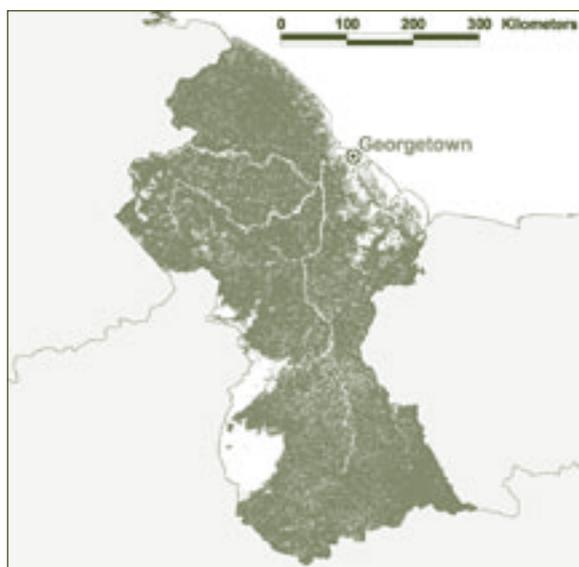


GUYANA



*For legend see page 58

Forest resources

Located on the Atlantic seaboard in northeastern South America between Suriname and Venezuela, Guyana has a land area of 21.4 million hectares and a population of about 800,000 people. It has a very humid climate and can be divided into four biogeographical zones: (i) the narrow coastal plain, where 90% of the population lives and which is largely used for agriculture. It has a narrow fringe of mangroves; (ii) the so-called rolling hills, an extensive, forested area with sandy acid infertile soils reaching 90 m above sea level; (iii) a Precambrian lowland region of tropical rainforest; and (iv) the Pakaraima Mountains, a forested sandstone plateau along the borders with Venezuela and Brazil that stands between 1,000 and 1,200 m above sea level (reaching 2,740 m at Mt Roraima). Forest

cover is an estimated 16.9 million hectares, or 78% of the land area (FAO 2005).

Forest types. The major vegetation types are rainforest, seasonal forest, dry evergreen forest, marsh forest (including mangrove and swamp forest) and mountain forest. The composition of the forest changes considerably from north to south and reflects varied topographic and geological conditions. Rainforest is the most common type and the most important source of timber. Seasonal forests have a lower, more even canopy and include deciduous trees; they are found in the north Rupununi and upper Berbice areas. Dry evergreen forests occupy belts of leached white sands and are also found throughout the Pakaraima Mountains.

Dynamics of forest resource change. Most of Guyana's forests are still intact, unexploited and not threatened by the expansion of agriculture. The annual rate of deforestation is estimated variously to be 0.3% (49,000 hectares, FAO 2005) and less than 0.1%^b. Deforestation is mainly caused by semi-urban expansion and mining.

Permanent forest estate. About 13.6 million hectares have been classified as state forest and may be considered potential production forest. Of these, 5.8 million hectares are allocated to commercial use, 500,000 hectares to research and protection and 63,000 hectares are protected and outside the jurisdiction of the forest service. About 7 million hectares (56% of the state forest), mainly in the south of the country, have not yet been allocated to timber harvesting or other uses; a lack of ready access and long distances to market make the commercial harvesting of these forests economically infeasible at present.

Table 1 PFE *

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) ^d			
		Production		Protection	Total
		Natural	Planted		
16.9	16,916	5,450	12	980**	6,442

* Amerindian lands are not included here as part of the PFE. A conservation concession area initiated with the support of Conservation International of about 300,000 hectares is included as part of the protection PFE

** Source: UNEP-WCMC (2004)

Planted forests. The estimated total area of planted forest is 12,000 hectares (FAO 2005). No significant reforestation activity is taking place.

Institutional arrangements

Forest tenure. Ownership of the PFE is vested in the state; the remainder of the forest comprises 'other state land', Amerindian land and private property. No Amerindian lands are considered part of the PFE, although many are surrounded by it. Nine indigenous (Amerindian) tribes (Akawaio, Arawak, Arekuna, Carib, Macusi, Patamona, Waiwai, Wapisiaana and Warao), with a total population of about 40,000, have legal title to approximately 1.4 million hectares of land, including forest.

SFM policy framework. Guyana was a participant in the development of the Tarapoto C&I under the Amazon Cooperation Treaty. In 2001, the Guyana Forestry Commission (GFC) reviewed both the Tarapoto and ITTO C&I in the development of a new national forest plan.

Forest policy and legislation. The current forest act was promulgated in 1953. The GFC drafted a new forest act in the late 1990s with technical assistance from the UK Department for International Development; this was approved by the Cabinet Subcommittee on Natural Resources but by late 2004 had not been passed by Parliament. The draft forest act provides the basis for control in state forest, assistance to hinterland communities, and the sound management of forest in Amerindian lands through the provision of advisory group services^b.

The national forest policy was formulated in an open and transparent way with extensive consultation with a wide range of stakeholders and approved in 1997. It is now accepted by all stakeholders as a sound guide for the forest sector as a whole. An ITTO diagnostic mission to Guyana in 2003 found that the national forest policy framework was both comprehensive and sensible, although it was predicated on mutually supportive approaches by government and industry which had not yet developed at the level required^b.

Institutions involved in forests. The president has direct responsibility for forestry, although the day-to-day administration is delegated to the Minister of Agriculture. The Office of the President is also

responsible for other matters related to the environment and natural resources (such as wildlife and protected areas). Two statutory bodies are responsible for coordinating developments in natural resources: (i) the Cabinet Sub-Committee on Natural Resources and Environment, which discusses all matters requiring policy decisions before they are presented to the full cabinet; and (ii) the Natural Resources and Environment Advisory Committee, which includes the heads of Forestry, Geology and Mines, Lands and Surveys, the Guyana Natural Resources Agency, the energy agencies, the Land-use Planning Unit, the Institute of Applied Sciences and Technology, the Hydro-meteorological Department, and the Environmental Protection Agency (EPA). The Presidential Adviser for Natural Resource Management is responsible for coordinating the work of the individual agencies involved in natural resources and the environment. The GFC Board of Directors has direct responsibility for formulating policy guidelines and planning frameworks for the development, use and management of forests.

The GFC, a semi-autonomous public agency, was created in 1979 to replace the Forest Department, which was set up in 1925. The GFC advises the minister on issues relating to forest policy, forest laws and regulations. Guided by the national forest plan, it has the legal mandate to manage and control the utilization of all state forest lands to ensure the optimal use and sustained yield of forest produce and the maintenance and improvement of the forest environment. The GFC also develops and monitors standards for forest-sector operations, develops and implements forest protection and conservation strategies, oversees forest research, and provides support and guidance to forest education and training. It is also involved in a number of initiatives to address emerging social issues in forestry.

The EPA, which was established in 1996, carries out environmental impact assessments on all major land-based developments; before any operation can commence in a forest concession, a company must submit an environmental impact assessment for approval by the EPA and the GFC. The GFC has also established an Environmental Monitoring Unit to monitor all environmental matters pertaining to forestry. The EPA delegates the routine monitoring of forestry developments to the GFC.

One forest producers' association and a number of smaller community-based loggers' associations represent loggers and sawmillers in the forestry sector and endeavour to ensure collaboration in activities such as training, information, public awareness and institutional development. National environmental NGOs are weak, but international environmental organizations are assuming independent roles in forest control and information-sharing, partly in collaboration with the forest administration.

Status of forest management

Forest for production

Current forest harvesting permits are allocated according to three categories based on area and length of contract. The categories are:

- timber sales agreements (TSAs): concessions are granted on a lease for 20 years or more over an area of 24,000 hectares or more. As of October 2004, 23 TSAs had been allocated to local and international companies covering an area of more than 4.0 million hectares (65% of all commercial allocations). The average size of a TSA is 176,000 hectares (ranging from 29,500 to 1.67 million hectares), and companies can hold more than one TSA at a time (Tropical Forest Foundation (TFF) pers. comm., October 2004);
- wood cutting leases (WCLs): licences are granted on 3–10-year leases theoretically for areas of 8,000–24,281 hectares, although a few of the actual WCLs exceed this. In October 2004, five licences were in existence covering a total area of about 327,500 hectares (ibid.) The average size of a WCL was therefore 65,500 hectares;
- state forest permits (SFPs): cutting permits are granted on an annual basis for areas of state forest up to 8,094 hectares in size. SFPs are generally issued to small-scale operators; 284 permits covering a total area of 1.33 million hectares were allocated in 2004 (21% of all commercial allocations) (ibid.). The average size of an SFP is about 4,600 hectares; and
- exploratory permits: before a WCL or a TSA is issued, a three-year exploratory period is granted in order to gather all the necessary information for the preparation of an investment proposal,

an environmental and social impact assessment, and a forest management plan; this requires an exploratory permit. The permit process has been developed to ensure transparency in concession allocation, that the proposed investment is in the national interest, and that the proposed investment is designed to achieve the maximum beneficial use of the forest resource. The permit does not convey the right to harvest or remove any forest produce or to construct roads, buildings or other infrastructure. Permission may be granted to fell and remove forest produce for research purposes only. In 2004, three exploratory permits covering an area of 376,728 hectares had been issued (ibid.). Exploratory permits are also prescribed in the draft forest act.

In 1998, the GFC introduced a Code of Practice for Timber Harvesting based on FAO's Model Code of Forest Practice; the code, which was revised in 2002, prescribes internationally accepted standards for exclusion areas and buffer zones, 100% pre-harvest inventory, road construction, felling, skidding, trucking, operational and camp hygiene, and occupational health and safety. Besides exclusion areas and buffer zones, the code also restricts logging on slopes greater than 40% and sets a minimum distance of 10 m between harvest trees to minimize the size of canopy openings. A log-tagging system to assist the monitoring of timber harvesting and reduce illegal cutting has been in effect since 1999. For the SFPs, a quota system has been put in place that is determined by the size and assumed stocking of the area. The GFC has also developed a draft code of practice for the harvesting of NWFPs.

The draft forest act prescribes the issue of forest concession agreements to replace TSAs and WCLs, and also allows 'forest concession agreements for conservation purposes' and 'use permits'. The former are designed to allow conservation organizations to pay an amount equivalent to that which would have been paid for commercial harvesting rights for the exclusion of timber harvesting from particular forest areas; the latter are designed to address matters such as the collection of orchids or ecotourism where a full concession agreement is not required.

Guyana's forests are characterized by a predominance of relatively slow-growing, high-density timber species and smaller trees than in most other tropical

Table 2 Some commonly harvested species for industrial roundwood*

Timber species	Remarks
<i>Catastemma commune</i> (baromalli)	38% of total log production in 1999–2000
<i>Eperua falcata</i> (wallaba)	Predominantly used for roundwood and splitwood products
<i>Chlorocardium rodiei</i> (greenheart)	20% of total log production
<i>Mora excelsa</i> (mora) and other <i>Mora</i> spp	5% of total log production
<i>Peltogyne venosa</i> (purpleheart)	9% of total production

* Source: TFF pers. comm., October 2004

regions due to the inherently low fertility of soils derived from the ancient Guiana Shield. Commercial timber occurs in spatially segregated 'reefs' or stands in which one or two commercial species are dominant. Nevertheless, a large proportion of the commercial stock in these stands is defective (hollow or crooked), possibly due to the poor nutrient availability of the soils and a very low rate of natural disturbance (which seems to have resulted in over-mature stands), and commercially viable stands are usually separated by stands that are nearly devoid of commercial species. Forest harvesting is, therefore, highly selective; on average, two to three trees are felled per hectare, with an average yield of about 7 m³. The national forest plan prescriptions allow up to 20 m³ per hectare to be harvested on a 60-year cycle, but few concessionaires take even half of this (TFF pers. comm., October 2004). Because of poor operational planning and poor matching of timber resources with markets, most companies re-enter logged-over areas before the end of the cutting cycle, particularly in the more easily accessible areas (ibid.).

Detailed forest management plans are not required for SFPs. The code of practice applies to TSAs and WCLs but is presently only mandatory for new concessions. Nevertheless, companies are being monitored for the implementation of its requirements and violations are reported. The new forest act, once adopted into law, will make the code mandatory for all forest concession areas. At present, few if any companies fully conform to the code, particularly where harvest restrictions (steep slopes, buffer zones, 10 m rule) are concerned, although a few companies conduct 100% pre-harvest forest inven-

tories and harvest planning (ibid.). Log-tagging appears to have been accepted by the industry and has increased the capability of the GFC to monitor timber transactions. RIL techniques are promoted by the ITTO-funded Forestry Training Centre, a subsidiary of GFC, through demonstration forests and hands-on training. This training program, which had trained some 90 forest operators by 2004, has been well received and has led to a growing acceptance and awareness of the GFC's code of practice and RIL practices, and an increasing demand for RIL training. The Iwokrama International Centre for Rainforest Conservation and Development (known as the 'Iwokrama forest') is responsible for the management, conservation and sustainable development of 360,000 hectares of tropical rainforest, which the government of Guyana allocated as a way of demonstrating that tropical forests can provide economic benefits while also conserving biodiversity. Its operation has been supported by a range of donors, including ITTO.

The lack of security associated with logging permits discourages investments in SFM. These arrangements provide little guarantee that the investor will continue to have access rights to the same concession area in the future, thereby encouraging excessive logging and other unsustainable practices. Indeed, it would appear that there is an entrenched culture of forest extraction and utilization within the industry rather than a commitment to enhancing the productivity or value of the forest that is left after harvesting^b.

Silviculture and species selection. The default silvicultural system is natural regeneration with polycyclic cuts, without post-harvest silvicultural

Table 3 Management of the production PFE ('000 hectares)

Total	Natural			Planted		
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	With management plans	Certified
5,450	3,800	3,730	0	520	12	0

interventions. Under the 1953 Forest Act, yield is regulated by a minimum diameter limit of 34 cm, while forest management plans for WCLs and TSAs must specify the cutting cycle and yield per cutting cycle; they must also indicate species for harvesting and harvesting rules.

There are more than 1,000 tree species but only a few are commercially known and marketed. About 16 species are known to be marketable (Table 2 shows five of these), *Chlorocardium rodiei* (greenheart), *Peltogyne venosa* (purpleheart), *Eperua* spp (wallaba), and *Hymenaea courbaril* (locust) being the favoured species on the international market.

Greenheart is resistant to attack by marine borers and has long been valued as piling for wharves and for other marine applications. *Catostemma commune* (baromalli), the predominant species harvested for plywood production in 2001, was never harvested commercially in any significant way before 1992. Greenheart's share in the total wood production is greater than suggested by log production volumes (of which its share was 20% in 1999–2000), since the production of piles and chainsaw lumber is not included in these figures. Other important species include *Goupia glabra* (kabukalli), *Trattinickia* spp (ulu), *Pouteria speciosa* (suya), *Aspidosperma* spp (shibadan), *Simarouba amara* (marupá) and *Carapa guianensis* (crabwood).

Planted forest and trees outside the forest. About 12,000 hectares of forest plantations, mainly *Pinus caribaea*, were established in the 1960s. They were originally intended to supply a pulp industry but are currently untended. No major reforestation activity is taking place.

Forest certification. Certification became an issue in Guyana when, in 2000, overseas buyers requested evidence of SFM for timber imported from Guyana. An FSC-endorsed national working group has

developed a national certification standard based on FSC and the Peru and Bolivia examples; this was to be submitted to the FSC for endorsement in early 2005. To date, there is no certified forest in Guyana, but two concessionaires are engaged in the process of certifying forest management and chain-of-custody under the FSC scheme, while two more concessionaires have shown an interest in pursuing certification.

Estimate of the area of forest sustainably managed for production. The area of production PFE estimated to be sustainably managed is at least 520,000 hectares^d (Table 3); this is the sum of the concession areas applying for certification and the production forest area of the Iwokrama forest.

Timber production and trade. Total industrial log production was 251,000 m³ in 2003, down from 435,000 m³ in 1999 (ITTO 2004, 2006 in prep.). The ten-year average for 1994–2003 was 342,000 m³, and the highest was in 1997 (521,500 m³) (ITTO 2004). Sawnwood production was 38,000 m³ in 2003, compared to 50,000m³ in 1999. Plywood production also declined, from 87,000 m³ in 1999 to 75,000 m³ in 2003 (ITTO 2004, 2006 in prep.).

Guyana is a net timber exporter. It allows log exports of all timber species except crabwood and locust, while a ban is proposed for purpleheart to benefit the furniture industry. The total export value of logs, sawnwood and plywood in 2003 was US\$26.4 million, compared to US\$31.3 million in 1999 (ITTO 2002, 2005). Some 66,000 m³ of logs, 27,000 m³ of sawnwood and 53,000 m³ of plywood were exported in 2003 (ITTO 2005).

Non-wood forest products. Many NWFPs are harvested from natural forests but only a few are extracted commercially. *Euterpe oleracea* (palm

Table 4 Management of the protection PFE ('000 hectares)

Total	Attributed to IUCN categories I-IV	Allocated for soil and water	With management plans	Sustainably managed
980	980	n.d.	243 ^d	243 ^d

heart, manicole) is an important product that is exported in large quantities, valued at more than US\$5 million per year (van Andel et al. 2003). Nibi and kufa (rattan-like *Heteropsis flexuosa* and *Clusia* spp) are used for furniture-making and exported to the Caribbean islands, the UK and North America. Fibres of *Mauritia flexuosa* (ité palm) are used to make baskets, mats and other items for export. Other products include latex from *Manilkara bidentata* (balata), *Bixa orellana* (annatto dye) and *Carapa guianensis* (crabwood oil). Mangrove bark is exported for tanning leather. There is a legal trade in wildlife, especially birds, reptiles and amphibians; the export revenue from this is estimated at US\$1.5–2 million per year (ibid.).

Forest for protection

Soil and water. Forests are still intact over large areas and no specific measures have been set out for large-scale soil and watershed conservation. There are, however, threats to biodiversity and to soil and water, of which gold mining may be the greatest. Small-scale gold mining takes place over a wide area; impacts include localized deforestation, the removal of topsoil and the pollution of water-courses with sediment and mercury. Trees felled by gold-miners cause blockages to rivers, sometimes resulting in downstream flooding.

Biological diversity. Guyana's large areas of intact forest ecosystems have a very high conservation and ecological value. More than 1,200 vertebrate species were counted in a 1997 inventory, including 198 mammals, 728 birds, 137 reptiles, 105 amphibians, and more than 6,000 plant species, of which about one hundred are forest trees of commercial interest. It is almost certain that many more species remain to be discovered. Thirteen mammals, three birds, six reptiles, six amphibians and 23 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, five mammals, three

birds, five amphibians and two plants are found in forests (IUCN 2004). Guyana has listed three plant species in CITES Appendix I and 57 in Appendix II (CITES 2005).

Protective measures in production forests. The code of harvesting practice includes provisions for protecting watercourses, reducing the impact of logging on residual stands and conserving protected wildlife. Forest management plans must identify biodiversity reserves (4.5% of the productive forest area). The GFC's monitoring division monitors TSAs against the standards prescribed by the code.

Extent of protected areas. Guyana has only one protected area managed under the Environmental Protection Act – the Kaieteur National Park, which is 63,000 hectares in size. In addition, 16 forest reserves cover a total of 7,700 hectares and the Mabura Hill Forest Reserve extends over 2,000 hectares of forest. According to UNEP-WCMC (2004), 980,000 hectares of Guyana's forest estate are in protected areas conforming to IUCN protected-area categories I-IV. Of the 360,000 hectares of primary forest managed by the Iwokrama International Centre for Rainforest Conservation and Development, 180,000 hectares have been set aside for forest conservation purposes. Conservation International has been awarded a conservation concession of 82,000 hectares to the south of Iwokrama^b. A project funded by the GEF will assist the government with the establishment of a representative system of protected areas. The project has set up an independent Protected Areas Commission and has started to establish a system of protected areas by identifying and supporting the management and development of two pilot areas.

Estimate of the area of forest sustainably managed for protection. The estimated area of protection PFE under sustainable management is at least 243,000 hectares. This area comprises the Kaieteur National Park and the conservation area set aside in the Iwokrama forest.

Socioeconomic aspects

Economic aspects. In 2003, forest-based activities contributed 3.3% to GDP, generating US\$842,700 in royalties (Bank of Guyana 2004) and providing employment for 14,000–16,000 people in 720 enterprises, including sawmills and timber dealers (actual forest-based activities employ approximately 7,000 people)^b. There is also considerable informal and unrecorded employment and economic activity.

Livelihood values. Forests are an integral part of Amerindian culture and are important for building materials, fibres for textiles and weaving, and tannins and dyes, as well as for wildlife, fruit, seeds and nuts that are hunted or gathered for food. Medicines are obtained from more than 130 plant species (van Andel et al. 2003). Some communities have undertaken the commercial harvesting of these resources.

Social relations. Amerindian communities are generally located in remote areas away from urban centres and rely on subsistence fishing, shifting cultivation and hunting for a living. The creation of a Ministry of Amerindian Affairs in 1992 has facilitated a more participatory role for these communities in national development; this takes place mainly through regional democratic councils. Not all Amerindian claims have been fully addressed, but there have been major developments in this direction. Amerindian communities are afflicted by severe social and health problems, particularly in communities adjacent to gold-mining and timber concessions. The Ministry of Amerindian Affairs and the Guyana Geology & Mines Commission (GGMC) have collaborated to train a number of rural residents as rangers to complement GGMC's monitoring efforts in mining districts. The Iwokrama forest initiative has had significant success in involving local Amerindian communities in forest management (Bakken Jensen 2005).

Summary

Guyana has a broad forest resource base and large growing-stock of hardwood timber. It has introduced and implemented a well-designed forest management and control system in its timber production forests. However, there is a gap between the well-functioning core staff of the GFC and the industry that has to implement forest management in the field. Political and social uncertainty, lack of secure tenure, lack of understanding and awareness, lack of skilled labour, outdated management practices and, recently, a difficult economic environment have imposed major challenges for the achievement of SFM. Progress is being made in improving forest harvesting practice.

Key points

- Guyana's forests are still largely intact.
- The PFE comprises an estimated 5.45 million hectares of production forest and 980,000 hectares of protection forest. A further 7.35 million hectares of state forest have not yet been allocated.
- Uncontrolled gold mining is a significant cause of forest degradation and environmental pollution.
- At least 520,000 hectares of production PFE and 243,000 hectares of protection PFE are being managed sustainably.
- A detailed management provision and control system has been elaborated but is inadequately implemented.
- Progress is being made in the training of logging operators.
- The area of totally protected forests is low and there is not enough control and management in protected areas.
- The national forest policy is widely accepted as a sound guide for the forest sector but is yet to be fully implemented.
- A new forest law, which would establish a forest concession system in place of the current TSAs and WCLs, has been drafted but is yet to be enacted.

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