

FIG.1 A spectacularly wild rainforest harboring whitewater rapids, mountains, petroglyphs, and a deep history of Indigenous ecological knowledge, Guyana's Acarai-Corentyne Corridor is one of the most important conservation opportunities in South America.

Guyana: Acarai-Corentyne Corridor

FIG. 2A Bounded by Guyana's largest rivers—the Essequibo to the west and the New and Corentyne to the east—the Acarai-Corentyne Corridor stretches more than half the length of Guyana. Dozens of rapids and waterfalls along the major rivers make this one of the least accessible and most poorly explored regions of the country. A vast plateau of low hills between 200 and 300 m elevation dominates the corridor, stretching from the base of the Acarai Mountains in the south to the lower coastal plain in the north.

2B Lying at the heart of southern Guyana's vast forests, the Acarai-Corentyne Corridor has the potential to anchor a mosaic of conservation lands that preserve biodiversity, uphold Indigenous land rights, and deliver real benefits to all Guyanese. To the south the corridor borders Kanashen Amerindian Protected Area and Brazil's largest protected area. Just outside its borders, Waiwai, Wapishana, Trio, and Macushi residents who have been exploring and using these forests for millennia hold deep and invaluable stores of knowledge about the landscape and its biodiversity.

2B LEGEND

- International border
- Protected area
- Indigenous territory
- Mining concession
- Forestry concession in Guyana
- Town

Sources: RAISG, Field Museum

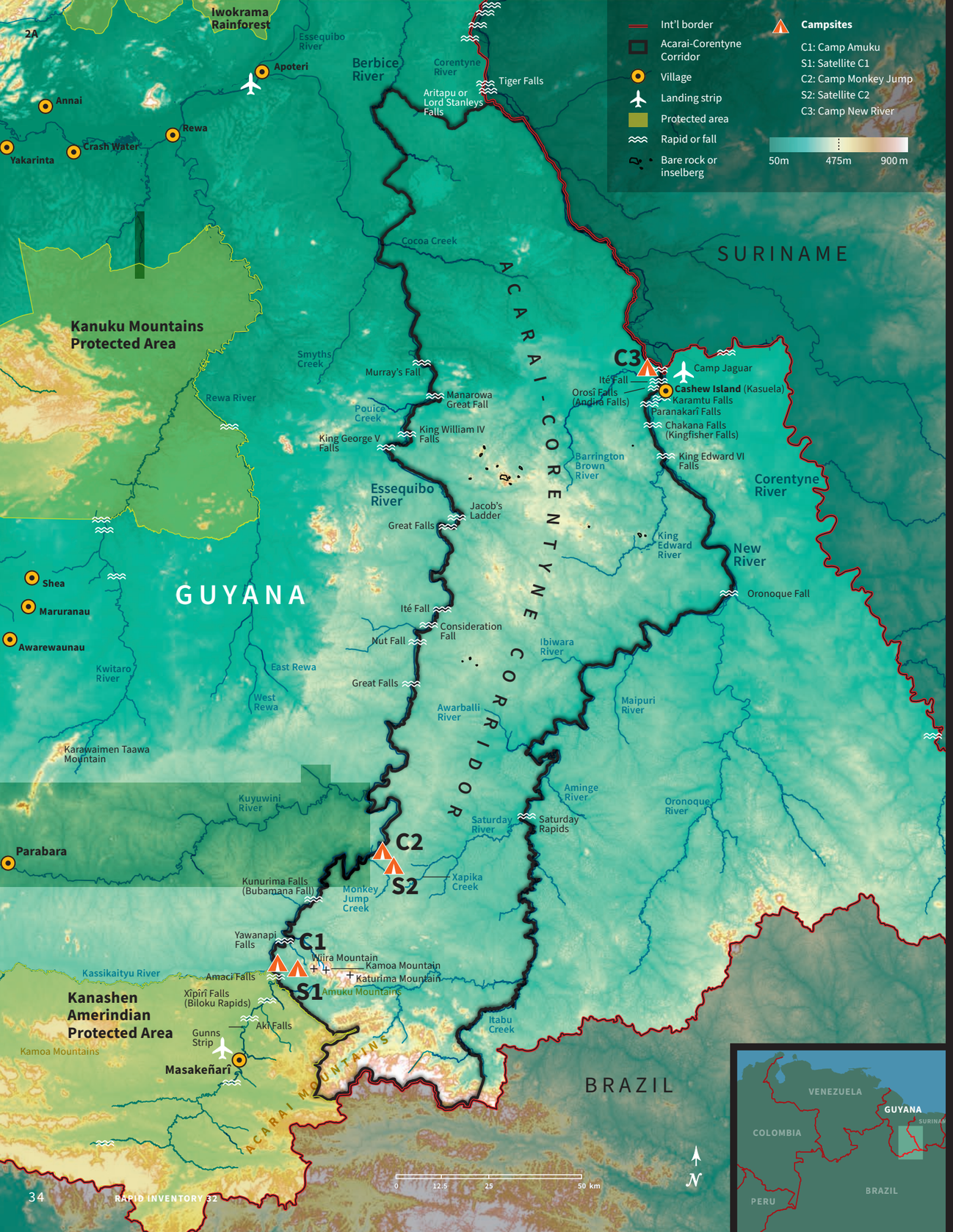














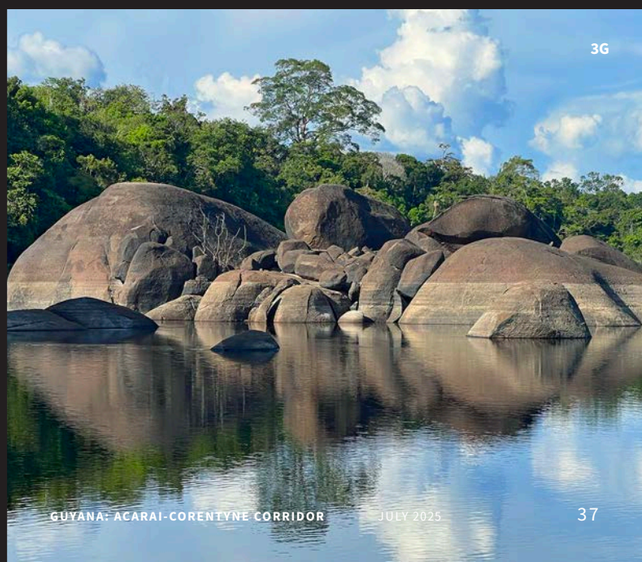


FIG. 3A The predominant feature of the Acarai-Corentyne Corridor, seen here from above our first campsite, is an unbroken expanse of forests and rivers that stretches to the horizon in every direction.

3B–E Just as Guyana is the Land of Many Waters, the Acarai-Corentyne Corridor is the Land of Many Rapids. The Essequibo (3A, C, E–G), New (3B, D), and Corentyne rivers tumble over hundreds of rapids and waterfalls on their way to the Atlantic Ocean.

3F Four of Guyana's most important rivers—the Essequibo, New, Corentyne, and Berbice—have their headwaters in the Acarai-Corentyne Corridor. Annually, rainfall in this region of Guyana generates more than 11 cubic kilometers of freshwater to Guyana's rivers—the equivalent of 4 million Olympic swimming pools. Water level in this stretch of the Essequibo fluctuates 11 m between the dry, low-water season (September–December) and the wet, high-water season.

3G Massive granite boulders along the Essequibo and New rivers testify to the ancient, 2 billion year-old Guiana Shield bedrock that underlies the corridor.



4A Eighty people from across Guyana and around the world took part in the rapid inventory. We were an interdisciplinary team of biologists, social scientists, and geologists from six Guyanese and seven international institutions, as well as 50 local experts from three nearby Indigenous villages.

4B–D Over 20 days we visited three sites spanning a broad range of forest and aquatic habitats in the Acarai-Corentyne Corridor.

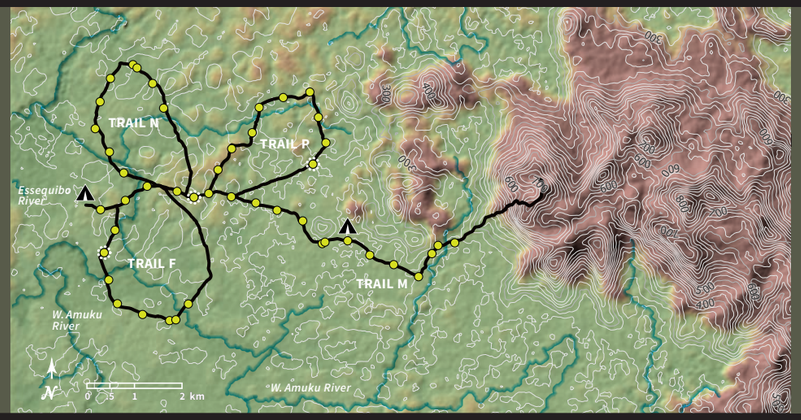


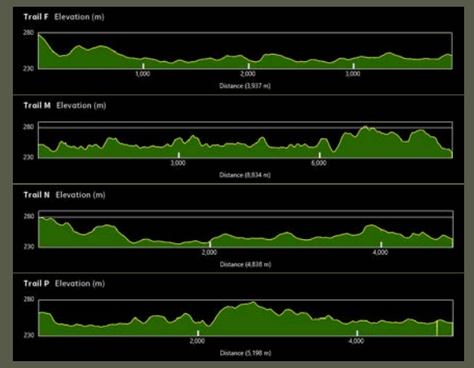
Campsites
Trails
Bat Audio Recorder
Camera Traps

C1: CAMP AMUKU

Our first camp was on the eastern bank of the Essequibo River, where we sampled lowland forests around camp as well as a 700-m peak in the nearby Amuku Mountains (visible on the horizon in Fig. 4B).





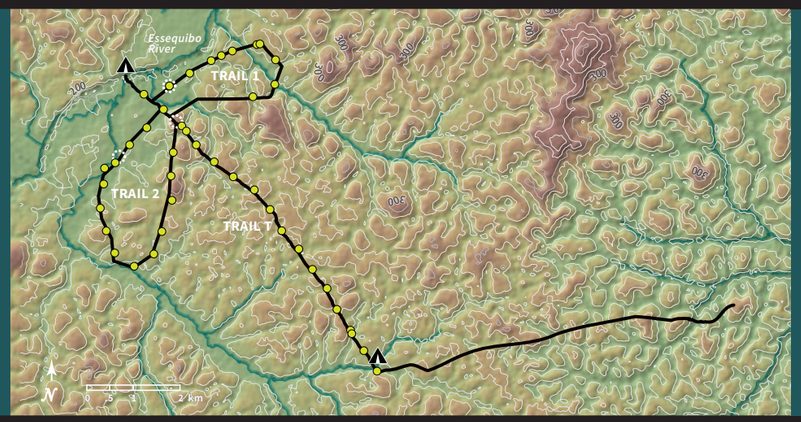




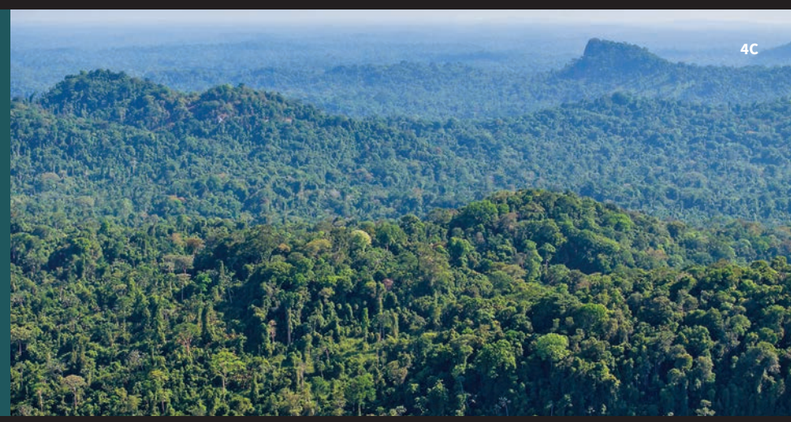
C2: CAMP MONKEY JUMP

Our second camp was a day's travel down the Essequibo, near the mouth of Monkey Jump Creek. A 17-km trail crossed the low divide between the Essequibo and New River watersheds, allowing us to sample both.









C3: CAMP NEW RIVER

Our third camp was on the western bank of the New River, where it splinters into a braided channel of rapids and islands just before meeting the Corentyne River at the Guyana-Suriname border.



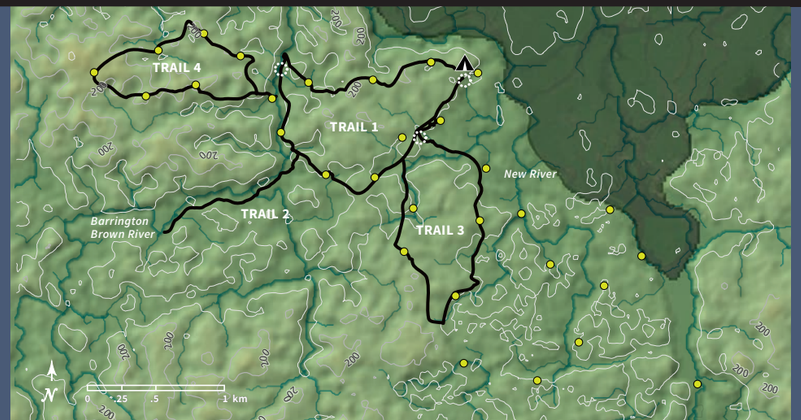






Fig. 5A Geologist Bob Stallard surveyed the soils, waters, and surface geology of this ancient landscape.

5B The corridor is dominated by a plateau of rolling hills whose 2 billion year-old bedrock, illustrated here by granite boulders along the Essequibo, is covered by 10 million year-old soils.

5C Deep, reddish brown loamy soils are common throughout the uplands of the corridor.

5D Whitish clay soils have formed in the floodplains along the major rivers.

5E–F The complex surface geology of the corridor—and metamorphosed rocks like these along the Essequibo—bear witness to billions of years' worth of faulting, shearing, melting, folding, and weathering on the Guiana Shield, which boasts some of the most ancient rocks on Earth.

5G–K Where the New and Essequibo rivers encounter ledges in the underlying bedrock they form rapids, waterfalls, and complex braided channels punctuated by whirlpools and whitewater. On typical rivers, these rapids would erode the bedrock over millions of years. On the New River, however, these rapids appear to be stable or even increasing in elevation, due to the formation of a unique conglomerate that cements loose rocks together.


5E


5F


5A


5B


5G


5C


5D


5H


5J


5K





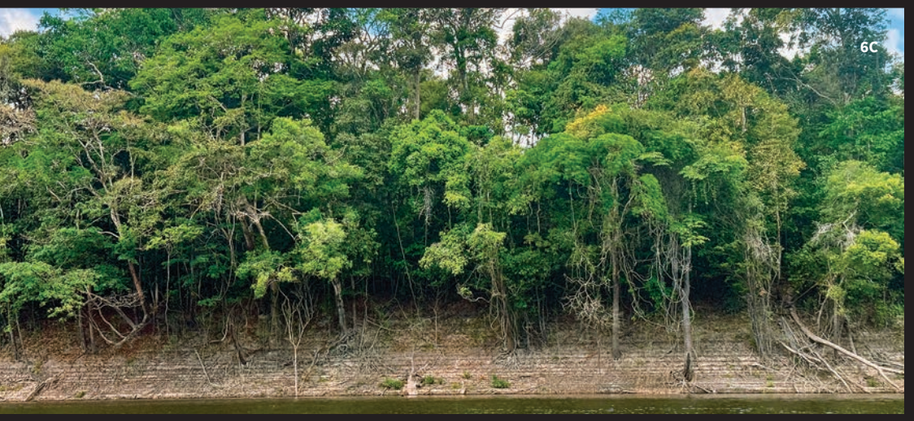




FIG. 6 Dominated by mature, never-logged forest, the Acarai-Corentyne Corridor is home to more than 800 million trees large enough to sling a hammock from.

6A More than 80% of the corridor is hyperdiverse upland forest that grades from a more Amazonian composition in the south to one more similar to Iwokrama Rainforest in the north.

6B Low-lying areas covering 5–10% of the corridor harbor seasonal swamp forest where the açaí palm (*Euterpe oleracea*) plays a central role.

6C Mature riparian forest borders the major rivers, accounting for another 5–10% of the landscape.

6D Younger forests tangled in vines—apparently the result of riparian disturbance—occupy the remainder of the landscape.

6E–S The botanical team recorded several hundred species of an estimated flora of >2000.

6E A diverse aquatic flora, including *Mourera fluviatilis*, thrives in the region's many rapids.

6F–G, K, R Extrapolations from our tree surveys suggest that several million towering emergent trees—many more than 50 m tall—stand guard in the corridor.

6H *Prionostemma aspera*

6J *Aechmea rubiginosa*

6K *Minquartia guianensis*

6L The deep and intact botanical knowledge in nearby Indigenous communities, like that of Waiwai plant expert James Suse, represents a major asset for science, for Guyana, and for the corridor.

6M In addition to Indigenous plant experts, our team included Kaslyn Holder-Collins of the University of Guyana and two international experts.

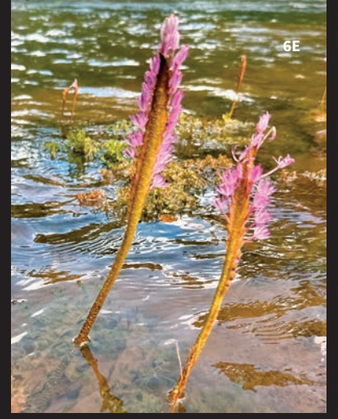
6N *Dioclea* sp.

6P Freshwater sponges (*Drulia* sp.), exposed by the low water levels, dotted the forest along the Essequibo River.

6Q We visited at the height of the dry season, when flowers and fruits were scarce. The only place we encountered a large number of plants in flower—like this *Paloue* sp.—was along the banks of the New River.

6R *Bertholletia excelsa*, Brazil nut

6S Hundreds of other plant photos taken in the Acarai-Corentyne Corridor can be viewed on iNaturalist.org.











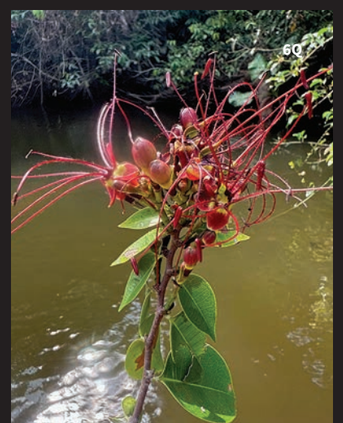


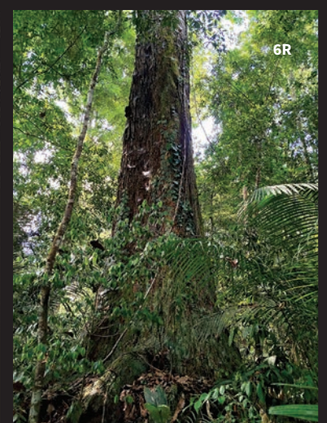















7A

7B


7C


7D


7E


7F


7G

FIG. 7 During the rapid inventory we recorded 234 species of freshwater fishes, including 33 potentially new species to science (7A–G), 22 new records for Guyana (7H–P), and healthy stocks of important food fishes (7Q–T).

7A *Potamotrygon boesemani*

7B *Microglanis* sp.

7C *Bryconops* sp.

7D *Imparfinis* sp.

7E *Eigenmannia* cf. *sayona*

7F *Melanocharacidium* sp.

7G *Leporinus* cf. *fasciatus*

7H *Eigenmannia macuxi*

7J *Sternopygus astrabes*

7K *Pseudancistrus corantijniensis*

7L *Metaloricaria nijsseni*

7M *Pseudacanthicus fordii*

7N *Paralithoxus surinamensis*

7P *Pseudoplatystoma* cf. *reticulatum*

7Q *Myleus pacu*

7R *Cichla ocellaris*

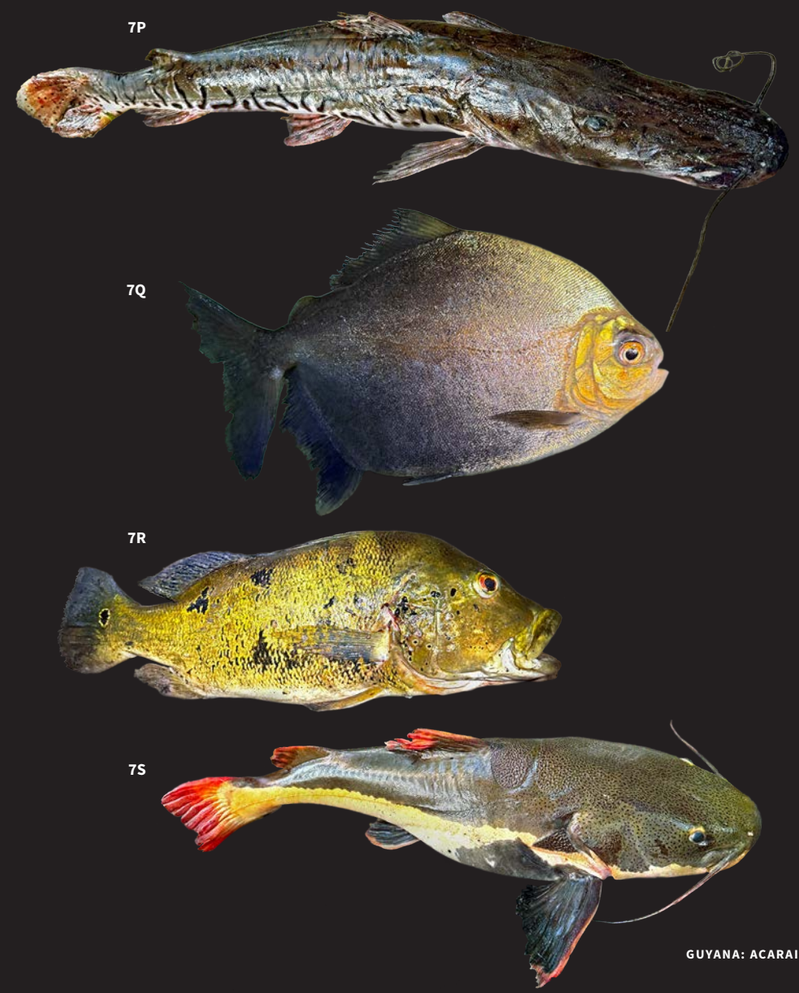
7S *Phractocephalus hemioliopterus*

7T–U We sampled fishes in rivers, creeks, swamps, and ponds using nets, environmental DNA, and Indigenous fishing techniques.


7H


7K


7M


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7U


8A


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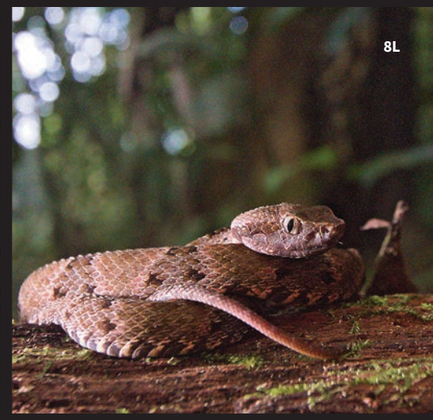

8F


8G


8H


8J


8K


8L


8M


8N


8R


8P


8Q

FIG. 8 Over 17 days we recorded 47 species of amphibians and 51 species of reptiles, including 10 species that are globally threatened, new records for Guyana, or potentially new to science.

8A *Pristimantis zeuctotylus*

8B *Rhinella lescurei,* new to Guyana

8C *Dendrobates tinctorius*

8D *Synapturanus mirandaribeiroi*

8E *Pristimantis koehleri*

8F *Anomaloglossus* sp., potentially new to science

8G *Chiasmocleis haddadi,* new to Guyana

8H Additional sampling will likely yield a total of ~90 amphibian and ~90 reptile species.

8J *Oxyrhopus petolarius*

8K *Dendrophidion dendrophis*

8L *Bothrops atrox*

8M *Chironius multiventris*

8N *Epictia tenella*

8P *Caiman crocodilus*

8Q *Chelonoidis denticulata,* globally Vulnerable

8R *Plica umbra*

8S *Arthrosaura* cf. *reticulata,* potentially new to science


8S

















FIG. 9 We detected 339 species of birds that, alongside a half-dozen regional surveys, projects a total of ~450 species—more than half of Guyana's bird diversity.

9A Crested Eagle (*Morphnus guianensis*)

9B Male Band-tailed Antshrike (*Thamnophilus melanothorax*)

9C Female Band-tailed Antshrike (*Thamnophilus melanothorax*)

9D Nest of a Speckled Spinetail (*Thripophaga gutturata*), a new species for Guyana

9E Harpy Eagle (*Harpia harpyja*)

9F Crested Eagle (*Morphnus guianensis*)

9G For the first time, autonomous recording units featured prominently in our sampling design.

9H Gray-winged Trumpeter (*Psophia crepitans*)

9J Ferruginous-backed Antbird (*Myrmoderus ferrugineus*)

9K Common Scale-backed Antbird (*Willisornis poecilinotus*)

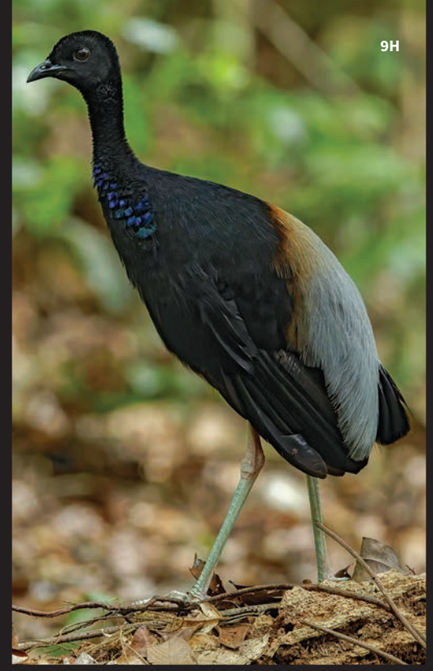
9L Black-whiskered Vireo (*Vireo altiloquus*)

9M Asaph Wilson co-led the bird surveys.

9N *Marail Guan (Penelope marail)*

9P Yellow-throated Woodpecker (*Piculus flavigula*)

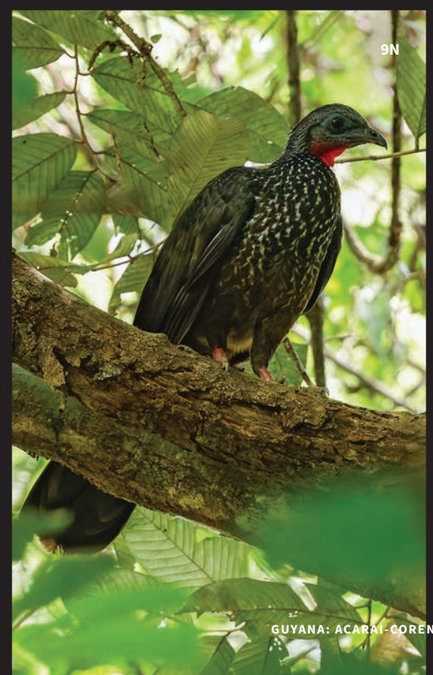
9Q Yellow-billed Jacamar (*Galbula albirostris*)

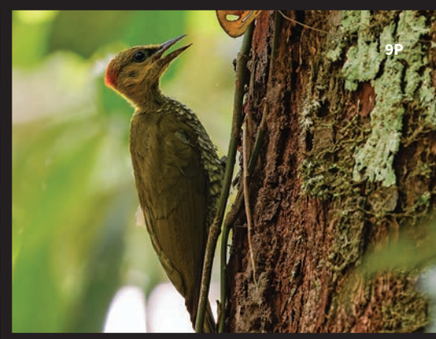


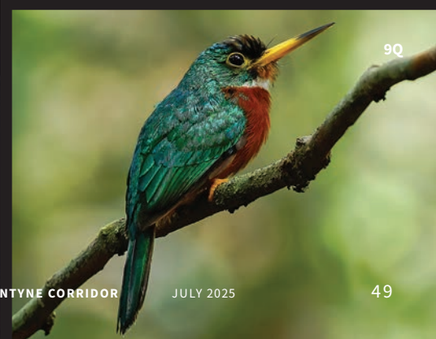






























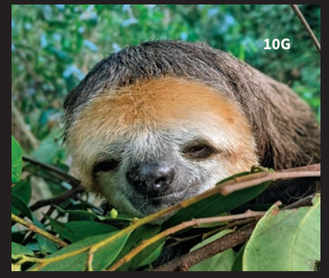








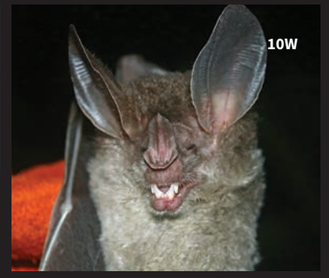






















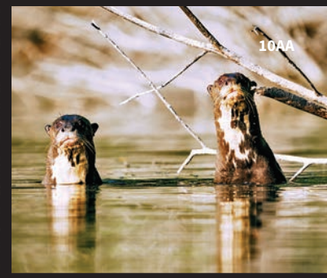










FIG. 10 The Acarai-Corentyne Corridor harbors one of the most diverse mammal communities on Earth. Our team of outside and Indigenous experts used trail surveys (10A), camera traps (10B), mist nets (10U), audio recorders, environmental DNA, and opportunistic encounters to record as many mammals as we could. The inventory yielded 83 of the 192 species expected to occur in the corridor, including all eight of Guyana's primate species, 10 globally threatened species, and 25 species protected in-country by the Guyana Wildlife Conservation and Management Commission. Local Indigenous communities possess deep knowledge of the behavior, abundance, and distribution of mammals on the landscape. We documented Waiwai, Wapishana, and Trio names for nearly all of the species we recorded (Appendix 7).

10C *Marmosops* sp.

10D *Didelphis marsupialis*

10E *Dicotyles tajacu*

10F *Dasypus guianensis*

10G *Bradypus tridactylus*

10H *Eira barbara,* a leucistic individual

10J *Alouatta macconnelli*

10K *Ateles paniscus,* globally Vulnerable

10L *Saimiri sciureus*

10M *Cebus olivaceus*

10N *Myoprocta acouchy*

10P *Cuniculus paca*

10Q *Priodontes maximus,* globally Vulnerable

10R *Lophostoma silvicola*

10S *Rhynchonycteris naso*

10T Stenodermatinae sp.

10V *Pteronotus parnellii*

10W *Chrotopterus auritus*

10X *Leopardus wiedii*

10Y *Panthera onca*

10Z *Leopardus pardalis*

10AA *Pteronura brasiliensis,* globally Endangered

10BB *Nasua nasua*

10CC *Tapirus terrestris,* globally Vulnerable

10DD *Tayassu pecari,* globally Vulnerable

10EE *Mazama americana*

FIG. 11 Nearby Indigenous communities maintain robust local ecological knowledge about the Acarai-Corentyne Corridor, an important cultural asset for community well-being, including sustainable use practices like hunting and fishing. Local expertise also strengthened biological data collection during the rapid inventory.

11A The local ecological knowledge team documented detailed understanding of connections between species through dialogues on topics like seasonality.

11B Kwang Suse and Asaph Wilson brought knowledge from nearby forests to the bird team.

11C Local experts classify forest habitat types and notice old farm areas from social memory or the vegetation composition.

11D An Indigenous fishing technique using the *Deguelia chrysophylla* vine yielded 40% of the total fish specimens collected in the inventory.

11E–F Local experts like Tina Kenke know where to procure the vine and where it is best used. Cultural norms shape decision-making about frequency of use and sharing the catch.

11G Pounding the vine releases a juice whose compounds immobilize fish through vasoconstriction.

11H Masakeñarî experts readying for a day on the trail system.

11J Local experts possess detailed knowledge about the different fish communities of each watershed, like this stingray collected in a New River tributary.

11K Connecting Indigenous and Linnean species names helps convey local knowledge to visitors.

11L Richard Andrew reviewing Wapishana species names with Jeremy Campbell.

11M Phillip Suse identifying giant anteater scratch marks.

11N Local experts evaluate upland forest soils when selecting farm sites.

11P–Q Detailed local knowledge of aquatic ecologies helped procure different fish specimens, as Mark Suse (11P) and Syra Ayaw (11Q) demonstrate.

11R Isaiah Ayaw preparing bait for a Waiwai *kamina* fish trap. The fish trap design was seen on petroglyphs in the area.


12A


12B


13A


12C


12D


12E


12F


12G


12H


13B


13C


12J


12K


12L


12M


13D

FIG.12 The vast forests of the Acarai-Corentyne Corridor are a social landscape. Well-traveled river routes and trails connecting Waiwai, Wapishana, and Trio Indigenous peoples living nearby show the area's cultural value, as do abundant petroglyphs. Local experts who know these rivers and forests best are important assets for the Corridor's conservation future.

12A Traversing falls on river journeys requires skill and experience.

12B Indigenous trails connecting the Essequibo and New rivers date back generations.

12C Syra Ayaw traces a glyph at Tipa.

12D Anthropogenic figure at Kunurima Falls.

12E Tikkil Kenke interprets a glyph at Orosî Falls.

12F Primate figure at Kunurima Falls.

12G Tina Kenke feels for a glyph's contour at Orosî Falls.

12H–J Grinding surfaces evidence deep human history, where stone tools were sharpened in the past.

12K–L Participatory mapping at each camp revealed the extent of Indigenous mobility.

12M Wild *manihot* on the New River suggests past human occupation.

13A–D In addition to traditional sampling methods, we inventoried vertebrates via the emerging tool of environmental DNA (eDNA). Water samples taken at 97 different locations during the inventory were subsequently analyzed in labs at the University of Georgetown and the Field Museum and the genetic sequences in the samples identified to species. 221 species of vertebrates were recorded via eDNA, and 90 of them by no other method.

FIG. 14 With one of the least-disturbed rainforests on Earth, Guyana aims to achieve global conservation goals in a way that benefits all Guyanese.

14A–C The rapid inventory reflected Guyana's commitment to engage diverse conservation stakeholders: discussing findings with local residents in the field (14A); synthesizing results in a Georgetown workshop to share immediately with policymakers (14B); and coordinating closely with Indigenous leaders (14C).

14D–F The team showcased the Acarai-Corentyne Corridor in Georgetown just a week after leaving the field, including Protected Areas Commission speakers Robert Persaud (14D), Fitzroy Sealey (14E), and Damian Fernandes (14F).











