



**IWOKRAMA INTERNATIONAL
CENTRE FOR RAIN FOREST
CONSERVATION AND
DEVELOPMENT**

**Public Summary: Forest
Management and
Monitoring**

October 2018

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The mark of
responsible forestry

The Iwokrama Forest has been certified for Forest Management in accordance with the requirements of the Forest Stewardship Council® A.C. using the Soil Association Certification Adapted Standard for Guyana (v2.4; 2014)

Public Summary: Forest Management and Monitoring

What is Iwokrama?

The Iwokrama International Centre for Rain Forest Conservation and Development (*Iwokrama*) is an organisation created through the Iwokrama International Centre for Rain Forest Conservation and Development Act, Act No 7 of 1996, and an Agreement between the Government of Guyana and the Commonwealth signed in November 1995.

The Government and people of Guyana have “gifted” 371,000 hectare¹ to the Iwokrama Forest to show how tropical forests can be conserved and used wisely for ecological, social and economic benefits to local, national and international communities. The Iwokrama International Centre is responsible for the management and conservation of the Iwokrama Forest.

The mission of Iwokrama is,

“To promote the conservation and the sustainable and equitable use of tropical rain forests in a manner that will lead to lasting ecological, economic and social benefits to the people of Guyana and to the world in general, by undertaking research, training, and the development and dissemination of technologies.”

Site Location

The Iwokrama Forest is located at the centre of the Guiana Shield. To the west of the forest is the Pakaraima Mountain Range that extends through western Guyana and eastern Venezuela and to the east are the inselberg and highland formations scattered through central-east Guyana, Suriname and French Guiana. There are also savannahs to the southwest and northeast of the Iwokrama Forest in Guyana, as well as in south-western Suriname.



Figure 1: Site Location

¹GIS mapping shows the actual size of the Iwokrama Forest to be 371, 681 hectares

Key Milestones in the History of the Iwokrama Centre

Year	Milestone
1989	<ul style="list-style-type: none"> Guyana offered nearly one million acres (371,000 hectares) of intact rain forest to the international community through the Kuala Lumpur Commonwealth Heads of Government Meeting, Malaysia.
1993	<ul style="list-style-type: none"> US\$3M secured from Global Environment Facility for legal establishment, demarcation and research and institutional development
1994	<ul style="list-style-type: none"> First Field Station built, led by Macushi leader, Robert Frederick Allcock who became Iwokrama's first Field Station Manager
1995	<ul style="list-style-type: none"> Iwokrama Agreement signed by President of Guyana H.E. Dr Cheddi Jagan MP and the Commonwealth Secretary General H.E. Chief Emeka Anyaoku
1996	<ul style="list-style-type: none"> Iwokrama Act passed unanimously by the Parliament of Guyana Iwokrama supported the development of the North Rupununi District Development Board (NRDDB)
1997	<ul style="list-style-type: none"> First Tourists visited the Iwokrama Field Station
1998	<ul style="list-style-type: none"> US\$10M secured from the International Tropical Timber Organization (ITTO), British Department for International Development (DFID), the Canadian International Development Agency (CIDA) and the European Commission to support the Centre 11 Community based wildlife clubs formed in Apoteri, Fair View, Annai Central, Rewa, Yakarinta, Massara, Toka, Surama, Wowetta, Kwatamang, and Aranaputa in response to a community-led request to grow capacity in natural resource management.
2000	<ul style="list-style-type: none"> HRH Prince Charles, Prince of Wales became Patron of Iwokrama
2001	<ul style="list-style-type: none"> Forest zoned into Sustainable Utilization Area (SUA) and Wilderness Preserve (WP) after extensive consultations with community representatives International Wildlife Workshop hosted to address issues and lessons learnt impacting community members and resources, south to south and south to north. First Wildlife Conservation Festival hosted in Annai. Two hundred and forty five children from all over the country show an appreciation for and celebrate Guyana's rich wildlife. Initiation of Citizen Science monitoring project with 14 communities of the North Rupununi.
2002	<ul style="list-style-type: none"> An Amerindian representative of the local North Rupununi communities appointed for the first time to Iwokrama's International Board of Trustees. State of the art Canopy Walkway installed in the Iwokrama Forest Supported development and programming of Radio Paiwomak: 97.1 FM, the first community radio station in Guyana.
2003	<ul style="list-style-type: none"> Programme restructured to meet shortfall in global realignment in donor support focus, leading to 40% reduction in operational costs. Iwokrama develops first draft manual on Intellectual Property Rights Iwokrama completes first management level inventory of the Sustainable Use Area
2004	<ul style="list-style-type: none"> Turtle Mountain Satellite Camp opened A new entomopathogenic species discovered <i>Stilbella iwokramensis</i> (Ascomycotina, Hypocreales) - a new beetle pathogen species distinguished from other fungi of the genus <i>Stilbella</i>.
2005	<ul style="list-style-type: none"> Collaborative Management Agreement signed with Local Communities for management of the Iwokrama Forest. HRH Prince Charles, Prince of Wales renews patronage of Iwokrama International Centre
2006	<ul style="list-style-type: none"> Fair View Village received land title to 21, 950 hectares of the Iwokrama Forest; chose to remain within the boundaries of the Forest. Special collaborative management and benefit-sharing agreements signed. 111 persons from across Guyana trained as rangers, tour guides, protected area management and collaborative management. Airstrip built in Fair View Village within the Iwokrama Forest
2007	<ul style="list-style-type: none"> First phase of model low impact sustainable timber harvesting operation started in the Iwokrama Forest

<p>2008</p>	<ul style="list-style-type: none"> • Iwokrama Forest received Forest Stewardship Council® (FSC®) Certification for Forest Management • Innovative Ecosystem Service Agreement signed with private sector company of the United Kingdom – the first in Guyana • First in-land fisheries management system (the Arapaima Management Plan) developed with the communities of the North Rupununi for Guyana. Formally gazetted by the Ministry of Agriculture • Iwokrama launched innovative inclusive governance arrangement for its Canopy Walkway with shareholder participation by local communities and local and international private sector operators. • Iwokrama designated Regional Focal Point Organization as part of an EU-funded project to establish a forestry research network in 12 countries spanning the Africa Caribbean and Pacific region. • Iwokrama received funding from the Gordon and Betty Moore Foundation in the United States to support national initiatives and build awareness on climate change, REDD+ and natural resources management • Iwokrama establishes network of Permanent Sample Plots (PSPs)
<p>2009</p>	<ul style="list-style-type: none"> • Iwokrama Science Committee formed, International Resident Scientist recruited. • State of the art climate and hydrology monitoring equipment installed in the Iwokrama Forest and its environs. • Iwokrama produced the only known Volume and Decay study on tropical forests. • Iwokrama played major role in developing the community manual on Climate Change and the Role for Forests which includes the contributions from communities, NGOs and Government (accessible online and in 6 languages). • Ground breaking agreement for climate and forest partnership between Government of Guyana and Kingdom of Norway signed by President H.E. Bharrat Jagdeo and Norwegian Minister of International Development and the Environment Erik Solheim in the Iwokrama Forest. • Iwokrama sponsored only non-governmental public forum on Guyana’s Low Carbon Development Strategy (LCDS) as a 3-part series. • Iwokrama trained over 400 community, private and public sector representatives on climate change and the role of forests. • Iwokrama’s brainchild, the Wildlife Festival included in the national calendar of tourism events. • Iwokrama sub-contracted by the Centre for International forestry research (CIFOR) to define the state of Forest Law, Enforcement and Governance including the role and level of illegal logging in Guyana • Visitor numbers surpassed 1,000 for the first time • Iwokrama International Centre presented its Sustainable Forest Management programme to the World Forestry Congress in Buenos Aires, Argentina • Two new species discovered <ul style="list-style-type: none"> – Crabwood: <i>Carapa akuri</i> –belonging to the family Meliaceae, considered endemic to Central Guyana – a new genus and species of lungless caecilian: <i>Microcaecilia iwokramae</i> (Synonym <i>Caecilita iwokramae</i>)
<p>2010</p>	<ul style="list-style-type: none"> • HRH Prince Charles, Prince of Wales renewed his patronage of the Centre for an additional five years. • First results of the Iwokrama climate monitoring programme presented at the Commonwealth Forestry Congress in Scotland
<p>2011</p>	<ul style="list-style-type: none"> • Iwokrama in partnership with the Global Canopy Programme and the NRDDB launched innovative community Monitoring, Reporting and Verification (MRV) system – the first in Guyana • 10th Wildlife Festival held- growth in conservation leadership seen as a measure of success and commitment
<p>2012</p>	<ul style="list-style-type: none"> • Iwokrama won the Community Benefit Award from the Caribbean Tourism Organisation/TravelMole Sustainable Tourism Awards • A new species of lizard was discovered - <i>Gonatodes timidus</i> • Comprehensive management level inventory completed in Wilderness Preserve.
<p>2013</p>	<ul style="list-style-type: none"> • Agreement signed with a development Bank to support the second phase of its low impact model timber operation in the Iwokrama Forest.

	<ul style="list-style-type: none"> • Iwokrama led successful lobby in Suriname for Guyana to host the 2016 International Congress on the Biodiversity of the Guiana Shield. • Iwokrama launched its corporate sponsorship scheme. • New species of poison dart frog discovered in the Iwokrama Forest: <i>Allobates amissibilis</i> (in Latin “that may be lost”). • Government of Guyana injected US\$900,000 over the period July 2012 – July 2013. • Three indigenous persons complete Master Degrees in heritage education at Newcastle University supported under the “Encompass” heritage preservation project
2014	<ul style="list-style-type: none"> • Agreement signed with a private sector company to conduct sawmilling operations in the Iwokrama Forest • Iwokrama hosted Biodiversity Corridors Workshop in collaboration with United Nations Development Programme, World Wildlife Fund and Convention of Biological Diversity at the Iwokrama River Lodge • Government of Guyana injected an additional US\$600,000 to support core activities • Funding received for Forest Stewardship Council® (FSC®) Certification from the German Government under the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) implemented Caribbean Aqua-Terrestrial Solutions Programme • Iwokrama launched new tourism dedicated website – www.iwokramariverlodge.com • First Indigenous Film Festival held in Georgetown, Guyana, COBRA Project, partnership Iwokrama, NRDDDB and Royal Holloway University, UK. • Travelling Exhibition in collaboration with Ministry of Culture, Encompass Project, partnership Iwokrama with NRDDDB and Newcastle University, UK
2015	<ul style="list-style-type: none"> • Iwokrama River Lodge awarded the TripAdvisor 2015 Certificate of Excellence • Second Phase of its sustainable timber harvesting and sawmilling operations in partnership with Farfan and Mendes Ltd. • Iwokrama and Rupununi Communities rescued and relocated twenty-seven (27) Arapaima (<i>Arapaima gigas</i>)
2016	<ul style="list-style-type: none"> • Iwokrama celebrated the 20th anniversary of the passage of the Iwokrama Act • Iwokrama reviewed and renewed Memorandum of Understanding and the Collaborative management Agreement with the North Rupununi District Development Board • Iwokrama showcased model forestry operations in UK at Commonwealth Secretariat in February • His Excellency Brigadier David Granger, MSS. President of the Cooperative Republic of Guyana launched National Tree Day at Iwokrama River Lodge on October 1st • Iwokrama Forest achieves FSC® Certification for Forest Management on October 14th • UK Environment Agency lifts procurement ban in October on Guyana’s Greenheart by approving FSC® wood from the Iwokrama Forest • Iwokrama featured with 8 others as examples of good governance practices in the Amazon Region in a regional report titled “Implementation of the Program of work on Protected Areas 2011-2015 Amazon Biome Region” presented at the recent 13th COP of the Convention on Biological Diversity, held in Cancun, Mexico in December. • Key visits to the Iwokrama Forest: <ul style="list-style-type: none"> – His Excellency Brigadier David Granger, MSS. President of the Cooperative Republic of Guyana (June) – Hon. Moses V Nagamootoo, MP, 1st Vice President and Prime Minister of the Cooperative Republic of Guyana (July) – Rt. Honourable Baroness Patricia Scotland QC. Secretary General of the Commonwealth of Nations (July) – Hon. David Patterson MP, Minister of Public Infrastructure (September) – Hon. Raphael Trotman MP, GC, Minister of Natural Resources (September) – HRH Prince Henry of Wales (December)

	<ul style="list-style-type: none"> • Iwokrama received <ul style="list-style-type: none"> – EPA’s Green Award for Environmental Leadership (June) – Guyana Tourism Authority’s Award People's Choice for Responsible Tourism (September) • Iwokrama hosted final year University of Guyana forestry students for Sustainable Forest Management course • Iwokrama rolls out its climate change training programme in 4 high schools • Airstrip in the Iwokrama Forest extended to 4200 feet and completely resurfaced • Iwokrama forges Memorandum Of Understanding with Tropical managed Forests Observatory
2017	<ul style="list-style-type: none"> • IIC participation in Guyana Forest Policy Review – Iwokrama was part of the technical advisory committee for the review and revision of the National Forest Plan and Policy Statement. • IIC/FML signed a new 5-year agreement for period of 2019-2023 • FSC Audit – 1st FSC ® Surveillance Audit successfully completed in September • Iwokrama secured Exxon-Mobil funding for New Science and Research Programme • ACP Scholarship offered to three staff • ACP Secretary General P.I Gomes Visited Iwokrama Office • A team from the University of Arkansas at Pine Bluff (UAPB) visited our Georgetown office to participate in an information exchange session on Iwokrama's work and partnership opportunities. • Iwokrama, Biomimicry Roraima and the University of Massachusetts Boston held a series of half-day workshops to launch the Guyana 'Green Growth' SDG Lab 2017 to identify key challenges of transitioning Guyana to a Green State. • Iwokrama led a MARCH FOR SCIENCE to celebrate Earth Day under the theme “Environmental and Global Literacy”. • Iwokrama hosted a Public Science Lecture in celebration of World Science Day on November 8. Exxon funded the lecture and the Keynote Speaker was Mr. Andrew Mitchell, Founder Director of the innovative Global Canopy Programme in the United Kingdom. • Iwokrama hosted 385 students from schools and universities along with researchers for 2017. Operation Wallacea, Earth Expeditions (Miami University) and University of Central Lancashire continued to make annual visits. • Iwokrama partnered with Repsol to update and reprint the Guide to the Mammals of the Iwokrama Forest • Iwokrama partnered with Tocuma Indigenous Restaurant to host Traditional Amerindian Cooking Classes in celebration of Amerindian Heritage Month. • Iwokrama began talks in Barbados for Destination Twining Experience with Accra Beach Hotel.
2018	<ul style="list-style-type: none"> • Iwokrama received Japanese funding for medical centre • New Science Committee formed – Inaugural meeting was held in February • Iwokrama reprinted CATS of Iwokrama poster that was previously done in Collaboration with NRDDB.

Area Description and Land Use

The Iwokrama Forest Area is generally well drained by creeks which flow into two major river systems – the Essequibo and Siparuni Rivers. The flat to undulating terrain varies in elevation between 50 and 1000m and consists largely of small sand and loam plateaus, terraces and mildly inclined valleys dissected by a few waterways. The soils of the Kurupukari Sandy Plains and Terraces landform are composed principally of quartzite sand with varying amounts of clay and loam.

The Iwokrama Forest (371,681 hectares) has been zoned into two distinct areas: the Wilderness Preserve (WP- 187,175 ha) and the Sustainable Utilization Area (SUA- 184,506 ha). The WP has been set aside as a biodiversity reserve, wherein all activity will be severely restricted. The SUA is available for multiple uses including Iwokrama’s sustainable businesses:

- Sustainable Timber Harvesting,
- Sustainable Tourism,
- Training and Learning Services

The SUA has been further divided into five compartments for forest management planning purposes (Map 2). Fair View's titled area lies within the Essequibo compartment of which, approximately 15,400 hectares are dedicated for sustainable forest management (Map 3). Current harvesting is rotated between the Essequibo and Kurupukari Compartments.

The Net Operable Area (NOA) is the area selected for timber harvesting purposes. The NOA is located in the sustainable use area and excludes non-commercial forest types, which are mostly located in two major land areas: the Pakatau Hills area in the north-west and the Maipa Mountains area in the far south.

The other excluded areas are: special use reserves; river and stream buffers; road buffers; slopes greater than 40%; and small, isolated inaccessible areas. The NOA accounts for only 29% of the entire Iwokrama Forest.

Biodiversity of Iwokrama and North Rupununi Area

The Iwokrama Forest and the neighbouring North Rupununi wetlands are extraordinary ecosystems which include a range of habitats - more than 200 lakes, 1,000 metre tall mountains, lowland tropical rain forests, palm forests, seasonally flooded forests and savannahs.

The Iwokrama Forest and North Rupununi Wetlands also contain the largest number of fish and bat species in the world for an area of its size.

Faunal diversity of the Iwokrama Forest

- 476 species of birds
- 130 species of mammals
- - 86 species of bats

- 140 species of reptiles and amphibians
- + 400 species of fish

Floral diversity: There are 9 distinct forest types in the Iwokrama Forest.

- The largest forest type covers 33% of the forest - mixed greenheart, black kakaralli and wamara forest.
- Around 20% of the forest is mixed greenheart, sand baromalli and soft wallaba forest
- About 16% of the forest is mora, manicole, crabwood and trysil forest
- 15% of the forest is mixed low stature forest
- 7% of the forest is manicole, kokerite and soft wallaba palm forest
- the remainder of the forest is less than 5% each of wallaba, dakama, muri scrub and liana forest.
- Botanical surveys of the Iwokrama Forest have found over 1,250 species of plants. However, the total number expected for the area is likely to exceed 2,000 species with additional work in highland areas.

The People

Populations South of the Iwokrama Forest:

There are over 7,000 people in the 20 villages linked to the Iwokrama Forest. About 91% of this population is ethnic Amerindian: 77% Makushi, 11% Wapishana, and 3% Arawak. Five percent of households are self-described as 'Mixed,' (Head of Household is half Coastlander/half Amerindian) and 3% of households as 'Coastlander,' (African or East Indian descent).

Populations North West of the Iwokrama Forest:

The majority of Amerindian communities in Region 8 are Patamona, and two communities Itabac and Kanapang are Makushi. These are located to the northwest of the Forest, in upland savannah areas, about a week's walk north from the Siparuni River, the north-western boundary of the Iwokrama Forest. The entire population of Region 8 is under 10,000 persons, (Ministry of Indigenous Peoples' Affairs, 2016). About one-third of this total is located at distances of a week's walk to the Iwokrama border at the Siparuni River.

Socio-Economic Context

The Iwokrama Act of 1996 provides for the protection of indigenous rights, traditional access and participation of associated communities in its activities. Iwokrama currently partners and works with the 20 communities within and south of the Iwokrama Forest through the umbrella organisation – the North Rupununi District Development Board (NRDDB).

Fair View Village, the only village within the boundaries of the Iwokrama Forest, has legal ownership through title of 21,950 hectares of the Forest since 2006. The community has opted to remain as part of

the Iwokrama Forest and a collaborative management agreement was signed with Iwokrama International Centre in 2006. The other communities lying south of the reserve (See Map 1) in the North Rupununi are mostly located in the savannah area. These communities maintain traditional access to the resources of the Iwokrama Forest. The population of the 20 communities is now over 7,000 with Fair View having more than 320 persons. In the North Rupununi, health care is very basic; most of the villages are equipped with health centres and community health workers. There is also a doctor at Annai.

Communities are governed and administered by Village Councils, District Councils, Regional Democratic Councils, and regional representatives of Ministries of Indigenous Peoples' Affairs, Agriculture and Health.

Iwokrama's relationship with local communities is based on equal partnerships rather than the more traditional relationships—patron-client or senior partner-junior partner. Iwokrama benefits from the knowledge, skills and support of local communities and in return, the communities are partners/shareholders in the management and conservation of the Iwokrama Forest.

While the Guyanese people, in general, are recognized as the legal owners of the Iwokrama Forest, the indigenous peoples who live in, and around, the Iwokrama Forest maintain a claim of ancestral domain and land rights.

Association with Iwokrama

Local people benefit from the Iwokrama Forest though legally maintained rights to use forest resources. The local people also represent a major human resource base from which the Iwokrama Centre draws for the management of the Iwokrama Forest.

Iwokrama has a strong partnership through the North Rupununi District Development Board (NRDDB) with the 20 communities and involves people in management planning and development activities.² There is also a community representative on the Iwokrama International Board of Trustees (IBOT).

A collaborative management agreement with the NRDDB sets out guidelines on how the Iwokrama Forest should be managed between the Iwokrama Centre and the communities. A separate collaborative management agreement was signed with Fair View Village because of their status as titled land holders within the Iwokrama Forest.

² The NRDDB is an umbrella organisation that represents the interest of the communities in the North Rupununi.

Sustainable Business Development and Iwokrama

To fulfil its mission of ecosystem conservation, *Iwokrama* must address the issues that affect conservation and wise use of tropical rain forests. To do so, *Iwokrama* is developing model forest-based businesses that

- are sustainable and profit-making
- include private sector and local communities
- are compliant with national laws and regulations
- produce and market low-impact and high-value products and services
- use environmental best practice methods
- are repeatable

Iwokrama will have achieved its mission when investors and local people can work together to achieve a single set of objectives which guarantees long term enhancement of livelihoods of people through the conservation and sustainable development of natural resources.

Sustainable Forestry at Iwokrama

In January 2014, the Iwokrama International Centre signed a five-year agreement with Farfan and Mendes Limited (FML) to develop Phase II of its sustainable timber harvesting operation. Iwokrama is using the results of the research and experience it acquired in Phase I of its operations in areas such as forest dynamics, inventories, community engagement and forest certification to improve operations and forest management in Phase II.

Iwokrama and FML will harvest a maximum of 1,800 ha per year (less than 0.5% of the Iwokrama Forest) under a very selective harvesting system so only a few stems per ha will be removed and no large gaps are created in the forest canopy. The operation will employ best practices in forestry including a strict “no-log export” policy and the employment of Reduced Impact Logging (RIL) and Directional Felling (DF) techniques.

Farfan and Mendes Ltd (FML) has been in business in Guyana for 50 years supporting the local timber industry, bringing many new technologies and practices to the local industry, including the introduction of chainsaws and chainsaw milling to Guyana in 1967 and band-mill technology in the early 1970’s. The company is the agent for Wood-Mizer mills and Stihl chainsaws and equipment amongst other products. Farfan and Mendes Ltd is working with McVantage Guyana Ltd who is providing technical and financial support to FML for harvesting and sawmilling activities.

An Environmental Impact Assessment (EIA) for the Sustainable Timber Operations was prepared in accordance with the Environmental Protection Act of 1996. The Environmental Protection Agency (EPA) of Guyana issued an Environmental Permit for Timber Harvesting and Sawmilling in 2007, which was revised in 2008 and renewed in 2015.

Management Objectives

The general objective of the timber operation is

“The Company will be a global sustainable model for timber harvesting and wood processing, demonstrating innovative governance models (including communities and the private & public sectors) and operations that are environmentally, socially, culturally and economically sustainable. The Project will aim to be certified by FSC® Standards for sustainable forest management.”

The specific forest management objectives of the timber operation are to

1. Be economically viable whilst following sound environmental and social practices
 - a. Producing 20,000 m³– 30,000m³ annually of sustainably harvested, certified logs for sale in Guyana
2. To maintain an environmentally sound and sustainable operation that complies with relevant local and international laws, regulations, guidelines and policies
3. Enhance the sustainable livelihoods and social well-being of Iwokrama’s community partners, particularly Fair View Village and the NRDDB

In Phase II, the sustainable timber harvesting operation will process logs into rough sawn lumber and squares in the forest. These products will be trucked to FML's reprocessing operations in Coverden where they will be converted to kiln dried and dressed sawn wood and other high value products for the local and export markets.

It shall also:

- test models of governance, planning, harvesting and management; this includes economic, social and environmental assessment of the process
- acquire practical experience in establishing, managing and operating a certified timber operation

Inventory Design

Iwokrama carried out a management level inventory of the NOA in April and May 2003, with the assistance and collaboration of the Guyana Forestry Commission. Pre-harvest inventories or 100% enumerations, are carried out on each annual cutting area to determine precisely the volumes by species and size classes that will be felled.

Management Regime

IIC has opted for a 60 year felling cycle and an annual allowable cut of 20 m³/ha. This allows an annual harvest area of about 1,800 ha and an annual harvest volume of 36,000 m³. The GFC's current yield regulation procedure will limit IIC to an average harvest of 16 m³/ha or about 29,000 m³/year.

Silviculture System

The silviculture system applied on the Net Operable Area (NOA) of the Iwokrama Forest is a natural regeneration system. This is a simple system consisting of selecting only a few trees at a time for removal, allowing natural regeneration to fill in the gaps created, and maintaining standing volumes of all tree species. It may also be called "*selective cutting*" or "*selection system*". It falls within the "*polycyclic systems*" of forest management and regeneration, as it contains trees in different stages of their growth cycles.

Infrastructure Development

Iwokrama developed a permanent base camp off the Linden-Lethem road about 8 km south of the Kurupukari Crossing. It provides housing, offices and equipment maintenance and storage facilities. Over the first 10 to 15 year period, the Linden-Lethem road will serve as the primary logging road. Secondary and feeder road development into the forest could extend up to 13km/year this period.

Employment and Training

There are over 7000 people living in 20 communities associated with Iwokrama, 19 of which lie south of the Iwokrama Forest in Region 9. Approximately 90% of them are Indigenous people. This potential labour base is readily accessible via the north-south road connector to Lethem. Preferential employment is given to residents of local communities.

The operation is practicing Reduced Impact Logging (RIL) and, to that end, all personnel involved with the harvesting operation will receive adequate training in RIL procedures.

Some of the specific training opportunities already provided and/or planned for the near future by Iwokrama, are:

- Ranger training, with emphasis on patrolling/monitoring and research;
- Tour Guide Training in the specific skills required for ecotourism development;
- Collaborative and Protected Area Management Training.

Iwokrama Monitoring

Iwokrama focuses on three main aspects as it relates monitoring; these are climate, hydrology and biodiversity. The goal of the monitoring programme is to measure and track changes in key physical and biological components in and around the Iwokrama Forest. Long term monitoring of the environment is key in identifying and evaluating the impacts of human activities on the environment.

Iwokrama's monitoring has benefited significantly from its ability to engage international and local research organizations, and co-monitoring agreements with local indigenous communities. The results of research partnerships includes several peer reviewed journal articles and other publications all which contributed to the general understanding of the impacts of human activities and assessing the effectiveness of the monitoring efforts on Iwokrama Forest.

The Iwokrama Rangers and the support staff continue to contribute to the positive developments at the Iwokrama River Lodge and Research Station throughout the year. Monitoring in Iwokrama continues to be a collaborative effort between communities and other stakeholders.

Biophysical Monitoring

- **Rainfall**

Rainfall data was collected at two sites: Iwokrama River Lodge (IRL), and Ranger Station 2 (Corkwood) within the Iwokrama Forest during the year 2017.

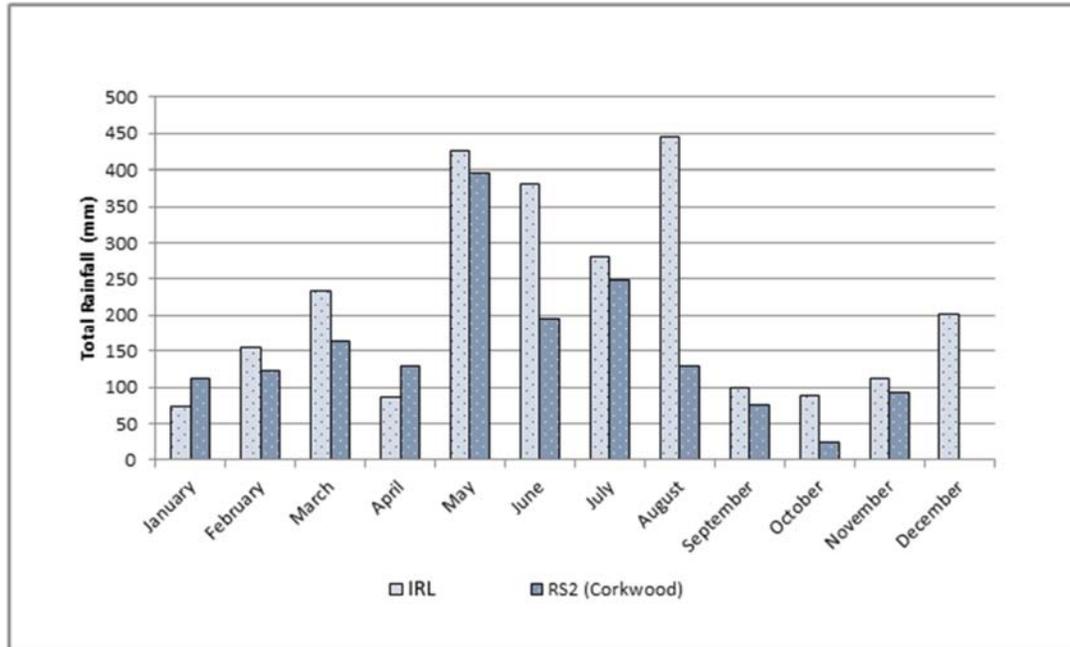


Figure 1. Total monthly rainfall for the Iwokrama River Lodge (IRL), and Ranger Station 2 (RS2) (Corkwood) for the year 2017

The areas north of the Iwokrama Forest have been recorded to have higher rainfall than areas found south of Iwokrama Forest, where the savannah regions are found. The Rupununi savannah is known to have a different weather pattern characterized by lower annual rainfall in comparison to the tropical rainforest of Iwokrama. As such, Ranger Station 2 (Corkwood) located south of Iwokrama Forest tends to show a different rainfall trend due to its close proximity to the Rupununi savannah.

Water Quality

Water quality samples were taken along the three main rivers: Essequibo River, Burro Burro River and Siparuni River. Five sites were monitored along the Essequibo River upstream and downstream of the Kurupukari rapids; one site each located within the Burro Burro and Siparuni Rivers was also monitored.

Physical, chemical and biological water quality parameters such as dissolved oxygen, electrical conductivity, and temperature were monitored in 2017. The results of the water quality tests indicated that each parameter were within their acceptable ranges. Therefore, the water is suitable for household, industrial and biological uses.

- **Fauna**

The Iwokrama Forest is home to countless species that occupy different habitats throughout the forest and the presence-absence of specific indicator species in aquatic or terrestrial habitats can be used to assess the overall health of an ecosystem. It is therefore, critical to monitor the impacts of the external and internal anthropogenic activities within the Iwokrama forest. Iwokrama monitoring includes the following wildlife surveys:

- **Road Patrols**

Wildlife observations were made for selected species along the 72 km main public road that runs through the Iwokrama Forest. A total of 7 species were observed during the survey, where 1 species was listed as 'Data Deficient', 3 species were listed as 'Least Concern', 1 species were listed as 'Vulnerable', 1 species was listed as 'Near Threatened' and 1 species that was not evaluated by the International Union for Conservation of Nature (IUCN).



Illustrations of the three most observed species – Grey-winged trumpeter, Black curassow and Red-rumped agouti

- **Borrow Pits**

There are six borrow pits adjacent to the road corridor that were selected for wildlife observations because they are greater than one hectare and were not easily visible from the road. A total of 28 species were identified during the surveys, where 1 species was listed as 'Data Deficient', 15 species were listed as 'Least Concern', 17 species were listed as 'Vulnerable', and 3 species were listed as 'Near Threatened' by IUCN.



Illustrations of the three most observed species – Brazilian tapir (VU), Red brocket deer (DD) and Red-rumped agouti

- *Bird Transects (Road)*

Bird monitoring included audio-visual encounter surveys along six permanent bird transects distributed along the 72km road corridor in Iwokrama forest. Bird diversity was highest in Mixed Greenheart and Mora forests, compared to the other forest type. A total of 201 species of birds were identified during the surveys, where 174 species were listed as ‘Least Concern’, 21 species were listed as ‘Vulnerable’ and 11 species were listed as ‘Near Threatened’ by International Union for Conservation of Nature (IUCN).



Helmeted pygmy-tyrant,



Screaming piha



Swallow-winged puffbird.

Illustrations Copyright © - David Ascanio, Gustavo Rodriguez and Robin Restall

Illustrations of the three most observed species – Helmeted pygmy-tyrant, Screaming piha and Swallow-winged puffbird.

- *Bird Transects (River)*

Audio-sound surveys were done at seven bird transects – five along the Essequibo River and one each on the Burro Burro and Siparuni Rivers. Surveys are done upstream and downstream in each river. In 2017, a total of 21 bird species were identified during the surveys, where 19 species were listed as ‘Least Concern’, 2 species were listed as ‘Vulnerable’ by IUCN.



Agami heron



Cocoi heron

Illustrations Copyright © - David Ascanio, Gustavo Rodriguez and Robin Restall

Illustrations of the two most observed species – Agami heron and Cocoi heron.

Ad hoc Wildlife Sighting

In Iwokrama, Ad hoc wildlife sightings are made by guests and staff at the IRL, as well as Iwokrama Rangers during monitoring visits within the forestry area. Sightings are recorded at the IRL and its immediate surroundings, the Linden-Lethem Road, the Mill Site and skid trails within the forestry area.



Jaguar



Giant river otter



Red brocket deer

Illustrations copyright © - Fiona A. Reid

Illustrations of the three most observed species – Jaguar, Giant river otter and Red brocket deer.

Forest Impact Monitoring

Forest impact monitoring was established in 2009 with staff and international scientists. This monitoring was focused specifically on evaluating the impacts of timber harvesting on the ecosystem by tracking key bio-indicator species. Data from this research/monitoring has been synthesised and presented in a peer review publication.

Synthesis and applications. (Extract from paper)

'Our study demonstrates the relatively benign effect of reduced impact logging (RIL) on birds, bats and large mammals in a neo-tropical forest context, and therefore, we propose that forest managers should improve timber extraction techniques more widely. If RIL is extensively adopted, forestry concessions could represent sizeable and important additions to the global conservation estate – over 4 million km².'

Reference: Bicknell, J.E., Struebig, M.J., Davies, Z.G. (2015). **Reconciling timber extraction with biodiversity conservation in tropical forests using reduced-impact logging.** *Journal of Applied Ecology.* 52, 379-388.

Other research supporting monitoring

Iwokrama continues to partner with Operation Wallacea and Surama Village to implement faunal surveys that follow our Forest Impact monitoring methodology, within the Iwokrama Forest and Surama Village. Volunteers from Universities primarily from the UK, Canada, the USA, and the University of Guyana join international and local scientists to conduct research relating to wildlife surveys. Volunteers get the opportunity to gain knowledge on theoretical research methods and hands-on field techniques from experts within the different fields, which include birds, insects (dung beetles), mammals, amphibians and reptiles.

This exercise ensures that long term monitoring data is collected from Iwokrama and Surama, which can be used to observe changes that are happening within these areas over time. A number of other research projects are also supporting Iwokrama's Monitoring Program including two camera trapping studies.

Social Monitoring

The Iwokrama Forest is historically and continues to be, a coupled human natural system, where people have always been forest resource users. As technology changes, impacts on forest use and users may also change.

Social monitoring is designed to determine the impacts of activities in the forest on the social, natural and economic environment. Data is collected from the medical reports, Fair View Village records, human resource records and tourism and timber records.

Employment

In 2017, 61 people were employed at the Iwokrama International Centre as outlined in the table below;. There are 24 women and 37 men employed and the overall average age of people employed (not including contractors) at Iwokrama is 35 years (Table 1).

Type of work	Number of people		
	Fair View village	Other NRDDDB villages	Non-NRDDDB
Iwokrama River Lodge admin	5	12	7
Iwokrama International Center Georgetown admin	0	0	15
Monitoring and research	1	5	1
Forestry contractors	2	4	1
Forestry	0	1	3
Contractors	0	4	0
Total	8	26	27

Table 1. Number of people employed by Iwokrama in 2017.

McVantage of Guyana, employs 42 people, 25 of whom are from the NRDDDB communities, 17 from Fair View Village.

Population/Migration

In 2017, there was 1 death, 11 babies were born (8 female, 3 male) and one family of 4 migrated out of Fair View and one family returned to the village. As a result of these changes the population increased from 307 to 316 souls. There is an almost equal gender split of 165 males (52%) and 151 females (48%). The largest age group is the 8-15 year olds with 65 people, followed by the 16-23 year olds and the 24-31 year olds.

Sustainable Businesses

- Timber

In 2015, The Iwokrama International Centre for Rain Forest Conservation and Development and Farfan and Mendes Limited started model forestry operations. This is in keeping with the Centre's mandate

to develop sustainable business models using multiple forest resources. The majority of the timber operations takes place at the Mill Site in the Iwokrama Forest. Iwokrama and its partners maintains a wood supply policy with communities outlining how communities can procure timber from Iwokrama. In 2017, there were 5 requests from NRDDDB communities for lumber. Fair View village also benefits from the delivery of lumber deliveries to the village quarterly, mainly for use as firewood.

- **Tourism**

Tourism is Iwokrama’s oldest business, a percentage of the Forest User Fee, paid by all visitors, is designated to the NRDDDB for use in community development. 1033 individuals visited the Iwokrama River Lodge in 2017, arriving mainly by land. A total of 1338 people visited the Canopy Walkway; 1090 adults and 248 children. Data collected shows that the tourism low season is May June during the rainy season.

Dispute Resolution

There is a dispute resolution committee in the event that matters arising between partners cannot be resolved. The members of the committee include an Iwokrama representative, NRDDDB executive or Fair View representative and Civil Society representative. No disputes were filed in 2017.

Health

The Iwokrama Medex provides service to all staff employed at the River Lodge and Mill Site and all members of Fair View village; treatment can involve dispensing of drugs or treating physical ailments. If this is above the station of the Medex, patients are referred to Annai Hospital. In 2017, a total of 937 visits were recorded by the Medex and of that, 83 different diagnoses were made. Patients are separated by location in the table below.

Location	Number of people
Fair View	398
Iwokrama River Lodge	328
Mill Site	110
Other	101
Total	937

Table 2. Number of people who visited the Medex in 2017.

The data collected identified the most common reasons for IRL staff to visit the Medex included: skin infections, minor injuries, cold and flu and headaches. The most common reasons for Mill Site staff to visit the Medex included cold and flu, skin infections, strain, injury and muscle pain. The most common reasons for Fair View residents to visit the Medex included deworming, cold and flu, skin infections, minor injuries and rashes.

Education and Outreach

- Fair View School

The Kurupukari Primary School is the only educational institution within Fair View and the Iwokrama Forest. There are a total of 98 students enrolled in the Fair View primary school; 56 males and 42 females enrolled. In December, Iwokrama hosts an annual Christmas party in for Fair View Primary School and fundraises amongst friends and colleagues to provide a gift for all children enrolled in school.

- Wildlife Clubs

Fair View Junior Wildlife and Observation Club was reformed with the support of the village council, in 2017 by the Peace Corps volunteer, who is stationed there. Activities include weekly bird monitoring exercises, where bird identifications are done with the help of an Iwokrama Ranger.

- Timber Committee Meetings

A timber committee made up of Fair View Village Council, Iwokrama Forest Manager, Mc Vantage Forest Manager meets every other month. The purpose of the committee is to keep all partners informed and to provide a forum for discussion.

- Outreach

Outreach activities continued with

1. Broadcasts on Radio Paiwomak which included announcements, local news and a programme titled “Eye on the Environment
2. Training and Outreach Seminars for staffers and community members which included health and safety, labour laws, forest certification,

Collaborations with Iwokrama

NRDDB

Since the NRDDB’s inception in 1996, Iwokrama is always invited to present on “partner’s day”, the CEO often attends meetings, and Iwokrama staff are always available to make presentations. At the November 2017 meeting in Apoteri, members of the Iwokrama monitoring, outreach and tourism departments made presentations.

Training and Information Sessions

Training and capacity building is an essential component in Iwokrama’s activities as a business as well as to provide on-going skills development for staff. Over the course of the year, 19 training sessions were provided to staff. These courses included a review of health and safety, labor and timber as it pertained to certification. This included reviews of certification principles, biophysical monitoring procedures, social monitoring context, report writing, public speaking, communications, tourism, public relations, and photography at the Iwokrama River Lodge.

Illegal activities

Two illegal activities were recorded in 2017. In both cases, reports were written and filed and protocols were followed and addressed in a manner that did not involve conflict or endanger the safety of rangers or others involved. Details of these incidences can be found in our Annual Report.

High Conservation Value Forests

An HCV is a biological, ecological, social or cultural value of outstanding significance or critical importance. The Iwokrama Forest contains several attributes that can be described as HCVs as defined by the Forest Stewardship Council® International Generic Indicators (FSC-STD-60-004 V1-0 EN September 2015).

The Iwokrama Forest contains several qualities which can be considered as indicators of high conservation value e.g.

- Threatened or Endangered Species,
- Possible Endemic Species,
- Key Ecosystems and Habitats,
- Critical Ecosystem Services and
- Sites of potential cultural, archaeological value or historical significance.

Many of these attributes can be found in reserve areas of the forest, either in the Wilderness Preserve (WP) or in reserve areas of the Sustainable Utilization Area (SUA). This zonation is particularly relevant for the protection of species in the forest, since the most effective method of species protection and biodiversity conservation is the protection of habitats.

Table 3 below defines the High Conservation Values and the protection measures that Iwokrama employs to protect each value. For additional detail see HCVs in the Iwokrama Forest (April 2018).

HCV	Simplified Definition	Protection Measure
HCV 1	Species diversity. High Concentrations of biological diversity including species that are endemic (only found in Guyana), rare, threatened or endangered.	The Iwokrama Forest is zoned into two spatially equal zones: the Sustainable Use Area (SUA) and Wilderness Preserve (WP). This zonation ensures that concentrations of biological diversity, including endemic, rare, threatened or endangered species, are protected because their habitats are protected in the Wilderness Preserve.
HCV 2	Landscape-level ecosystems. Large forested areas (greater than 10,000 hectares) with low fragmentation that contain healthy populations of the naturally occurring species in natural patterns of distribution or abundance	The Wilderness Preserve can be considered a large landscape level block of forest because its total area is 187,174.5 ha (comprised of three areas of size 127,059.2; 25,330.1 and 34,785.2 ha) . It serves as a biodiversity reserve and helps to maintain a pool of genetic resources in an intact state. This ensures that biological diversity is protected because their habitats are protected in the Wilderness Preserve.
HCV 3	Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia	The Iwokrama Forest contains several forest and ecosystem types. Iwokrama's zoning exercise divided the Iwokrama Forest into two zones: the Wilderness Preserve (WP) and the Sustainable Use Area (SUA). This zonation ensures that concentrations of biological diversity, including endemic, rare, threatened or endangered species, are protected because their habitats are protected in the Wilderness Preserve.
HCV 4	Critical ecosystem services: Basic ecosystem services in important situations, including protection of water catchments and control of erosion of vulnerable soils and slopes	Iwokrama's zoning process is particularly relevant for the protection of ecosystem services since 70.8% of the forest is exempt from commercial timber harvesting. Additionally, compliance with the Guyana Forestry Commission's Code of Practice for Timber Harvesting and Reduced Impact Logging Guidelines will mitigate damage to ecosystem services in harvesting areas.
HCV 5	Community needs: Sites and resources important for meeting the basic necessities of local communities or Indigenous Peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or Indigenous Peoples.	<p>The Iwokrama Forest is fundamental to meeting the needs of the local communities, particularly Fair View Village (Fair View Village has legal title for 21,950 hectares of the Iwokrama Forest). Critical waterways, which supply the village's drinking water have been identified; signage has been established (on road) and waterways are subject to testing under Iwokrama's water quality monitoring regime.</p> <p>A system to monitor hunting and fishing off-take for community users entering the southern end of the Iwokrama Forest is in place. Fishing data from Fair View is collected and quantified through personal interaction with the villagers involved in this activity and the Iwokrama Rangers. Iwokrama also keeps records of fish consumption for the Iwokrama River Lodge (what is used in the kitchen). Fishing is the most common community resource use activity that occurs within the forest.</p>
HCV 6	Cultural values: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement with these local communities or Indigenous Peoples.	<p>Through community consultations several sites have been identified. Most notable are the Iwokrama Mountains which were identified in the zoning process as a place of great spiritual and cultural significance for the Makushi people. This was one of the main criteria for inclusion of the entire Mountain range within the Wilderness Preserve where protection is ensured.</p> <p>A forest impact monitoring system is in place for discovery of sites within harvesting units. In the first instance, forest inventory teams look out for potentially important sites when conducting inventories and if any such sites are located, management and monitoring teams and the community are informed. After checks and if the site is determined to be a potential site of cultural and spiritual significance, the Walter Roth Museum is contacted to do an assessment.</p> <p>Any sites identified that are determined to be of cultural significance are removed from the NOA and protected by an appropriate buffer.</p>

Table 3. High Conservation (HCV) and associated protection measures.

Iwokrama's Forest Certification Process

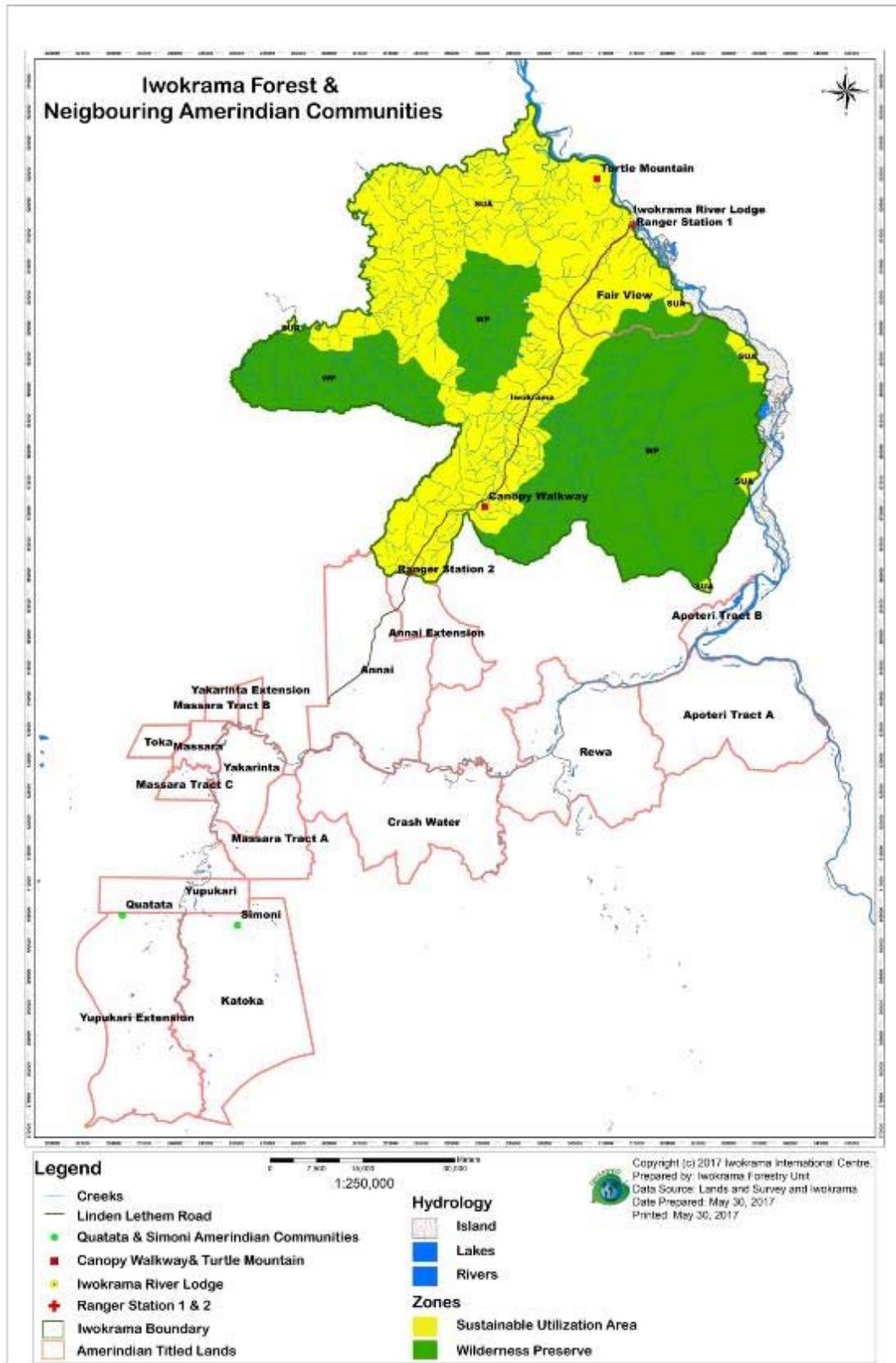
To validate its use of best practice methods in its operations, *Iwokrama* has once again received certification for forest management from the Forest Stewardship Council® (FSC®). FSC® is the most prestigious international forest certification scheme.

The Iwokrama Forest is now the only forested area in Guyana certified for Forest Management. Iwokrama received similar recognition by the international auditors in 2008 and maintained these credentials throughout the first phase of its timber harvesting operations.

Key to compliance with FSC® guidelines is that forest managers must follow all national rules, laws and guidelines including the GFC's comprehensive Codes of Practice.

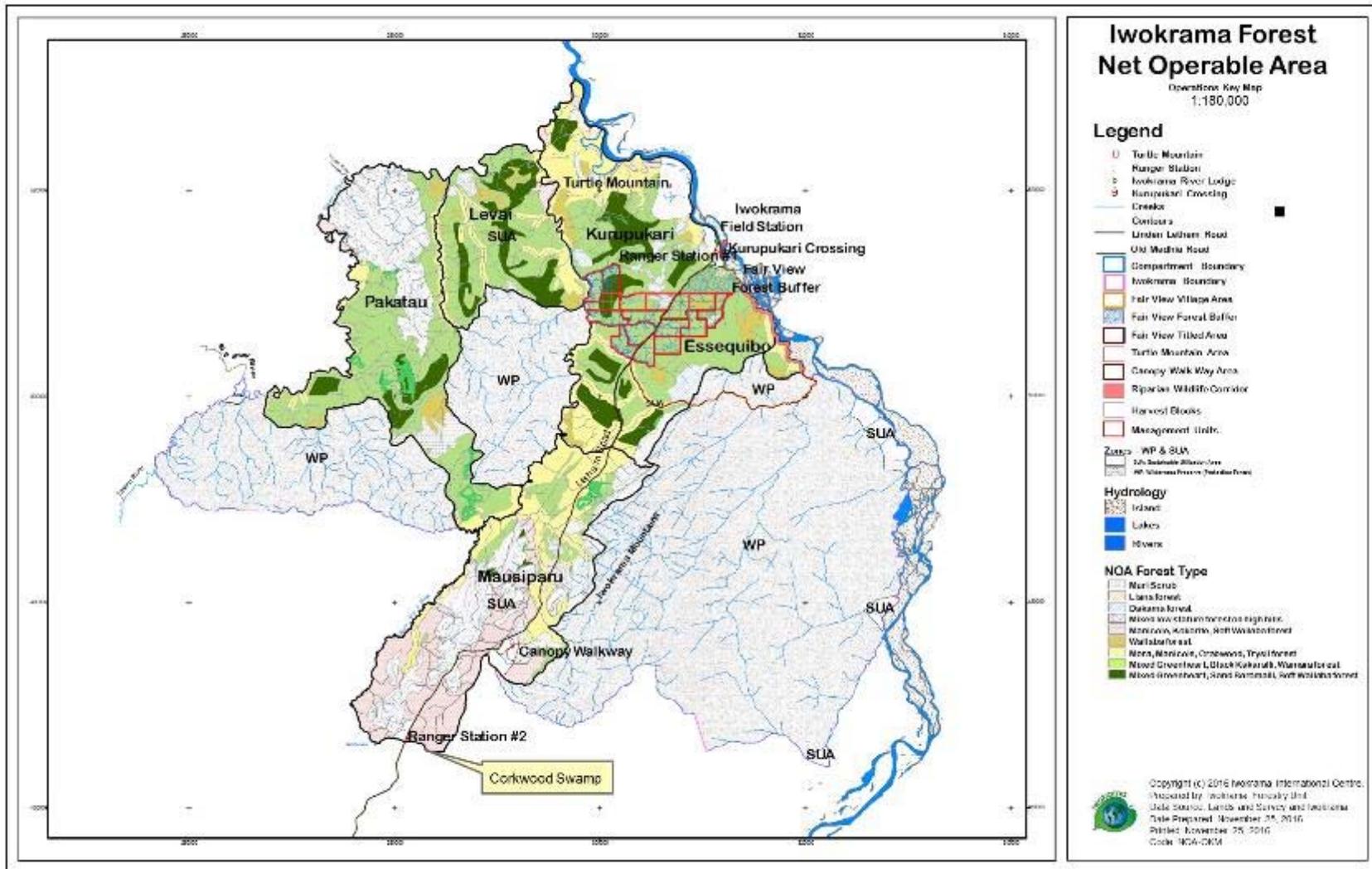
Maps attached

1. Iwokrama Forest and Neighbouring Communities
2. Iwokrama Forest Net Operable Area
3. Five Year Harvest Plan



MAP 1: IWOKRAMA FOREST AND NEIGHBOURING COMMUNITIES

MAP 2: IWOKRAMA FOREST NET OPERABLE AREA



MAP 3: IWOKRAMA 5 YEAR HARVEST PLAN

