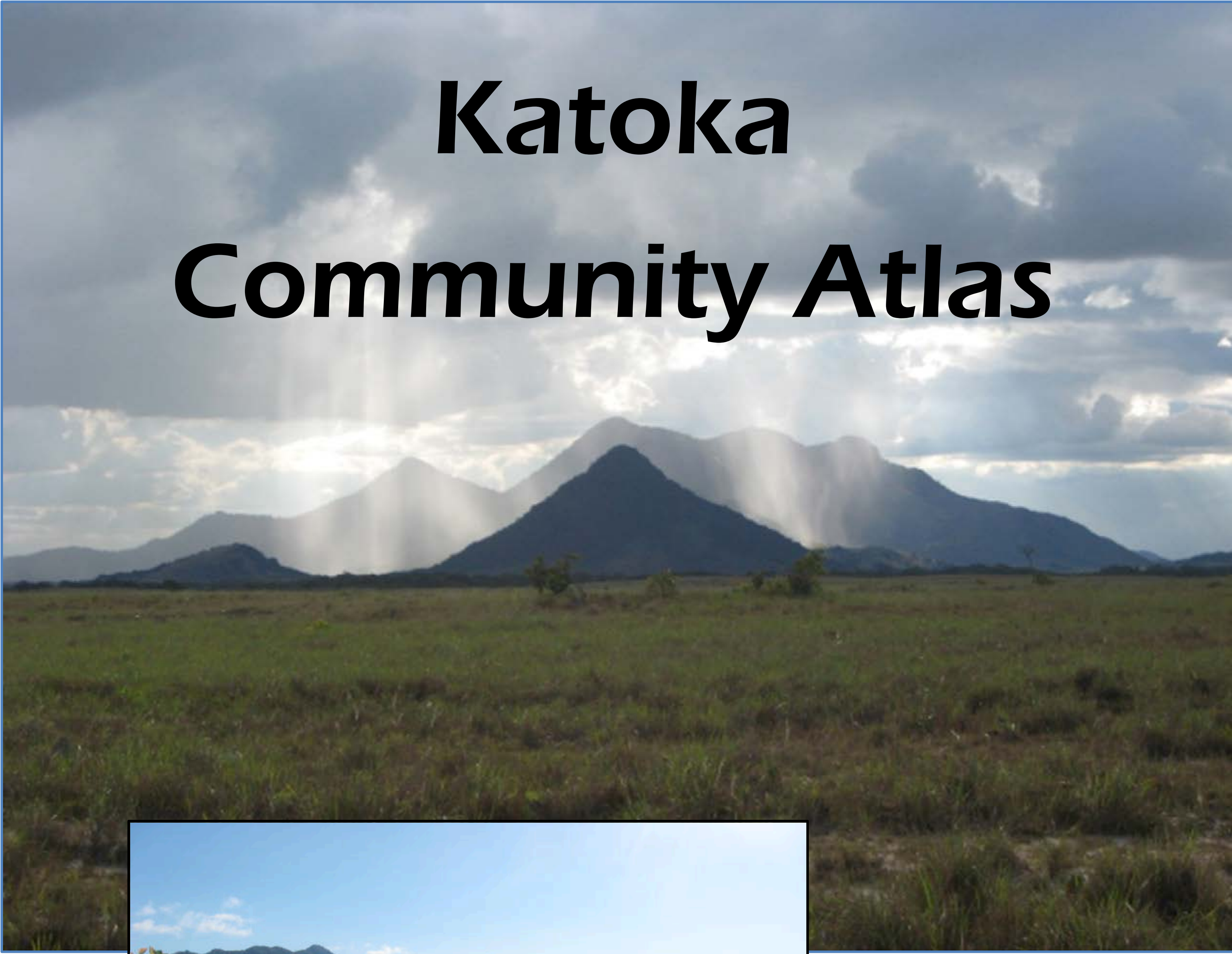
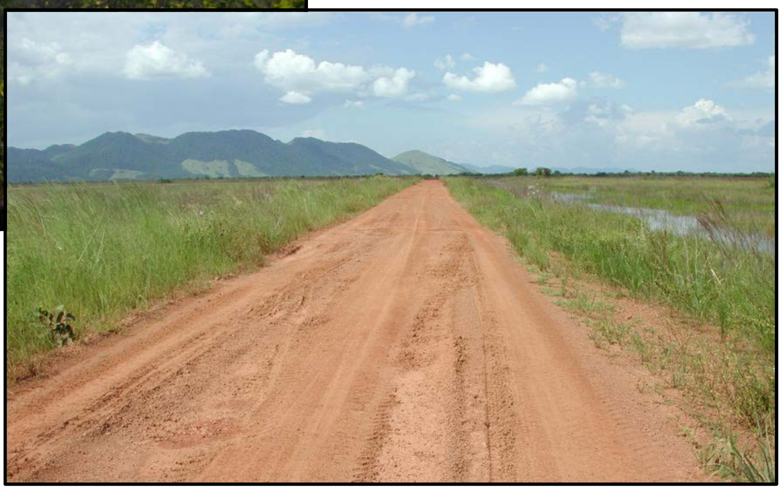
Katoka Community Atlas



Rupununi
Guyana



Project Fauna
January 2013

Project Fauna Community Atlas January 2013

Atlas credits: Jane M. Read, Syracuse University; Jose M.V. Fragoso and Jeffrey Luzar, Stanford University; Han Overman, State University of New York – ESF.

Layout, design, and maps: Paul G. Kloster and Philip G. Curtis.

Photo credits: Jose M.V. Fragoso , Jeffrey Luzar, Jane M. Read, Sean Giery, Anthony Cummings

Based on data gathered by Project Fauna from 2007-2010. Images based on Landsat Thematic Mapper scenes acquired 1st October 2005 combined with Aster GDEM elevation data (ASTER GDEM is a product of METI and NASA).

Project Fauna is the field name for U.S. National Science Foundation award DEB 0508094 (2005-2011) "Biodiversity dynamics and land-use changes in the Amazon: multi-scale interactions between ecological systems and resource-use decisions by indigenous peoples", directed by Principal Investigator Jose M. V. Fragoso.

This atlas was created in the Integrated Spatial Dynamics (ISD) Laboratory, Dept. Geography, Syracuse University, Syracuse, NY, USA.

Cite as:

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Acknowledgments

This atlas was created by Project Fauna as part of U.S. National Science Foundation-funded research to investigate biodiversity dynamics and cultural practices by the indigenous peoples of the Rupununi. It provides a summary of the major datasets that we created using data gathered in the field from 2007-2010 at 23 study communities, focusing on information that can be of immediate use by the communities.

Project Fauna gratefully acknowledges the Katoka and Katoka Control para-biologists and para-anthropologists Randolph Brown, Davis Brown, Gibson Marco, Cameron Anton, John Samuels, Shaun Pedro and Hezron, along with their substitutes who included Aloysius, Amos, Anthony, Carlos, Devinard, Eutius, Lee, Lloyd, Mark, Moses, Odin, Orvinius, Senesius, Vincent, Weinstein, Betsy Samuels, Dorman Brown, Carl, Chan, George, Gordon, Mark, Matthew, Michael, Odisius, Anton Clarence, Jason Alvin, Kennard and Romalo for their dedicated service to their community and this project. Without their hard work and dedication, as well as the logistical and technical assistance of the community leaders, the study and this atlas would not have been possible. In Guyana, William Andries, Mike Williams, Sydney Allicock, Emily Allicock, Bryan Allicock, Kid James, Nick Fredericks and Wilson Laurantino, among others, provided strong moral and logistical support for all our efforts and we thank them for their commitment to the project. We also thank the North Rupununi District Development Board, the Bina Hill Institute, the South Central and Deep South District Toshaos' Councils. Thanks also to David Singh of Conservation International-Guyana; Raquel Thomas, Dane Gobin and other members of the Iwokrama International Centre; the Guyana Environmental Protection Agency; the Regional Democratic Council of Region 9 (RDC); and the Ministry of Amerindian Affairs for supporting the project, and the latter two for permitting the work. A special thanks to Shirley Melville for her friendship and support, and to Duane de Freitas of Dadanawa Ranch. We are grateful for the help of a number of volunteers throughout this effort.

A week-long conversation between José Fragoso and Jacir de Souza during a visit to Jacir's community of Maturuca, in Roraima, Brazil, inspired the quest to understand the relationship between indigenous culture and the environment that ultimately gave rise to this project. We thank all the Macuxi, Wapishana and Wai Wai leaders in Brazil who supported the initial development of the project, especially Marinaldo Trajano, Joênia Batista de Carvalho, and Jacir José de Souza.

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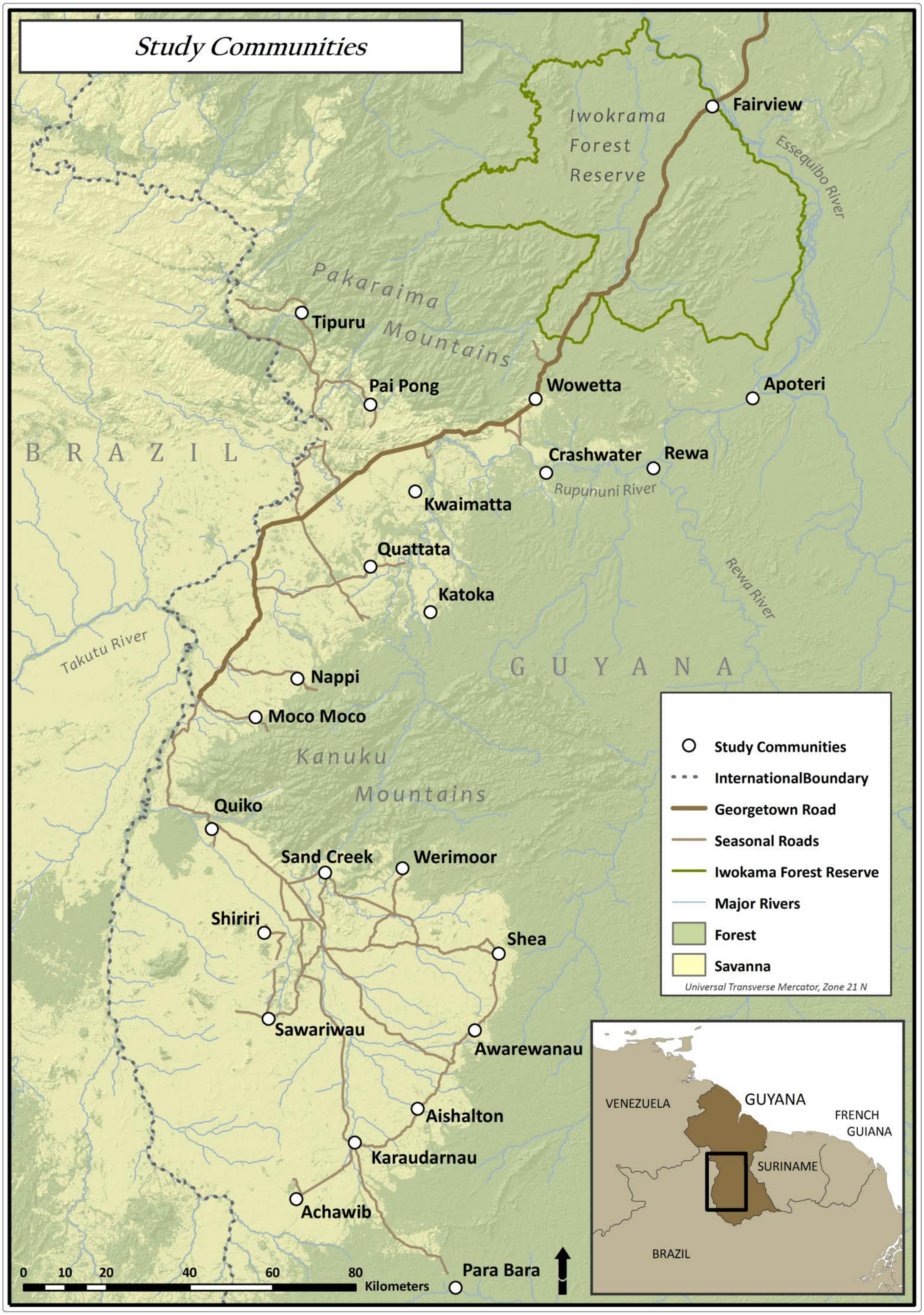

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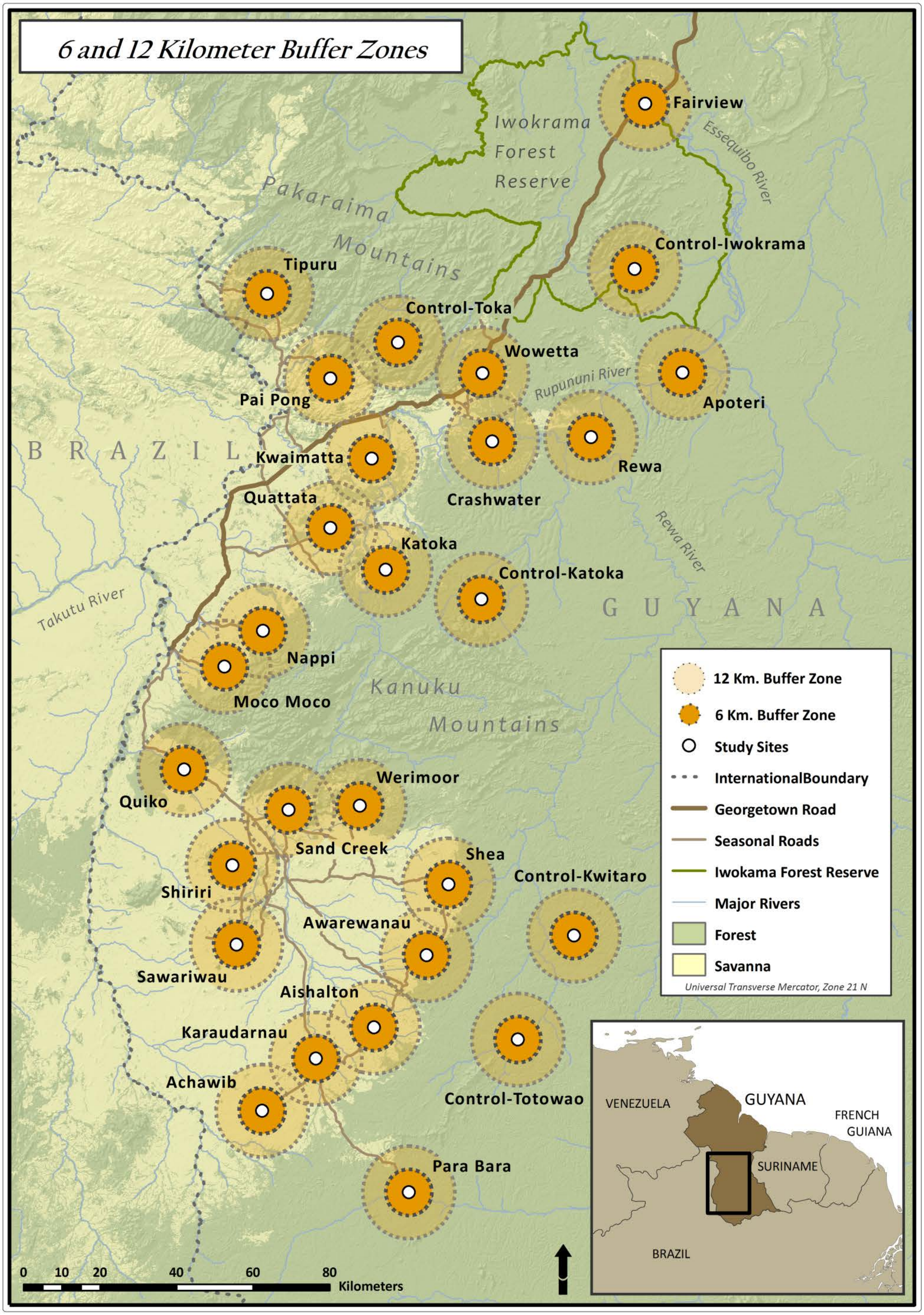
The Research Design

Project Fauna focused on 23 communities and five control sites throughout the Rupununi. The communities were selected based on their distribution in the study area, their representative location with respect to vegetation type and topographic characteristics, proximity to other communities, and willingness of the community members to participate in the project.

Eight transects were opened around each study site. At each site, four transects were opened within a 6km radius (‘near’) from the center of the site, and four within a 6-12km radius (‘far’) of the center. The map opposite shows the locations of the 6 and 12km buffers around the study sites. This design allows us to determine whether the number of animals changes with distance from the community.

Within each buffer, the starting location of each transect (start coordinates and bearing) was determined randomly, from which trained field technicians from the communities used global positioning system (GPS) units, compasses, and tape measures to cut 4km-long straight transects. In the case of meeting impassable obstructions (cliffs, rivers), the technicians followed rules for turning and continuing the transects until they reached 4km in length.


6 and 12 Kilometer Buffer Zones
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Tipuru
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Kilometers
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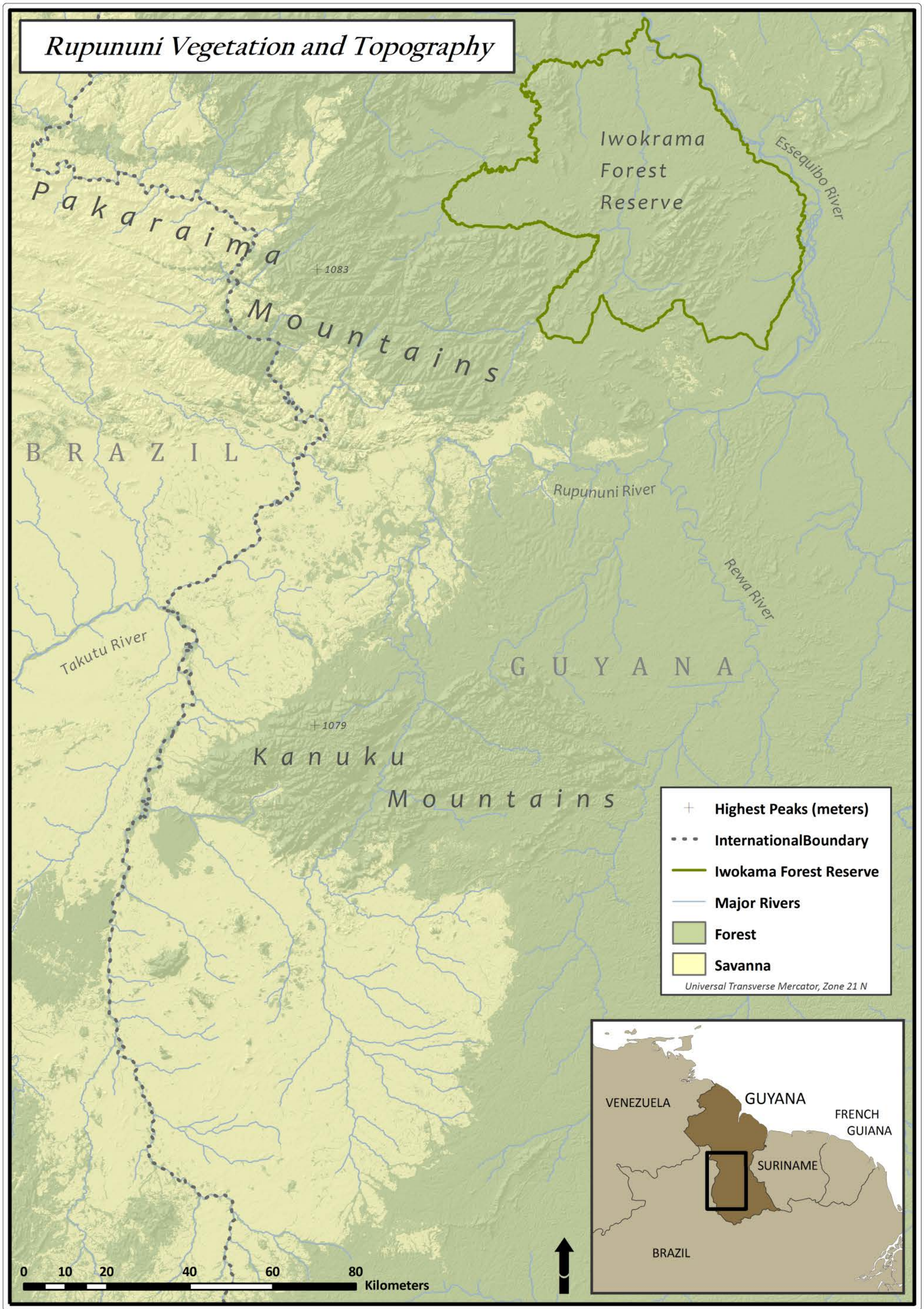

Rupununi Vegetation and Topography
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Essequibo River
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1083
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FRENCH GUIANA
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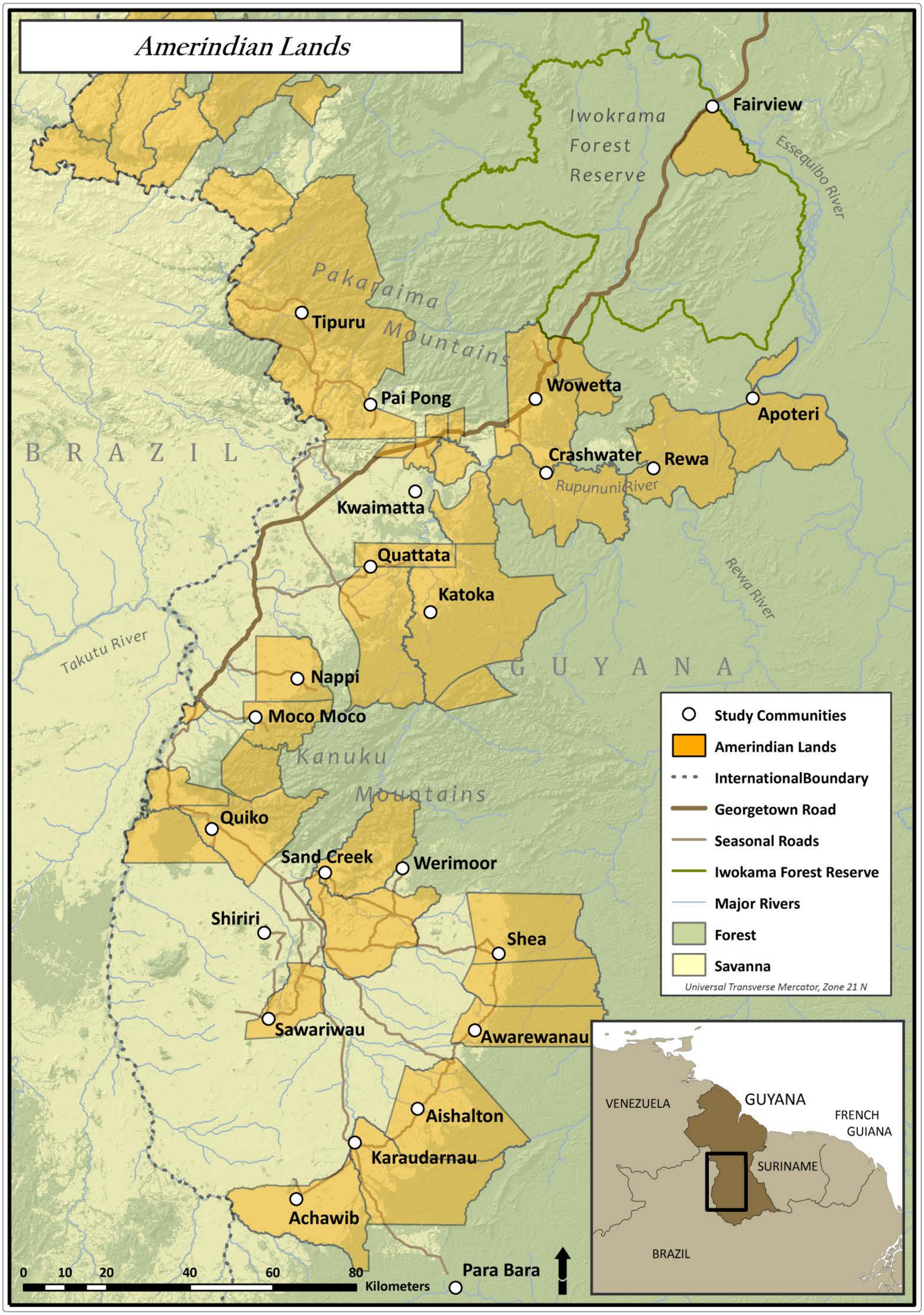
BRAZIL
0 10 20 40 60 80
Kilometers



Amerindian Lands
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Tipuru
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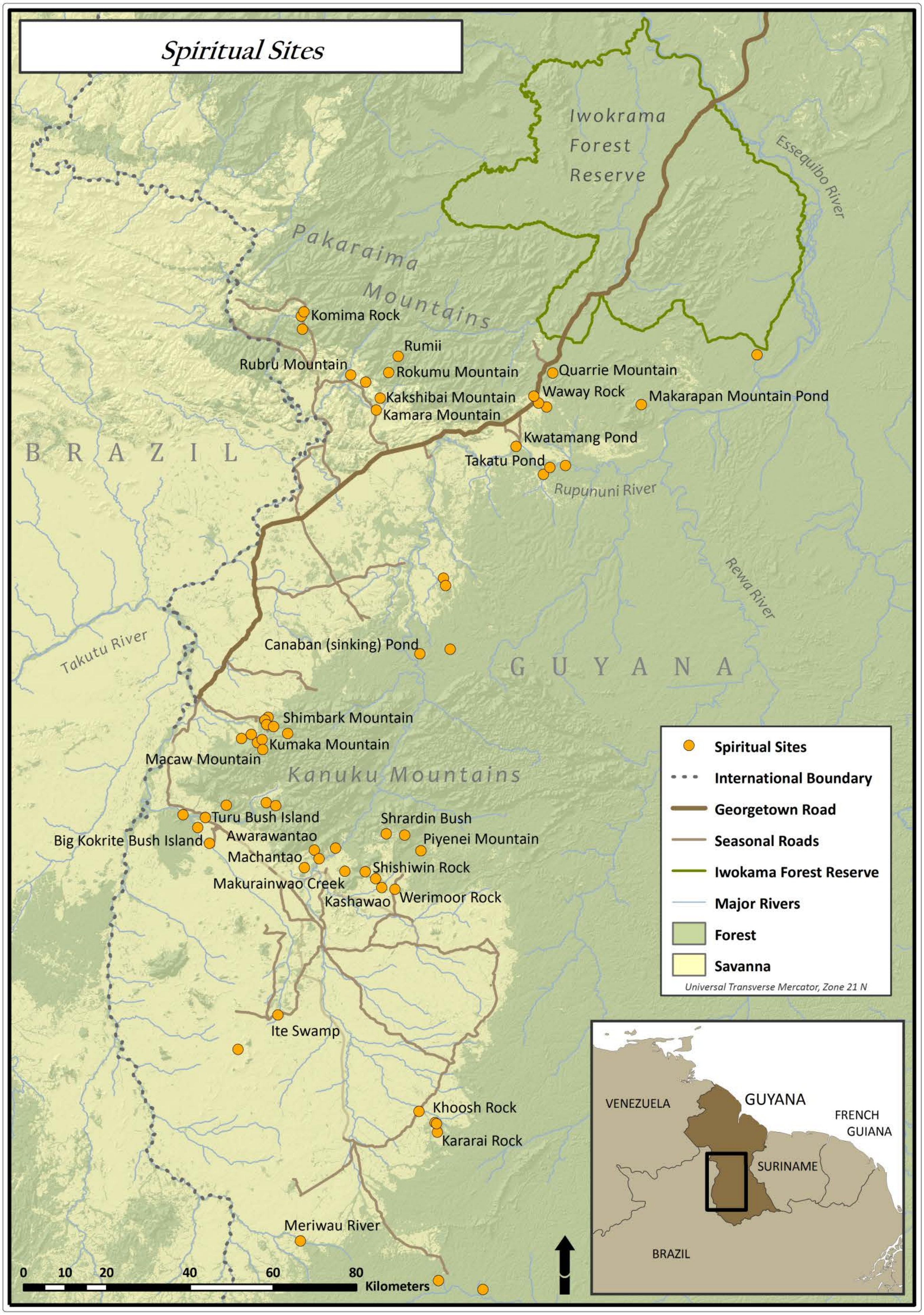
Community	Village Population	Distance from Village to Gtown Road (km)
Achawib	620	122.5
Aishalton	1076	111.8
Apoteri	311	41.9
Awarewanau	621	103.9
Crashwater	191	15.3
Fairview	197	0.1
Karaudarnau	1053	113.1
Katoka	649	37.0
Kwaimatta	122	10.7
Moco Moco	393	13.5
Nappi	578	15.7
Pai Pong	494	12.1
Para Bara	147	154.4
Quattata	212	19.5
Quiko	428	31.8
Rewa	245	32.8
Sand Creek	649	51.9
Sawariwau	453	78.9
Shea & Marurunau	1192	94.8
Shiriri	68	58.6
Tipuru	193	38.8
Werimoor	323	63.9
Wowetta	199	0.0

Spiritual Sites

The map of spiritual sites on the opposite page shows locations of sites identified by community members as having special meaning.

Data were gathered by local technicians or the project anthropologist through one-time surveys with the principal hunters of each community (as identified by the community leaders and/or hunting return surveys). Questions were asked about places that hunters avoided or in which they had to use extra caution. In addition, interviews were conducted with knowledgeable members of each community including the elderly, *toshao* (community leader), and/or *piaiman* (shaman) about places generally known to be sacred and/or dangerous.

Details and locations of sites were determined and mapped based on information gathered from the surveys and interviews, as well as from supplementary information provided by project technicians. Locations of sites were marked on topographic or hardcopy satellite images and later digitized and stored in GIS (geographic information system) format as points.



Spiritual Sites
Iwokrama Forest Reserve
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Pakaraima Mountains
Komima Rock
Rumii
Rubru Mountain
Rokumu Mountain
Quarrie Mountain
Kakshibai Mountain
Waway Rock
Makarapan Mountain Pond
Kamara Mountain
Kwatamang Pond
Takatu Pond
Rupununi River
B R A Z I L
Rewa River
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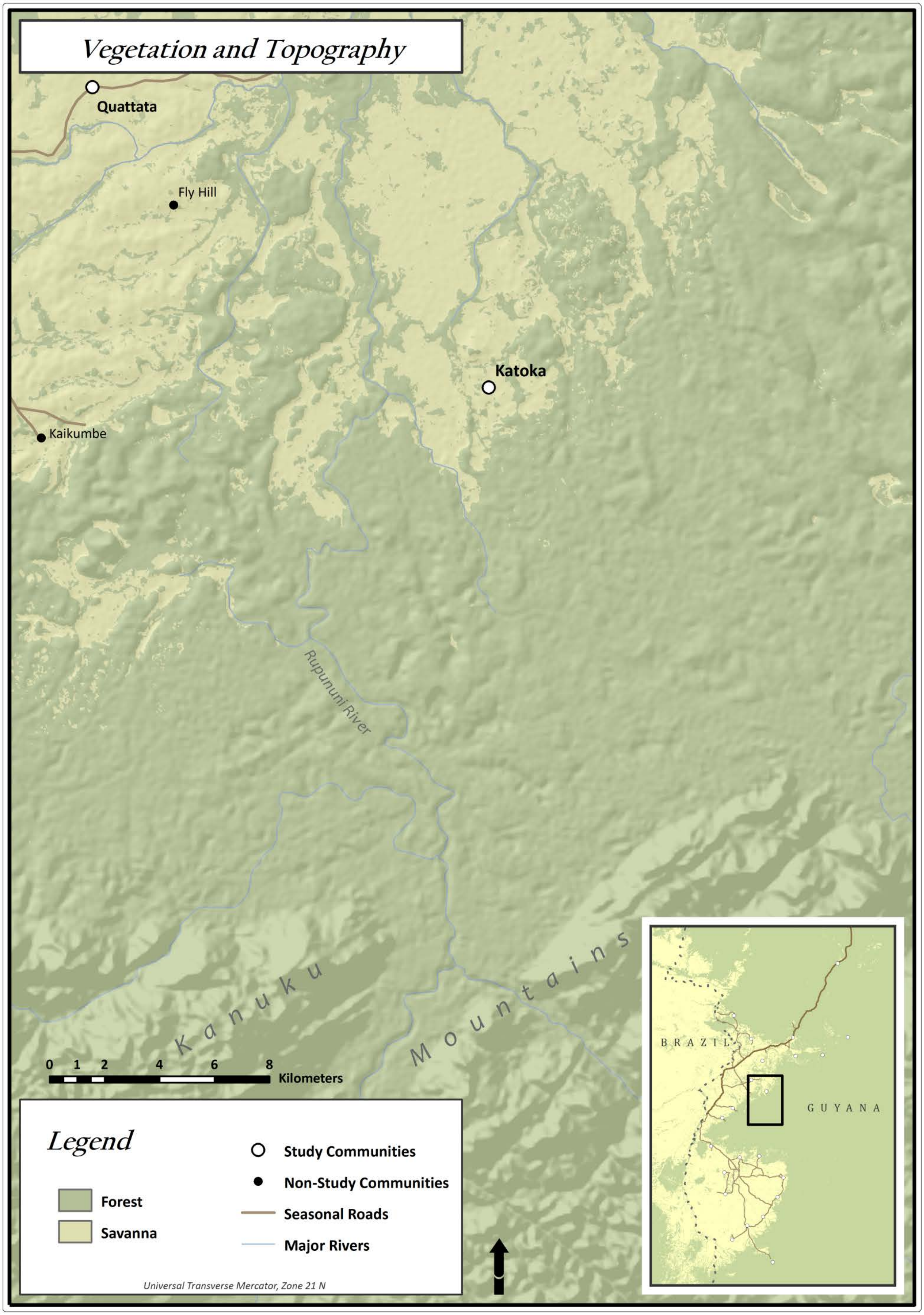
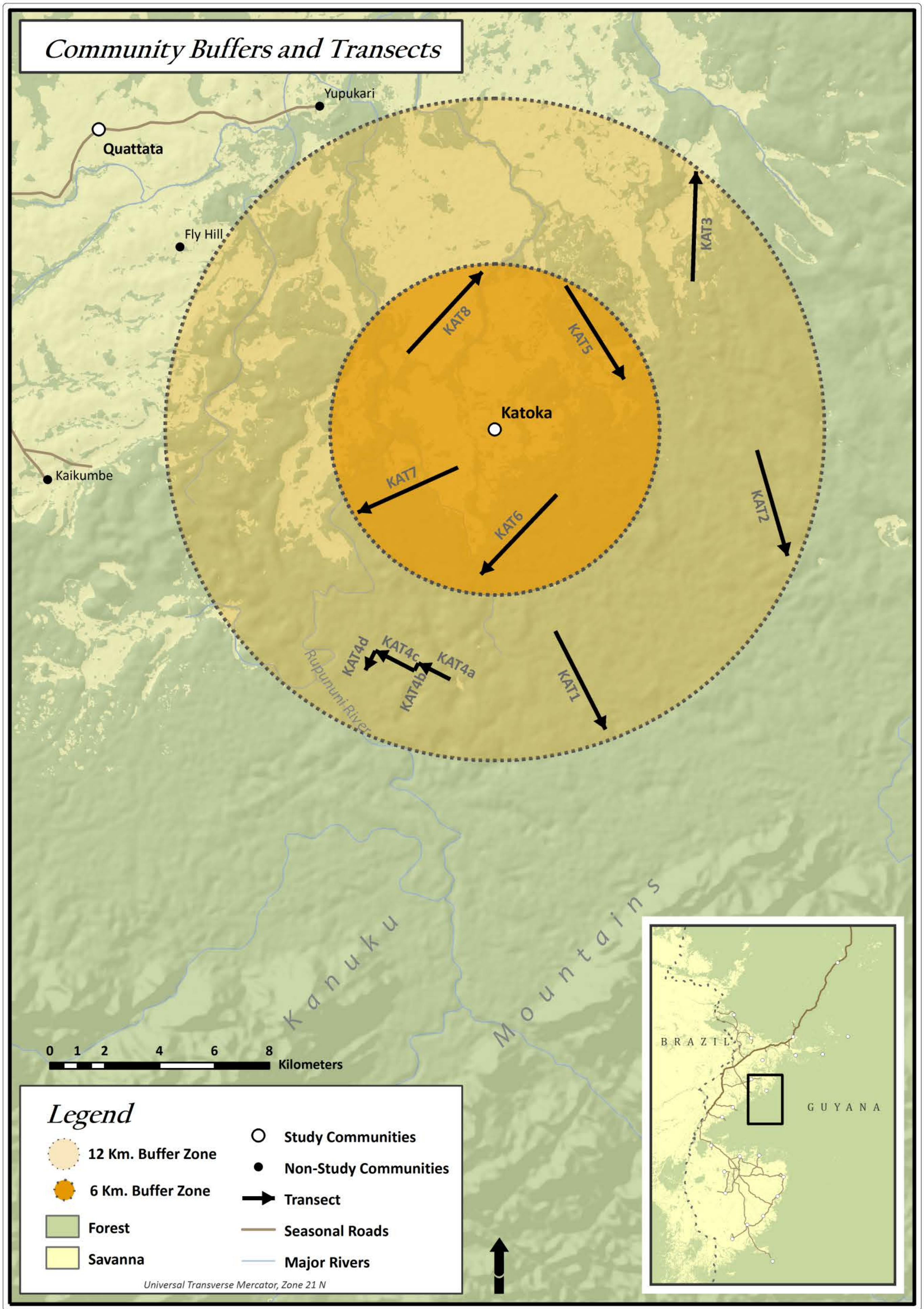
Katoka



Vegetation and Topography
Quattata
Fly Hill
Katoka
Kaikumbe
Rupununi River
Kanuku Mountains
0 1 2 4 6 8
Kilometers
Legend
Forest
Savanna
Study Communities
Non-Study Communities
Seasonal Roads
Major Rivers
Universal Transverse Mercator, Zone 21 N
BRAZIL
GUYANA


Community Buffers and Transects
Yupukari
Quattata
Fly Hill
Kaikumbe
Katoka
KAT1
KAT2
KAT3
KAT4a
KAT4b
KAT4c
KAT4d
KAT5
KAT6
KAT7
KAT8
Rupununi River
Kanuku Mountains
0 1 2 4 6 8 Kilometers
BRAZIL
GUYANA
Legend
12 Km. Buffer Zone
6 Km. Buffer Zone
Forest
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Study Communities
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Transect
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Major Rivers
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Vegetation

We calculated forest and savannah cover for Katoka's current (2011) titled area. 83139 ha of these lands were forested and 10100 ha in savanna in October 2005 (based on classified Landsat-TM data).

Transects

Transect ID	Near/Far Buffer	Start X-coordinate (UTM m)	Start Y-coordinate (UTM m)	End X-coordinate (UTM m)	End y-coordinate (UTM m)	Azimuth*	Compass Bearing*	Length (m)
KAT1	Far	247152	385958	248968	382394	153	168	4000
KAT2	Far	254509	392508	255612	388663	164	179	4000
KAT3	Far	252177	398622	252317	402620	2	17	4000
KAT4a	Far	243317	384217	242159	384807	297	312	1300
KAT4b	Far	242159	384807	242023	384540	207	222	300
KAT4c	Far	242023	384540	240597	385266	297	312	1600
KAT4d	Far	240597	385266	240234	384553	207	222	800
KAT5	Near	247559	398477	249679	395085	148	163	4000
KAT6	Near	247216	390904	244437	388027	224	239	4000
KAT7	Near	243623	391904	239969	390277	246	261	4000
KAT8	Near	241796	396064	244524	398989	43	58	4000

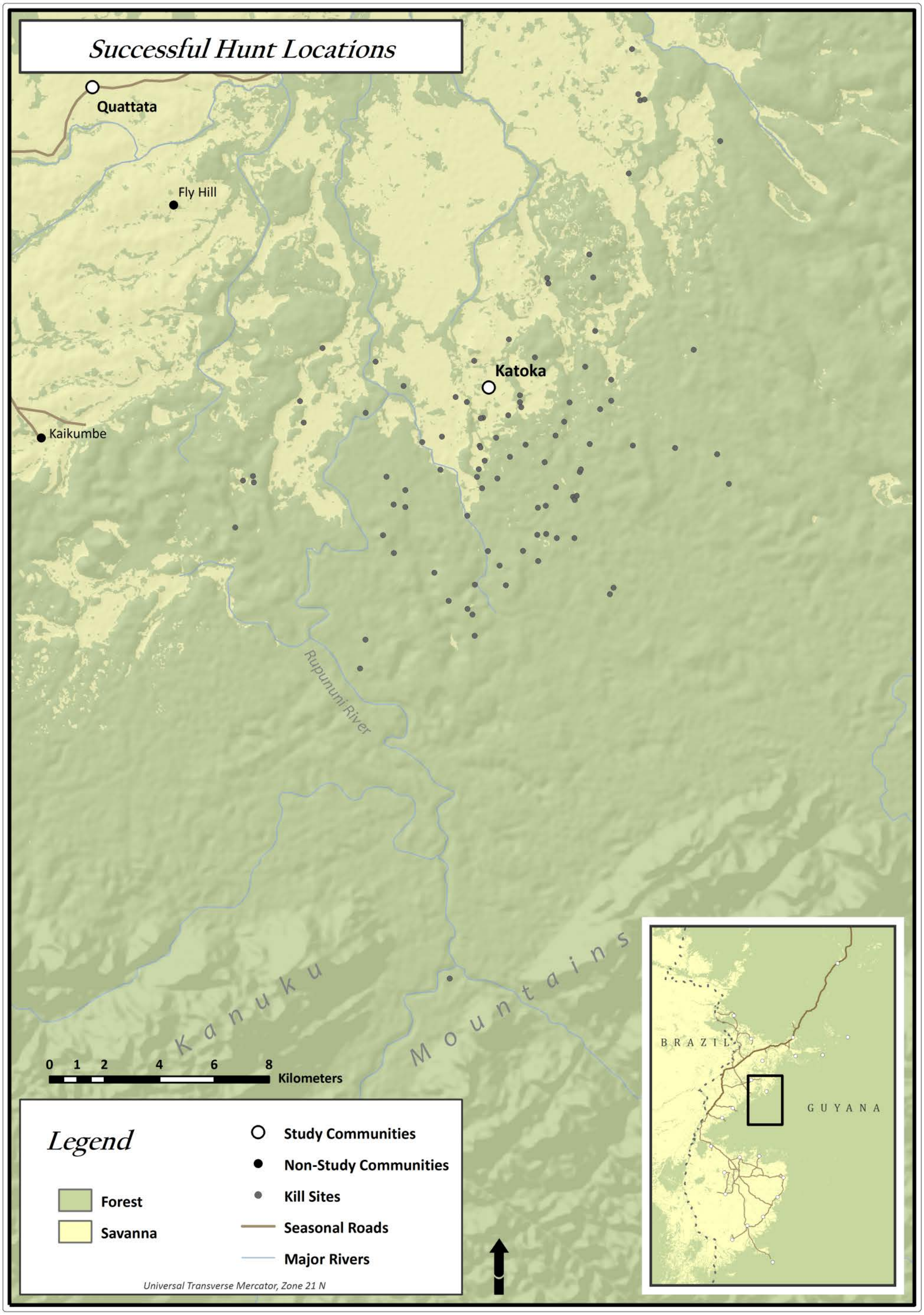
* Azimuth = bearing from true North in degrees; Compass = bearing from magnetic North in degrees (magnetic declination = 15 degrees).

Transects were walked by two field technicians twice a month. On the first pass each month, the technicians recorded data on animal sightings. On the second pass, they recorded information on animal signs as well as fruits. For the majority of transects, we obtained two years, and in many cases three years, of data. Analysis of these datasets is ongoing and not yet completed, and so we do not present summaries here. These will be made available at a later date.

Hunting

Surveys on hunting activities were administered to every household in each study community by field technicians who were residents of each community. The surveys were conducted weekly to ensure that hunters did not have to remember details of their hunting activities over long periods of time. The hunters were asked to mark an ‘X’ of the location of the kill on a hardcopy topographic map (1:50,000) or printed Landsat-TM satellite image centered on their community. Locations of hunt kill sites were digitized and stored in GIS format. The map opposite shows the locations of all reported kill sites.

The species maps on the following pages show the kill locations of the top five most frequently killed species for the community. They also show the directional ellipses for each species. The directional ellipse shows the mean center (the central point around which successful hunts for a species were concentrated) and directional trend of a community’s hunting activity for that species. The mean center can be compared with the location of the community center in terms of distance away and direction from the center. In addition, the shape and size of the ellipse adds information about the spread of distribution of kill sites. Directional ellipses were mapped using 1 standard deviation (representing 68% of the points) from the mean center in the x- and y-directions (east to west and north to south) to define the axes of the ellipse.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Quattata
Fly Hill
Katoka
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Rupununi River
Kanuku Mountains
0 1 2 4 6 8
Kilometers
Legend
Study Communities
Non-Study Communities
Kill Sites
Seasonal Roads
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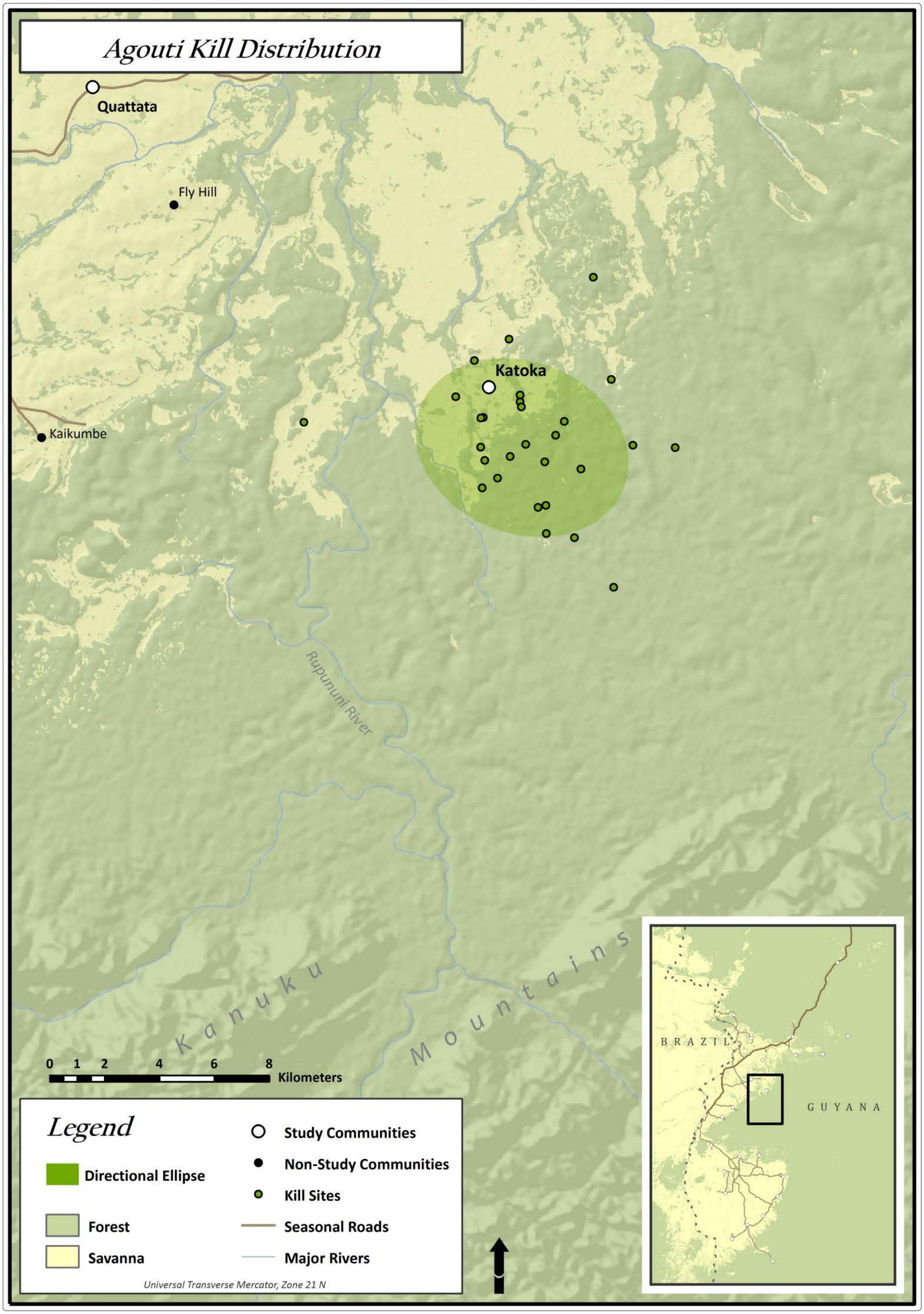
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Rupununi River
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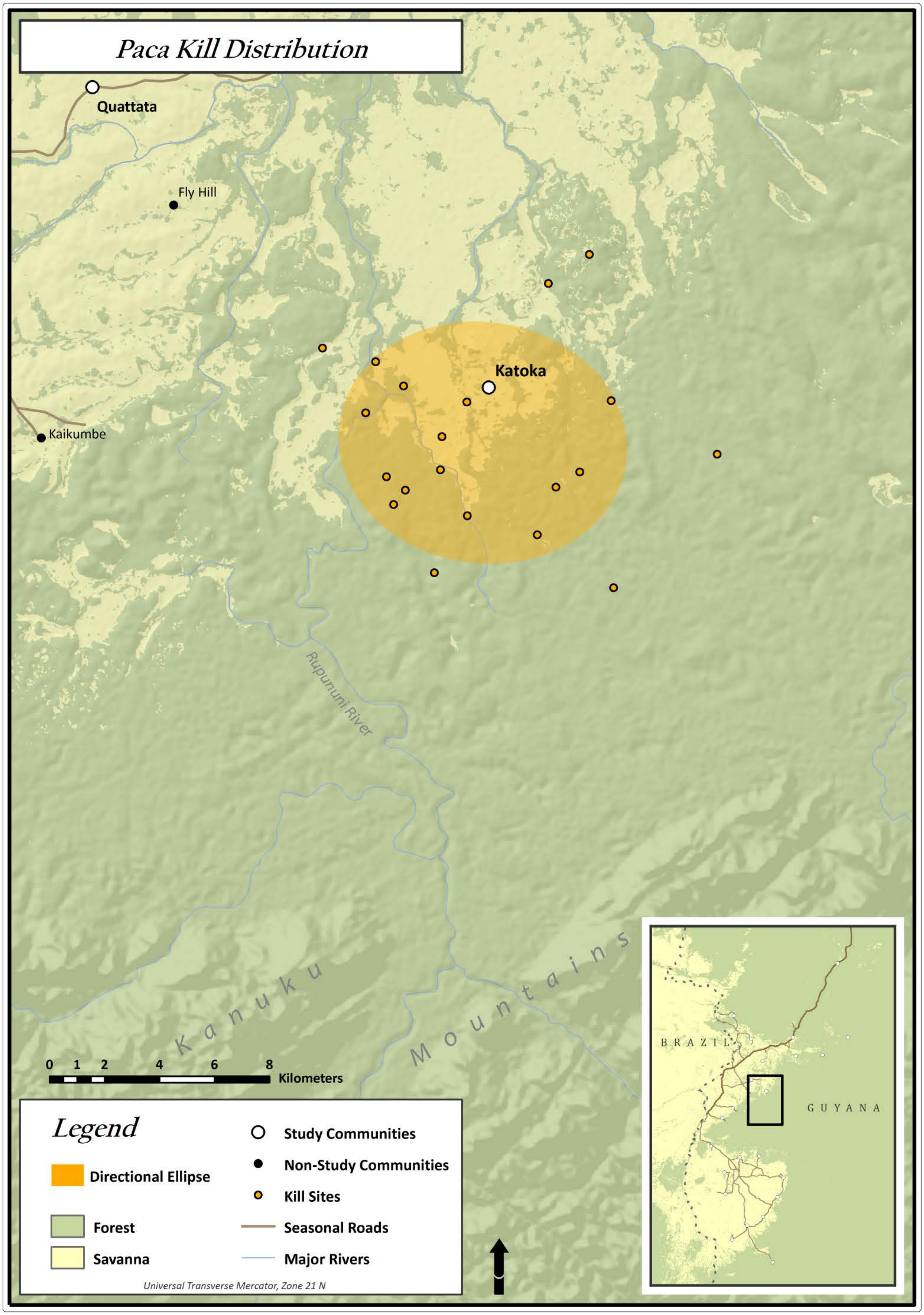
Paca Kill Distribution
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Study Communities
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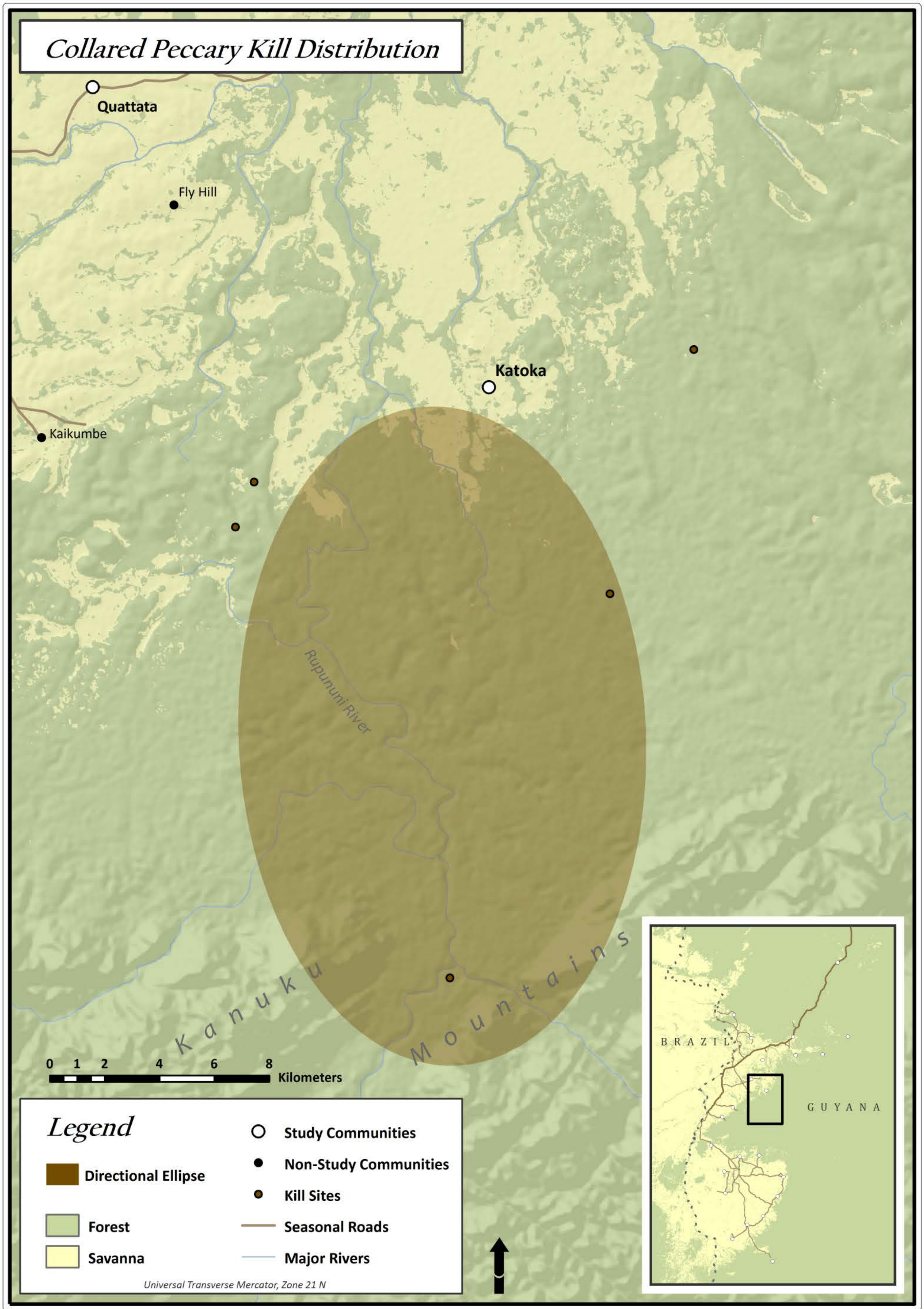
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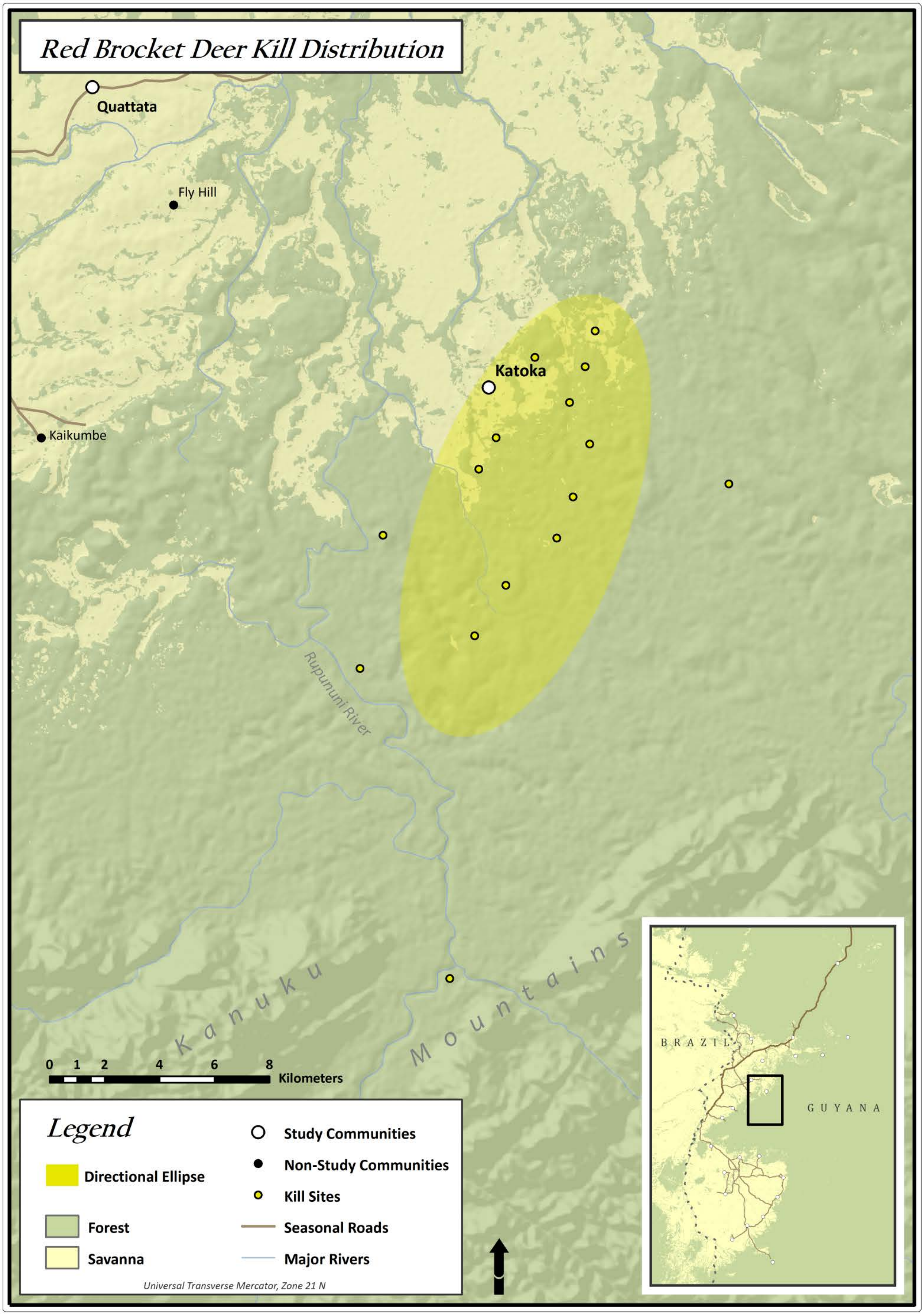

Red Brocket Deer Kill Distribution
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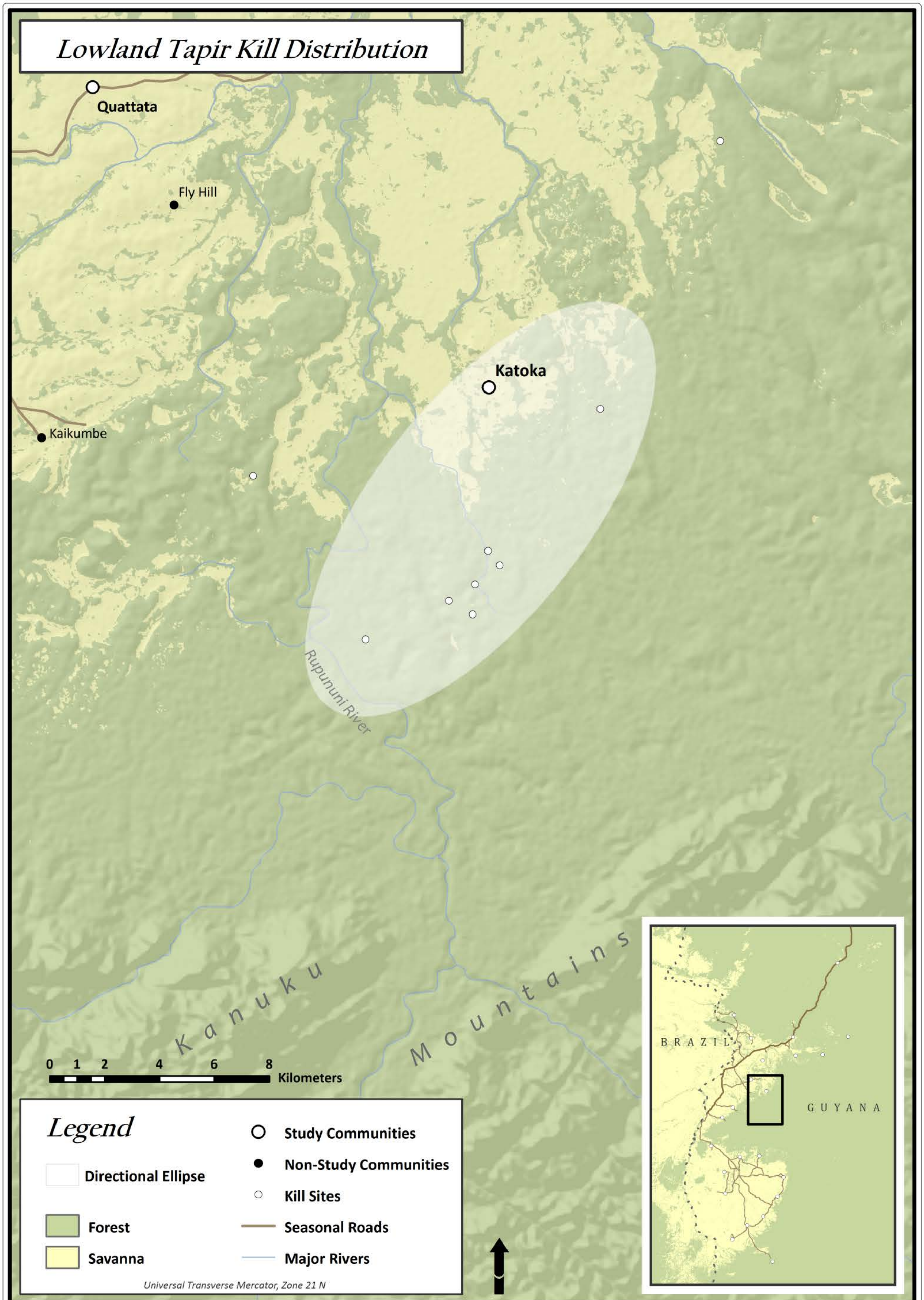

Lowland Tapir Kill Distribution
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Fly Hill
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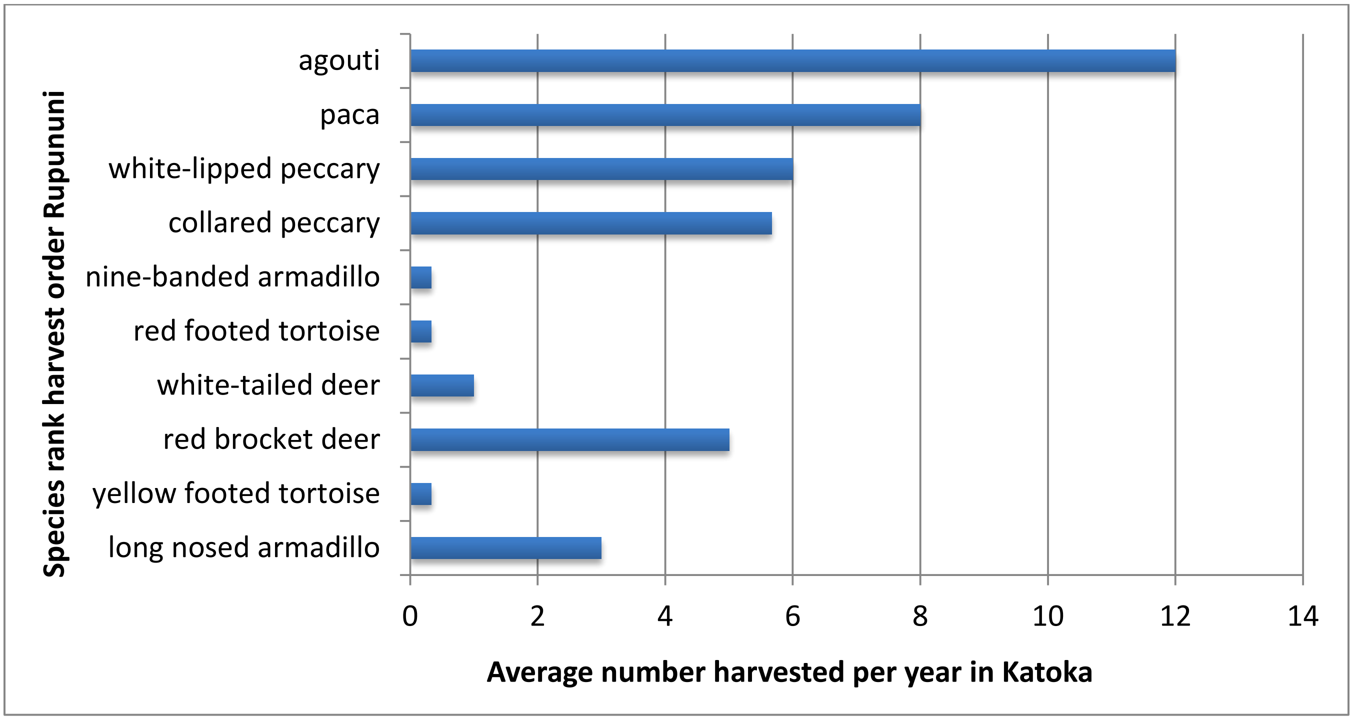
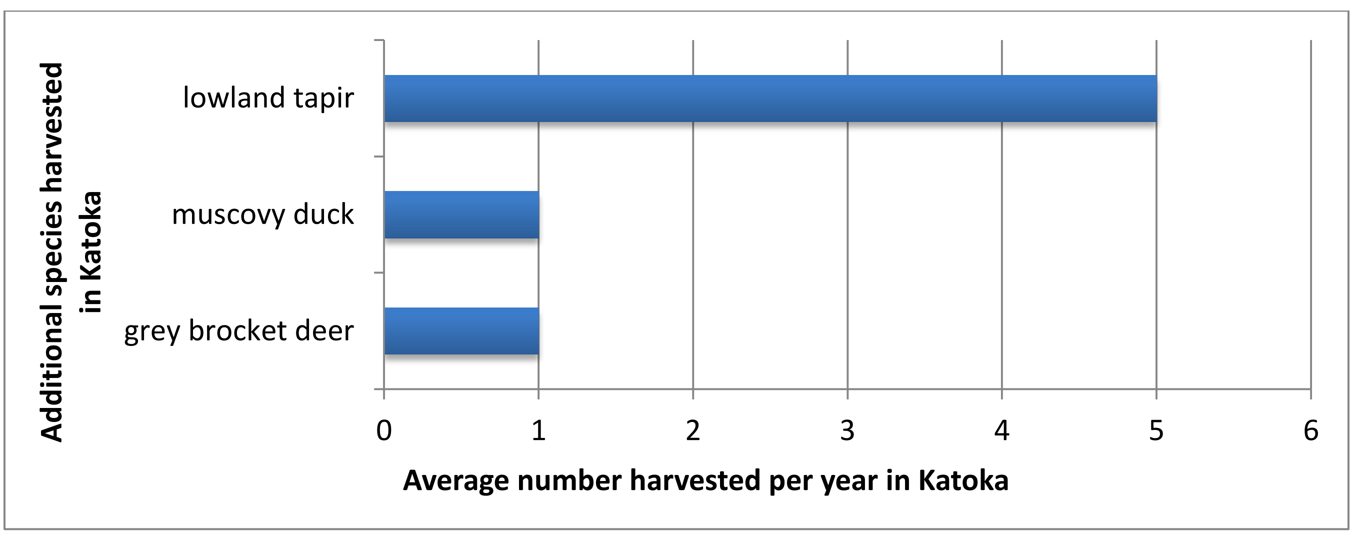
Wildlife harvested by Katoka hunters (monitoring period July 2007 - June 2010)		
Species	Per Year	Per Month
All species (in kilograms)	1426	119

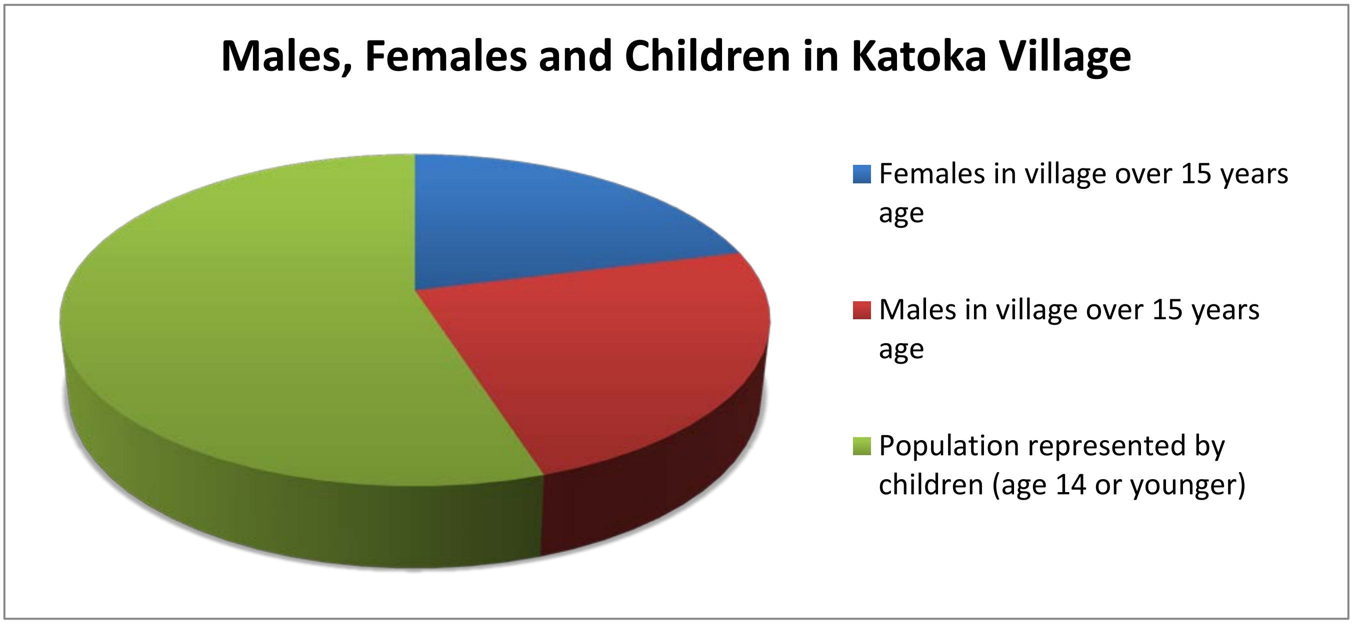
The 10 animal species most commonly harvested in the Rupununi by rank order, and the number harvested by Katoka hunters (monitoring period July 2007 - June 2010).

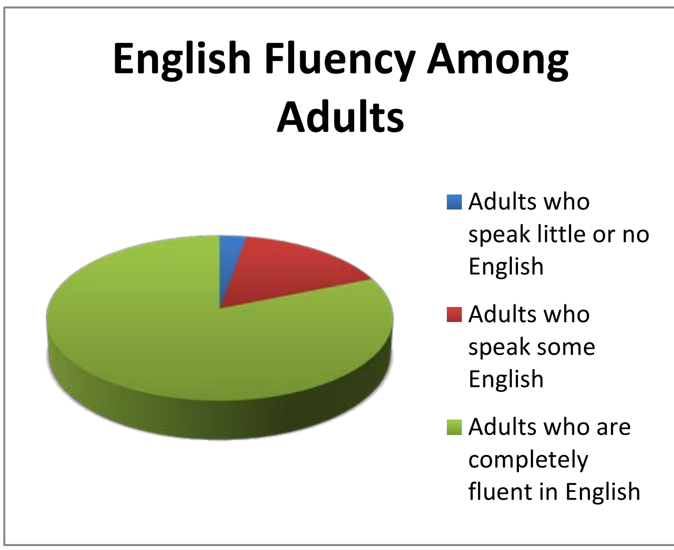


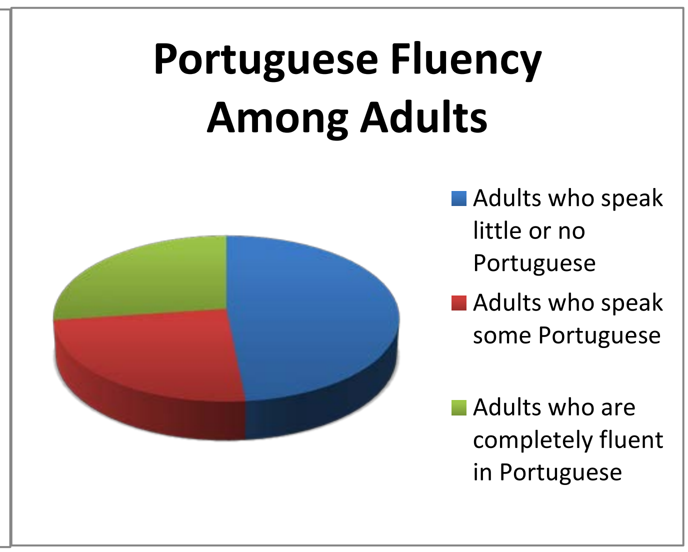
Additional animals harvested by Katoka hunters that are amongst the 10 most commonly harvested for the village, but not for the entire Rupununi (monitoring period July 2007 - June 2010).

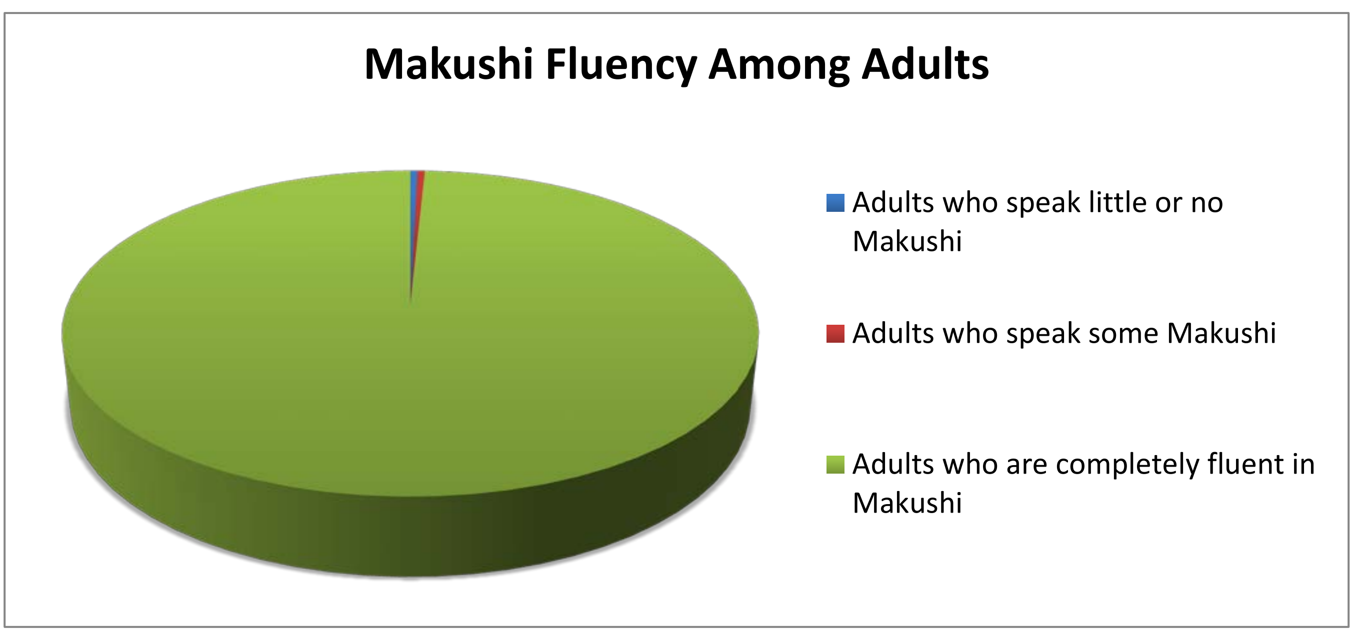


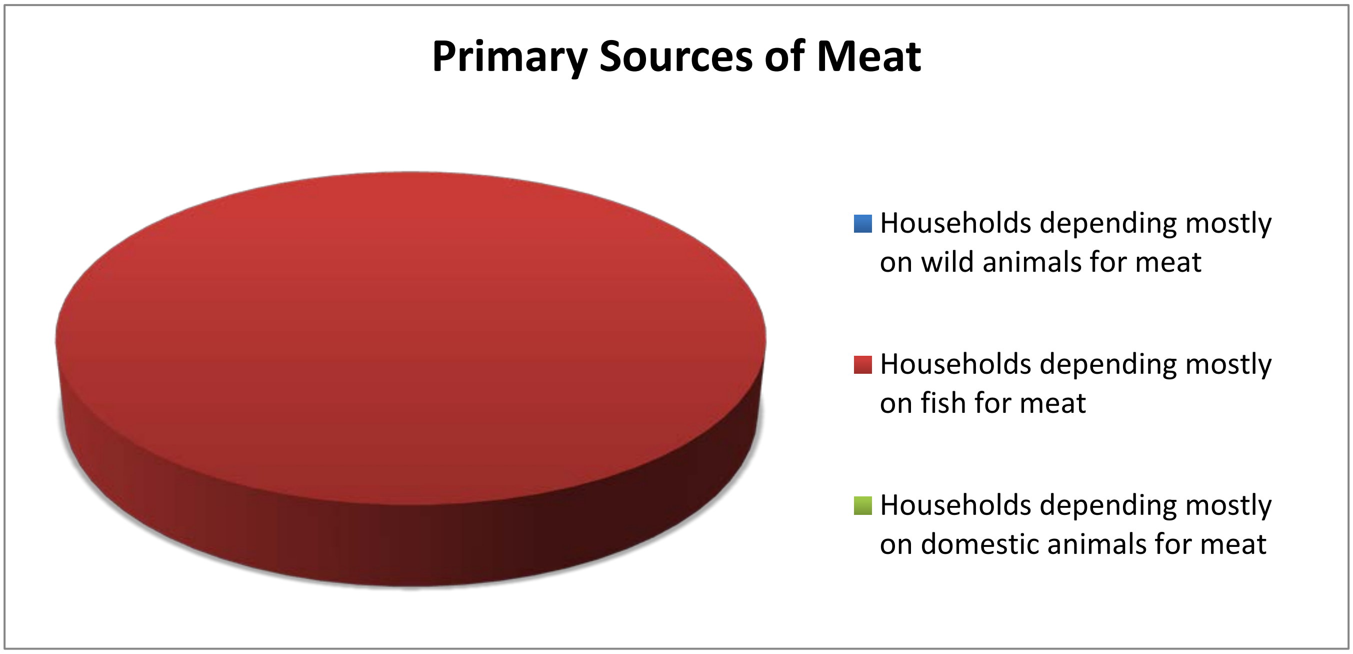
Socioeconomic Data

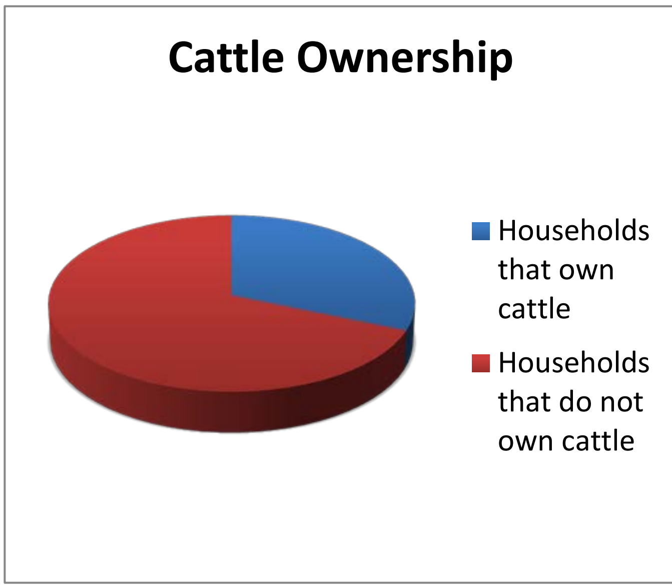


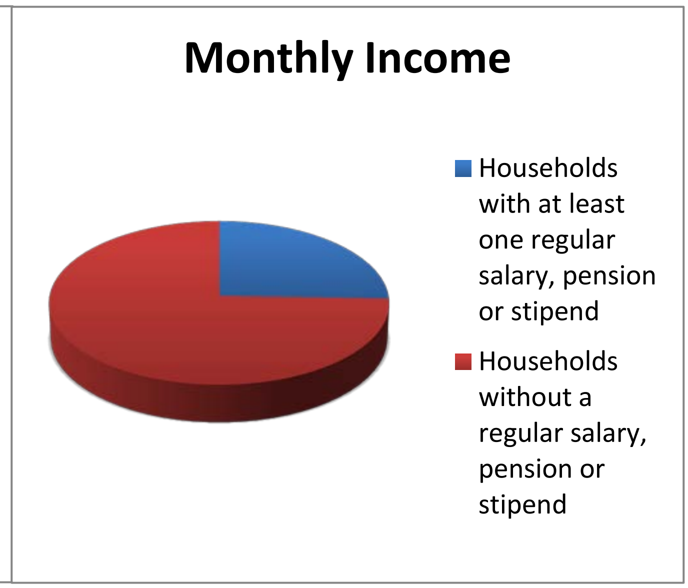


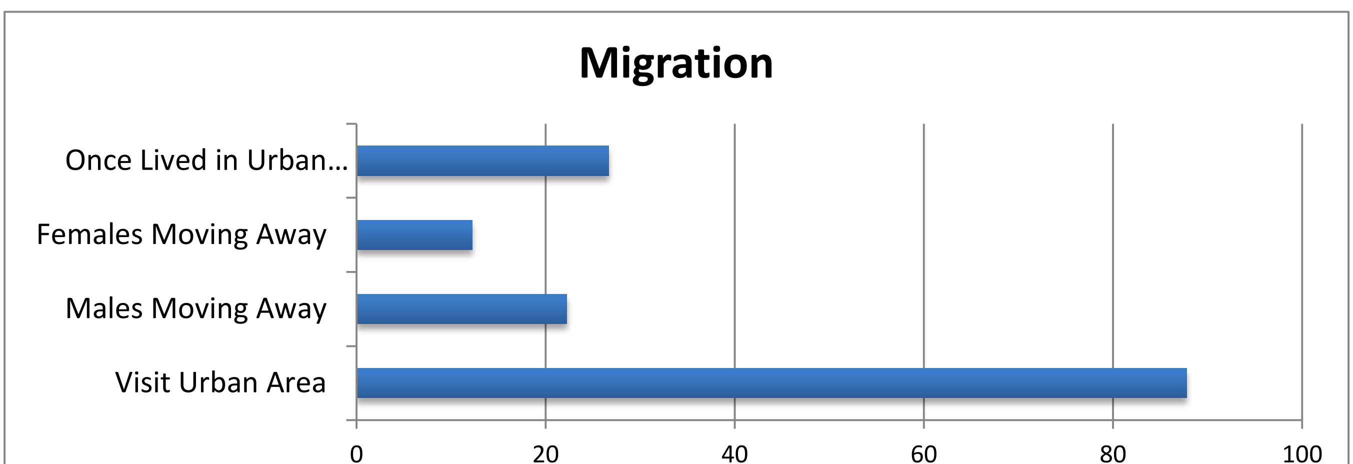




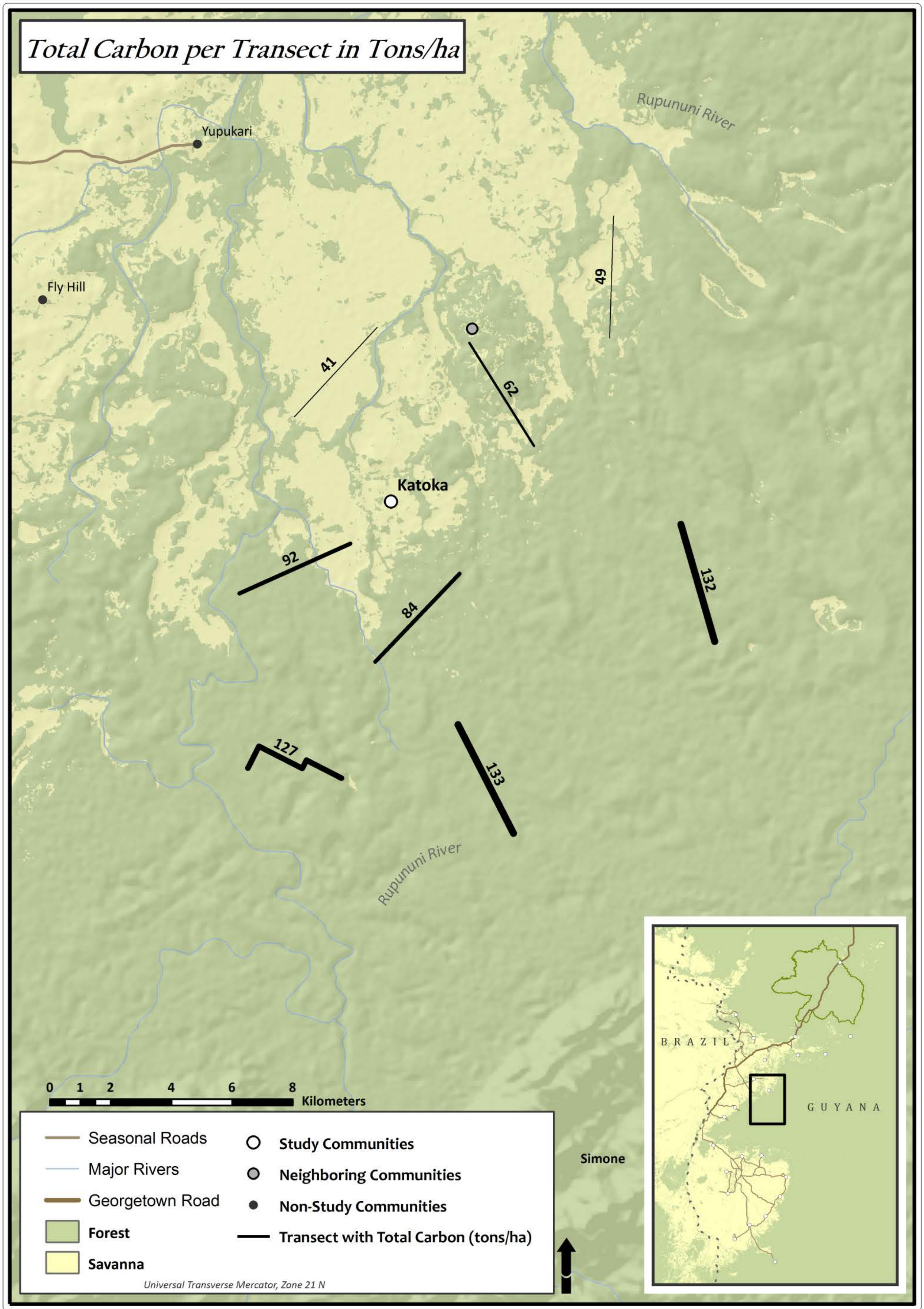








This chart shows the percentage of Katoka households where 1) at least one current member has once lived in an urban area (Lethem, Normandia, Georgetown, or Boa Vista) 2) at least one female has moved away to an urban area in the last 5 years, 3) at least one male has moved away to an urban area in the last 5 years and 4) where at least one current member has (temporarily) visited an urban area in the past year.



Total Carbon per Transect in Tons/ha
Rupununi River
Yupukari
Fly Hill
49
41
62
Katoka
92
132
84
127
133
Rupununi River
BRAZIL
GUYANA
0 1 2 4 6 8
Kilometers
Seasonal Roads
Major Rivers
Georgetown Road
Forest
Savanna
Study Communities
Neighboring Communities
Non-Study Communities
Transect with Total Carbon (tons/ha)
Simone
Universal Transverse Mercator, Zone 21 N

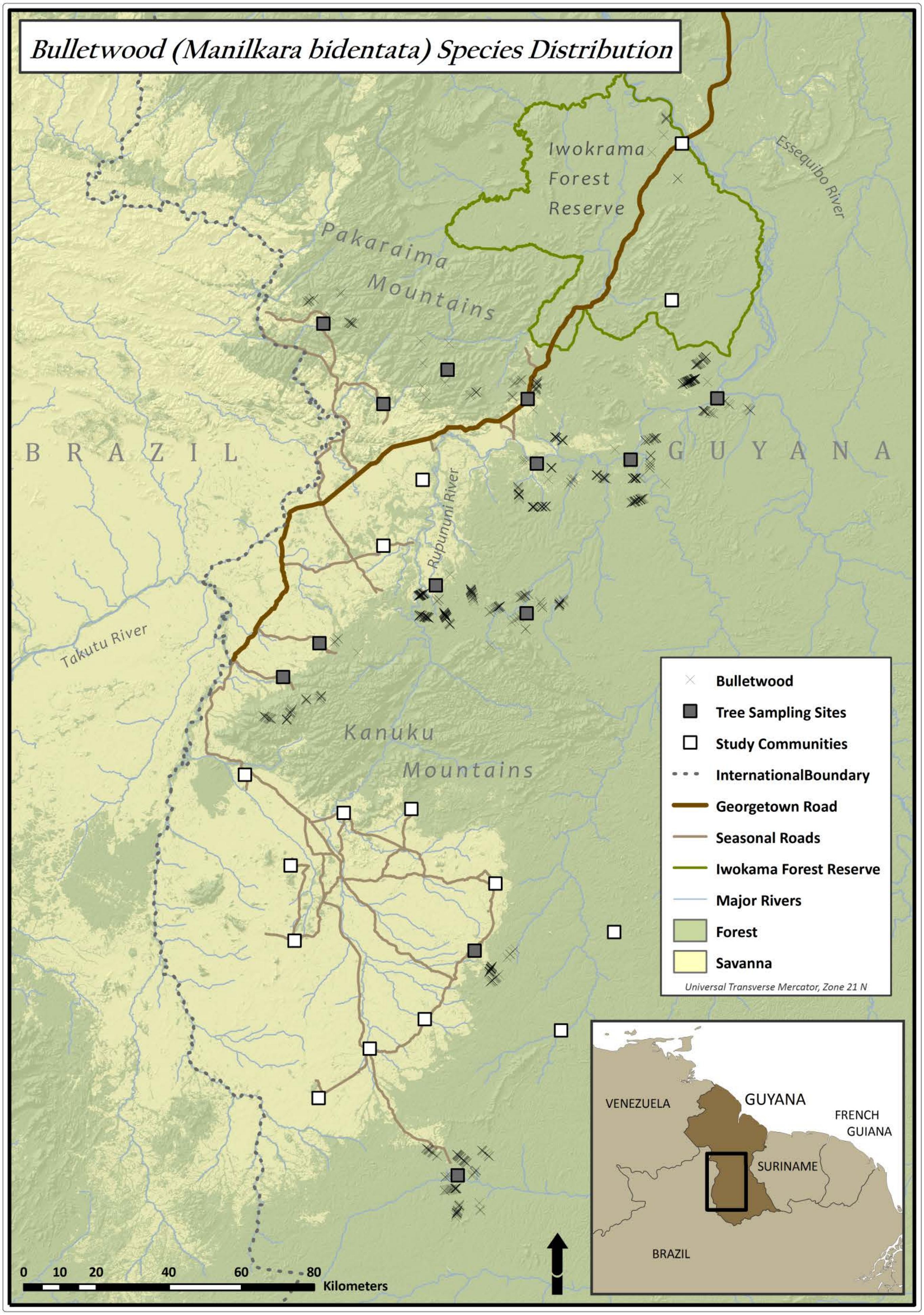
Carbon

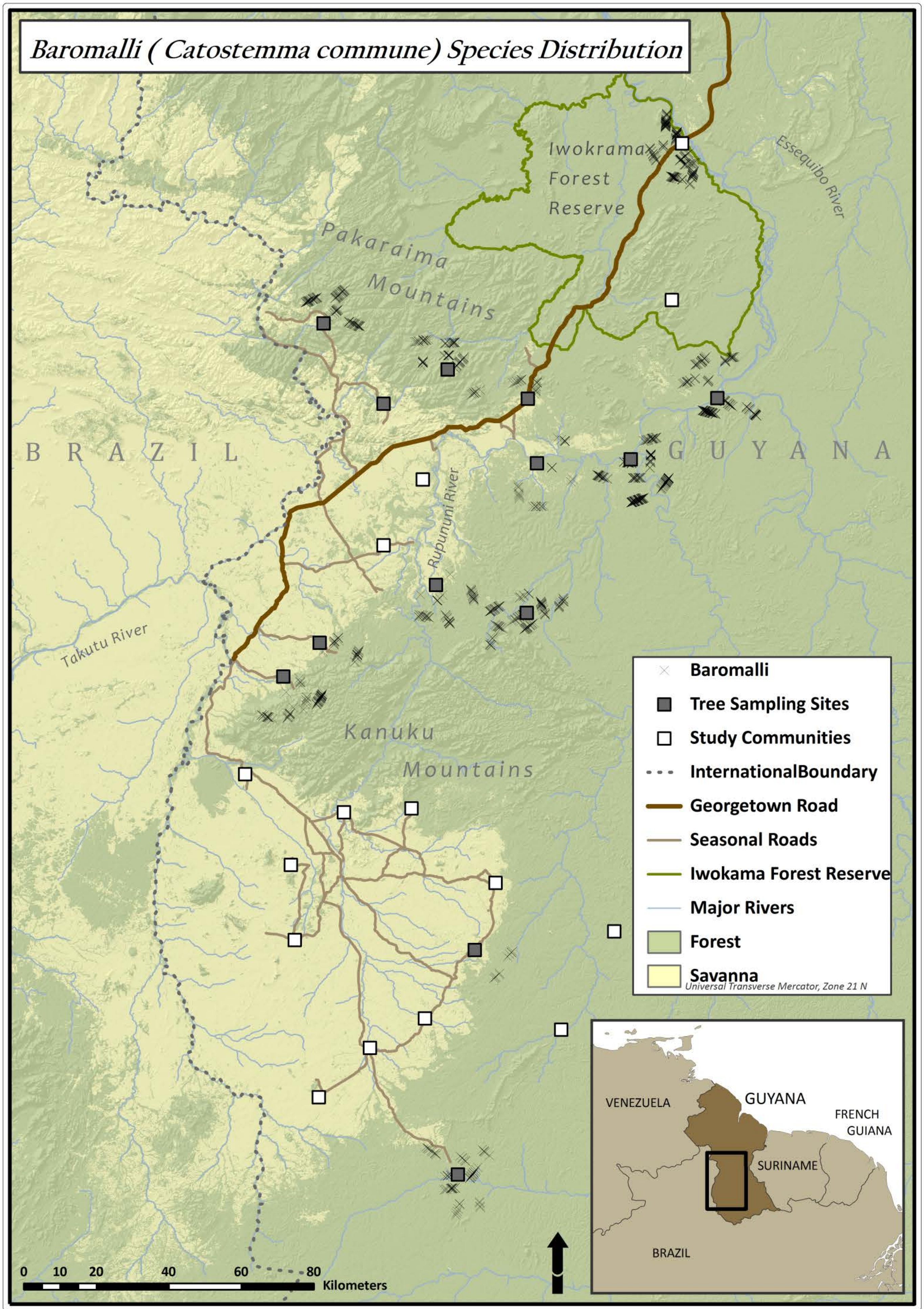
The map of total carbon per transect on the opposite page shows the total amount of carbon in tons/ha for each transect calculated using land cover distribution and carbon estimates of each land cover type.

This was calculated based on sample measurements from a 4 ha area derived from a 10m-wide strip centered along the transect. Total Moist Carbon was calculated based on soil, litter, shrub, and tree biomass.

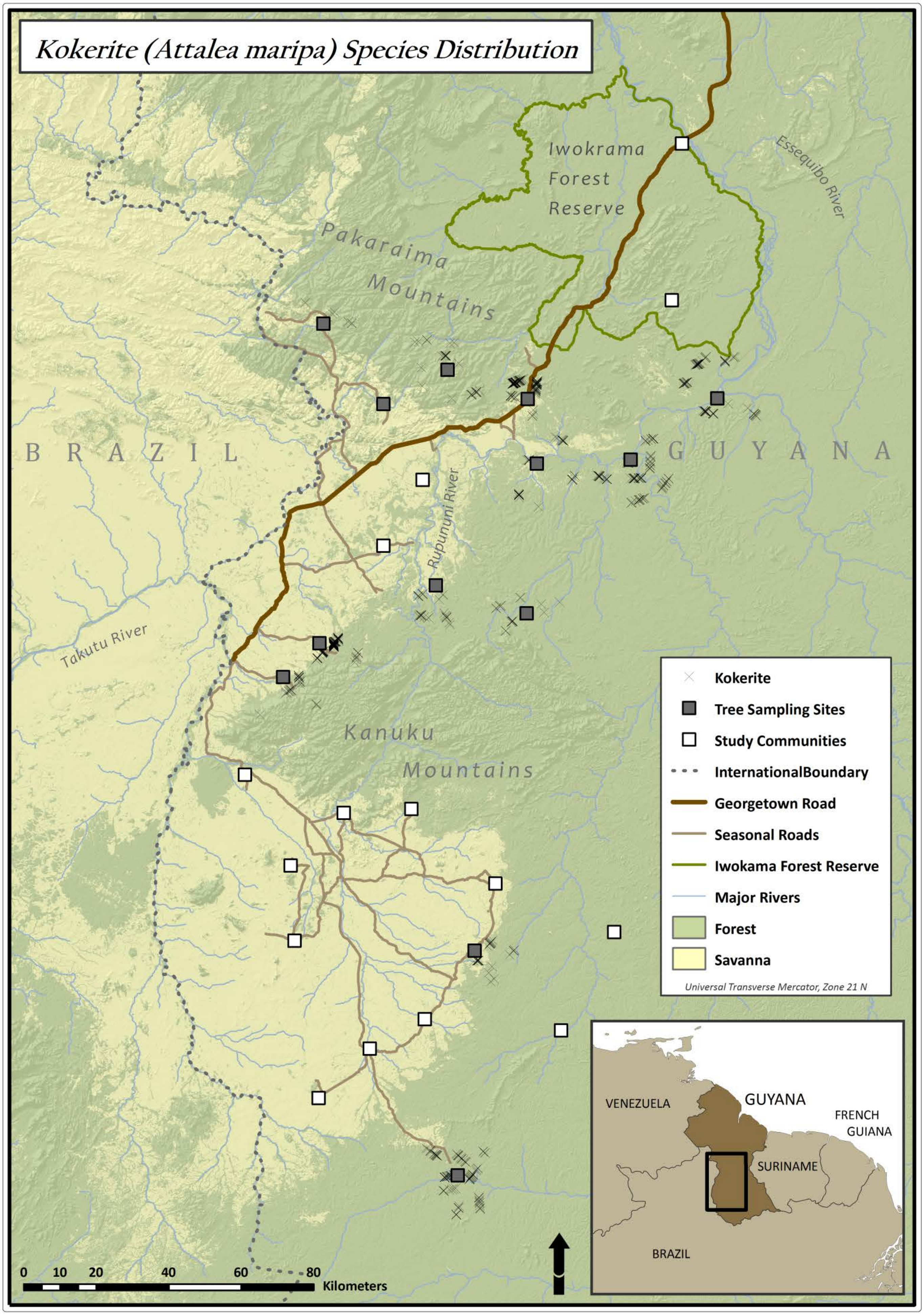
Fruiting Trees

Data on fruiting trees were gathered by Anthony Cummings, Persaud Moses, Ricky Moses, Carro Moses, Stephen Andries, Matthew Alvin, Benedict Joseph, and Han Overman along transects at selected (forested) study sites. On each transect, the following data on all trees ≥25cm DBH (diameter at breast height) and all mature palms were gathered: location along the transect, species name, and DBH. Individual trees were mapped using GIS. The maps opposite show the locations of trees mapped along the transects for four species that are important for the most-hunted wildlife in the Rupununi.

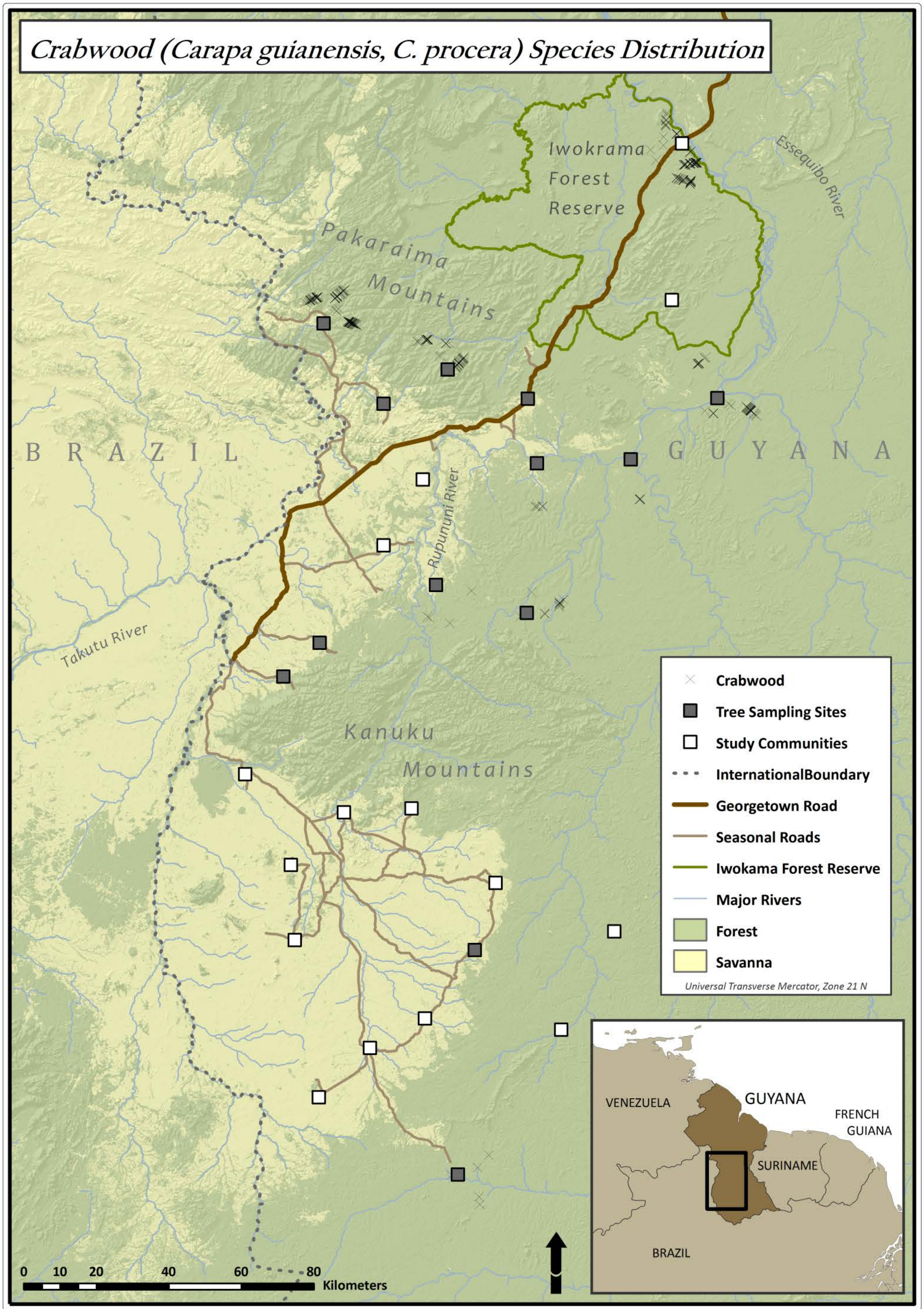

Bulletwood (Manilkara bidentata) Species Distribution
Iwokrama Forest Reserve
Essequibo River
Pakaraima Mountains
B R A Z I L
G U Y A N A
Rupununi River
Takutu River
Kanuku Mountains
Bulletwood
Tree Sampling Sites
Study Communities
InternationalBoundary
Georgetown Road
Seasonal Roads
Iwokama Forest Reserve
Major Rivers
Forest
Savanna
Universal Transverse Mercator, Zone 21 N
VENEZUELA
GUYANA
FRENCH GUIANA
SURINAME
BRAZIL
0 10 20 40 60 80
Kilometers



Baromalli (Catostemma commune) Species Distribution
Iwokrama Forest Reserve
Essequibo River
Pakaraima Mountains
BRAZIL
GUYANA
Rupununi River
Takutu River
Kanuku Mountains
Baromalli
Tree Sampling Sites
Study Communities
InternationalBoundary
Georgetown Road
Seasonal Roads
Iwokama Forest Reserve
Major Rivers
Forest
Savanna
Universal Transverse Mercator, Zone 21 N
VENEZUELA
GUYANA
FRENCH GUIANA
SURINAME
BRAZIL
0 10 20 40 60 80
Kilometers



Kokerite (Attalea maripa) Species Distribution
Iwokrama
Forest
Reserve
Essequibo River
Pakaraima
Mountains
B R A Z I L
G U Y A N A
Rupununi River
Takutu River
Kanuku
Mountains
Kokerite
Tree Sampling Sites
Study Communities
InternationalBoundary
Georgetown Road
Seasonal Roads
Iwokama Forest Reserve
Major Rivers
Forest
Savanna
Universal Transverse Mercator, Zone 21 N
VENEZUELA
GUYANA
FRENCH
GUIANA
SURINAME
BRAZIL
0 10 20 40 60 80
Kilometers


Crabwood (Carapa guianensis, C. procera) Species Distribution
Iwokrama Forest Reserve
Essequibo River
Pakaraima Mountains
BRAZIL
GUYANA
Rupununi River
Takutu River
Kanuku Mountains
Crabwood
Tree Sampling Sites
Study Communities
InternationalBoundary
Georgetown Road
Seasonal Roads
Iwokama Forest Reserve
Major Rivers
Forest
Savanna
Universal Transverse Mercator, Zone 21 N
VENEZUELA
GUYANA
FRENCH GUIANA
SURINAME
BRAZIL
0 10 20 40 60 80
Kilometers

Project Fauna Personnel

Researchers

Jose Fragoso, Principal Investigator (PI): Stanford University; biologist
Kirsten Silvius, co-PI: Moore Foundation; biologist
Jane Read, co-PI: Syracuse University; geographer
James Gibbs, co-PI: State University of New York—ESF; biologist
Luiz Flamarion de Oliveira, co-PI: Museu Nacional, Rio de Janeiro; biologist
Leda Martins, co-PI: Pitzer College; anthropologist
Robert Miller, researcher: FUNAI; agro-ecologist
Carla de Albuquerque, researcher: Independent; anthropologist
Jerome Chave, co-PI: Centre National de la Recherche Scientifique; biologist
Jeffrey Luzar, Post-doc: State University of New York—ESF; anthropologist
Han Overman, Post-doc: State University of New York—ESF; biologist
Oskar Burger, Post-doc: Stanford University; anthropologist
Sean Giery, graduate student: University of Hawaii; biologist
Anthony Cummings, graduate student: Syracuse University; geographer
Marla Torrado, graduate student: Syracuse University; geographer
Taal Levi, collaborator: University of California-Santa Cruz, biologist
Kimberly Epps, collaborator: Stanford University; soil scientist
Takuya Iwamura, Post-doc: Stanford University
Jean Huffman, collaborator: Louisiana State University; botanist
Joel Strong, graduate student: University of Hawaii; biologist
Emily Kachorek, graduate student: California State University, Sacramento; biologist
Josefien Demmer, data manager: State University of New York—ESF; biologist
Chris Carrico, post-doc: University of Hawaii; anthropologist
Clay Trauernicht, graduate student: University of Hawaii; botanist
Randall Moorman, graduate student: University of Hawaii; biologist
Dominique Irvine, collaborator: Stanford University; anthropologist
Maayan Gadisman, volunteer: University of California, Santa Cruz; anthropologist
Amy Ortiz, volunteer: New College, Florida; botanist
Jane Mulcahy, undergraduate student: Syracuse University; geographer
Philip Curtis, undergraduate student: Syracuse University; earth scientist/geographer
Paul Kloster, undergraduate student: Syracuse University; geographer

Administrative

Mike Morris, USA
Ketlin Williams; Lethem
Esther Joseph; Lethem
Stacy Ramspersaud; Lethem
Bertie Xavier; University of Guyana/Wowetta Village
Michelle Joseph; Lethem