Importance of Conserving Southeastern Suriname

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Chapter 1

Importance of Conserving Southeastern Suriname

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As the greenest country on Earth, Suriname has long protected its forest resources through sound conservation management. Suriname's status as a high forest low deforestation (HFLD) country, its immense freshwater resources, its high biodiversity, rich tropical ecosystems, and low population density place the country in a truly unique position to become a global model for sustainable development and to take advantage of emerging ecosystem service markets and natural capital valuation schemes.

Natural and Cultural Resources of Suriname

- Suriname is located within a global treasure: the largest tract of pristine rainforest on Earth
- Suriname has extensive freshwater resources that are essential for the country and are a future resource for the region and the world
- Many Indigenous and Maroon communities in Suriname rely on the forest and freshwater resources for their livelihood and survival

Suriname is located within the Guiana Shield, a vast tropical wilderness covering over 2.2 million square kilometers in northern South America and containing over 25% of the world's tropical rainforests in the largest tract of pristine rainforest on Earth. With most of its 539,000 human inhabitants residing along the coast, Suriname maintains 95% of its original forest cover, comprising 148000 km^2 of pristine lowland rainforest, savanna, and montane ecosystems. Nowhere else on Earth exist such extensive, unaltered forests filled with an incredible diversity of animals and plants, inhabited by few human beings. Suriname and its forests contain high biodiversity with over 740 species of birds (Ribot 2013), 207 species of mammals (IUCN 2013), 104 species of amphibians (Ouboter 2012) and and 481 currently known fresh- and brackish-water fish species (Mol et al. 2012). Suriname is also blessed with plentiful supplies of high quality ground and surface freshwater, ranking globally among the top 10 nations of the world in renewable freshwater resources (FAO Aquasat Data, The World Bank 2012). Seven major watersheds capture and carry freshwater throughout the country (Table 1.1).

Table 1.1. The 7 major watersheds of Suriname.

Surface area of watershed (km^2)		Average discharge (m^3/sec)	
Corantijn	67,600	1,597	Joint estuary: 1,771
Nickerie	10,100	174	
Coppename	21,700	565	Joint estuary: 882
Saramacca	9,400	257	
Suriname	16,500	422	Joint estuary: 591
Commewijne	6,600	169	
Marowijne	68,700	1,791	

In addition to natural resources, Suriname is also rich in cultural diversity. A great diversity of people live along the coast, with origins from India, the Netherlands, Indonesia, China, several African countries, and many other nationalities. The interior of Suriname is inhabited principally by several indigenous groups, including the Wayana and Trio, and Maroon tribes, descendants of escaped African slaves who live mostly in the country's interior.

Suriname is one of the last places on Earth where an opportunity still exists to conserve extensive tracts of pristine diverse tropical forests and freshwater. Suriname has an annual deforestation rate of 0.02%, exhibits the lowest population density of any moist tropical region on Earth (0.2 people/ha), has few roads in the forested part of the country (which can be accessed only by small boat, small plane, or on foot), has 29.6 hectares of forest per capita and virtually all of the lands are public and under the control of the national government or indigenous and Maroon communities.

However, the isolation that has protected Suriname's ecosystems, natural resources, and indigenous cultures is disappearing at an increasing rate, and the opportunity to act to preserve these remarkable resources will soon be gone. Record high commodity prices have encouraged the rapid growth of small-scale gold mining activities as illustrated by

a 192% increase in gold production (kg) from 2000 to 2011. Timber production increased by 107% from 2000 to 2011, with an additional 10–20% growth expected over 2012. These changes are also providing incentives to press ahead with new infrastructure projects.

As global access to freshwater and forest resources decline, Suriname's resources will only become more valuable. Conserving these remarkable resources now will provide Suriname a unique opportunity to develop sustainably, to mitigate climate change, and ensure the country's sustained economic growth and prosperity.

IMPORTANCE OF SOUTHEASTERN SURINAME

Southeast Suriname is the most isolated and pristine region of the country, and perhaps the world. Most of the region is uninhabited by humans, with only a few small villages of indigenous and tribal peoples to the north and east. The area is mostly covered by lowland rainforest, partially inundated along the many rivers, and on terra firme (unflooded) ground at higher elevations, which ranges from 25–900 m above sea level. Scattered throughout the region are many granitic rock outcrops (inselbergs) that rise above the forest canopy. The region also contains several mountain ranges including the Grensgebergte in the southwest, the Tumukhumak Mountains in the southeast, and the Oranjegebergte in the center (See Map 1, page 13).

Southeastern Suriname is critical to the health and wellbeing of Suriname

- Protects a major source of freshwater for the country, the region, and the world (used for food, transport, energy, agriculture, mining, etc.)
- Provides a sustainable supply of forest resources for the people of Suriname (e.g. water, food, medicines, and recreation)
- Ensures long-term resilience of Suriname's freshwater resources despite predicted freshwater declines elsewhere in response to climate change
- Maintains potential for future economic and water-based infrastructure development in Suriname
- Mitigates global climate change through conservation of large tracts of carbon rich tropical forest
- Safeguards an exceptional diversity of species and healthy ecosystems
- Represents high potential for sustainable economic growth through ecotourism—one of the world's largest growing industries

Ecological and Biological Importance

Southeastern Suriname supports exceptionally rich biodiversity, making it a high priority region for conservation. This region was highlighted in the Guiana Shield Priority Setting Workshop held by CI, IUCN and UNDP in April 2002 (Huber, Foster 2002) as one of the highest ranked areas for biodiversity conservation (Conservation International 2011).

The area is contiguous with the Tumucumaque Indigenous Reserve (3,071,070 million ha), the Tumucumaque National Park (3,877,393 ha) in Brazil and the Parque Amazonien de Guyane (2 million ha) in French Guiana (see Map 6, page 18). Consequently, ensuring the protection of this area is crucial for maintaining connectivity between this much larger network of protected areas spanning three separate countries. This type of large-scale ecological connectivity is essential for maintaining broad ecosystem services such as regional climate regulation, and healthy and genetically diverse populations of wide-ranging species, such as jaguar and migratory fish. The contiguous network of protected areas also allows species to persist in the face of climate change by providing corridors for redistribution, especially from the lowlands into the mountains.

South Suriname includes at least 16 land cover types identified through remote sensing of Landsat satellite imagery combined with field observations (Bánki and Aguirre 2011, Map 3, page 15). These land cover types include, for example, flooded forest, mixed dryland rainforest, granite forest, shrub forest, savannahs and wetlands (see Bánki and Aguirre 2011 for more details).

The 2012 RAP survey revealed that the area of the Upper Palumeu River around the Grensgebergte and Kasikasima mountains contains a wealth of biological diversity. Due to its extensive forest, remote location, and pristine nature, the area contains species not commonly seen in other parts of Suriname or elsewhere in the Neotropics, such as large cracid birds (guans, curassows) and macaws, jaguar, puma, and eight species of primates. These species are more heavily hunted in other parts of the Guiana Shield, but are thriving in the undisturbed refuge of Southeastern Suriname.

The RAP results also show that the Grensgebergte Mountains harbor species not found elsewhere in Suriname and may contain unique species assemblages of birds, small mammals, reptiles, ants and beetles. The plant communities of the region differ from those of northern Suriname (see Chapter 3 this volume), the water beetle and dung beetle fauna differs from other sites sampled in southwestern Suriname (see Chapters 4 and 5 this volume), and the bird and small mammal communities of the Grensgebergte differ from the surrounding lowlands (see Chapter 10 and 11 this volume). Over 50 species new to science were documented in Southeastern Suriname during the 2012 RAP survey (see Executive Summary this volume) and many more remain to be discovered. In addition to supporting unique species, Southeastern Suriname contains very high overall species richness relative to other regions, which is likely influenced by the diversity of habitat types,

including elevational gradients in the mountains, and by the lack of historical disturbance.

Freshwater Importance

The rivers originating in the Grensgebergte, Eilerts de Haan gebergte, Tumukhumak, and Oranjegebergte feed into the upper Marowijne River and the Tapanahony River which joins other rivers to form the 68,700 km^2 Marowijne River watershed. This watershed provides freshwater for transportation, food, drinking and bathing for ca. 15,000 people in the region including French Guiana as well as to ca. 35,000 people downstream along the Marowijne river and along the eastern coast and as far as Paramaribo. The western portion of the area also likely feeds water into the Suriname River and Brokopondo Lake which generates hydro power for the country.

The freshwater resources of Southeastern Suriname are a critical source of water for the local communities living along the rivers. Protection of the Southeastern Suriname watersheds would ensure flows of fresh and clean water far into the future. Impacts of small scale mining on water quality are already apparent downstream, with serious consequences for human health. Consequently, avoiding upstream mining is especially important to reduce health impacts, as mercury may be deposited widely via atmospheric deposition (see Chapter 2 this volume). While the 2012 RAP survey concluded that the Palumeu River and its tributaries have high water quality conditions typical of undisturbed aquatic ecosystems in the interior of Suriname, mercury analysis of sediments and fish tissues indicates that some mercury contamination is entering the area (see Chapter 2 this volume). Protecting the headwaters of Southeastern Suriname will be important for safeguarding this source of clean freshwater for local communities and the entire country.

The fish of the rivers of Southeastern Suriname are a critical source of protein to the indigenous and Maroon people living along the Tapanahony, the Palumeu and Suriname rivers. Fish are a common and highly valued food source. Large and medium-sized fish species that are routinely eaten have local names. Large fishes like anyumara (*Hoplias aimara*) and kwimata (*Prochilodus* and *Semaprochilodus*) are popular food fishes and are also most vulnerable to overfishing. While not eaten, many of the small fish species are highly valued in the aquarium hobby and could play a beneficial economic role in the development of the area if fisheries for these species are strictly regulated (see page 23).

Although the 128 fish species documented during this RAP and a previous survey in the Palumeu River is comparable to the number of species collected in other rivers of the Guiana Shield, the species composition is distinct from the Coppename River and the Sipaliwini River (see Chapter 8 this volume). Seven fish species collected during the RAP survey are endemic to the Marowijne River system, with one of these species, *Aequidens paloemeuensis*, is endemic to the Palumeu River proper (see Chapter 8 this volume).

A variety of economically and locally important fish species are migratory, and spawn near the headwaters or in the upstream flooded forests of Suriname's rivers. Since the mountains of Southeastern Suriname support many of these headwaters and flooded forest habitats, it is likely that they play in important role in sustaining spawning grounds for migratory fishes. Several species encountered during the 2012 RAP survey, such as *Prochilodus*, *Semaprochilodus*, and *Pseudoplatystoma tigrinum*, are likely to migrate there to spawn. Consequently, conserving the forests and rivers of Southeastern Suriname is essential to ensure food security for Suriname's tribal and indigenous people locally, as well as to protect the migratory species that people throughout Suriname depend upon.

Southeastern Suriname, Freshwater and Climate change

As is the case in many countries around the world, climate change threatens the long-term sustainable economic development of Suriname and is likely to affect many poor and indigenous communities disproportionately. Using an assemblage of all climate models to explore the value of Southeastern Suriname in terms of climate resilience, Southeastern Suriname emerges as one of the most climate resilient places in the country and therefore, its protection is essential to Suriname's sustainable development and successful adaptation to climate change (See Map 5, page 17). The mountainous regions of Southeastern Suriname are of particularly high value for ensuring sustainable flows of water as climate is changing. Effectively managing the watersheds in Southeastern Suriname will ensure greater long-term climate resilience by conserving forests, biodiversity, freshwater, agriculture and water infrastructure for future generations and will be one of the boldest climate adaptation strategies for Suriname, which is both low cost and high reward.

Cultural Importance

Research conducted by CI-Suriname indicates that the local indigenous communities in Southeastern Suriname depend heavily on the forest and freshwater resources of the region to sustain their livelihoods (Map 4, page 16). The forests, rivers, creeks, mountain ranges and savannahs are critically important for their economic well-being, culture, recreational pursuits, subsistence (hunting, fishing, growing cassava, gathering wood and nuts, etc.) and necessary for their future generations and their continued way of life. Particularly important for most villages are the rivers and other freshwater resources, which act as key modes of transport, provide critical food resources and support physical and mental wellbeing through their cultural significance and role in hygiene and sanitation (Map 4, page 16).

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