

IWOKRAMA

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

**SUMMARY REPORT**

**1998 - 2002**



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KRANMA



## SUMMARY REPORT

1998 - 2002



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# FOREWORD

The Iwokrama Forest and Rupununi in central Guyana encompass key landscape features of tropical South America. The Iwokrama Forest covers 371,000 hectares of pristine greenheart, wallaba and seasonally flooded palm and Mora forests. The neighbouring Rupununi is part of the broader human ecosystem and includes a seasonally flooded savannah and over 200 oxbow and depression lakes distributed along the Rupununi, Essequibo and Rewa Rivers.

The Iwokrama human ecosystem is home to more than 500 species of birds, 200 mammals, 150 reptiles and amphibians and countless invertebrates. Interestingly, the Iwokrama Forest is habitat for more than 400 species of fish; extremely high diversity especially when one considers only a small portion of the total water area has been sampled. The area is also home to endangered species.

The whole area is part of the homeland of the Makushi people who historically used the area for harvesting forest products including wildlife. Today, local communities depend on the Iwokrama Forest for subsistence hunting, fishing and farming.

This extraordinary site is part of the Guiana Shield Frontier Forest, one of the four remaining extensive pristine forested areas left in the world (the Amazon, Congo, and Papua New Guinea are the other three). The Guiana Shield Forests are set in a complex social, economic and cultural environment with inhabitants that are among the poorest people in the world. The area is characterized by weak national and local community institutions, and dispersed small scale gold mining, chainsaw logging, and wildlife trading. The Guiana Shield, the Amazon, the Congo, and Papua New Guinea represent the last chance for humanity to demonstrate that we can effectively manage tropical rain forests.

The broader global context for tropical rain forest management includes the need to consider private sector and local community involvement. The private sector exports more than US\$28 billion worth of products every year from developing nation forests. The financial benefits from these businesses are not equitably distributed and the negative ecological consequences of some forest use systems are already being felt in many countries. Over 20% of the remaining tropical forest areas are owned or managed by indigenous people. It therefore seems clear that the effective management of tropical forests will require pluralistic and collaborative efforts involving local communities, the private sector, the public sector, and civil society. In this context, Iwokrama's objectives are to show how tropical rain forests can be sustainably used and conserved, show how multiple goods and services can be captured from forests, forge a pathway for private sector and community involvement in using and conserving forests, and finally transfer management models to other forest users and owners.

From 1998 to 2002, Iwokrama worked to support local community and national institutions and prepared a basis for collaborative management of the Iwokrama ecosystem. Iwokrama has developed infrastructure within the Iwokrama Forest including a field station, canopy walkway, a ranger station and four satellite stations. These facilities are manned by rangers and other staff, from local communities, who have been trained through our own programmes. Iwokrama

has also begun developing embryonic businesses with tourism, aquarium fish, crabwood oil, honey, natural products, and training.

In March 2003, Iwokrama underwent a metamorphosis from a primarily research based organization to a dynamic business oriented institute. We have a new International Board of Trustees, management with a strong business perspective, and are implementing performance driven management systems. We have reduced our annual operating budget from US\$2 million in 2002 to US\$1 million for the 2003 financial year; core operational costs are now less than US\$600,000.

During 2003, Iwokrama will develop effective communications systems and decentralize forest management decision making, implement forest patrols and monitoring, develop collaborative decision making mechanisms and document Iwokrama's lessons learned. In addition, Iwokrama will focus on partnering with private sector and local communities to develop forest based businesses. We will finalize a timber management plan based on sound marketing advice and a forest inventory presently funded by ITTO. Iwokrama will also finalize agreements with private sector and community partners for the management of tourism concessions within the Iwokrama Forest. In order to fund Iwokrama's core costs, we will pursue merchandising and training contracts. We will also explore the development of sponsorship programmes and a trust fund.

Iwokrama's goal is to demonstrate how to use the forest to satisfy the needs of local people, the development aspirations of Guyanese people, and the international concerns about deforestation and biodiversity loss. This is an exciting time for Iwokrama as we shift from research to implementation and business development. I am privileged to work in what I consider to be one of remaining wonders of the natural world for a programme that could provide answers to many of the vexing management questions facing the Guiana Shield and all of the world's tropical rain forests.



Graham Watkins  
Director General (Acting)  
Iwokrama International Centre for Rainforest Conservation and Development  
Georgetown, Guyana.  
April 2003





# ACRONYMS

APA	– Amerindian Peoples Association
ASL	– Above Sea Level
ATAC	– Amerindian Touchaus Area Council
Audubon	– National Audubon Society
CDC	– Community Development Council
CEW	– Community Environmental Worker
CFTC	– Commonwealth Fund for Technical Cooperation
CHW	– Community Health Worker
CIDA	– Canadian International Development Agency
CITES	– Convention on International Trade in Endangered Species of Flora and Fauna
DFID	– Department for International Development
EC	– European Commission
EPA	– Guyana Environmental Protection Agency
GBC	– Guyana Broadcasting Corporation
GEF	– Global Environment Facility
GFC	– The Guyana Forestry Commission
GIS	– Geographical Information Systems
IAST	– Institute for Applied Science and Technology
IBOT	– Iwokrama Board of Trustees
IDRC	– Canadian International Development and Research Centre
INSAT	– Information Network for Science and Technology
IPR	– Intellectual Property Rights
IPF	– Intergovernmental Panel on Forests
ITTO	– International Tropical Timber Organization
IUCN	– International Union for the Conservation of Nature
Iwokrama	– Iwokrama International Centre for Rain Forest Conservation and Development
MAB	– Man and the Biosphere
MRU	– Makushi Research Unit
NBAP	– National Biodiversity Action Plan
NDS	– National Development Strategy
NGO	– Non-Government Organization
NRDDB	– The North Rupununi District Development Board
NTFP	– Non-Timber Forest Product
NTPP	– Non-Timber Plant Product
PRSP	– Poverty Reduction Strategy Paper
RDC	– Regional Democratic Council
RIL	– Reduced Impact Logging
SYE	– Audubon School Yard Ecology programme
UNDP	– United Nations Development Programme
UNESCO	– United Nations Education and Science Council
USAID	– United States Agency for International Development
UPOV	– International Union for the Protection of New Varieties of Plants
VC	– Village Council
WWF	– World Wide Fund for Nature

# EXECUTIVE SUMMARY

The Iwokrama International Centre for Rain Forest Conservation and Development is an autonomous institution responsible for the management of the 371000 hectare Iwokrama Forest in central Guyana, South America, and the implementation of the Iwokrama Programme.

The management of the Iwokrama Forest has been entrusted by the Government of Guyana to the international community with the goal of showing how tropical forests can provide economic, social, and ecological benefits while conserving biodiversity.



*His Royal Highness The Prince of Wales during a visit to the Iwokrama Forest with the Honourable Minister Satadeo Sawh and Sydney Allicock, member of the Iwokrama Board of Trustees, Dec. 2000. Photo by Iwokrama*

Guyana's offer to provide forest resources for the Iwokrama Programme was made at the 1989 Commonwealth Heads of Government meeting in Kuala Lumpur, Malaysia. The Iwokrama Centre was legally established in Guyana after Parliament unanimously passed the 1996 Iwokrama Act. His Royal Highness the Prince of Wales became Patron of Iwokrama in November 2000.

Iwokrama's accomplishments have been achieved because of the vision, foresight and persistence of individuals and the support of numerous governments

and institutions. Special recognition is due to the two founding partners: the Government and people of Guyana for their generous contribution of the Iwokrama site and early financial support to the fledgling Iwokrama Centre, and the Commonwealth Secretariat for its patronage and contribution of expertise. The United Nations Development Programme (UNDP), using Global Environmental Facility funds, implemented a project to support the early institutional development of Iwokrama, whilst the Overseas Development Administration of the United Kingdom, the Commonwealth Fund for Technical Cooperation (CFTC) and the United States Agency for International Development (USAID) contributed funds and technical assistance in the early years. The Canadian International Development Research Centre (IDRC) was also a partner to strengthen Iwokrama as an institution and assist with communications. Principal current donors include the British Department for International Development (DFID), the European Commission (EC), the Canadian International Development Agency (CIDA) and the International Tropical Timber Organization (ITTO); Japan, Switzerland, United States of America, Korea.

Iwokrama is a tangible step toward demonstrating how some of the challenges to natural resource management can be addressed. To date, Iwokrama has shown the importance of participatory and collaborative management approaches in ensuring the equitable and sustainable use of tropical forest resources. In this context, Iwokrama has worked closely with local partners including the North Rupununi District Development Board (NRDDB) and national partners including the Guyana Forestry Commission (GFC), the Environmental Protection Agency (EPA), the Fisheries Department of the Ministry of Fisheries, Crops and Livestock, and the Ministry of Amerindian Affairs.



## Iwokrama's most notable achievements

**Prepared the Ground for Developing Sustainable Forest Businesses** - Iwokrama has begun to develop an understanding of the available utilization options within the Iwokrama Forest. Several consultancies and two international workshops have led to the development of business principles and initiated agreements on Intellectual Property Rights (IPR) and benefit-sharing. Iwokrama also sponsored an assessment of carbon sequestration potential in Guyana's forests; this study suggests that sequestration is likely to be less important than previously thought.



*Iwokrama Rangers during their graduation in Lethem, Rupununi, 23 September 2001. Photo by Iwokrama.*

A reduced-impact logging feasibility study examined the operational costs of selective timber felling and the factors influencing these costs. Timber and Non-Timber Forest Products (NTFP) market feasibility studies have outlined the expected costs, processing options, current markets and expected returns of harvesting and processing timber and cane materials from the Iwokrama Forest. Tourist facilities, local staff skills and the range of offered visitor activities have been upgraded to accommodate the growing number of visitors to the Iwokrama Forest. The Iwokrama Forest canopy walkway is the first in the Guianas, and

should significantly enhance the base for tourism in the Iwokrama Forest. Iwokrama has also developed a nascent merchandise line and the beginnings of a sponsorship programme.

**Developed Systems and Institutional Capacity for Collaborating with Local People** - the collaborative relationships between Iwokrama and local communities are underpinned by the Iwokrama Act and include partnerships based on the exchange of knowledge and skills, mutual support, and shared decision making. In this context, Iwokrama has facilitated the emergence of the North Rupununi District Development Board (NRDDB) as a representative structure for the North Rupununi. Iwokrama has also facilitated the development of the Community Environmental Worker (CEW) programme, the Makushi Research Unit (MRU), and Wildlife Clubs as local institutions linked to natural resource management.

**Built Partnerships for Natural Resource Management** - Iwokrama has developed an array of institutional collaborations from local communities to national agencies and non-government groups, to regional and international research institutes. Iwokrama is demonstrating how inclusion and dialogue promote efficiency and sustainability in natural resource management. Iwokrama's impact is reflected in relationships with national institutions including the Guyana Forestry Commission (GFC), the Guyana Environmental Protection Agency (EPA), the Guyana Broadcasting Corporation (GBC), the Fisheries Department of the Ministry of Fisheries, Crops, and Livestock and the University of Guyana. Iwokrama is providing models for participatory processes in the management of natural resources and so encouraging policy and legislative change relating to timber harvesting, certification, wildlife, mining, protected areas, and road management.

**Developed an Understanding of the Iwokrama Ecosystem** - Iwokrama has documented the diversity and natural history of wildlife and other resources in the Iwokrama Forest. This

research has been based on local knowledge and scientific studies. In this context, Iwokrama has worked with the NRDDB to both recognize and apply traditional ecological knowledge; including recognizing copyright vested in indigenous knowledge products. The Centre also recognizes local expertise in traditional skills and incorporates this into its Ranger Training Programme. The social, economic, cultural, archaeological, geographical, and biological information about the Iwokrama Ecosystem has been integrated within a Geographical Information System (GIS).



*Computer training for community environmental workers and mapping interns at the Iwokrama Field Station: Photo by Afira Appron, Dec. 2000.*

The information gathered has been used in participatory resource management planning processes. The Centre has developed a strategic decision-support system, IWOPLAN, to assist in identifying the best opportunities for timber and NTFP harvesting in the Iwokrama Forest. The system integrates GIS, commercial timber and NTFP growth models and operational cost models to evaluate the best areas for harvesting, the likely costs, and estimated returns for each harvest unit.

**Raised Funds for Natural Resource Management in Guyana** - US \$15 million has been raised by Iwokrama in the last ten years to support sustainable

forest management and human resource development in Guyana.

**Developed Iwokrama Stakeholder Capacity and Skills** - Iwokrama has trained 24 Forest Rangers, 15 of these rangers continue to work within the Iwokrama Forest. Iwokrama has trained 24 Community Environmental Workers (CEWs) based in their villages and 13 Young Guyanese Professionals. Iwokrama has also supported national and international undergraduate and graduate students and a volunteer programme. In addition, the Centre has provided attachment for more than 12 Guyanese and 12 overseas interns on short projects. Short term employment of local people has also provided "learning by doing" opportunities.

**Developed a Systematic Programme for Natural Products** - Iwokrama has established a national Natural Products screening laboratory at the University of Guyana. This programme will form the basis for future business development based on natural products.

**Developed Public Outreach Mechanisms** - Iwokrama manages an Information and Communications Unit and has organized four International Technical Workshops, twice monthly Lunch-time Seminars, Friends of Iwokrama Meetings every two months, and annual Public Fora involving the Board of Trustees. Iwokrama, in partnership with GBC and UNESCO also facilitated the first community radio station in Guyana – Radio Paiwomak – based in the North Rupununi.



# Introduction



The Essequibo River bordering the Iwokrama Forest.  
Photo by Iwokrama

The Iwokrama International Centre for Rain Forest Conservation and Development is an autonomous institution responsible for the management of the 371,000 hectare Iwokrama Forest in central Guyana, South America and the implementation of the Iwokrama Programme. The management of the Iwokrama Forest has been devolved by the Government of Guyana to the International Community with the goal of showing how tropical forests can provide economic, social, and cultural benefits without destroying biodiversity. The International Community, through the Commonwealth Secretariat, has worked with the Government and people of Guyana to develop the Iwokrama Centre that will manage the Iwokrama

Forest and implement the Iwokrama Programme as a demonstrative model for the following mission:

*"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"*

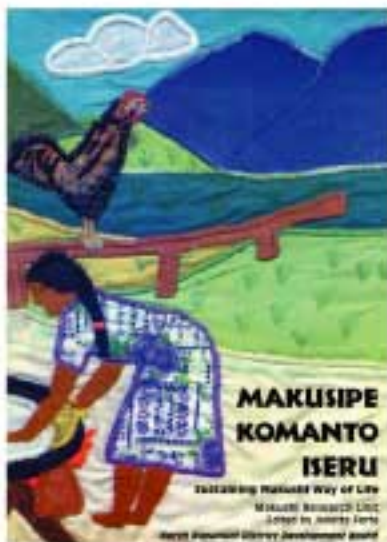
Guyana's offer to provide land for the Iwokrama Programme was made at the 1989 Commonwealth Heads of Government meeting in Kuala Lumpur, Malaysia. The Iwokrama Centre was legally established in Guyana by the unanimous passing of the 1996 Iwokrama Act by the Guyana Parliament. The Iwokrama Centre came into official existence in 1998 through the formation of the first International Board of Trustees. Iwokrama's mission and history place the Iwokrama Forest in local and national social, economic and cultural contexts. Consequently, the Iwokrama Centre emphasizes the participation of local and national stakeholders in decision making. The open and transparent participation of stakeholders is fundamental to the pragmatic success of the Iwokrama Centre and the effective management of the Iwokrama Forest.

Approximately half of the Iwokrama Forest is managed for wilderness and conservation values as the Wilderness Preserve. The other half of the forest, the Sustainable Utilisation Area, is managed for commercial production values. The Iwokrama Act recognizes the importance of the Iwokrama Forest to local communities and guarantees continued local community use of the forest. Commercial operations in the Iwokrama Forest will contribute to the financial sustainability of the Iwokrama Centre.

## IWOKRAMA 1998 - 2002 SUMMARY REPORT

The activities of the Iwokrama Centre are guided by seven fundamental principles. These principles include:

- Iwokrama will actively seek opportunities for partnering with local, regional and international organizations and agencies and develop appropriate mechanisms for collaboration to carry out its activities



*"Sustaining the  
Makushi Way  
of Life"*

for the sustainable management of forests and their biodiversity in Guyana. As far as possible, Guyanese and regional experience and expertise will be used in Programme activities

- Iwokrama will collaborate on an ongoing basis with academic, private, and public institutions to share the processes, methodologies, and technologies developed as a result of its research and development activities
- Iwokrama recognizes that the development of appropriate policies is an important element in the sustainable use of rainforests; Iwokrama will contribute, where possible, to national policy development in Guyana
- Iwokrama will actively pursue business opportunities and partnerships, in particular those that provide business support services for low income producers, adhere to certifiable guidelines and standards, and increase access to market information

This report summarizes the activities of the Iwokrama Centre over the period 1998 to 2002. The purpose of this report is to provide stakeholders with an understanding of the activities and direction of the Iwokrama Centre and Programme in this period that form the basis for the future activities of the Centre.



# The Context and Rationale for Iwokrama



The Giant More tree (*Mora excelsa*) in the Iwokrama Forest.

## The International Context

Tropical rain forests are crucial to human survival and development. These forests cover 6% of the planet; yet, are home to over 50% of the world's plants and animals. Over 22% of the remaining tropical rain forests are either owned by, or managed by, indigenous people. Developing nation forest commercial exports amount to at least US\$28 billion every year.

Unfortunately, an estimated 142,000 km<sup>2</sup> of tropical forest is lost every year (1% of the total tropical forest area). To date, 55% of the world's tropical forests have been converted to non-forest uses. The loss of tropical forests has important local, national, and international

consequences. Forests are a source of food, housing and medicines for local people. The future economic basis of many developing countries comes from the resources that are found in tropical forests. Ultimately, the consequences of forest loss will be felt by the international community through biodiversity loss, climate change, and poverty driven political instability. One of the major global challenges is the development of mechanisms for the management of tropical forests to meet the needs of local, national, and international stakeholders.

Future effective management of tropical rain forests will include realizing all forest values through fully involving private sector and local communities through constructive collaborative partnerships. In this context, four tropical forest areas in the world – the Amazon, the Congo, Papua New Guinea and the Guiana Shield - are coming under increasing global focus as the last large tracts of pristine forest in the world.

Several features distinguish the Guiana Shield frontier forests from other tropical forests. Pressures on natural resources have historically been relatively low because of low human population densities, the low agricultural potential of highly weathered forest soils, low commercial timber volumes and growth, and relative inaccessibility<sup>1, 2</sup>. These features mean that Guiana Shield frontier forest ecosystems represent one of the highest per capita forested areas in the world and one of the largest relatively well preserved landscapes remaining in the world<sup>3</sup>.

Another characteristic of these frontier forests is economic restructuring and rapid development in the last thirty years. These changes are occurring in response to economic adjustments

<sup>1</sup> Haden, P. (1999). *Forestry Issues in the Guiana Shield Region: A Perspective on Guyana and Suriname*. Brussels, Overseas Development Institute.

<sup>2</sup> Cjantzi, J. (1996). *Wildlife Utilization in Latin America: Current Situation and Prospects for Sustainable Management*. Rome, Food and Agriculture Organization of the United Nations.

<sup>3</sup> Carter, S. K. and Ross, J. C. W. (1997). Biology and conservation of the Giant Otter *Pteronura brasiliensis*. *Mammal Review* 27(1): 1-26.

resulting from oil price fluctuations, inappropriate historical economic strategies, and civil unrest. Recent economic developments in the Guiana Shield include growing pressures on national governments to attract large-scale investments for natural resource exploitation (gold, timber, diamonds, and bauxite). This large-scale resource exploitation is often associated with increasing road access to new areas. At the same time, economic shifts have caused local

livelihood strategies to move toward dispersed extractive commercial enterprises including small-scale gold mining, chain saw logging, and wildlife trading. Recent declines in world market prices for the region's commodities including gold, bauxite, timber, diamonds, sugar and rice have exacerbated existing debt burdens and reduced national income that can be directed towards development. These economic and social changes increase pressures on the relatively well-conserved Guiana Shield forest ecosystems. Unfortunately, national natural resource management systems have also weakened as human and financial resource bases have dwindled over the last 30 years.

**Box 1: The 2002 Commonwealth Heads of Government Coolom Communiqué mentions Iwokrama in paragraph 36 headed "Climate Change".**

*"Heads of Government expressed concern about the consequences of global warming and climate change, especially for vulnerable small island states and other low-lying areas. They welcomed progress made by the Iwokrama International Rain Forest Centre in Guyana in conserving and sustainably utilising tropical rain forest resources."*

The Guiana Shield forest ecosystems therefore offer numerous opportunities for developing effective

resource management systems because of their presently well-preserved nature. Growing threats at local and national levels and severe human and financial resource constraints to developing effective natural resource management systems also exist. The challenge for Guiana Shield countries is to develop management approaches, within human and financial resource constraints, that can capture the full range of forest values and consequently reduce the threats to these values.

The Iwokrama International Centre is considered as part of the Commonwealth's action on the implementation of the 1992 Rio Agenda on forests, biodiversity and climate change. In this context, Iwokrama is seen as the Commonwealth's flagship environmental programme.

The 2000 IUCN World Congress in Amman, Jordan, also recognized the work of the Iwokrama Centre in the preamble to the resolution<sup>4</sup>:

*Recognition to "the Government of Guyana's contribution to the world through its generation donation of land for the establishment of the Iwokrama International Centre for Rain Forest Conservation and Development to promote sustainable forest management"*

The United Nations Intergovernmental Panel on Forests (IPF) and the independent World Commission on Forests and Sustainable Development both re-iterate the need for demonstrative

<sup>4</sup> [www.iucn.org/ammann/forest/resolution/res53.pdf](http://www.iucn.org/ammann/forest/resolution/res53.pdf)



models of tropical forest management. Iwokrama provides a rare opportunity to implement an integrated forest ecosystem use and conservation programme in an adaptive management setting informed by sound research. Iwokrama addresses key general recommendations of the IPF including:



Lush vegetation in the Iwokrama forest.

- *Encouraging countries to develop, implement, monitor and evaluate national forest policies which use holistic inter-sectoral approaches based on ecosystem concepts integrate the conservation of biodiversity and the sustainable use of biological resources*
- *Urging countries to include capacity building as an objective of national forestry programmes, paying particular attention to training, extension services, technology transfer and financial assistance for developing countries taking due account of local, traditional knowledge.*
- *Encouraging countries to develop the concept and practice of partnership as one of the potential approaches for improved coordination and cooperation between all national and international partners*

Iwokrama also addresses the ten summary recommendations of the report of the World Commission on Forests and Sustainable Development<sup>5</sup>:

- *Stop the destruction of the earth's forests*
- *Use the world's rich forest resources to improve life for poor people and for the benefit of forest-dependent communities*
- *Put the public interest first and involve people in decisions about forest use*
- *Get the price of forests right, to reflect their full ecological and social values, and to stop harmful subsidies*
- *Apply sustainable forest management approaches so we may use forests without abusing them*
- *Develop new measures of forest capital so we know whether the situation is improving or worsening*
- *Plan for the use and protection of whole landscapes not the forest in isolation*
- *Make better use of knowledge about forests and greatly expand this information base*
- *Accelerate research and training so sustainable forest management can become a reality quickly*
- *Take bold political decisions and develop new civil society institutions to improve governance and accountability regarding forest use*

<sup>5</sup> Krishnaswamy, A. and Hassan A. (1999). Our Forests, Our Future, UK, World Commission on Forests and Sustainable Development: 37.

Special attention is given to Iwokrama and forest management in the full Report of the World Commission on Forests and Sustainable Development<sup>6</sup>.

Iwokrama is also important in the context of the Convention on Biological Diversity, which obliges all agreeing parties to conserve biodiversity and equitably share the benefits from its wise use. Iwokrama champions the conservation and equitable sharing of benefits as one of its main programmes.



Giant River Otters (*Pteronura brasiliensis*) are common in the Iwokrama ecosystem. Photo by Fotomatara

Iwokrama was also discussed as a success story from Latin America and the Caribbean at the Special Session of the General Assembly to Review and Appraise the Implementation of Agenda 21 at the EARTH SUMMIT+5 in New York, 23-27 June 1997.

Finally, Iwokrama is working with the Guyana EPA to develop an understanding of the wildlife trade in Guyana. This work is part of a national management planning process to satisfy Convention on International Trade in Endangered Species of Flora and Fauna (CITES)

requirements. The final goal of this work is to provide locally situated solutions to wildlife trade management problems.

### The National Context

Despite severe economic constraints, the Government of Guyana has demonstrated commitment to the effective management and conservation of biodiversity. Guyana has undergone a series of policy, legislative, and institutional changes over the last ten years. New plans, policies, and legislation include the Iwokrama Act (1996), the Environmental Protection Act (1996), the

National Environmental Action Plan (1997<sup>7</sup> and 2001-2005<sup>8</sup>), the National Strategy for the Conservation and Sustainable Use of Guyana's Biodiversity (1997), the National Biodiversity Strategy (1988) and Action Plan (NBAP; 2000<sup>9</sup>), National Forest Policy (1999), National Forestry Action Plan (1989), the National Development Strategy (NDS; 2001-2010<sup>10</sup>), and the Poverty Reduction Strategy (2002). Iwokrama is part of Guyana's institutional efforts to conserve and use forests and biodiversity.

In addition to Iwokrama, eight Government agencies

#### Box 2: Guyana in Brief

- Largest country in the Caribbean
- 215,000 km<sup>2</sup> – 78% forested
- Population – 750,000
- With Haiti, lowest rank in the Caribbean in terms of absolute (36%) and critical (19%) poverty
- English-speaking
- Highest per capita fresh water availability in the world
- Abundant charismatic megafauna

<sup>6</sup> See page 106, Box 4.15 in Salim, E. and O. Ullsten (1999). *Our Forests, Our Future: Report of the World Commission on Forests and Sustainable Development*. Cambridge, UK, Cambridge University Press.

<sup>7</sup> (1997). *Guyana National Environmental Action Plan*. Georgetown, EPA.

<sup>8</sup> EPA (2001). *Guyana National Environmental Action Plan (NEAP) 2001-2005*. Georgetown, Guyana, Environmental Protection Agency.

<sup>9</sup> (1999). *National Biodiversity Action Plan*. Georgetown, Guyana, Environmental Protection Agency (EPA): 135.

<sup>10</sup> National Development Strategy Secretariat (2000). *National development strategy: (2001-2010) a policy framework*. Georgetown, Guyana, National Development Strategy Secretariat.



have responsibilities relating to natural resource management:

**The Environmental Protection Agency** is the umbrella agency for natural resource management and is charged with biodiversity protection, public awareness and environmental regulation and monitoring.



*Location of the Iwokrama Forest in Guyana.*

**The Fisheries Department** of the Ministry of Fisheries, Crops, and Livestock is responsible for fisheries policy, planning, and regulation and the development of aquaculture.

**The Guyana Forestry Commission** is charged with the sustainable use and conservation of forests in Guyana, developing policy, and monitoring and enforcement in the forestry sector.

**The Lands Commission** is the principal steward of State Lands and administers land lease for agricultural purposes, carries out land surveys, produces maps and stores and distributes geographical information through GINRIS.

**The Ministry of Agriculture** administers the agriculture sector including crops, lands, hydrometeorology and climate change.

**The Ministry of Amerindian Affairs** represents the Amerindians of Guyana and implements the outdated

Amerindian Act (1969) which includes components relating to natural resource management on Amerindian Titled Lands.

**The Ministry of Foreign Trade and International Cooperation** works on IPR and is the focal point for regional and international environmental initiatives; the Ministry also publicizes the work of Iwokrama through overseas missions.

**The Wildlife Unit** of the Office of the President houses the wildlife management authority and regulates the trade in wildlife.

In addition,

**The University of Guyana** and several associated institutes carry out training and research relative to national human development and resource management and maintain facilities and expertise available to work with Iwokrama. Conversely, several Iwokrama staff members have also lectured at the University.

**The Centre for the Study of Biological Diversity** at the University of Guyana maintains the national collections of biological specimens and information databases. The Centre also carries

out systematic biodiversity research and uses this information to help identify management areas in Guyana.

**The Environmental Studies Unit** at the University of Guyana carries out research and training in environmental management, land use planning, and environmental education.

**The Institute for Applied Science and Technology** with UG is the focal point for research, development, and technology transfer. The Institute is also developing a database on research and technology innovations.

**The Guyana School of Agriculture** provides training in agriculture and forestry.

**The National Agricultural Research Institute** carries out research on soils and germ plasm management and has also worked on IPR.

Finally, several conservation and development non-government organizations work in Guyana:

**Conservation International** works with environmental education, biodiversity inventories, and protected area development in the Kanuku Mountains as well as the Rupununi, and the development of innovative funding mechanisms for forest conservation.

**The Forest Products Association** represents forest producers in Guyana and has substantial practical knowledge of timber production and forest uses.

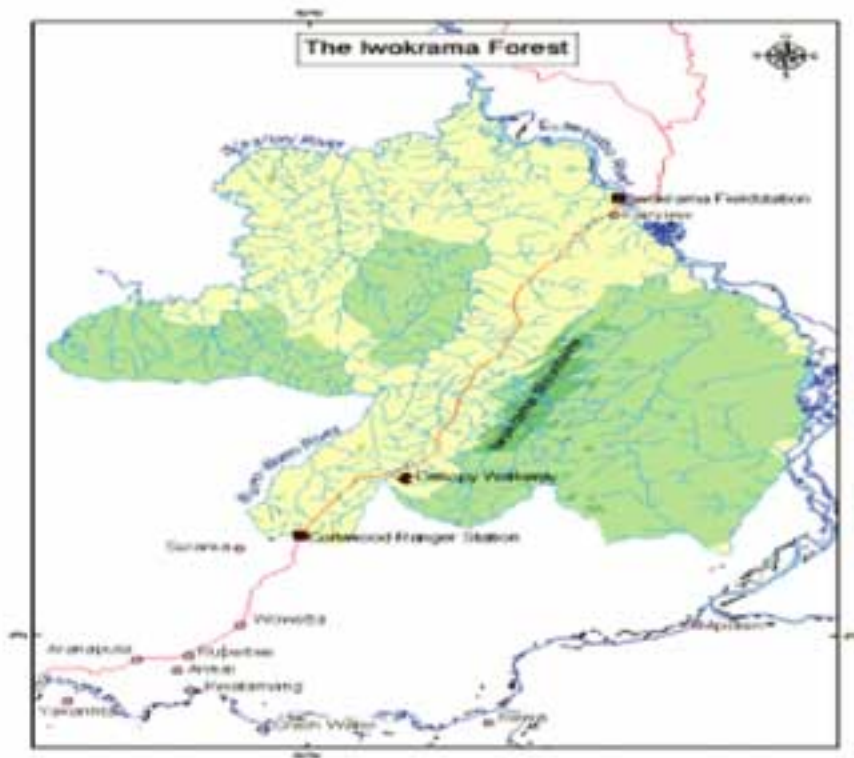
**The Guyana Marine Turtle Conservation Society** focuses work on the conservation of the four marine turtle species that nest in Guyana and the development of Shell Beach as a protected area. Iwokrama has collaborated with the GMTCS on environmental education programmes.

**The Karanambu Trust** focuses work on the conservation of Giant River Otters and the management of the North Rupununi Wetlands.

**The Tourism and Hospitality Association of Guyana** represents private sector interests in tourism and lobbies for policy development in Guyana.

**The World Wide Fund for Nature-Guiana Shield Forest Ecosystem Conservation Project** is based in Suriname and focuses on forest conservation, biodiversity protection and general conservation support across the three Guianas.





*The Iwokrama Forest and its closest user communities.*

## The Local Context

The physical demarcation of the Iwokrama Forest is arbitrary with respect to the structure and dynamics of the ecosystem in which the forest stands. Resources flow now, and have flowed historically, between the Iwokrama Forest and surrounding areas. The Iwokrama Forest is ecologically linked to the Rupununi Wetlands and the Pakaraima Mountains through wildlife and fish migrations and through the extensive forage areas for predators such as harpy eagles and jaguars. In addition, Makushi, Patamona, and Wapishana peoples have historically extracted gold, balata, curare, fish, wildlife and other products from the Iwokrama Forest. Local people still depend on resources in the Iwokrama Forest such as wildlife, fish, timber, minerals, medicinal plants, and farming lands that have been, and could be in the future, of great importance to local communities.

The Iwokrama Forest is in Regions 8 and 9 and is part of the ancestral domain of the Makushi peoples. Iwokrama presently works most intensively with the fourteen communities of the North Rupununi consisting of approximately 3,500 people. One of these communities, Fairview, is officially in Region 8 but is under Region 9 administration. Eight of the communities are situated on lands legally recognized under the Amerindian Act and have legal authority vested in

village councils. The Annai Amerindian District includes Annai Central, Surama, Rupertee, Wowetta, and Kwatamang villages. Toka, Massara, and Yakarinta villages all have their own land titles, whilst Kwaimatta is presently under the jurisdiction of Massara. Apoteri, Rewa, and Fairview villages are Amerindian communities that do not have legally recognized titled lands. Aranaputa village is a mixed Coastlander-Amerindian community situated on State lands. In



Overview of the Iwokrama Forest and the Essequibo River from Turtle Mountain.

addition to these communities, several smaller communities exist, such as Simuni, Crash Water, Mora, Kuribu, Kokobai, Haiawa and Makarapan.

In 2000, Iwokrama began working with the Region 8 Area Council and hopes to develop links with communities in the Pakaraima Mountains including Taruka, Monkey Mountain, Kurukubaru, Paramakatoi, Tuseneng, and Kato.

The indigenous peoples of the area are part of the fourth largest ethnic group in Guyana with a total population estimated as 50,000 (6.3% of the total population<sup>11</sup>). Seventy percent of Amerindians live in the interior of Guyana, whereas most East Indians and Afro-Guyanese and other minorities live in the coastal

plains of Guyana. Amerindians comprise 73.5 % of the population in Region 8 and 81% of the population in Region 9<sup>12</sup>. Twenty-two percent of the population in Regions 8 and 9 are settlers; the first of whom arrived as cattle ranchers in the late 19th century.

The areas surrounding the Iwokrama Forest represent mountains, wetlands and river systems of global importance. Over 400 species of fish were recorded from surveys of the Essequibo, Burro-Burro, and Siparuni Rivers; the surveys did not extend into the upper Essequibo, Rewa, and Rupununi Rivers. Comparable wetlands in South America such as the Varzêa of Mamiraua and the Pantanal wetlands contain 400 and 200 species of fish respectively. The Rupununi, Rewa, and Essequibo Rivers are home to healthy populations of the endangered species Giant River Turtles (*Podocnemis expansa*), Black Caiman (*Melanosuchus niger*), and Giant Otters (*Pteronura brasiliensis*). Early work also revealed healthy populations of Pimelodid catfish (*Phractocephalus hemiliopterus*, *Brachyplatystoma* spp., *Paulicea luetkeni*, and *Pseudoplatystoma* spp.), recovering populations of Arapaima (*Arapaima gigas*), large Characids (*Myleus pacu*), the peacock bass (*Cichla ocellaris*), and the fresh water drum (*Plagioscion squamosissimus*).

<sup>11</sup> Bureau of Statistics (1993). Report on Household Income and Expenditure Survey 1992-1993. Georgetown, Guyana, Bureau of Statistics.

<sup>12</sup> Bureau of Statistics (1993). Report on Household Income and Expenditure Survey 1992-1993. Georgetown, Guyana, Bureau of Statistics.



# Financial Report

Financial reporting on the Iwokrama Programme commenced in calendar year 1993 with funding from Global Environmental Trust Fund (GEF) and most of the funding was expended by mid 1998 with the residual funds being used to build the Workers Accommodation at the Iwokrama Field Station during 1999 and 2000.

For the period 1997-2001, Iwokrama generated revenues totaling US\$375,000 with 67% arising from visitors to the Iwokrama Field Station and the other significant component of US\$98,000 being obtained from consultancies undertaken by Iwokrama staff. Merchandising of Iwokrama products and interest earned from our foreign currency bank accounts make up the balance of internally generated revenue.

	TOTAL	2001	2000	1999	1998
<b>Revenue <sup>13</sup></b>					
Grants	6,940,817	2,771,941	2,158,083	1,451,557	540,245
Field Station Income	252,232	75,843	34,847	39,178	71,496
Consultancy Income	98,023	-	88,240	9,783	-
Other Income	24,552	6,731	17,724	97	-
<b>Total Revenue</b>	<b>7,315,624</b>	<b>2,854,515</b>	<b>2,298,894</b>	<b>1,500,615</b>	<b>611,741</b>
<b>Operating Expenses</b>					
Sustainable Management of Forests	1,389,874	623,197	294,648	460,126	7,209
Sustainable Human Development	2,194,319	940,648	710,867	346,873	195,931
Conservation & Utilisation of Biodiversity	874,717	501,263	296,981	76,473	-
Forest Research	457,082	117,250	224,670	115,162	-
Information and Communication	520,695	108,776	170,995	160,042	68,452
Administration & Finance	1,521,383	422,383	510,245	241,653	321,548
Institutional Arrangements	200,266	97,672	42,068	60,526	-
<b>Total Operating Expenses</b>	<b>7,158,336</b>	<b>2,811,189</b>	<b>2,250,474</b>	<b>1,460,855</b>	<b>593,140</b>
<b>Revenue over Expenditure</b>	<b>157,288</b>	<b>43,326</b>	<b>48,420</b>	<b>39,760</b>	<b>18,601</b>

<sup>13</sup> Expenditures do not include those under the UNDP-GEF national project because of the separate audited financial statements that are certified by the Government Auditors for the Iwokrama UNDP-GEF Project. The expenditures included herein are extracted from the audited financial statements.

# Sustainable Management of Forests



*Scarlet macaw nesting along the road that bisects the Iwokrama Forest – such birds are a major draw for ecotourism. Photo by Fotonatura*

The objective of the core programme 'Sustainable Management of Forests' is to demonstrate how tropical forests can be both conserved and equitably utilized, yielding ecological, economic, and social benefits to the people of Guyana and the international community.

## Natural, Social, Economic and Cultural Resource Surveys

The Iwokrama Forest has been characterized as a set of 930 catchments. Information on these catchments has been gathered through surveys of the geology, soils, water, archaeology, zoology, botany, and mycology of the Iwokrama Forest. Forest type maps have been developed and refined as a result of these studies.

Iwokrama has worked in partnership with the NRDDB and Village Councils, to describe the socio-economic and cultural characteristics of communities in the Iwokrama Ecosystem. The resulting georeferenced maps and participatory human resource interaction appraisals are the basis for monitoring the socio-economic and cultural impacts of Iwokrama's activities on local communities.

## Iwokrama Forest Management Planning

The Iwokrama Forest has been zoned into a Sustainable Utilization Area and a Wilderness Preserve with input from local and national stakeholders. Draft management plans for the Iwokrama Forest and the Road Corridor are presently under consultation with stakeholders and will be finalized at the end of 2003. The draft plan for the Iwokrama Forest is based on managing the broader Iwokrama Ecosystem and integrates conservation and utilization of goods and services from the Iwokrama Forest. The management planning process also involves local communities and national stakeholders.

Iwokrama has also facilitated community and national management planning for the areas surrounding the Iwokrama Forest while the NRDDB is developing fisheries collaborative management systems with the EPA and the Fisheries Department. Iwokrama is also working on collaborative management systems (national wildlife legislation and national wildlife management planning) at a national level with the EPA.



Fifteen of the 24 trained Iwokrama Forest Rangers remain with Iwokrama; these rangers will play a major role in the implementation of the Iwokrama Forest management plan. Their skills include stakeholder communication, environmental education and guiding, in addition to the more traditional ranger skills of patrolling and forest management.

### Sustainable Use of the Iwokrama Forest

The Iwokrama Centre has begun income-generating operations in the Iwokrama Forest. Over 400 visitors passed through the Iwokrama Forest between 1997 and 2002. Iwokrama grossed US\$75,843 from 189 visitors in 2001. A canopy walkway was built in 2002 and improvements have been made to the Field Station visitor accommodations. Furthermore, discussions have begun with potential business partners for the further development of ecotourism in the Iwokrama Forest. The Iwokrama Training Unit has also begun to sell training services to other organizations and to develop mechanisms for external training at the Iwokrama Field Station.

In addition, Iwokrama is supporting the development of knowledge-based industries with the NRDDB. The MRU has produced several booklets and, to date, grossed over US \$5,000 in income.

### Business Arrangements for Forest Management

Iwokrama held a national workshop in September 2000 to discuss the development of principles for business partnerships between Iwokrama and the private sector<sup>12</sup>. The following guiding principles were the major outcome from this meeting:

- *All resource utilisation rights and contractual arrangements must be developed through open, competitive processes that are transparent to all stakeholders.*
- *Potential partners must be committed to independent evaluation and certification of their environmental performance and set high standards of environmental stewardship as part of their core business strategy.*
- *Potential partners must be committed to honouring the IPR and Benefit Sharing Protocols being developed by the Centre with its stakeholders.*
- *Potential partners must be committed to developing equity partnerships with both their employees and with the local communities living in the Iwokrama Ecosystem.*
- *Potential partners must demonstrate the capacity to link Iwokrama to high-value niche markets.*
- *Preference will be given to partners prepared to involve national entrepreneurs in joint venture operations.*

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<sup>12</sup> Radzick, V. (2000). Developing Sustainable Forest-Based Business Partnerships. Georgetown, Guyana, Iwokrama International Centre.

## Impacts on National and Regional Forest Policies and Practices

Iwokrama's approach to management planning through participation, transparency and local community involvement are having broad effects on national protected area and forest planning. In addition, Iwokrama has hosted four major international workshops on Reduced

Impact Logging (RIL; April 1999), Business Partnerships (September 2000), Wildlife Management (December 2000) and Public Policy, Natural Resources and Equity (September 2001). Iwokrama is also working under Memoranda of Understanding with the NRDDDB, the GFC, the EPA, the Fisheries Department, the GBC, and the Institute for Applied Science and Technology (IAST).



*Alberto Rodriguez of the Yekwama people from Venezuela presenting at the Iwokrama regional technical workshop on wildlife management in the Guiana Shield in December 2000. Photo by Iwokrama.*

The regional workshops and collaborative relationships at local, national, and international levels have important consequences for national and regional forest management policies and practices. These impacts include contributions to developing national timber certification procedures and influencing national wildlife and inland fisheries management policies and approaches. Participatory approaches employed by Iwokrama are seen as contributing nationally to the development of more effective natural resource management systems.

Iwokrama also completed a consultancy reviewing "Criteria and Indicators for Sustainable Management of Natural Tropical Forests"<sup>13</sup>. This document will contribute to the development of new ITTO guidelines that are better suited to local circumstances. Further, working in collaboration with the NRDDDB and Mamirauá Institute of Brazil, Iwokrama has developed Guyana's first freshwater fish management plan aimed at the conservation and management of the endangered Arapaima.

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<sup>13</sup> Caselle, D. S. and C. Hall (2000). 'Taking the Policies to the Forest,' Tropical Forest Update 10(3).



# Conservation and Utilization of Biodiversity

The objective of the thematic core programme "Conservation and Utilisation of Biodiversity" is to manage part of the forest as a wilderness preserve and systematically prospect the rich biodiversity for new products from the forest, thereby increasing local scientific and technical capacity.



Iwokrama Ranger and Staff explaining about snakes to a group of students from University of the West Indies.

## Inventory of the Iwokrama Forest Biodiversity

The Iwokrama forest has been identified as a global hotspot for the diversity of bats, several plant families (*Lecythidaceae* and *Chrysobalanaceae*), and fresh water fish. The Iwokrama Ecosystem is located at a crossroads between Amazonian and Guianan flora and fauna. As a result of this it contains high species richness and several species threatened or extinct across most of their former geographic ranges. These endangered species include Arapaima (*Arapaima gigas*), Jaguar (*Panthera onca*), Black Caiman (*Melanosuchus niger*), Giant River Turtles (*Podocnemis expansa*) and Harpy Eagles (*Harpia harpyja*).

Extensive, though incomplete, faunal surveys of the Iwokrama Forest reflect the following:

Taxonomic Group	Recorded in Iwokrama	Estimated in Iwokrama	Estimated in Guyana
Birds	450	>480	>800
Mammals	127	>180	>220
Fish	420	>500	>800
Reptiles & Amphibians	114	>180	>200

In April 1999, it was decided that the best way to augment existing information on the vertebrate and higher plant diversity of the Iwokrama forest would be to target smaller organisms. Inventory efforts from 2000 to 2002 were directed towards sampling one of the least studied organisms in tropical forests – endophytic fungi. Outputs include sample plots in the Iwokrama forest, a system of information management for fungi, technical papers in international journals, lecturing to University of Guyana students and Iwokrama ranger trainees, and the production of a field guide. Inventory work has resulted in the culturing of

over 200 morpho-species of endophytic fungi from 14 host plants and collection of at least 67 species of macro fungi from the forest. A series of presentations and publications have resulted from the work on endophytic fungi.

Faunal inventories have continued after the initial inventory studies that took place from 1996 to 1998. This work has been undertaken through the ranger training programme and several collaborating institutes have been involved including the Centre for the Study of Biological Diversity at the University of Guyana, the Royal Ontario Museum and Florida International University.



*Jaguars are seen relatively often on the road through the Iwokrama Forest. Photo by Futonatura.*

### Wilderness Preserve

The boundaries of the Wilderness Preserve have been identified and a draft management plan for the Iwokrama Forest that incorporates planning for the Wilderness Preserve was completed in April 2002. The Wilderness Preserve planning process is also leading to consideration of the Iwokrama Forest and surrounding areas (the Iwokrama Ecosystem) for Man and the Biosphere (MAB) Reserve and Ramsar nomination. The management planning process for the Wilderness Preserve has

also had an impact on the approach to national protected area system planning and establishment in Guyana because a member of the National Protected Areas Secretariat worked on the Iwokrama team that developed the draft Iwokrama Forest management plan.

### Natural Products in the Iwokrama Forest

Iwokrama has developed a natural products development programme through partnership with CABI Bioscience, the Royal Botanical Gardens at Kew, the University of Guyana, the University of the West Indies, and the Institute of Applied Science and Technology. The main focus of this programme has been the establishment of a national biodiversity screening laboratory in Guyana as well as research on bioactive metabolites of pharmaceutical and insecticidal significance from endophytic fungi and their host plants. Any commercial exploitation is capped until Iwokrama has IPR and benefit sharing protocols in place. Substantial work has already been done on these protocols and they should be completed in 2003.

Iwokrama employs staff from the University of Guyana and the University of the West Indies in the laboratory in addition laboratory technicians, who also do field surveys, have been recruited from the local Amerindian communities



# Sustainable Human Development

The objective of the thematic core programme 'Sustainable Human Development' is to help people develop their ability to benefit from the tropical rain forest and to address the complex issues related to its sustainable management.

## Tools for Forest Management



*A multi-stakeholder workshop on fisheries management held in December 2000 at the Bina Hill Institute in the north Rupununi. Photo by Iwokrama.*

Poor forest management can lead to considerable economic, social and environmental losses. Iwokrama has examined approaches to producing timber, NTFPs and delivering tourist services through a range of feasibility and cost accounting studies. A reduced-impact logging feasibility study has characterized the operational and broader economic costs and savings of better harvest planning while; two ITTO-funded studies explored a wide range of options for downstream processing and marketing of timber and NTFP materials. These studies identify market requirements and demand, reduce waste, focus on product quality, and increase local benefit delivery. A cost assessment of delivering tourist services to visitors at the Iwokrama Field Station has identified where more effective tools can be used to increase net benefit generated through this activity.

## Neighbouring Communities Developing in Harmony with Iwokrama

Iwokrama is committed to a participatory approach to management of natural resources and the development of commercial opportunities in the Iwokrama Ecosystem. A striking success of Iwokrama is the development of the local governance institution – the NRDDB in Region 9. The NRDDB began in 1996 and since then it has developed substantial capacity for management in the North Rupununi Wetlands and Savannas.

Several local community programmes based in Region 9 are contributing to the development of communities and the increasing maturity of the relationship between Iwokrama and the NRDDB. Iwokrama has worked with the NRDDB to develop participatory research capacity in communities

through the Makushi Research Unit (MRU) and CEWs. The MRU began in 1996 and plays an important role in understanding local knowledge systems and cultural affirmation. The MRU work has recently expanded to include working with the Ministry of Education to develop Makushi language teaching in schools. CEWs work with villagers and local schools to increase understanding of the environment, conduct wildlife and resource mapping research, and work with communities to develop natural resource management systems.



*Wildlife Club banners on display during the annual wildlife festival held in Annai, 2003. Photo by Samantha James*

Iwokrama has also facilitated the development of 14 wildlife clubs, one in each of the North Rupununi villages. These clubs expose 8 to 18 year olds to natural resource management, organizational and governance issues, and provide fora for discussion of environmental and other issues.

Iwokrama has supported two Wildlife festivals in Annai with these clubs, and club members are now involved in monitoring natural resources in the Rupununi and Iwokrama Forest.

Iwokrama has also facilitated the development of local natural resource management skills through conservation contracts with communities and management planning with the NRDDB. Conservation contracts involve agreements between Iwokrama and communities where Iwokrama facilitates resource management processes. More importantly, these contracts require learning by doing in communities for effective natural resource management. The contracts also facilitate the testing of Iwokrama Forest based models on a smaller, locally based scale. The contracts are also important in community-based income generation and employment.

Iwokrama training programmes support local community development, focusing on training to build skills for Iwokrama functions, natural resource management, and for village development. Training to date has been completed in resource surveys and mapping, financial management, cottage industry development, carpentry and masonry, and participatory management. The Centre has also reached beyond the communities that live in or near the Iwokrama Forest. For example, three women from the Wai Wai community at Gunn's Strip have benefited from training in food preparation and service, and room management while three of their male counterparts have received training in tour guiding and visitor-interaction skills.

Iwokrama has also begun developing relations with the more distant Region 8 communities through the Region 8 Amerindian Touchaus Area Council (ATAC). These relationships include incorporating Region 8 leaders into planning processes, visits for Region 8 leaders to the North Rupununi, and initial outreach to Region 8 communities.



### **Institutional Capacity for Training in Natural Resource Management**

Iwokrama has established the capacity to provide training in a range of natural resource subject areas. This training is supported through physical facilities, and a network of local, national, and international trainers. The Centre now has completed two rounds of a live-in one-year training programme for rangers. The success of this programme is indicated by unsolicited feedback from researchers, visitors and community members relating to the quality of graduates. The modular structure of the programme makes it possible to meet the needs of clients beyond the tourism and natural resource sectors and short courses in several subjects are being offered. The ranger training programme is the most comprehensive course of its kind offered in the Caribbean. The value of the ranger training programme was underscored by the very positive review that was accorded to one of the Rangers following participation in the World Youth Action Summit that was held in the Netherlands in July 2002.



*The renovated visitor buildings at the Iwokrama Field Station. Photo by Iwokrama.*

### **Trained Guyanese Carrying out Operational Tasks at Iwokrama**

Iwokrama has been identified within the Guyanese Environmental Protection Agency's National Report to the Conference of Parties of the Convention Biological Diversity as a key institution responsible for developing the Guyana's capacity to fulfill its commitments for identifying and monitoring, research and training, access to and transfer of technology, scientific and technical co-operation, and sustainable use. Iwokrama's capacity to deliver this responsibility has been enhanced by the competence of its Rangers. The Iwokrama Rangers are the basis for patrolling and enforcement within the Iwokrama Forest; recently, agreement was reached with the Guyana Police Force for rangers to be commissioned as supernumeraries and rural constables. The Rangers have also developed skills in ecotourism, research, community liaison, and are able to train others in these skill areas. Twenty of the 24 trained rangers are from local communities.

Iwokrama has also developed a Young Professionals Programme that has supported six Professional Development Fellows and eleven Research Assistants. Further, the Centre offers an Internship programme for promising individuals from Guyana and abroad to learn skills and embrace the Iwokrama effort.

In the area of natural resources management, community members carry out land and wildlife surveys and are now using information from these surveys to manage resources in the Iwokrama Ecosystem. The NRDDB has also embraced natural resource management programmes for NTFPs, timber, fisheries, and wildlife outside the Iwokrama Forest. The hope, is that in the long-term, communities will play a pivotal role in monitoring the Iwokrama Forest and Ecosystem.

### **Information from Iwokrama Promoting Sustainable Forest Use in the World**

Iwokrama has close linkages with the World Commission on Forests and was cited as a success story at Rio+5. Iwokrama featured at Commonwealth Heads of Government Meetings and the World Summit on Sustainable Development as the "Flagship" environment project for the Commonwealth. At the WSSD meeting President Jagdeo reiterated Guyana's commitment to Iwokrama and called upon other Commonwealth states to support the programme. Regional linkages are also being developed with other programmes such as the EU-funded Caribbean Regional Environmental Programme, the Caribbean Conservation Association, and CARISCIENCE, which prompts basic sciences in the Caribbean.



# Forest Research

The objective of the thematic core programme “Forest Research” is to compile, refine, generate, and disseminate knowledge and technologies needed to improve the conservation, management and utilization of the resources of tropical rain forests in order to provide a sustainable basis for human development.



*Community environmental workers and wildlife club members employing school yard ecology techniques to ask questions about their environment during a research training workshop in 2002: Photo Ricardo Stamos.*

## Policy Framework to Guide Collaborative Research

Iwokrama has developed base agreements to guide research in the Iwokrama Forest. Draft agreements are available on the Iwokrama home page ([www.iwokrama.org](http://www.iwokrama.org)) and are modifiable for particular research projects. In addition, Iwokrama has developed research agreements for work with communities. Final IPR protocols and agreements also address collaborative research relationships.

## Intellectual Property Rights

Over the past five years, Iwokrama has worked toward agreements relating to IPR, Access, and Benefit Sharing to guide the work of the Centre. In the absence of a formal policy, interim agreements have been drawn up on the initiative of

staff members and used to guide activities including on-going collaborative research, tourism, and filming.

The Centre seeks at all times to protect the IPR of local stakeholders. Most notably, in 1998 and 1999 Iwokrama helped transfer copyright from the Ministry of Foreign Affairs to the NRDDB for work completed by the MRU. The Centre has also negotiated and drawn up agreements on IPR and benefit sharing relating to the use of verbal and printed information as well as artwork supplied by local collaborators and incorporated in Iwokrama books, booklets, posters, and cards.

Other activities relating to IPR include an international workshop with key stakeholders<sup>16</sup>, and community-level consultations in Regions 8 and 9. The focus of these discussions was on the need to elaborate the exchanges of benefits between Iwokrama and various stakeholders and to operationally determine benefit sharing in a context of sharing decision-making. This work reiterated the need for a clear definition of relationships between Iwokrama and stakeholders, through recognizing reciprocal contributions, interdependency, and mutual expectations that were identified in a previous report on stakeholder involvement at

<sup>16</sup> Mangal, S. (2001). Key Elements of Benefit Sharing for the Iwokrama Program: Feedback from Local, National and International Stakeholders. Georgetown, Guyana, Iwokrama International Centre.

Iwokrama<sup>17</sup>. In this context, it was recommended that the Iwokrama Board of Trustees include key representatives of Guyanese civil society and local communities and that Iwokrama formalize and institute the National Stakeholders Group.

During 2002, an internal IPR Working Group was formed. The Working Group benefited greatly from the advice proffered and the supply of relevant documents from CABI Bioscience and the Royal Botanic Gardens, Kew. Members of the IPR Working Group participated in parallel national processes relating to IPR and A&BS. These included attendance at a Workshop on the International Union for the Protection of New Varieties of Plants (UPOV) in 2001, and a Workshop on Conservation and Sustainable Use of Agro-Biodiversity: Bio-Prospecting, Access and Benefit Sharing in Barbados in 2001. Iwokrama was also represented on the National Advisory Committee on Access to Genetic Resources and Benefit Sharing, convened under the aegis of the Environmental Protection Agency and on the Technical Working Group formed by the Ministry of Foreign Trade and International Cooperation that examines the IPR and other implications of the FTAA agreements for Guyana.

In November 2002, Iwokrama contracted an IPR lawyer to review the draft policy and agreements drawn up to date. It is expected that the policy will be ready for consideration by the IBOT and Iwokrama's stakeholders by the end of the second quarter of 2003. The project to develop Policy and Agreements relating to Intellectual Property Rights, Access and Benefit Sharing for Iwokrama International Centre is funded by IDRC, Canada.

### Compilation of Indigenous Knowledge about the Iwokrama Forest

The MRU have worked toward developing an understanding of the resources in the Iwokrama Forest and North Rupununi<sup>18</sup>. In addition, work on wildlife management has been a key entry point for developing natural resource management relationships between Iwokrama and local communities<sup>19</sup>. Iwokrama's approach to wildlife research is not typical of neotropical wildlife research programmes; the high levels of local involvement permit the interaction of social and biological sciences in addressing management and research issues. The recognition of local knowledge<sup>20, 21</sup> has led to local ownership of management prescriptions and stronger local compliance than would normally occur.

### Identification of Non -Timber Forest Products and Production Procedures

Work on NTFPs has been an active research theme at Iwokrama. Research has focused on wildlife and fish (*Arapaima gigas*) as well as on NTFP species that could form the bases for industries. In this context, research studies of Balata (*Manilkara bidentata*), Nibbi (*Heteropsis flexuosa*), and Crabwood Oil (*Carapa guianensis*) have been completed or are ongoing. In

<sup>17</sup> Schen, L.M. (1999). Stakeholder Involvement and Mechanisms for Participation in Iwokrama. Georgetown, Guyana, Iwokrama International Centre.

<sup>18</sup> Forte, J., ed. (1999). *Makwipi Komanto Iemtu Sustaining Makwipi Way of Life*. Amai, Guyana, North Rupununi District Development Board.

<sup>19</sup> Forte, J., M. Janki, G. Watkins, eds. (1999). *Community-based wildlife management in the North Rupununi*. Guyana, North Rupununi District Development Board & Iwokrama International Centre for Rain Forest Conservation and Development.

<sup>20</sup> Makwipi Research Unit and J. Forte, eds. (1999). *Birds of the North Rupununi District*. Guyana, North Rupununi District Development Board.

<sup>21</sup> Makwipi Research Unit and J. Forte, eds. (2000). *Fishes of the North Rupununi District*. Guyana, North Rupununi District Development Board.



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November 2002 the Centre conducted a workshop on the sustainable and equitable use of crabwood oil for local crabwood oil producing communities and other support agencies, as well as government and non-government organisations.

### **Established Trials and Demonstrations for Sustainable Timber Production**

In 1999, Iwokrama jointly hosted a workshop with Tropenbos and the GFC on RIL. The workshop led to a review document in a special issue of the *International Forestry Review*,<sup>22</sup> dedicated to the workshop proceedings. The workshop resulted in a training course for Guyanese foresters in RIL, the development of a national working group on certification, and an ongoing cost-benefit study of operational scale RIL currently being run jointly by Iwokrama, Tropenbos and the GFC in the Demerara Timbers Ltd. concession neighbouring the Iwokrama Forest. Finally, an Iwokrama Young Professional and a student from the University of the West Indies completed a study of carbon storage capacities of native forest types and fluxes after RIL and conventional logging applications.

Iwokrama has encouraged independent researchers to use the research facilities at the field station. In April 2002, the Centre provided a bursary to the University of Guyana to support several students to undertake research projects in the Iwokrama Forest.

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<sup>22</sup> Hammond, D.S., P. van der Houst, R.J. Zagt, G. Marshall, J. Evans, D.S. Cassels. (2000) 'Benefits, bottlenecks and uncertainties in the pantropical implementation of reduced impact logging techniques.' *International Forestry Review* 2(1): 45-53.

# Information and Communication

The objective of the thematic core programme “**Information and Communication**” is to establish an international information and communication resource unit. This unit is to serve as a channel for dissemination of knowledge gained from the Iwokrama Centre, to facilitate dialogue between Iwokrama staff, local communities and diverse regional and international stakeholders as well as to support the research activities of the Centre.



*The President of Guyana, the Honourable Bharrat Jagdeo visiting the Iwokrama booth in the 2002 Gayexpo.*

## Guyanese Public with Greater Appreciation of Forest Resources

Apart from developing wildlife clubs in all of the communities of the North Rupununi, the Iwokrama-facilitated CEWs have contributed substantially to community understanding of resource management approaches and the different values of forest resources. Students from local primary and secondary schools have also visited the Iwokrama field station.

Nationally, Iwokrama has facilitated the development of a “Friends of Iwokrama” group that began in 1999. This group meets every two months to discuss natural resource management issues. Iwokrama also hosts fortnightly “Brown-

Bag” seminars that attract up to 30 natural resource management professionals to hear national and international speakers. In addition, the Iwokrama Foundation Day lecture series, now in its ninth year, continues to attract a large public audience. The Centre embraces an active programme of outreach to local schools and groups.

Iwokrama has developed publications and posters that raise awareness and increase public appreciation for Guyana’s forest resources. Iwokrama is also partnering with The National Audubon Society, the Ministry of Education and the EPA to implement a national programme in School Yard Ecology (SYE) and Citizen Science that raises awareness about research and management issues among students and teachers.

## Constructive Two-Way Dialogue with Stakeholders

Community Environmental Workers, the MRU, and Wildlife Clubs form part of the basis for a two way flow of information between Iwokrama and communities. In addition, village leaders meet with Iwokrama staff every two months to discuss issues of importance at the NRDDB meetings. Iwokrama is also developing relations with Region 8 communities through the Region 8 ATAC and an outreach programme to associated villages.



## Multi - partner Stakeholder Linkages

Beyond the two-way dialogues with institutions which are organic to the NRDDB, Iwokrama also embraces very strong multi-partner stakeholder linkages that are delivering benefits to the communities of the North Rupununi. These linkages have brought together Iwokrama, CIDA Gender Equality Programme, APA, Help and Shelter, the Guyana Book foundation, and the Ministry of Education to promote the concerns of the communities that live in or near the Iwokrama Forest.



Volunteers pitch in during the International Coastal Clean-up, September 2002.

## Environmental Education

Iwokrama's major environmental education thrust has been in the SYE<sup>23</sup> programme in partnership with Audubon and the Ministry of Education.

## Disseminating Results through Culturally Appropriate Material

Iwokrama produces a regular newsletter, and has published over 80 national and international papers in this period. Furthermore, Iwokrama staff members have given over 75 public presentations over the last five years.

## Information Networks with Collaborators

Iwokrama is one of the founding members of Guyana's **Information Network for Science and Technology**(INSAT). This network was created to facilitate the exchange of information among member organisations. Among the services offered by INSAT is access via the internet to consolidated bibliographic information from nine national environmental organisations ([www.insatguyana.net](http://www.insatguyana.net)).

## Databases of Information Relevant to Iwokrama

The Iwokrama Information and Communications Unit houses one of the most complete libraries on natural resource management in Guyana. Species lists for vertebrates and trees are also available on the Iwokrama web site ([www.iwokrama.org](http://www.iwokrama.org)).

## Geographic Information System in Use

An operational GIS has been developed at Iwokrama, including information on the Iwokrama Forest and neighbouring areas. The Centre's GIS is key to the decision model developed to zone the Iwokrama forest and has also been used in community resource mapping, road management planning, and ecotourism development. Geographic Information Systems staff members have also contributed to the formulation of Guyana's National Policy on Geographic Information. Iwokrama has also developed initial prototype spatial models for Greenheart distribution and tree growth, in addition, to having examined the application of satellite radar for the delineation of seasonal under-storey flooding of the forest.

<sup>23</sup> Mangil, S. (2001). Schoolyard Ecology Guyana. Report on the Schoolyard Ecology Workshop in Guyana. Georgetown, Guyana. Iwokrama International Centre; Audubon Society; Ministry of Education.

# Infrastructure Development

## National Natural Products Laboratory

The national natural products screening laboratory was established at the University of Guyana, Turkeyen Campus in June 2001. The laboratories have been established in the Annex Building of the Department of Chemistry. The existing laboratories were renovated and

refurbished for offices, a natural products laboratory, culture and media preparation and extraction. The laboratories have been outfitted with several pieces of modern equipment, including cooled incubators, an Ultra Violet light incubator, a spark-free refrigerator, microscopes, autoclaves, balances, a drying oven, a rotary evaporator, vacuum pumps, an orbital shaker, a centrifuge, sample concentrators, chromatography equipment, and computers to facilitate the culture, storage, identification and cataloguing of microorganisms as well as the extraction, isolation and bioassay of compounds obtained from the Iwokrama Forest.



*The Iwokrama Field Station at Kurupukari.*

## Field Station

Field station and visiting head office staff are housed in four buildings with eight single rooms at the Kurupukari Field Station; five separate other cabins have been set aside for a maximum of six persons each, but are, however, best suited for double occupancy or families. Students at the field station including Iwokrama Ranger trainees and primary school children can be accommodated in a dormitory, with room for 20 persons in hammocks. The field station also operates a fleet of four vehicles and four outboard motor boats to transport staff and visitors.

## Teaching and Research Capacity

A teaching centre was constructed at the Field Station to offer better facilities for students and researchers. The facilities include an open-air teaching and recreation hall, a computer laboratory, dry and wet labs, and associated furnishings and equipment.

## Trail Systems

There is a network of forest trails in the Iwokrama Forest; tourists, Rangers, students, and researchers use these trails which are situated near the field station, and at selected satellite camp sites within the Iwokrama Forest.



## Satellite Camps

Satellite field camps have been established at Turtle Mountain, Kabokalli, Whitewater and Sandstone. These camps are sites for Rangers on forest monitoring exercises as well as researchers and tourists.



*View from one of the four Canopy Walkway platforms in the Iwokrama Forest.*

## Canopy Walkway

In October 2002, Iwokrama completed the construction of the only canopy walkway in the Guiana Shield. The 150 metre long walkway is located in the south of the Iwokrama Forest at Maushiparu within easy access of the North Rupununi. The walkway was funded by CIDA and cost US \$200,000; it is made entirely of aluminum suspended by steel rope and built by the Greenheart Construction Company of Canada. The design is an improvement on earlier walkways built by the company in Brazil and Ghana. The walkway provides an entirely new perspective to the Iwokrama forest, and a better opportunity for visitors to enjoy and study the biological diversity of the area.

# Appendix I:

## Publications Relating to Iwokrama

**Baines, G. and R. Warner.** 2000. Report of the final project evaluation mission: GEF assistance to the Iwokrama Rain Forest Programme. Georgetown, Guyana, UNDP.

**Bassett, Y., E. Charles, D.S. Hammond, and V.K. Brown.** 2001. Short-term effects of canopy openness on insect herbivores in a rainforest in Guyana: *Journal of Applied Ecology*, 38: 1045 -1058.

**Biller, D. S., D. S. Cassells, C. A. Meyer, and M. Rodriguez-Becerra.** 1998. Forest policy initiatives and opportunities in the Americas: *Journal of World Forest Resource Management*, 9: 51-72.

**Cannon, P. and C. Simmons.** 2002. Diversity and host preference of leaf endophytic fungi in the Iwokrama Forest Reserve, Guyana. *Mycologia*. Vol. and page No not available.

**Cassells D.S. and C.A. Hall.** 2000. Proposals for the development of a comprehensive framework and practical working manuals on all relevant aspects of sustainable forest management. International Tropical Timber Organization Yokohama, Japan.

**Cassells, D.S.** (In Press) Guidelines for controlling the watershed Impacts of timber harvesting. Invited overview paper to the UNESCO International Hydrological Programme Symposium on Forests. In *Proceedings of Water and People*. Bangi, Malaysia, July 31- August 4, 2000.

**Cassells, D.S. and C.A. Hall.** 2000. A Structure for Sustainability. *Tropical Forest Update*, 10(3): 2-4.

**Cassells, D.S. and G.G. Watkins.** 1998. Natural resource management: Some implications for professionals and institutions involved in natural resource management in the Caribbean and Latin America. In "Furthering Cooperation in Science and Technology for Caribbean Development" 10th Anniversary Conference of the Caribbean Academy of Sciences (CAS), Pp 282-304 Hilton Hotel and Conference Centre, Trinidad & Tobago.

**Chen, M. H.** 1998. The herpetofauna of the Iwokrama Forest: A comparison of sampling methods. *Biological Sciences* 87.

**Clarke, H. D., V.A. Funk, and T. Hollowell.** 2001. *Plant diversity of the Iwokrama Forest, Guyana*. Texas, USA: Botanical Research Institute.

**Datadin, V.K.** 1999. GIS and strategic planning in tropical forest management: (a) Predictive modelling of the distribution of greenheart (*Chlorocardium rodiei*) in mixed tropical forest with GIS; (b) Assessing the microscale variation of tropical soil characteristics with GIS. MSc thesis, Edinburgh University, Edinburgh, UK.

**Datadin, V.K.** 2001. Iwokrama forest boundary report. Georgetown, Guyana: Iwokrama International Centre.

**Datadin, V.K.** 2001. Predictive modeling of tree distribution in tropical forest using GIS. In *Proceedings of the Urban and Regional Information Systems Association (URISA) Caribbean Conference*, 234-247, Montego Bay, Jamaica.



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**Biller, D. S., D. S. Cassells, C. A. Meyer, and M. Rodriguez-Becerra.** 1998. Forest policy initiatives and opportunities in the Americas: *Journal of World Forest Resource Management*, 9: 51-72.

**Cannon, P. and C. Simmons.** 2002. Diversity and host preference of leaf endophytic fungi in the Iwokrama Forest Reserve, Guyana. *Mycologia*. Vol. and page No not available.

**Cassells D.S. and C.A. Hall.** 2000. Proposals for the development of a comprehensive framework and practical working manuals on all relevant aspects of sustainable forest management. International Tropical Timber Organization Yokohama, Japan.

**Cassells, D.S.** (In Press) Guidelines for controlling the watershed Impacts of timber harvesting. Invited overview paper to the UNESCO International Hydrological Programme Symposium on Forests. In *Proceedings of Water and People*. Bangi, Malaysia, July 31- August 4, 2000.

**Cassells, D.S. and C.A. Hall.** 2000. A Structure for Sustainability. *Tropical Forest Update*, 10(3): 2-4.

**Cassells, D.S. and G.G. Watkins.** 1998. Natural resource management: Some implications for professionals and institutions involved in natural resource management in the Caribbean and Latin America. In "Furthering Cooperation in Science and Technology for Caribbean Development" 10th Anniversary Conference of the Caribbean Academy of Sciences (CAS), Pp 282-304 Hilton Hotel and Conference Centre, Trinidad & Tobago.

**Chen, M. H.** 1998. The herpetofauna of the Iwokrama Forest: A comparison of sampling methods. *Biological Sciences* 87.

**Clarke, H. D., V.A. Funk, and T. Hollowell.** 2001. *Plant diversity of the Iwokrama Forest, Guyana*. Texas, USA: Botanical Research Institute.

**Datadin, V.K.** 1999. GIS and strategic planning in tropical forest management: (a) Predictive modelling of the distribution of greenheart (*Chlorocardium rodiei*) in mixed tropical forest with GIS; (b) Assessing the microscale variation of tropical soil characteristics with GIS. MSc thesis, Edinburgh University, Edinburgh, UK.

**Datadin, V.K.** 2001. Iwokrama forest boundary report. Georgetown, Guyana: Iwokrama International Centre.

**Datadin, V.K.** 2001. Predictive modeling of tree distribution in tropical forest using GIS. In *Proceedings of the Urban and Regional Information Systems Association (URISA) Caribbean Conference*, 234-247, Montego Bay, Jamaica.

- Datadin, V.K. and D.S. Cassells.** 1997. Protected Area planning management and development in the Iwokrama Forest. In *Proceedings of the Guyana-Suriname Binational Seminar*, Paramaribo, Suriname.
- Engstrom, M. D. and B. K. Lim.** 2001. Diversity and conservation of mammals in Guyana. In, G. Ceballos, Ed. *Ecologia y conservacion de los mamiferos de Latinoamerica*.
- Engstrom, M. D., B.K. Lim, and F. A. Reid, in association with the North Rupununi Development Board.** 1999. *Guide to the Mammals of Iwokrama* (on-line version): <http://www.sdn.org.gy/iwokrama/ROM/mammals/index.html>
- Engstrom, M., B.K Lim, F.A. Reid and NRDDB.** 1999. *Guide to the mammals of Iwokrama*. Georgetown, Guyana: Iwokrama International Centre.
- Forget, P. M., D.S. Hammond, T. Milleron, T., and R. Thomas.** 2002. Seasonality of fruiting and food hoarding by rodents in neotropical forests: Consequences for seed dispersal and seedling recruitment. In D. Levey, W. Silva and M. Galetti Eds. *Frugivory and Seed Dispersal*. Wallingford, UK: CABI Publishing.
- Forte, J.** 1999. Emerging local and global discourses on NTFP use and study: a view from Guyana. In M.A.F. Ros-Tonen, Ed. *Proceedings of the NTFP Research in the Tropenbos Programme: Results and Perspectives*. 33-43: Wageningen, The Netherlands: The Tropenbos Foundation.
- Forte, J.** 1999. Karikuri: The evolving relationship of the Karinya people of Guyana to gold mining. *New West Indian Guide/Nieuwe West-Indische Gids*: Vol 73 (1 & 2).
- Forte, J.** 2000. Amerindian languages of Guyana. In F. Queixalos & O. Renault-Lescure, Eds. *As Linguas Amazonicas Hoje*. 317-333: In Instituto Socioambiental, Sao Paulo.
- Forte, J., D. Cassells, S. Ousman, and R. Thomas.** 2001. Working groups' recommendations for forest certification, summary of the critical issues affecting certification. Georgetown, Guyana: PROFOR.
- Forte, J., Ed.** 1998. *Prantina yenyakamoto Makusiyami ya eseru. Alcohol use in Makushi culture*. Georgetown: Makushi Research Unit, North Rupununi District Development Board.
- Forte, J., Ed.** 1999. *Kise ipukku yare wani. Cassava, our staple food*. Georgetown: Makushi Research Unit, North Rupununi District Development Board.
- Forte, J., Ed.** 1999. *Makusipe Komanto Iseru: Sustaining Makushi way of life*. Annai, Guyana: North Rupununi District Development Board.
- Forte, J., Ed.** 1999. *Toronyami Raponani Ponkon. Birds of the North Rupununi District*. Georgetown: Makushi Research Unit, North Rupununi District Development Board.
- Forte, J., Ed.** 2000. *Moro'yami' Raponani kawonkon. Fishes of the North Rupununi District*. Georgetown: Makushi Research Unit, North Rupununi District Development Board.
- Forte, J., Ed.** 2001 *Iwokrama pantoni: Stories about Iwokrama*. Georgetown: North Rupununi District Development Board and Iwokrama International Centre for Rain Forest Conservation and Development.



- Forte, J., Janki, M., & G.G Watkins., Eds.** 1998. *Community-based wildlife management in the North Rupununi*. Georgetown, Guyana: North Rupununi District Development Board and Iwokrama International Centre.
- Forte, J. and S. Mangal, Eds.** 2000. Elaboration of Critical Issues Raised by Stakeholders at the GFC/PROFOR Workshop on Forest Certification. National Interim Working Group on Forest Certification, Georgetown, Guyana.
- Hammond, D.S.** 1999. Iwokrama: Protected areas and production. *Guyana Review* 7: 18-19.
- Hammond, D.S.** 2001. Iwokrama's promise. *Guyana Review* 9: 24 -25.
- Hammond, D.S and D.A. Hughell.** 2001. Zoning the forest. *Tropical Forest Update*, 11(4): 3-6.
- Hammond, D.S. and D.A. Hughell.** 2001. *Zoning of the Iwokrama Forest*. Georgetown, Guyana: Iwokrama International Centre.
- Hammond, D. S. and H. ter Steege.** 1998. Propensity for fire in Guianan rain forests. *Conservation Biology*, 12(5): 944-947.
- Hammond, D.S. and R. Thomas.** 2001. Implications of logging to seed dispersal and predation by rodents in lowland rainforests of central Guyana. In R. Fimbel, A. Grajal & J. Robinson, Eds. *The Cutting Edge: Conserving Wildlife in Managed Tropical Forests*: 147-148: New York: Columbia University Press.
- Hammond, D.S., V.K. Brown, and R.J. Zagt.** 1999. Spatial and temporal patterns of seed attack and germination in the large-seeded neotropical tree species. *Oecologia* 119: 208-218.
- Hammond, D.S., S. Nokta and S. Ousman.** 2000. *Considerations in the establishment of an airstrip at Kurupukari Landing, Region 8*. Georgetown, Guyana: Iwokrama International Centre.
- Hammond, D.S., P. van der Hout, R. J. Zagt, G. Marshall, J. Evans, and D. S. Cassells.** 2000. Benefits, bottlenecks and uncertainties in the pantropical implementation of reduced impact logging techniques. *International Forestry Review* 2: 45-53.
- Iwokrama.** 2002. *Iwokrama Road Corridor Management Plan 2002-2005*. Georgetown, Guyana: Iwokrama International Centre.
- Jepson, P., J.K. Jarvie, K. Mackinnon, and K.A. Monk.** 2001. The end for Indonesia's lowland forests. *Science* 292: 859-861.
- Lim, B. K., M. D. Engstrom, R. M. Timm, R. P. Anderson, and L. C. Watson. 1999. First records of 10 species of bats in Guyana and comments on the diversity of bats in Iwokrama forest. *Acta Chiropterologica*, 1(2).
- LTS International, 2001. *Timber Forest Product Marketing Study Final Report*. Iwokrama International Centre.
- Mangal, S. 2001. Key elements of benefit sharing for the Iwokrama programme: feedback from local, national, and international stakeholders. Georgetown, Guyana: Iwokrama International Centre.
- Mangal, S.** 2001. *Schoolyard Ecology: Guyana*. Report on the Schoolyard Ecology Workshop in Guyana. Georgetown, Guyana: Iwokrama International Centre, Audubon Society, and the Ministry of Education.

- Mangal, S.** 2000. Report on the Iwokrama-NRDDDB Workshop on Zoning of the Iwokrama Forest. Iwokrama International Centre, Georgetown, Guyana.
- Mangal, S.** 2001. Key Elements of Benefit Sharing for the Iwokrama Programme: Feedback from Local, National, and International Stakeholders. Georgetown, Guyana, Iwokrama International Centre.
- Mangal, S.** 2001. Schoolyard Ecology: Guyana. Report on the Schoolyard Ecology Workshop in Guyana. Georgetown, Guyana, Iwokrama International Centre; Audubon Society; Ministry of Education.
- Monk, K.A.** 2001. After the fires. *Lifewatch (Autumn/Winter)*: 18-20.
- Monk, K.A.** 2001. The evolution and scope of ICDPs: the example of the Leuser Ecosystem, Sumatra, Indonesia. *PARKS* 11(2): 33-40.
- Ousman, S.** 1999. Considerations in the Planning and Management of the Road Corridor in the Iwokrama Forest. MSc. Thesis. Department of Geography and Geology, University of the West Indies, Mona Campus, Jamaica.
- Ousman, S.** 2001. A Socio-economic Assessment of the Iwokrama Road Corridor. Iwokrama Technical Series. Georgetown, Guyana: Iwokrama International Centre.
- Ousman, S. and D.S. Hammond.** (2001). The Iwokrama Road Corridor Management Plan: Developing Partnerships for the Protection and Management of the Iwokrama Forest. In *Proceedings of the 16th Commonwealth Forestry Conference*. Fremantle: Australia.
- Ousman, S.** 2001. Commonwealth Forestry Initiatives – Iwokrama, an Exciting Project in Guyana, Moves Ahead. *Commonwealth Forestry News*, No. 14, ISSN 1463-3868.
- Payne, K.** 2000. The potential sustainable production of *Carapa guianensis* (Meliaceae) Abul. oil in the Iwokrama rainforest, Guyana. BSc thesis, Department of Environmental Science, University of West England, Bristol, UK.
- Plew, M. and J., Forte, Eds.** 1998. *A bibliography of Guyana anthropology*. Boise, Idaho: Boise State University.
- Radzik, V.** 2000. *Developing sustainable forest-based business partnerships*. Georgetown, Guyana: Iwokrama International Centre.
- Ridgely, R. S. and D. J. Agro.** 1997. *Preliminary list of the birds in the Iwokrama Forest*. [sapphire/acnatsci.org/ornith/iwok-list.html](http://sapphire/acnatsci.org/ornith/iwok-list.html).
- Schuster, L.** 2001. *Lolita and Maria ask "What is AIDS?"* Georgetown, Guyana: Guyana Book Foundation.
- Schuster, L.** 2001. *Lolita and Maria have good, clean teeth*. Georgetown, Guyana: Guyana Book Foundation.
- Schuster, L.** 2001. *Lolita and Maria learn to keep clean*. Georgetown, Guyana: Guyana Book Foundation.
- Schuster, L.** 2001. *Lolita and Maria say "No more Malaria!"* Georgetown, Guyana: Guyana Book Foundation.
- Schuster, L.** 2001. *Lolita and Maria talk about alcohol*. Georgetown, Guyana: Guyana Book Foundation.
- Smith, D.** 2002. Future Funding for the Iwokrama International Centre fort



Rainforest Conservation and Development. Department for International Development.

**Ter Steege, H.** 2001. *Biomass estimates for forests in Guyana and their use in carbon offsets*. Iwokrama International Centre Research, Report No, 2001-01, Georgetown, Guyana: Iwokrama International Centre.

**Ter Steege, H. and D. S. Hammond.** 2000. An analysis at the ecosystem level: community characteristics, diversity and disturbance. H. Ter Steege (ed): *Plant Diversity in Guyana, Tropenbos Series 18*: 101-115:

**Ter Steege, H. and D.S. Hammond.** 2001. Character convergence, diversity, and disturbance in tropical rainforest in Guyana. *Ecology* 82: 3197-3212.

**Ter Steege H, M. J Jansen-Jacobs, and V.K Datadin.** 2000. Can botanical collections assist in a National Protected Area Strategy in Guyana? *Biodiversity and Conservation* 9(2): 215-240.

**The Environment and Development Group.** 2001. The multi-donor mid-term review of the Iwokrama International Centre for Rain Forest Conservation and Development. Oxford, United Kingdom.

**Thomas, R. and D.S. Hammond.** 2002. *Key plant species of the Iwokrama Forest: Indicators for, forest planning and monitoring*. CD-ROM guide. Georgetown, Guyana: Iwokrama International Centre.

**Watkins G.G.** 1998. Case study for the elaboration and validation of a methodological guide for the analysis of gender – Apoteri and Rewa Villages. Report submitted for “Elaboración y Validación de una Guía Metodológica en Análisis de

Género.” Red de Educación Popular para Mujeres – REPEM & Secretaria Pro Tempore - Tratado de Cooperación Amazónico.

**Watkins G.G.** 1998. Review of the geographical, political, and socio-economic situation in the Guyana Amazon with a consideration of gender. Report submitted for “Elaboración y Validación de una Guía Metodológica en Análisis de Género.” Red de Educación Popular para Mujeres – REPEM & Secretaria Pro Tempore - Tratado de Cooperación Amazónico.

**Watkins, G.G.** 1998. Iwokrama's fauna. *Guyana Review* 6 (60 and 61): 41-42.

**Watkins, G.G.** 1998. Guyana's bio-diversity. *Guyana Review* 6 (61): 68.

**Watkins G.G.** 1999. Floral and faunal surveys. *Guyana Review* 7 (77): 17-18.

**Watkins G.G.** 1999. Wildlife management. *Guyana Review* 7 (77): 15-16.

**Watkins, G.G. Ed.** 1999. The Vertebrate Fauna of the Iwokrama Forest: Final Report from Work Carried Out in the Iwokrama Forest by the Academy of Natural Sciences of Philadelphia 1996-1998. Georgetown, Guyana: The Academy of Natural Sciences, Philadelphia

Rainforest Conservation and Development. Department for International Development.

**Ter Steege, H.** 2001. *Biomass estimates for forests in Guyana and their use in carbon offsets*. Iwokrama International Centre Research, Report No, 2001-01, Georgetown, Guyana: Iwokrama International Centre.

**Ter Steege, H. and D. S. Hammond.** 2000. An analysis at the ecosystem level: community characteristics, diversity and disturbance. H. Ter Steege (ed): *Plant Diversity in Guyana, Tropenbos Series 18*: 101-115:

**Ter Steege, H. and D.S. Hammond.** 2001. Character convergence, diversity, and disturbance in tropical rainforest in Guyana. *Ecology* 82: 3197-3212.

**Ter Steege H, M. J Jansen-Jacobs, and V.K Datadin.** 2000. Can botanical collections assist in a National Protected Area Strategy in Guyana? *Biodiversity and Conservation* 9(2): 215-240.

**The Environment and Development Group.** 2001. The multi-donor mid-term review of the Iwokrama International Centre for Rain Forest Conservation and Development. Oxford, United Kingdom.

**Thomas, R. and D.S. Hammond.** 2002. *Key plant species of the Iwokrama Forest: Indicators for, forest planning and monitoring*. CD-ROM guide. Georgetown, Guyana: Iwokrama International Centre.

**Watkins G.G.** 1998. Case study for the elaboration and validation of a methodological guide for the analysis of gender – Apoteri and Rewa Villages. Report submitted for “Elaboración y Validación de una Guía Metodológica en Análisis de

Género.” Red de Educación Popular para Mujeres – REPEM & Secretaria Pro Tempore - Tratado de Cooperación Amazónico.

**Watkins G.G.** 1998. Review of the geographical, political, and socio-economic situation in the Guyana Amazon with a consideration of gender. Report submitted for “Elaboración y Validación de una Guía Metodológica en Análisis de Género.” Red de Educación Popular para Mujeres – REPEM & Secretaria Pro Tempore - Tratado de Cooperación Amazónico.

**Watkins, G.G.** 1998. Iwokrama's fauna. *Guyana Review* 6 (60 and 61): 41-42.

**Watkins, G.G.** 1998. Guyana's bio-diversity. *Guyana Review* 6 (61): 68.

**Watkins G.G.** 1999. Floral and faunal surveys. *Guyana Review* 7 (77): 17-18.

**Watkins G.G.** 1999. Wildlife management. *Guyana Review* 7 (77): 15-16.

**Watkins, G.G. Ed.** 1999. The Vertebrate Fauna of the Iwokrama Forest: Final Report from Work Carried Out in the Iwokrama Forest by the Academy of Natural Sciences of Philadelphia 1996-1998. Georgetown, Guyana: The Academy of Natural Sciences, Philadelphia



## Appendix II:

### Presentations Relating to Iwokrama

Agro, D. 1998. Surveying birds in the Iwokrama Forest: Exploring the Avifauna of South America in Guyana. Presented at Cornell University, USA.

Agro, D., R. S. Ridgely, and L. Joseph. 1998. Bird surveys and training. Presented at the Conference on North American Ornithology, St. Louis, Missouri, USA.

Cassells, D.S. 1998. Carbon sequestration and forest . Presented to a joint UNDP Global Forestry Programme/Government of Guyana/Iwokrama Stakeholder Briefing Workshop on Forest and Carbon Sequestration, Georgetown, Guyana, June.

Cassells, D.S. 1998. An update report on Iwokrama. Presented to CIFOR Systems Modeller, Dr Jerry Vanclay, as part of his Commonwealth Forestry Association Queen's Award Travel Fellowship. Iwokrama International Centre, Georgetown, Guyana, August.

Cassells, D.S. 1998. Report to the Commonwealth. Presented to a joint Iwokrama/CIFOR Technical Workshop on Cost Effective Forest Inventories for National Forest Sector Stakeholders. Iwokrama International Centre, Georgetown, Guyana, August.

Cassells, D.S. 1998. Outputs of Iwokrama Ecotourism Study. Presented to a joint

Iwokrama/UWICED Workshop to review the Ecotourism Strategy for Iwokrama Forest, Georgetown, Guyana, September.

Cassells, D.S. 1998. Key element of the Operational Plan for Iwokrama International Centre. Presented to the Commonwealth Secretariat, European Commission, and World Bank donor Round Table, Brussels, November.

Cassells, D.S. 1998. Carbon sequestration and forests of the Guiana Shield. Presented to EU Consultation on the Future of the Guiana Shield Forest, Brussels, Belgium, November.

Cassells, D.S. 1998. Key element of the Business Plan for Iwokrama International Centre. Presented to the Commonwealth Secretariat, European Commission, and World Bank Donor Round Table, Brussels, Belgium, November.

Cassells, D.S. 1998. Findings of the Iwokrama Tourism Study. Presented to the North Rupununi Community Workshop, Annai, Guyana, November.

Cassells, D. S. 1999. Ecotourism in the Forest. Presented to the Ecotourism Development Conference, UWICED, University of the West Indies, Mona, February.

Cassells, D.S. 1999. The Iwokrama Forest – An experiment in sustainable management. Presented to the Masterclass on Biodiversity

and Intellectual Property Rights, Murdoch University, Perth, Australia, December.

**Cassells, D.S.** 2000. Seeking business partnerships for the conservation and management of tropical rain forest ecosystems – The case of the Iwokrama Rain Forest. Presented to an International Technical Workshop on Biodiversity and Business, Royal Society for International Affairs, London, UK, March.

**Cassells, D.S.** 2000. The Iwokrama International Centre for Rain Forest Conservation and Development – Progress and priorities. Presented to an International Technical Workshop on Developing Sustainable Forest-Based Business Partnerships, Georgetown, Guyana, September.

**Cassells, D.S.** 2000. The Iwokrama Forest – An experiment in sustainability. Presented to a workshop on Experiences with Sustainable Forest Management, M. S. Swaminathan Foundation, Chennai, India, September.

**Cassells, D.S.** 2000. Introductory overview. Presented to the technical workshop on Forest Ecosystems, Biodiversity and Environmental Security at the IUCN World Conservation Congress, Amman, Jordan, October.

**Cassells, D.S.** 2000. The Iwokrama Forest – An experiment in economic, environmental and social sustainability. Presented to Iwokrama Technical Workshop on Forests Environmental Services and Markets, Georgetown, Guyana.

**Cassells, D.S.** 2000. Carrying capacity and site management. Presented to a UNESCO Seminar on Managing World Heritage Sites, Georgetown, Guyana.

**Cassells, D.S.**, 2001. Processes for resolving conflict: Managing land use change. Keynote Paper. Presented to Forests in a Changing Landscape, 16th Commonwealth Forestry Conference, Fremantle, Western Australia.

**Castello, L., G.G. Watkins, W. Prince, and the North Rupununi District Development Board.** 2001. Traditional ecological knowledge and arapaima management and conservation in the North Rupununi wetlands. Presented at The Biodiversity of Guyana: A Global Perspective for the Future. Smithsonian Institute, Georgetown, October.

**Chen, M. H.** 2000. A comparison of herpetofaunal sampling methods. Presented to the Second Annual Biology Research Symposium, Florida International University, Miami.

**Datadin V.** 2000. Briefing on the Iwokrama Zoning Plan and the Laws of Guyana and the IUCN Protected Areas Classification system. Georgetown, Guyana, April.

**Datadin V.** 2000. GIS and Strategic Planning in Tropical Forest Management. Presented at the 1st Conference on GIS, Georgetown Club, Georgetown, Guyana, June.

**Datadin V.** 2001. Iwokrama and GIS and RS work and opportunities. Presented at NASA Jet Propulsion Laboratory, USA, February.



**Datadin V.** 2001. Predictive modeling of tree distribution in tropical forest using GIS. Presented at the Urban and Regional Information Systems Association (URISA) 2001 Caribbean GIS Conference: GIS - The currency for modern governments, Montego Bay, Jamaica, September.

**Datadin V., and D. Husbands.** 2001. ArcView training seminar for Guyana Forestry Commission Forest Resources Information System (GFC FRIS) staff. Guyana Forestry Commission, Georgetown, Guyana, July.

**Datadin V., R. McDermott and A. Mancey.** 2000. Cutting trails to the information superhighway. Presented at a workshop on Critical Issues in the Conservation and Sustainable and Equitable use of Wildlife in the Guiana Shield, Le Meridian Pegasus, Georgetown, Guyana, December.

**Forte, J.** 1998. 'Karikuri: the evolving relationship of the Karinya people of Guyana to gold mining'. Presented at the Annual Conference of the Association of Caribbean Historians, Suriname.

**Forte, J.** 1998. Methodology lessons from Makushi fieldwork. Presented at the University of Guyana/University of Utrecht/Tropenbos Guyana International Workshop on Carib Studies in the Guianas: Ethnobotany, Language and Society, Georgetown, Guyana, August-September.

**Forte, J.** 1998. Carib Studies in the Guianas. Presented at the International Workshop on Carib Studies in the Guianas: Ethnobotany,

Language and Society, Georgetown, Guyana, August-September.

**Forte, J.** 2001. Stakeholder analysis and relations. Presented at the Conservation International Workshop on Forestry Conservation Concessions. Georgetown, Guyana, February.

**Forte, J.** 2001. Prospects for participatory development in the Iwokrama Rainforest Programme, Caribbean 1: Prospects for Participatory Development in the Caribbean. Presented at the 97th Annual Meeting of the Association of American Geographers, New York, USA, August.

**Forte, J.** 2001. Social aspects of forest management planning. Presented at the Seminar on Opportunities and Constraints for the Introduction of Certification of Forest Operations in Guyana.

**Forte, J. and S. Mangal.** 2000. Critical issues in developing co-management systems for wildlife management. Presented at the Iwokrama Symposium on Critical Issues in the Conservation and Sustainable and Equitable Use of Wildlife. Georgetown, Guyana, December.

**Hammond, D.S.** 1999. Key issues in biodiversity conservation in Guianan tropical forests. Presented at the GEF Brainstorming Workshop on Biodiversity Conservation in Production Forests. Mexico City.

**Hammond, D.S.** 1999. Scalar linkages: Quality vs. Quantity in the quest for sustainable forest

management in the Guianas. Presented at the International Botanical Congress, Sustainable Forestry Session, St. Louis, USA.

Hammond, D.S. 2000. Quality vs. quantity in the quest for sustainable forest management in the Guiana Shield. Presented at the Iwokrama International Centre Workshop on Sustainable Forest-Based Business Partnerships. Georgetown, Guyana.

Hammond, D.S. 2000. El Nino and forest fires: implications for forest management in the Iwokrama Forest. Presented at the Government of Guyana/ World Bank El Nino Emergency Assistance Project Workshop on El Nino/ La Nina and their Impacts on Guyana. Georgetown, Guyana.

Hammond, D.S. 2001. Forest animals and their plant associates: some verification options for indicators of forest health. Presented at the Tropenbos Foundation Workshop on Standards for Forest Management in Guyana. Georgetown, Guyana.

Hammond D.S and P.M. Forget. 2000. Wildlife, Timber and NTFPs: Invisible Services in Support of Sustainable Forest Management. Presented at the Symposium on Critical Issues in the Conservation and Sustainable and Equitable Use of Wildlife. Georgetown, Guyana, December.

Hoosein, M. G. Watkins, and Arjoon, D. 2001. Sustainable Development through Human Development – contributions of the Iwokrama Centre to the development of human capacity in local communities. Paper presented to

Twelfth Meeting and Conference of the Caribbean Academy of Sciences, Georgetown, Guyana, June.

Hughell, D. 1997. A methodological approach to the zoning of the Iwokrama Forest. Presented at the Workshop on the Management and Monitoring of Forest Concessions. Paramaribo, Suriname, February-March.

Hughell, D. 2000. Integration of GIS and mathematical optimisation to zone the Iwokrama Forest. Presented to the First National GIS Conference, Georgetown, Guyana.

Jafferally, D., W. Prince, D. Arjoon, and C. Chin. 2000. Case study: Testimonies on capacity development at the tertiary level for wildlife research and management: Lessons for strengthening capacity building programmes. Presented at the Symposium on Critical Issues in the Conservation and Sustainable and Equitable Use of Wildlife. Georgetown, Guyana, December.

Kranz, K.R., and G. Watkins 2000. Opportunities for partnerships between *in-situ* conservation programmes and zoos and aquaria. Presented at the Symposium on Critical Issues in the Conservation and Sustainable and Equitable Use of Wildlife. Georgetown, Guyana, December.

Mangal, S. 2000. Mechanisms for involving indigenous peoples in planning protected areas systems. Presented at the UNESCO Seminar on Management of Natural Heritage



Sites. Georgetown, Guyana, November.

**Mangal, S.** 2000. Critical issues in developing co-management systems for neo-tropical forests. Presented at the DFID-sponsored Workshop, Belem, December.

**Mangal, S.** 2000. Participatory processes and stakeholder analyses for community forestry. Presented at the Caribbean Foresters Meeting, Georgetown, Guyana.

**McDermott, C.** 2000. The Iwokrama Forest: A pluralistic partnership for ecotourism and sustainable forest conservation and development. Presented at Ecotour 2000, Bahia, March.

**McDermott, C.** 2000. Ecotourism in the Iwokrama Rain Forest of Central Guyana. Presented at the Caribbean Tourism Organization Annual Conference on Sustainable Tourism, Georgetown, Guyana, May.

**McDermott, C.** 2000. The Iwokrama Forest: A pluralistic partnership for ecotourism and sustainable forest conservation and development. Presented at the Ecotourism Association of Australia Annual Conference, Melbourne, Australia, October.

**Monk, K.A.** 2001. A look at the other side of the world. Presented at the Iwokrama International Centre Public Forum, Georgetown, Guyana, June.

**Monk, K.A.** 2001. Iwokrama International Centre for Rain Forest Conservation and

Development: A review of the programme 1997-2001, and challenges for the future. Presented at a seminar for CIDA, Georgetown, Guyana, September.

**Monk, K.A.** 2001. Iwokrama: The need for protocols on benefit sharing and intellectual property rights. Presented at the Workshop on Public Policy, Natural Resources and Equity: Development as if Equity Matters, Georgetown, Guyana, September.

**Monk, K.A.** 2001. Iwokrama International Centre for Rain Forest Conservation and Development: An example of progress or of constraints in action? Presented at the Workshop on Caribbean Protected Areas – Development & Management, Caribbean Regional Environmental Programme and Caribbean Conservation Association AGM, Bridgetown, Barbados, October.

**Monk, K.A.** 2001. The search for alternative methods of forest conservation and development: A global perspective for the future. Presented at the Symposium on The Biodiversity of Guyana, Georgetown, Guyana, October.

**Monk, K.A.** 2001. Is this El Dorado?: The case of the Iwokrama Forest Programme. Presented at the Sandals Regional Eco-Journalism Seminar, Montego Bay, Jamaica, November.

**Monk, K.A.** 2001. Iwokrama International Centre for Rain Forest Conservation and Development: A review of the programme 1997-2001, and challenges for the future.

Presented at a seminar for AIDCO, European Commission, Brussels, Belgium, November.

**Monk, K.A.** 2001. Iwokrama International Centre for Rain Forest Conservation and Development: A review of the programme 1997-2001, and challenges for the future. Presented at a seminar for IUCN and WWF, Gland, Switzerland, November.

**Nash, P., D. Arjoon, and T. Brasche.** 2000. Case study: North Rupununi Junior Wildlife Conservation Development Council: The next generation in wildlife management. Presented at the Symposium on Critical Issues in the Conservation and Sustainable and Equitable Use of Wildlife. Georgetown, Guyana, December.

**Pingal, R., C. Simmons.** 2001. Iwokrama's bioprospecting program. Presented at the Caribbean Academy of Sciences conference, Georgetown, Guyana, June.

**Pingal, R. and C. Simmons, P. Cannon, R. Paterson, M. Simmonds, R. Kokubun, B. Mootoo, A. Maxwell, and H. Jacobs.** 2002. Bioprospecting for bioactive metabolites from endophytic fungi and plants of the Iwokrama Forest. Presented at the Mona Symposium (nineteenth) on Natural Products and Medicinal Chemistry, UWI Mona, Jamaica, January.

**Simmons, C.** 2000. Identification of fungi of agricultural and environmental significance. Presented at CABI Bioscience International Conference, Egham, UK, July.

**Simmons, C.** 2001. Endophytic fungal diversity within the Iwokrama Forest. Presented at the Annual General Meeting of the Caribbean Academy of Sciences, Georgetown, Guyana, June.

**Simmons, C.** 2001. Conservation and sustainable use of agro-biodiversity: Presented at the Bioprospecting, Access and Benefit Sharing CDB Conference Centre, Widley, St. Michael, UK, November.

**Walton, P. F.** 2000. Managing change. Presented at the UNESCO/WWF Guiana Shield International Workshop on the Management of Natural Sites, Georgetown, Guyana, November-December.

**Watkins, G.G.** 1998. Community-based wildlife management with the North Rupununi Makushi people. Presented at University of Guyana/University of Utrecht/Tropenbos Guyana International Workshop on Carib Studies in the Guianas: Ethnobotany, Language and Society, Georgetown, Guyana.

**Watkins, G.G.** 1999. Community-based conservation in the North Rupununi, Central Guyana. Presented at Philadelphia Zoo, Philadelphia, USA.

**Watkins, G.G.** 1999. Review of the Iwokrama faunal survey – Lessons for research. Presented at the Academy of Natural Sciences Lunch Time Seminar, Philadelphia, USA.

**Watkins, G.G.** 1999. Tropical forest management. Presented at the University of



Pennsylvania Brown Bag Series. Philadelphia, USA.

Watkins, G.G., and J. Forte. 2000. Local ecological knowledge and neo-tropical wildlife management. Presented at a Symposium on Critical Issues in the Conservation and Sustainable and Equitable Use of Wildlife, Georgetown, Guyana, December.

Watkins, G.G., North Rupununi District Development Board, and K. Kranz. 1999. Community-based wildlife conservation, research, and Education in the North Rupununi and Iwokrama Forest, Central Guyana. Presented at the 1999 American Zoological Association Conference – “Strengthening the Bond”, Minnesota Zoo, USA.

Watkins, G.G., D. Arjoon, D. Jafferally, W. Prince, Toka Friends of the Environment Club, Toka Village, Massara Village, Yakarinta Village, and the North Rupununi District Development Board. 2001. A collaborative study of white-tailed deer (*Odocoileus virginianus gymnotus*) populations in the North Rupununi savannas, Central Guyana. Presented at the symposium on The Biodiversity of Guyana: A Global Perspective for the Future. Smithsonian Institute, Georgetown, Guyana, October.

Watkins, G.G., W. Prince, D. Jafferally, C. Chin, D. Arjoon, Rewa Village, Fairview Village, Apoteri Village, Crashwater Village, and the North Rupununi District Development Board. 2001. Population status of the black caiman

(*Melanosuchus niger*) in the North Rupununi Wetlands, Guyana. Presented at the Symposium on The Biodiversity of Guyana: A Global Perspective for the Future. Smithsonian Institute, Georgetown, Guyana, October.

Wilson, W., B. Piperata, and J. Forte. 2001. Birth order and growth among Makushi Indians of Guyana. Presented at the American Association for Human Biology, Kansas City, USA.

## Appendix III:

### Partners in Conservation and Development

Audubon Latin America – School Yard Ecology – 2002

CABI Bioscience – collaboration on natural products development – 2000-2002

Centre for International Forestry Research, Indonesia – 1997

Conservation International, Guyana, Ranger Training - 2001-2003

Cornell Laboratory of Ornithology, Training for Iwokrama Rangers - 2000

Divisional Intelligence Committee – E & F Division Committee Member (primary) - 2002

Ecole Supérieure de Commerce International (ESCI), France Internship – 2002

Eden Project (NARI Guyana and RGS) Guyana Cocoa Research Initiative – 1998 through the University of West England

Environmental Assessment Board – Member

Environmental Protection Agency – Advisor National Wildlife Surveys programme - 2001 to 2002

Environmental Protection Agency – Member National Biodiversity Advisory Committee 1999 to present

Environmental Protection Agency – Member National Environmental Education Advisory Committee - 1997 to 2001

Environmental Protection Agency (EPA) Framework Co-operation – 2000

Fiona Reid, Artist - 1999

Fisheries Department of the Ministry of Fisheries, Crops, and Livestock Framework for Cooperation - 2000

Fotonatura, Holland – 1997 - 1998

Guyana Broadcasting Corporation, Community Radio – 2000

Guyana Forestry Commission – GIS Unit Systems Review Advisor Systems Implementation Advisor - 2000– 2001

Guyana Forestry Commission Memorandum of Collaboration - 1998

Guyana Forestry Commission - Member Forest Research Coordinating Committee

Guyana Integrated Natural Resources Information System (GINRIS) – Member Technical Committee -2001

Guyana Marine Turtle Conservation Society, 2000.



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Guyana National Museum Committee – Member -2001-2003	National Protected Areas Secretariat – Member 2000 -2002
Guyana School of Agriculture – Part-time lecturing -1998 to 2000	National Wildlife Legislation Steering Committee – Member 2001 to 2002
Guyana’s Draft National GIS Policy – Team Leader and contributors -2001 to 2001	North Rupununi District Development Board, Institutional Strengthening Grant - 1999
Information Network for Science and Technology (INSAT) – Member of the Steering Committee -2000	Oxford University, United Kingdom - Expedition to Guyana -1998 -1999
International Coastal Clean-up – Member of the National Coordinating Committee-2002	Philadelphia Zoo – support for wildlife management- 1998-2002
Jacksonville Zoo – support for wildlife management;- 2002	Roehampton Institute, United Kingdom Studentship, Christie Allan - 1998 – 1999.
Jesuit Scholarship Fund – Committee Member Keane University, Pilot primate survey-1998	Royal Ontario Museum, Canada; Ranger Training- 2001-2002
Kew Gardens – natural products development- 2000-2002	Technical Working Group Ministry of Foreign Trade and International Cooperation to the Caricom Negotiation Machinery – Member 2002
Mamirau Institute for Sustainable Development, fisheries management- 2001-2002	Tourism and Hospitality Association of Guyana – Member of the Executive Board- 2000-2002
Ministerial Advisory Committee on Tourism – Member- 2001	Tourism Standard, Guyana National Bureau of Standards – Member of the Technical Sub-Committee- 2001
Ministerial Advisory Committee on Tourism (MACT) – Chairman -2001-2002	Tropenbos - Guyana Member of the Editorial Team – Reduced Impact Logging News Letter
Ministry of Tourism and Industry – Coordinator National Task Force -2001	UNDP-PROFOR – Project Member of the Interim Working Group on Certification
National Audubon Society 2001 – 2005	UNESCO Subcommittee on Conservation and

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Legislation on the National Heritage of Guyana – Member

United National Development Programme, Guyana – Technical Support Services – 2002

University of Calgary, Canada - 1999

University of Colorado – Research Projects - 1997

University of Guyana – Advisor Fourth Year Students Project Faculty of Natural Sciences-2001-2003

University of Guyana – Assessor, Faculty of Natural Sciences, Department of Biology - 2002

University of Guyana – Part-time Lecturer Anthropology 1998-2002

University of Guyana – Part-time Lecturer Faculty of Natural Sciences - 1998 to 2000

University of Guyana Part-time Lecturer – Faculty of Social Sciences, Department of Tourism - 2002 to 2003

University of Guyana Part-time Lecturer Faculty of Arts – Department of Caribbean & Tourism Studies - 1999 to 2001

University of Hertfordshire, United Kingdom – 1997

University of Strathclyde, United Kingdom Studentship - 1998

University of West England, Bristol, United

Kingdom Studentship – Guiana Shield NTFP Project Research Proposal – Lorna Hall - 1998 –2000

University of West Indies, natural products chemistry and student groups

Wartburg College, USA Students - 1996 and 1998



## Appendix IV:

### Iwokrama International Board of Trustees Members

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