European Commission 2003); while Brack and Hayman (2001) state that illegal logging not only includes the harvesting of timber but also when it is transported, bought or sold in violation of national laws. Contreras-Hermosilla (2002) provides a more detailed definition of illegal logging, which includes “unauthorized occupation of public and private forest lands, logging in protected or environmentally sensitive areas, harvesting protected tree species, woodland arson, wildlife poaching, unlawful transport of wood and other forest products, smuggling, transfer pricing and other fraudulent accounting practices, unauthorized processing of forest products, violation of environmental regulations and bribing government officials.

Management and harvesting of timber and non timber forest products (NTFP) in Belize is regulated by the Forest Act Chapter 213 of the Laws of Belize and its Subsidiary Instruments and The Private Forest Conservation Act, Chapter 217 of the Laws of Belize. The Forest Act notes that: no person except by virtue of and subject to the conditions of any license a.) cut, girdle, burn or injure any tree, b) collect, prepare, use or remove any forest produce; in any forest reserve (protected area) or in national and private lands to which the provisions of the Act have been applied. It is clear that the harvesting of timber or other NTFP is legal only with due permit or license. Part V, Section 28 of the Subsidiary Laws indicates that “No person shall transport, or allow to transport any timber (other than sawn lumber) by any public road except if the timber is accompanied by a waybill.” In addition, the Subsidiary Laws indicate that “No person shall export or attempt to export wild animals, products of wild animals, plants (other than cultivated plants), spices or seeds unless an application has been made by him to the Minister and his permit obtained authorizing the export.”

Therefore, according to the Belizean legislation illegal logging involves the harvesting of timber and non timber forest products, transport and financial transactions in violation of national legislation; similar to that of Brack and Hayman (2001) and Contreras-Hermosilla (2002).

**IMPACTS OF ILLEGAL LOGGING**

Rosander (2008) states that illegal logging is connected with corruption and organized crime. It fuels poverty and widens the gap between the powerful and the powerless and restricts access to natural resources.
Illegal logging poses a wide array of ecological impacts (Lawson & MacFaul 2010; Sheikh 2008). Some direct impacts include the loss of biodiversity (in many cases depletion of wild animal populations that depend on ecosystems being logged) and if this occurs within protected areas as is the case with the Chiquibul Forest important biological and ecological functions are altered (Lawson & MacFaul 2010). Since illegal logging is carried with no regards of protecting the ecological integrity of the system it leads to many collateral damages including damaging of other tree species, reduction on the amount of standing seed trees (reducing seed banks, which is directly linked to reduction of targeted species natural regeneration ability), deforestation (Rosander 2008), increase the risk of forest fires and lowers the potential for sustainable harvesting of timber species (Lawson & MacFaul 2010), reduction of carbon stocks, increase in soil erosion and sedimentation, leading to an increase in water pollution.

PROJECT DELIVERABLES

Despite the creation of the Chiquibul Forest Joint Enforcement Unit (CFJEU) comprised of BDF, Police and FCD rangers enabling a robust patrolling system; strengthening of the Chiquibul National Park Advisory Council to assist in reporting; opening of discussions with Guatemalan counterparts; activation of a database system to document illegal logging activities; strengthening of ranger capabilities through training; and improvement in the coordination mechanism among law enforcement agencies, we still continue to document an escalation of illegal logging in the Chiquibul Forest.

During this period several Guatemalan nationals have been approached and detained; lumber seized and horses confiscated. Yet the human resources at the CFJEU do not match the number of hotspot areas in the wider Chiquibul where signs of illegal logging occur.

It is clear that the resources in man-power, infrastructure, training and inter-institutional collaboration must be strengthened in order to contain the illegal activities and prevent it from spreading wider. Support from Guatemalan authorities is also key.

Illegal logging is conducted using chain saws. Loggers first hunt for trees of interest, then return at a further date to fell the trees, cut logs and saw these into planks. Planks are mostly 4 inches in height by 8 feet in length with varying widths. Planks are usually left standing to dry them in order to facilitate transportation, which is primarily conducted by using horses. Illegal loggers conduct their activities during the day and night depending on the location and presence of patrols; making law enforcement more complicated and risky. The destinations of the timber are primarily the nearby communities of Monte Los Olivos, La Rejoya, Las
Flores de Chiquibul, Las Brisas de Chiquibul, Puertas del Cielo Chiquibul, Nueva Armenia, and San Jose Las Flores. From here trucks ferry the lumber to the interior of Guatemala where it is sold locally but well ends up as a product for export.

**Illegal Logging Pilot Assessment**

**Site Description**

The Chiquibul Forest, located within the Cayo District, covers an area of 176,999 ha (437,376 acres) comprised of three protected areas being the Chiquibul National Park (106,838 ha), Chiquibul Forest Reserve (59,822 ha) and the Caracol Archeological Reserve (10,339 ha), with central UTM coordinates 1,878,200 – 1,871,800 North and 265,600 – 322,600 East. Meerman and Sabido (2001) identified 17 different ecosystems within the area, all being variants of Tropical Broadleaf Forests, except for a pine forest category. Caracol Archaeological Reserve (CAR) has five identified ecosystems all but one are variants of Tropical Broadleaved Forests and much of the soils are shallow over calcareous limestone.

**Data Collection**

Data collection for the pilot study was conducted within the limits of the Caracol Archaeological Reserve due to accessibility, human resources and time constrains. Data was collected along major xatero trails which were regarded as transects. Transects varied in distances (from 1 to 4.6 km). All logged trees that were within a perpendicular distance of 150 m from either sides of the trail were identified and measured. The variables that were taken from each logged tree included: species, perpendicular distance to trail (m), diameter at cut height (cm), diameter at cut end (cm) and commercial bole length (m). In addition, the geographic coordinates were taken for each tree. The diameter of logged trees was measured using a carpenters tape, and measurements were taken excluding the trees’ bark. The commercial bole length (refers to the ability to cut lumber from the logs contained in the trees) of the trees was regarded as the bole length of the same to the first major fork but if above branches were of suitable diameter and more than or equal to 3 m in length these were also measured both for diameter and length. Teams consisted of six FCD rangers and where necessary BDF and Police personnel joined to provide security.

**Zone of Influence**

![Area of Influence Illegal Logging Map](image)

Since illegal logging is not occurring throughout the entire Chiquibul Forest a zone of influence was identified. The zone of influence refers to the territory within the Chiquibul Forest that has been impacted by illegal logging. The identification of this zone was made possible by projecting the geographic coordinates of catalogued logged trees within the Chiquibul Forest; this data was mainly collected during routine ranger patrols over the last year (2010) to mid 2011. Once the coordinates were projected using ArcGIS, it was proceeded to draw a polygon by connecting the far extreme points (logged trees with greatest distance into Belizean territory). The “Zone of Influence” was used as a proxy to estimate the severity of illegal logging.

Based on these calculations illegal logging is occurring in an area of 26,642 ha. after calculating the difference between deforested and forested area. At its widest point, illegal logging is occurring up to 10 km into Belizean territory. Based on the “Zone of Influence” calculated by FCD on December of 2010
(18,167 ha.), in a period of 6 months there was an increase of 46.6% in area impacted by illegal logging.

RESULTS

A total of 212 logged trees were recorded within a surveyed area of 992.5 ha. (9.5% of the total CAR area). Data indicates that primarily mahogany (*Swietenia macrophylla* King, n = 113) and cedar (*Cedrela odorata* L, n = 98) were targeted by illegal loggers; only one Santa Maria (*Calophyllum brasiliense*) tree was recorded to have been logged. Mean diameter at cut height for all logged trees was $0.59 \pm 0.14$, just below the minimum cutting diameter for both species established by national laws. For Mahogany, mean diameter at cut height was $0.57 \pm 0.13$ with a mean commercial bole length of 13.48 m ($\pm 3.11$), while for cedar mean cutting diameter was calculated as $0.63$ m ($\pm 2.85$) with a mean commercial bole length of 13.89 m ($\pm 1.85$). The results indicate that 71% of all logged trees were below 65 cm (0.65 m) in diameter, while only 4% were greater than 88.5 cm. 72% of all logged mahogany trees fell below 63 cm (0.63 m) at cut height, while 54% of logged cedar trees had a diameter below 60 cm and only 3% of all logged cedar trees had a cutting diameter greater than 90 cm.

Based on the frequency distribution of tree commercial bole length classes, 38% of all logged mahogany trees had a commercial length less than 12.5 m, while 4% of the trees had a commercial bole length between 18.4 and 21.35 m and only 1% with bole length greater than 21.35 m. In regards to illegally logged cedar trees, 49% of these fell below the mean commercial bole length for the species. 11% of the cedar trees had lengths between 16.2 and 18.7 m, while only 6% of the illegally logged cedar trees had commercial bole lengths greater than 18.7 m.

Data indicates that on average, 0.114 mahogany trees have been illegally logged per hectare, which translates to a volume of 0.329 m$^3$ per hectare or 86.28 board feet for the same land area. This means that within Caracol Archaeological Reserve an estimated 730,792 board feet of mahogany with an estimated value of US $1,278,885.00 have been extracted. In regards to cedar an average of 0.099 trees have been extracted per hectare, translating to 90.13 board feet per hectare. Doing an estimation for the Caracol Archaeological Reserve, data indicates that a total of 838.53 cedar trees have been logged producing a total of 763,401 board feet with an aggregated economical value of US $1,145,102.00. In all, the economical value of the illegally extracted mahogany and cedar within the CAR was estimated as having an aggregated economical value of US $2,423,987.00. Taking into consideration the assumption that the same intensity of illegal logging is being conducted within the “Zone of Influence”, the data indicates that a total of 2,298,672 and 2,401,243 board feet of mahogany and cedar respectively have been extracted with an aggregated economical value of US $7,624,541.00. Caution must be taken while interpreting these values as these were calculated based on the assumptions that all lumber was of the same grade class and that all the commercial bole length was fully harvested (the former was based on the fact that once a tree was felled, its commercial value was 100%, even though it would have not been the case, due to bole deformities).

Although illegal loggers are conducting the activity in a much artisanal manner, by employing chainsaws to fell and saw lumber, the intensity at which it is occurring FCD has categorized the activity as one of the most important critical threats to the area’s biodiversity. It is important to understand that this activity is not only impacting the timber resources but it is having a domino effect on many dimensions, including ecological, economical, cultural and bi-national relations. Although no rigorous assessment exists on how illegal logging affects game species populations, it is evident that illegal hunting which is mainly conducted
Lessons Learned

- As enforcement measures are increased Guatemalan illegal nationals tend to become more tactical and confrontational in the Chiquibul forest.
- Once the legal processing is ineffective, more advantages are being given to encroachers.
- Persistency for local authority support has paid off.
- An unclear policy on how to deal with Guatemalan nationals breaking the environmental laws has further reduced our credible deterrence.
- Limited coordination among security agencies is advantageous for Guatemalan encroachers.
- Once priority is not given to this trans-border environmental crime loggers will continue taking the risk at relative ease.
- Dealing with trans-boundary illegal logging means for the security and park personnel taking risks at another level.
- It is overly ambitious to combat and contain illegal logging in the Chiquibul forest in the short term (1 year). It requires a multi-year and ongoing approach.
- Adaptation to new methodologies, skills and interventions is essential for operating in the Chiquibul forest.

Recommendations

Given the severity of the illegal logging activity in the Chiquibul it is recommended that:

- A new strategy for addressing trans-border environmental crimes all along the western border be analyzed and implemented. This strategy should consider the creation of additional functional conservation posts nearby hotspot areas.
- Enforcement units be more alert, coordinated and disciplined to undertake the taskings. Mahogany and cedar are primary hardwoods and of high economic value, therefore loggers involved will put a stand and take the risks.
- A revitalized Border Coordination mechanism be instituted. This to be housed within the Ministry of Foreign Affairs.
- A high level discussion between Ministers of the Environment and other pertinent Ministries of both Governments (Belize and Guatemala) be held in order to table the actual situation, identify interventions and garner their active cooperation.
CITES local authorities present a situational analysis to the CITES headquarters requesting for their support in calling Guatemala local authorities to abide with international conventions.

Conduct assessment over the whole illegal logging zone of influence to determine the total ecological and economical lost due to the activity, also taking into consideration the collection of data necessary to estimate the amount of lumber wasted.

Conduct a study to determine the rate of deforestation due to illegal logging which can support previous studies of carbon stocks and losses in the Chiquibul forest.

Maintain local attention and bring international attention to the demise of the Maya Forest due to illegal encroachments.

Develop long term financing strategies and mechanisms for the sustenance of efforts in this vast area for the continued provision of environmental good and services.

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REFERENCES


Background

Illegal logging has been identified as one of the primary threats and challenges facing the Chiquibul National Park and the greater Chiquibul forest. As a result the Chiquibul National Park Management Plan identifies critical steps in addressing the problem. More recently the Chiquibul Cave System Management Plan also recommends strategies to address illegal logging. FCD has developed both plans in consultation with the Forest Department, the Institute of Archaeology and many other stakeholders; and has the responsibility of implementing the recommendations within the next 3-4 years with multi-stakeholder participation. The plans recommend a robust and consistent monitor program on all hotspot areas including logging zones; creation of an information database to assist with an adaptive management program, development of in-house skills in database, liaising with concession holders, improvement of intelligence gathering capabilities, increase of bi-national communication systems and strengthening of multi-agency cooperation.

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