



TREE KANGAROO CONSERVATION PROGRAM



ANNUAL REPORT 2018





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 Cover: YUS Junior Rangers in Yopno Zone. Photo by Chris Banks, Zoos Victoria.
Back Cover: Matschie's tree kangaroo mother and offspring at TKCP's Wasaunon research site. Photo by Lisa Dabek, TKCP.
Inside Cover: Tree kangaroo fitted with tracking collar for TKCP's research on home range, behavior, and ecology. Photo by Jonathan Byers.
Left, top: Waterfall near Yawan village, Uruwa Zone. Photo by Penny LeGate.
Left, bottom: Sing sing welcoming ceremony in Yopno Zone. Photo by Chris Banks, Zoos Victoria.

www.treekangaroo.org

Tree Kangaroo Conservation Program
Annual Report 2018
Seattle, Washington, USA • 2019

About Us

Vision

The Tree Kangaroo Conservation Program envisions a sustainable, healthy, and resilient Huon Peninsula landscape which supports the area’s unique biodiversity, human communities, and culture.

Mission

The Tree Kangaroo Conservation Program fosters wildlife and habitat conservation and supports local community livelihoods in Papua New Guinea through global partnerships, land protection, and scientific research.

Three Organizations, One Common Vision

The **Tree Kangaroo Conservation Program (TKCP)** is the umbrella name for the partnership between Woodland Park Zoo’s TKCP and TKCP-PNG.



**TREE KANGAROO
CONSERVATION PROGRAM
– PAPUA NEW GUINEA
(TKCP-PNG)**

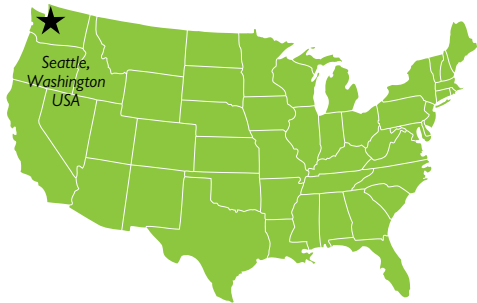
An independent non-governmental organization registered in PNG. TKCP-PNG is the implementing partner of TKCP. Based in Lae, PNG.





**WOODLAND PARK ZOO’S
TREE KANGAROO
CONSERVATION
PROGRAM (TKCP)**

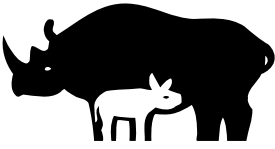
Woodland Park Zoo’s TKCP serves as a model for the “living landscape” approach to conservation among the zoo’s Signature wildlife conservation programs. Based in Seattle, Washington, USA.



YUS CONSERVATION ORGANIZATION (YUS CO)

To ensure local ownership and continued community support of our work, TKCP partners with the community-based YUS Conservation Organization which represents the interests of local landowners and their communities. Based in YUS, PNG.

International Partnerships for the Protection of Tree Kangaroos



Species Survival Plan

TKCP is the designated field program for the Association of Zoos & Aquariums Tree Kangaroo Species Survival Plan (AZA TK-SSP). Species Survival Plan programs focus on animals in danger of going extinct in the wild, using breeding in zoos as one approach to help the species survive and to link AZA institutions to field conservation work.



World Association of
Zoos and Aquariums
WAZA | United for
Conservation

TKCP is supported by zoological institutions throughout the globe which are working together for the conservation of tree kangaroos. Through the World Association of Zoos and Aquariums (WAZA) and its affiliate zoological associations, the international tree kangaroo partnership network promotes greater integration and a more holistic approach to protecting tree kangaroo species.

History

Building a Model for Community-based Conservation in Papua New Guinea

The Tree Kangaroo Conservation Program (TKCP) is Woodland Park Zoo’s flagship international conservation program, focused on conserving the endangered Matschie’s tree kangaroo (*Dendrolagus matschiei*) and the habitat in which it lives. From its beginnings in 1996 to determine the status of the Matschie’s tree kangaroo in the wild, TKCP has evolved into a holistic program supporting habitat protection for a wide range of threatened species, as well as initiatives to enhance local community livelihoods and access to government services. TKCP is the umbrella name for the partnership between WPZ’s TKCP and TKCP-PNG, the locally-registered nongovernmental organization in Papua New Guinea.

Over the course of more than 20 years, the program has grown from its mountainous roots to embrace a broad landscape encompassing marine and coastal reef ecosystems, lowland and montane rain forests, alpine grasslands, and the agricultural areas and settlements belonging to more than 50 villages within the Yopno, Uruwa, and Som (YUS) watershed areas on the Huon Peninsula.

Together with the local landowners in YUS, the PNG government, Conservation International, Lifeweb Initiative, and many other supporters, TKCP helped to establish the

country’s first nationally-protected Conservation Area in 2009. The 187,000-acre YUS Conservation Area is the first protected area of its type in PNG –providing protection at the landscape scale, wholly owned by local people, and with the support of the PNG government for long-term protection.

Under PNG’s customary land tenure system in which local people own and control over 90% of the land, long-term habitat protection relies on the commitment and participation of the local communities who depend on the forest’s products and services. Together with local landowners and communities, TKCP partners with the PNG government, conservation biologists, social scientists, universities, research institutions, and other NGOs to build local capacity for the sustainable management of the YUS Conservation Area (YUS CA) and the surrounding landscape. Through these efforts, TKCP strives to create a healthy landscape for humans, wildlife, and the environment.

Through these partnerships, local residents build a strong connection between their commitment to conservation in YUS with better opportunities for their families and communities. With more than two decades of effort and experience, TKCP continues to shape the concept of conservation for the country, setting a benchmark to which other national protected areas can aspire. ■

Tree Kangaroo Conservation Program Team Members 2018

Seattle,
Washington, USA



Dr. Lisa Dabek
Program Director

Expertise: Leadership, marsupial biology, partnerships, international networking, and sustainable funding strategies



Mr. Trevor Holbrook
Program Manager, Woodland Park Zoo

Expertise: Program management, strategic planning, livelihoods, and organizational development

Papua New
Guinea



Mr. Rick Passaro
Program Manager, Lae

Expertise: Project management, leadership, zoology, and capacity-building



Mr. Daniel Solomon Okena
Research and Conservation Manager

Expertise: Biological research, mammal surveying, plant phenology, and long-beaked echidna biology



Ms. Francisca Yagama
Community Health and Development Manager

Expertise: Community development, health education, partnerships, and project management



Mr. Gibson Gala
Education and Leadership Coordinator

Expertise: Environmental education, youth activism, and leadership development



Mr. Timmy Sowang
Lead Conservation Officer

Expertise: Leadership, conservation outreach, and community engagement



Mr. Namo Yaoro
Conservation Officer

Expertise: Leadership, conservation outreach, and community mobilization



Mr. Steven Fononge
Conservation Officer

Expertise: Leadership, conservation outreach, and community engagement



Mr. Chris Max
Conservation Officer

Expertise: Leadership, cocoa production, community engagement, and coastal resources



Mr. Victor Eki
Conservation Officer

Expertise: Landowner engagement and dispute resolution



Ms. Nadine Paira
Administrative Coordinator

Expertise: Office management, program administration, and human resource management



Mr. Karl Aglai
Coffee Operations Specialist

Expertise: Coffee husbandry and processing, agricultural extension services, and freight logistics



Mr. Nicholas Wari
Research Assistant

Expertise: Field research and coordination; data collection, management, and analyses; tree kangaroo biology



Mr. Dono Ogate
YUS Community-Based Organization Coordinator

Expertise: Leadership, community organizing, and conservation outreach



Mr. Matthew Tombe
Conservation Officer

Expertise: Landowner engagement and dispute resolution



Mr. James Jio
Mapping Officer

Expertise: Global Positioning Systems (GPS), field research



Mr. Sanangke Yape
Mapping Officer

Expertise: Global Positioning Systems (GPS)



Mr. Basip Matumangke
Conservation Coffee Project Assistant

Expertise: Coffee production, post-production processing and quality



Mr. Stanley Gesang
Tree Kangaroo Research Lead Tracker

Expertise: Field research and tree kangaroo tracking



Highlighting TKCP’s Partnerships

The success of TKCP and the YUS Conservation Area is built upon the support of our many long-term relationships both in Papua New Guinea and around the globe. As one of the program’s earliest and most dedicated partners, Woodland Park Zoo has been truly instrumental in fostering TKCP’s development – beginning more than 20 years ago with Lisa Dabek’s first field research expeditions and expanding to become a national model for holistic, community-based conservation.

In April, WPZ President and CEO Alejandro Grajal paid a visit to Papua New Guinea – the first such visit by the zoo’s CEO – to gain a deeper firsthand understanding of the Tree Kangaroo Conservation Program, the incredible YUS landscape, and to meet directly with the people of YUS. Upon his arrival to Port Moresby with TKCP Director Lisa Dabek, United States Ambassador to Papua New Guinea Hon. Catherine Ebert-Gray hosted a welcoming luncheon at her residence to discuss conservation and community resilience in the PNG context and to learn more about Woodland Park Zoo’s strategic commitment to protecting the country’s incredible habitats and biodiversity. Ambassador Ebert-Gray and the U.S. Embassy have been highly supportive of TKCP’s work over the years, and we are grateful for their generosity in hosting the luncheon.

Grajal also had the opportunity to travel with Dabek and TKCP’s research team to the Wasaunon research site deep in the pristine cloud forests of the YUS Conservation Area. Grajal observed the team’s research efforts as they changed the tracking collars on three wild tree kangaroos, explored the surrounding forests together with TKCP’s research assistants, and attempted to spot and identify the area’s unique birds and mammals.

“I had heard about tree kangaroos, and have seen them in zoos of course, but to see them in their natural environment with this kind of magnificent forest of mosses, ferns and orchids – the silence when you get into these primary forests, wow. The thing that you notice is that all the sounds come from this forest and otherwise there are no sounds from the outside. It’s almost poetic to see these animals in their own ecosystem. It’s one of those inspiring moments you live to live.”

Grajal also spent several days in Yawan village to hear the local perspectives regarding conservation and community priorities, and to observe some of TKCP’s community-focused activities including health trainings, Junior Ranger Program, YUS Conservation Coffee production, and local land-use management practices.

“We need to tell stories and show people that conservation is not a pessimistic attitude, but one of great optimism. Conservation and saving species from extinction can feel heavy and daunting, but it is a combination of hope, community, innovation and energy that make it an extremely exciting field to be in.”

To help in telling those stories, Seattle-based television journalist Penny LeGate joined Grajal and Dabek in YUS to experience the cloud forest first-hand and to hear the YUS communities’ perspectives relating to the conservation of their landscape. Together with stunning videography captured by wildlife filmmakers Joe and Nim Pontecorvo, LeGate collaborated with the Seattle Channel to produce a Northwest Regional Emmy-nominated three-part series featuring TKCP’s research and its partnership with the people of YUS.

Following his return from PNG, Grajal has generated a great sense of renewed focus in connecting WPZ’s exhibits, storytelling, and conservation programs together to drive toward the zoo’s new mission to save wildlife and inspire everyone to make conservation a priority in their lives. To share the broader story of TKCP and the conservation commitment of the YUS community with audiences in Seattle and beyond, WPZ anticipates the creation of a Papua New Guinea-themed exhibit as part of its next five-year campaign. ■



YUS Conservation Area Rangers

Appointed by the landowners of YUS to conduct monthly patrols through steep, treacherous terrain and challenging weather conditions, the YUS Conservation Area Rangers embody the commitment of local communities to protect their environment. TKCP is proud to support Papua New Guinea’s first conservation rangers in patrolling and monitoring, educating communities on the rules and boundaries of the YUS Conservation Area (CA), and upholding the YUS CA bylaws in collaboration with landowners and local magistrates. Building upon their traditional knowledge of the YUS landscape and ecosystem, the YUS Conservation Area Rangers are gaining expertise in species identification, tracking, and scientific research.



Back row from left: Danny Wande, Kemo Robert, Tommy Narete, Robson Soseng, Paul van Nimwegen (SMART Trainer), Ken (observer), Victor Eki (Conservation Officer), Hemon Yangeng, Sanangke Yape (Mapping Officer), Geno Yuwoc, Daniel S Okena (TKCP Research and Conservation Manager), Mathew Tombe (Conservation Officer), Steven Fononge (Conservation Officer), and Moses Nasing.
Front row from left: Obtus James, Chris Max (Conservation Officer), Tingke Sapenu, Namo Yaoro, Stanis Max, Weo Bafinuoc, Manrex Yasause, and Mr. Fononge (observer).

- Mr. Aramani Amos
- Mr. Jeffery Andrew
- Mr. Weo Bafinuoc
- Mr. Tawan Bogan
- Mr. Obtus James
- Mr. Mathias Katus
- Mr. Nas Manawase
- Mr. Stanis Max
- Mr. Tommy Narete
- Mr. Moses Nasing,
- Mr. Kemo Robert
- Mr. Mono Sem
- Mr. Robson Soseng
- Mr. Nelson Teut
- Mr. Danny Wande
- Mr. Soya Werawe
- Mr. Hemon Yangeng
- Mr. Geno Yuwoc

- Bonea/Nanaya village
- Gogiok village
- Nokopo/Nian village
- Mek/Nolum village
- Towet village
- Tajon/Bonkiman village
- Ronji/Koripon village
- Ronji village
- Sugan/Sindamon village
- Yawan village
- Mitmit/Mup village
- Singorokai village
- Gomdan/Sapmanga village
- Gua/Teptep village
- Kalaset village
- Kumbu/Keweng village
- Koripon/Bungawat village
- Worin village

Right page:
United States Ambassador to Papua New Guinea, Hon. Catherine Ebert-Gray hosted a luncheon for the Tree Kangaroo Conservation Program in April. Back row, from left: Rick Passaro, Lisa Dabek, Edward Vrkic (UNDP), Julie Hulama (USAID); Front row, from left: Penny LeGate, U.S. Ambassador Catherine Ebert-Gray, Alejandro Grajal (WPZ). Photo by US Embassy to PNG.
Woodland Park Zoo President and CEO Alejandro Grajal discusses the birds of Papua New Guinea with YUS Junior Rangers in Yawan village. Photo by Penny LeGate.
Penny LeGate received a warm welcome at the Wasaunon research site during her visit to YUS. Photo by Lisa Dabek, TKCP.

TKCP's Successes in 2018

2018 was an exciting year for YUS and the Tree Kangaroo Conservation Program!

TKCP made great strides in its research of Matschie's tree kangaroo ecology, behavior, and conservation status this year. Following the successful pilot deployment of three advanced GPS tracking collars developed in partnership with Microsoft engineer Doug Bonham, TKCP's Lisa Dabek, Daniel Solomon Okena, and Nicholas Wari led a multidisciplinary field research expedition in October. The team fitted eight tree kangaroos with updated, tailor-made collars equipped with GPS tracking and altitudinal sensors, enabling TKCP to collect extensive data on the ecology and behavior of tree kangaroos in the YUS Conservation Area. Additionally, with support from the National Geographic Society, TKCP research partner Jonathan Byers (University of Montana) collected thermal aerial imagery of the YUS Conservation Area using drones and machine learning technology. Together with the data collected by the tree kangaroo collars, the imagery will provide TKCP with a much greater knowledge of the vegetation, species behavior and how the animals interact with their habitat. This information is critically important, informing the management of the YUS Conservation Area to ensure adequate protection for tree kangaroos.

Recognizing that the health of humans, wildlife, and the environment are all interconnected, TKCP continued to build strategic relationships with local and international health-focused organizations to support its "One Health" approach in YUS. TKCP's Community Health & Development Manager, Francisca Yagama, led a series of trainings based on the PNG National Department of Health "Healthy Island" concept to empower local communities to take ownership of their health and to seek community support for health improvements. In November, TKCP organized a week-long training workshop for community health workers, midwives, and peer educators facilitated by a team of international volunteer physicians and local health partners. The physicians equipped participants with essential skills and knowledge regarding a wide range of local health concerns, and provided hundreds of YUS residents with professional health advice. TKCP has also developed a partnership with the University of Washington's Center for One Health Research to further investigate the relationships among human, wildlife, and environmental health and to apply sustainable systems-based solutions in YUS.

Throughout 2018, TKCP collaborated with cooperative development specialist Anand Aithal to build the capacity of the YUS Conservation Coffee & Cocoa Cooperative. Aithal visited PNG several times throughout the year to guide the Cooperative's interim leadership committee in drafting its constitution and soliciting input from its 700+ members across YUS. The Cooperative will hold its first elections in 2019. Through the sale of nearly 30 tons of their shade-grown YUS Conservation Coffee this year, participating farmers earned more than PGK176,000 (approx. US\$55,000) to support their children's school fees, family health expenses, and home improvements.

TKCP and Woodland Park Zoo also received tremendous media attention for our conservation efforts during 2018! Seattle-based journalist Penny LeGate and wildlife filmmaker Joe Pontecorvo traveled to YUS in April, along with Lisa Dabek and Alejandro Grajal, President and CEO of Woodland Park Zoo. TKCP reached many new audiences through feature stories on Seattle Channel's City Stream and through a stunning short film, A Life Among the Clouds. PBS Nature highlighted the program's groundbreaking conservation efforts through several different features on its Facebook page including a live Q&A session with Lisa Dabek and a virtual reality tour of Papua New Guinea's pristine cloud forests. In addition, the unique story of YUS Conservation Coffee was featured through a short CBS local TV news segment in Seattle on National Coffee Day. ■



• A juvenile tree kangaroo waits while TKCP fits its mother with a tracking collar to learn about its home range and behavior. Photo by Lisa Dabek, TKCP.
• Dense ferns and moss in the YUS cloud forest. Photo by Alejandro Grajal, WPZ.

Communities Partnering for a Sustainable Living Landscape

The Tree Kangaroo Conservation Program works together with local communities, responding holistically to the needs of wildlife, people, and the ecosystems on which they depend.

Together with the communities and landowners of YUS, TKCP developed five strategies to guide the efforts of TKCP and our partners to ensure the sustainable health and prosperity for the living YUS landscape including its biodiversity, people, and culture.



ONE: Managing the YUS Conservation Area

The YUS Conservation Area was created to protect wildlife and biodiversity. TKCP works with the PNG government and YUS community to support its effective management through YUS Conservation Ranger patrols, ecological monitoring, and mapping of the landscape. Local communities are engaged in the protection and management of the YUS Conservation Area.

TWO: Applying Our Research

Scientific research of species and ecosystems helps TKCP to better understand conservation threats and guides priorities in YUS. A broad range of research topics are investigated by TKCP, partners, and outside researchers. In addition to TKCP's ongoing studies of tree kangaroo ecology, research studies examine ecological and social questions to guide local initiatives and contribute to the global scientific knowledge of the species, ecosystems, and anthropology of YUS.

THREE: Sustainable Resource Management

The people of YUS depend upon their land and natural resources for food, water, shelter, and livelihoods. TKCP assists communities in land-use planning to ensure long-term sustainability and access to resources. Managing the responsible use of the forest products, wildlife, and water across the YUS landscape will ensure the communities' continued commitment to protecting the YUS Conservation Area.

FOUR: Supporting the YUS Communities

The people of YUS are an integral part of the living YUS landscape. TKCP works with communities to address their need for sustainable livelihoods, access to health, education, and skills training. In partnership with the government, businesses, and other NGOs, TKCP builds connections to provide YUS communities with alternative opportunities which build local resilience and reduce conservation threats.

FIVE: Operating the Tree Kangaroo Conservation Program

The protection of the YUS landscape relies on the effective management, expertise and local leadership of TKCP's efforts. TKCP is committed to building sustainable resources and staff capabilities in PNG to maintain long-term support for the landscape and people of YUS.



Managing the YUS Conservation Area

The YUS Conservation Area (CA) is managed in partnership among TKCP, the YUS community, and the PNG government. To ensure the effectiveness of the YUS CA, TKCP manages the YUS Conservation Ranger team and the Ecological Monitoring Program, conducts community awareness-raising and mapping, and facilitates the YUS Conservation Area Management Committee.

YUS Conservation Area Rangers

TKCP's team of 18 YUS Conservation Area Rangers is responsible for patrolling and monitoring wildlife in the YUS Conservation Area. Nominated by their communities and trained by TKCP, the YUS Rangers spend one week each month patrolling areas and gathering data regarding the presence or absence of priority indicator animal species key to achieving conservation goals. In addition, the YUS Rangers raise community awareness regarding conservation needs and priorities in YUS, and check for potential violations of the bylaws governing the YUS Conservation Area.

The YUS Conservation Area Ranger program is one of Papua New Guinea's most robust, developed protected area ranger programs, and is innovative in its approach to incorporate local knowledge with internationally-recognized standards for protected area management. In order to build upon the program's six years of experience conducting patrols throughout the YUS Conservation Area, TKCP is incorporating the use of the Spatial Monitoring and Reporting Tool (SMART) system to improve the collection, management, analysis, and application of patrol data. Following the development of a tailor-made SMART database for the YUS Conservation Area and a series of introductory trainings for the YUS Rangers during 2017, TKCP invited SMART training specialist Paul van Nimwegen to YUS in January 2018. Based on his review of TKCP's system design and capacity, van Nimwegen provided the YUS Ranger team with targeted guidance and hands-on assistance

in data collection using the SMART handheld field computers. To support TKCP's Daniel Solomon Okena to operationalize and administer the system for the YUS Conservation Area, van Nimwegen also provided guidance and recommendations for the development of standardized analyses and reporting formats. The YUS Rangers utilized the SMART data collection devices during their patrols throughout 2018, which covered more than 1,400 km within the YUS CA. These preliminary data have been highly valuable to the continued development of the SMART system for YUS, as Okena and the team are better able to analyze for patterns, trends, and outliers which will inform the focus of future YUS Ranger trainings. As the only protected area in PNG utilizing the SMART methodology, TKCP and the YUS Conservation Area are serving as a pilot and a model for PNG's Conservation & Environment Protection Authority (CEPA) to consider roll-out of the system in other protected areas throughout the country.

In November, Okena was invited to present at the first PNG National Ranger Forum, organized jointly by CEPA and the United Nations Development Program. Okena shared TKCP's experiences in establishing its YUS Conservation Area Ranger program including its patrol protocols and the application of SMART. TKCP is eager to collaborate further with CEPA to support the development of a national standard for protected area rangers in Papua New Guinea.



Left to right:
SMART specialist Paul van Nimwegen demonstrates patrol data entry for several YUS Conservation Area Rangers. Photo by Daniel Solomon Okena, TKCP.

Van Nimwegen advises TKCP Conservation Officer Victor Eki in downloading and analyzing YUS Ranger patrol data using the SMART system. Photo by Daniel Solomon Okena, TKCP.

Drone image of the YUS Landscape from TKCP's Wasaunon research site (foreground, right) to the coast in the distance. Photo by Jonathan Byers.

Governing the YUS Conservation Area

YUS CONSERVATION AREA MANAGEMENT COMMITTEE

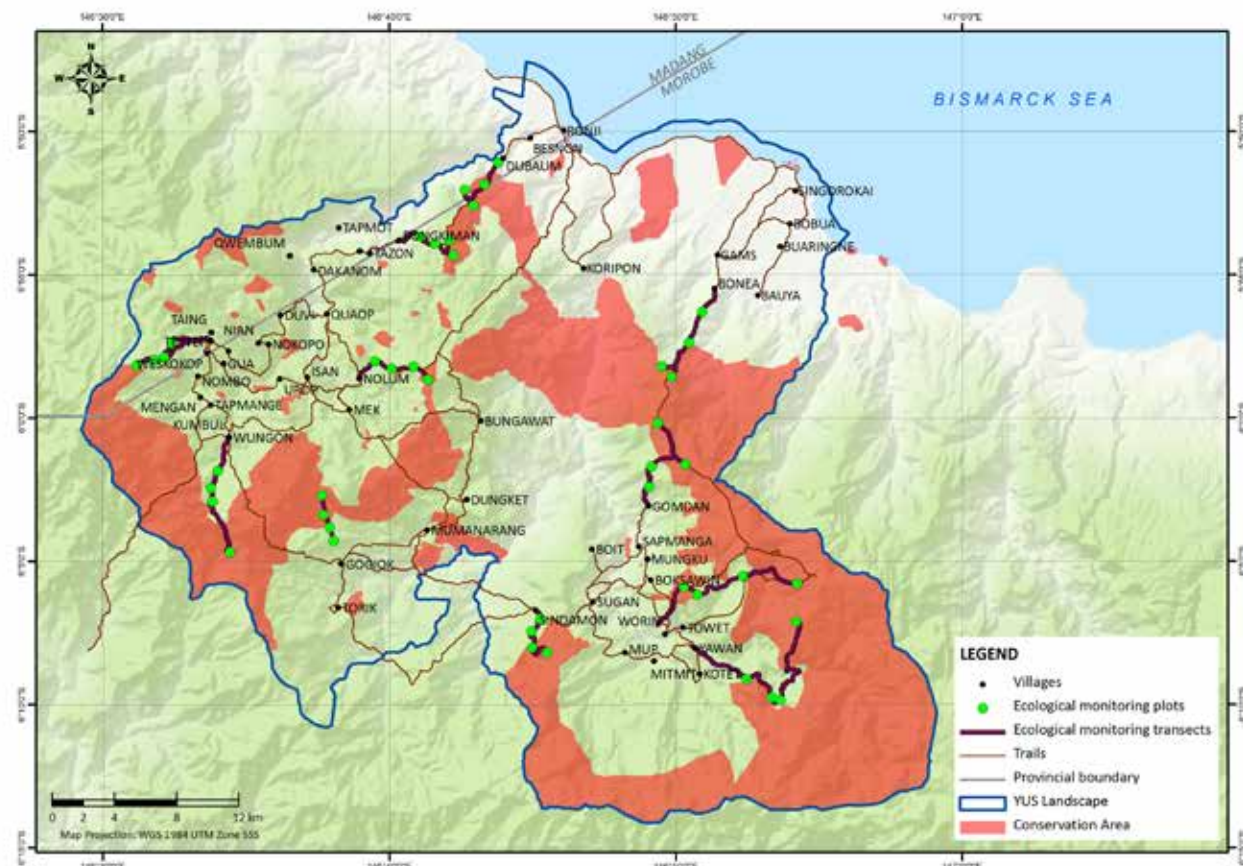
As required by the PNG Conservation Areas Act, the YUS Conservation Area Management Committee represents all stakeholders in decision making for long-term management of the protected area. The committee's members include:

- Landowner representatives from the YUS Conservation Organization
- President of the YUS Local Level Government
- President of the Wasu Local Level Government
- Kabwum District representative
- Morobe Provincial Government representative
- Conservation & Environment Protection Authority (CEPA) representative (National Government)
- Program Manager of Tree Kangaroo Conservation Program

The YUS Conservation Area Management Committee (CAMC) is responsible for facilitating communication among the various stakeholders of the YUS Conservation Area, from the grassroots level to the national government's Ministerial level. The committee meets twice a year to provide strategic direction for and to oversee management of the YUS Conservation Area.

In April, the YUS CAMC met in Port Moresby to discuss progress and plans for the re-gazettal of the YUS Conservation Area at the landscape level, incorporating the entire 390,000-acre landscape including all land-use categories. During the meeting, the CEPA representatives advised that TKCP submit a formal letter of intent to CEPA regarding the re-gazettal. During the 2nd biannual CAMC meeting held in September in Gogiok village, CAMC representatives Beside Thomas and Madeline Lahari affirmed the Authority's strong support for landscape-level re-gazettal in accordance with PNG's Protected Areas Policy and the pending Protected Areas Bill. As advised during the meeting, TKCP submitted the current boundaries and coordinates of the YUS Landscape to CEPA for inclusion in its YUS CA dossier. TKCP is grateful for CEPA's support and commitment to shepherding the YUS CA through its re-gazettal process.

During its September meeting, the YUS CAMC also approved plans for the installation of signage throughout YUS to demarcate and raise local awareness of the YUS Conservation Area's boundaries and bylaws. Based on feedback from the YUS Ranger team, TKCP expects that the signage will assist in further reducing unintentional bylaw violations among the YUS community. The signs will be installed at select access points in YUS in early 2019.



YUS is a "living laboratory," with 11 established monitoring transects to support the YUS Ecological Monitoring Program. Map by Karau Kuna, TKCP.

YUS Ecological Monitoring Program

The YUS Ecological Monitoring Program was first established in 2011. Following a second round of field data collection led by Okena during 2016-2017, TKCP collaborated with graduate student Thomas Luypaert (University of Florence, Italy) to complete statistical analyses of the Ecological Monitoring data for comparison with findings from 2011. Focused on priority indicator species including the Matschie's tree kangaroo and other macropod species, possum species, and dwarf cassowary, the analyses provided TKCP with its first time-over-time comparison of the YUS Conservation Area's effectiveness in protecting wildlife. The findings indicated that tree kangaroo populations remained stable between 2011 and 2017, and that several other species including cuscus showed higher population levels in the protected areas as compared to buffer and livelihood zones. Luypaert's graduate thesis, based on the Ecological Monitoring data and analyses, provided TKCP with observations and recommendations

regarding alternative monitoring and analysis methods to further strengthen the YUS Ecological Monitoring Program in the future.

Through Okena's fellowship with the Zoological Society of London's Evolutionarily Distinct and Globally Endangered (EDGE) program, TKCP incorporated monitoring of the critically-endangered long-beaked echidna (*Zaglossus bartoni*) into the YUS Ecological Monitoring Program. Based on the long-beaked echidna data gathered during 2016-2017, Okena completed his fellowship by statistically analyzing the presence of the species in YUS. While the small amount of data limited Okena's ability to draw conclusive findings, his observations provide TKCP with a baseline for potential future monitoring efforts. Okena valued his fellowship experience highly, as the technical guidance and exposure to the methods used by other wildlife biologists around the globe will serve him well as one of PNG's leading conservationist biologists.

Marine Ecosystem Protection

While TKCP's conservation efforts originated in its mountainous cloud forests, the YUS Conservation Area protects habitat stretching down to the area's coastal reefs and nearshore waters. Two of the 18 YUS Rangers focus their patrols and monitoring efforts on the protected marine areas of YUS. In June, Okena visited the Nambis Zone in YUS to collect monitoring data relating to key marine species and habitats and to provide targeted training for YUS Marine Rangers Aramani Amos and Nas Narawase. In October, TKCP invited Australia-based natural & cultural resource management specialists Anne O'Dea and Steve Winderlich with Windydea Professional Services and Consultants to train Okena and the two YUS Marine Rangers on sea grass monitoring methods. The trainings built on the knowledge and skills shared during trainings led by Windydea in 2017. In 2019, TKCP will incorporate its marine monitoring protocols and target species into the YUS Conservation Area's SMART system. ■



TKCP Research & Conservation Manager Daniel Solomon Okena advises the YUS Marine Rangers on monitoring methods and species identification. Photo by TKCP.

TKCP's YUS Marine Rangers monitoring sea grass in a protected reef area of YUS CA. Photo by Daniel Solomon Okena, TKCP.

Chris Max, TKCP Conservation Officer for the Nambis (coastal) Zone (left) is supporting the integration of marine monitoring protocols into the SMART system. Photo by Daniel Solomon Okena, TKCP.



Applying Our Research

TKCP is committed to science-based conservation. TKCP works to advance scientific knowledge of Papua New Guinea's wildlife and rain forest habitat so that the YUS Conservation Area can be managed in an ecologically sound and sustainable manner. TKCP conducts research on tree kangaroo ecology, facilitates collaborative research partnerships, and promotes YUS as a site for environmental and social research from outside researchers.

Tree Kangaroo Ecological Research

2018 was a milestone year for TKCP's research efforts to increase the scientific community's understanding of Matschie's tree kangaroo ecology, behavior, and conservation status. Based on the data collected during the pilot deployment of three advanced tracking collars between October 2017 and April 2018, TKCP's Lisa Dabek and Daniel Solomon Okena again collaborated with Microsoft engineer Doug Bonham to upgrade and refine the design of the custom tracking collars to meet the team's data collection needs and to perform in the challenging conditions of the YUS cloud forest. In October, Dabek, Okena, TKCP Research Assistant Nicholas Wari, and the rest of the team returned to the Wasaunon research site and fitted eight tree kangaroos with the second-generation collars. Equipped with GPS tracking and altitudinal sensors, the new collars automatically transmit the animals' locations to the

TKCP research team via satellite despite the thick canopy. As a result, TKCP is able to capture a substantial amount of data that cannot be collected using the traditional VHF-equipped collars, and on a much more frequent basis, which is expected to provide great insight into the species' activity budget, feeding behavior, home range, and ecology.

To further support the TKCP research team's efforts and maximize the opportunity to collect valuable data during the collaring of eight tree kangaroos, field veterinarian Dr. Carol Esson, radiologist Dr. Rob Liddell, and botanist Oliver Paul (PNG Forest Research Institute) also joined the group at Wasaunon in October. Dr. Esson collected biological samples and conducted general health assessments of each tree kangaroo prior to collaring and release, while Dr. Liddell examined the animals using portable ultrasound and x-ray



machines – capturing the first-ever medical images of wild tree kangaroo skeletal conditions, digestive tracts, and more. The images provide new information regarding the health and biology of tree kangaroos in the wild, and will also contribute to the knowledge base for the care and treatment of tree kangaroos at zoos around the world.

To support an ongoing collaborative research project among TKCP, the AZA Tree Kangaroo Species Survival Plan (TK-SSP), and nutritionist Ellen Dierenfeld, the Forest Research Institute's Oliver Paul joined the team at Wasaunon to assist in the collection and identification of tree kangaroo food plants. Paul provided firsthand expertise in the collection of samples and identification of plant species, as well as equipping TKCP's local research assistants with new knowledge and skills relating to botany and field specimen collection. With a strong familiarity with tree species in YUS, Paul's input was also valuable to train the drone imaging sensors to automatically label various species in the large-scale three-dimensional digital maps for correlation with the tree kangaroo movement data generated by the tracking collars.

6 Clockwise from top left: Tree kangaroo field research team at Wasaunon field camp. TKCP is tremendously grateful for its team of researchers, research assistants, and partners. Photo by TKCP. TKCP collected tree kangaroo food plants to better understand the species' diet and nutrition, in collaboration with the AZA Tree Kangaroo Species Survival Plan. Photo by Lisa Dabek, TKCP. From left: Hunter and local naturalist Eki Nimoniong, Daniel Okena, Stanley Gesang, and FRI botanist Oliver Paul gather tree kangaroo food plants at Wasaunon. Photo by Lisa Dabek, TKCP. Long claws help Matschie's tree kangaroos move quickly in the trees. Photo by Lisa Dabek, TKCP. TKCP Tree Kangaroo Research Assistant Nicholas Wari (right) and YUS research assistant Jux Faniong. Photo by Lisa Dabek, TKCP. From left: Field Veterinarian Carol Esson, Lead Tracker Stanley Gesang, and TKCP Director Lisa Dabek prepare to release a collared tree kangaroo. Photo by TKCP.

With support from the National Geographic Society, TKCP research partner and graduate student Jonathan Byers (University of Montana) joined the research team at Wasaunon in October to deploy drones equipped with multispectral and thermal imagery sensors capable of producing three-dimensional maps of the landscape and the forest canopy. By combining these data with those gathered by the tree kangaroo tracking collars and information about tree species, Byers developed machine learning algorithms and utilized Microsoft's Azure cloud computing platform (through an in-kind

grant from Microsoft's AI for Earth program) to provide unprecedented insights into Matschie's tree kangaroo behavior and interaction with its habitat. This "big data" integration of information places TKCP at the cutting-edge in terms of the application of technology for ecological research, and the methods present a new methodology for researchers studying endangered and elusive species around the globe. In 2019, Byers and TKCP will collaborate with the National Geographic Society to produce visual media highlighting this exciting research endeavor.



By combining drone imagery, tree species data, tree kangaroo collar data, and machine learning algorithms, TKCP is gaining incredible new perspectives on tree kangaroo ecology. *Photo by TKCP.*
Jonathan Byers assembles equipment for TKCP's National Geographic-funded research project. *Photo by Rob Liddell.*

Tree Kangaroo Distribution and Abundance

TKCP is highly committed to determine an accurate, up-to-date analysis of the distribution and abundance of the Matschie's tree kangaroo in YUS and across its range on the Huon Peninsula in order to better assess the YUS Conservation Area's effectiveness in safeguarding the species. Because of their elusive nature and the extremely rugged mountainous landscape, traditional counting methods are not feasible or appropriate. To overcome this challenge, TKCP has partnered with Dr. Falk Huettmann, Associate Professor in Wildlife Ecology with the Institute of Arctic Biology at the University of Alaska Fairbanks, to undertake a comprehensive three-year analysis of the Matschie's tree kangaroo's range, distribution, and abundance. Huettmann's innovative predictive modeling methods have proven effective for other species in vast or otherwise inaccessible areas including the ocean, the Antarctic, Siberia, and elsewhere. In October, Huettmann returned to YUS to gather additional data along the YUS Elevational Transect which stretches from the coast to the high mountains in the Uruwa zone. TKCP's Nicholas Wari and Robson Soseng assisted in the data collection, which will be incorporated into a multi-layered GIS map to inform the predictive modeling algorithm regarding Matschie's tree kangaroo abundance and distribution. Analyses of this complex data will be powered by Microsoft's Azure cloud computing platform with the support of an in-kind grant from Microsoft's AI for Earth program. Huettmann will visit YUS again in 2019 for a final field visit to address remaining data gaps and further refine the model, prior to finalizing the results of the three-year study. TKCP looks forward to sharing the indicative distribution and abundance based on the predictive modeling methods, and continuing collaborations with the scientific community to expand on the data set in the future. ■

Radiologist Dr. Rob Liddell and Field Veterinarian Carol Esson x-ray a tree kangaroo, using a portable x-ray machine provided through MinXray with the support of Imaging for a Cause Foundation. *Photo by Lisa Dabek, TKCP.*
Dr. Liddell examines the digestive tract of a Matschie's tree kangaroo with the help of a portable ultrasound machine provided by the Center for Diagnostic Imaging. *Photo by Lisa Dabek, TKCP.*
One of the first-ever x-ray images of a wild Matschie's tree kangaroo. The insights gained from these images are of great value to the conservation of the species, informing scientific knowledge of their biology and supporting the care of tree kangaroos among AZA institutions. *Image by Dr. Rob Liddell and MinXray.*





Sustainable Resource Management

Protecting the biodiversity and habitat of YUS requires coordinated commitment and action across the entire landscape, both in and around the YUS Conservation Area. To sustain the needs of local communities, the natural resources and services provided by the environment beyond the protected area must be maintained for the benefit of current and future generations. TKCP facilitates the development of land-use and community-based monitoring plans to ensure long-term sustainability and access to resources.

Ward-level Land-use Planning and YUS Landscape Management

TKCP works together with villages across YUS to develop Land-use Plans (LUP) which define community priorities for conservation and development. Through this process, community members establish zoning maps to guide local resource management decisions and outline specific activities relating to their ward's goals. TKCP's Land-use Planning process is widely recognized as an effective model for engaging communities in conservation efforts, particularly in the context of Papua New Guinea's customary land tenure system.

As TKCP is currently working with YUS landowners and the PNG government to re-gazette the YUS Conservation Area at a landscape level, the land-use zones and resource management decisions defined in the Land-use Plans will be further integrated into the overall framework for the management of the YUS Conservation Area.

In August, TKCP welcomed its new Conservation Strategies Manager Warren Jano to the team. Jano will assist with the YUS Conservation Area's landscape-level re-gazettal process together with the YUS Conservation Area Management Committee, and will facilitate the development of its management mechanisms. In preparation for the integration of the Land-use Planning process into the YUS landscape

management structure, TKCP is working to further expand on the local community's engagement in land-use management decisions using Participatory 3D Modeling (P3DM). By soliciting the various perspectives and priorities of the many groups within the YUS community regarding their natural resource needs and uses, TKCP and community leaders are better equipped to mobilize local efforts in support of sustainable resource management. Following positive community feedback for a pilot workshop in Yawan village and the construction of a large 3D relief model of the ward I landscape in late 2017, Jano and TKCP Manager Rick Passaro secured the commitment of PNG-based P3DM specialists Partners With Melanesians to facilitate a series of workshops in YUS throughout 2019. The 3D models will serve as valuable resources and tools for the communities to manage and monitor local adherence to their Land-use Plans, and to prompt discussion for the development of their next five-year LUPs.

TKCP is also helping the YUS community and the YUS Local Level Government to roll up the ward-level Land-use Plans into Local- and District-level planning, which can support the communities' conservation and development priorities through the budgeting and allocation of District funds. ■



What surprised me most about YUS was, first, the area is incredibly well-conserved. I saw nearly pristine primary cloud forests—the kinds that are hard to find anywhere in the world. Second, the generosity and pride that the people of YUS show about their conservation ethic and conservation planning. The work they are doing to figure out the balance between conservation and economic progress and health—it's a struggle just as it is for anybody—but they are very optimistic.

Alejandro Grajal – Woodland Park Zoo
President and CEO



Clockwise from top left:

TKCP Director Lisa Dabek (right) admires the 3-D model of Upper Uruwa Zone together with TKCP's Dono Ogate. Photo by Alejandro Grajal, WPZ.

Waterfall in YUS. Photo by Penny LeGate.

TKCP Lead Conservation Officer Timmy Sowang presents and discusses the land-use plan for ward 1. Photo by Francisca Yagama, TKCP.

Alejandro Grajal (left) and TKCP Manager Rick Passaro studying Upper Uruwa Zone's 3-D model and discussing the participatory process involved in its creation. Photo by Lisa Dabek, TKCP.



Supporting the YUS Communities

To ensure the long-term sustainability of the YUS Conservation Area, local communities must participate in and benefit from its protection. To encourage community engagement and sustainable development, TKCP builds partnerships to address local needs for livelihoods, health, education, and skills training. These partnerships provide increased access to essential services, access to markets and technical knowledge, and support for local leadership of conservation efforts.

Livelihoods

YUS CONSERVATION COFFEE

With the expansion of TKCP's YUS Conservation Coffee initiative to include nearly all villages in the coffee-producing areas of YUS over the last several years, the additional income generated as a result of the project plays an important role in garnering community commitment to local conservation efforts. Participating farmers collectively produced nearly 30 tons of parchment coffee during the 2018 season, leading to a total revenue of more than PGK275,000 (approximately US\$86,000) and direct farmer income of PGK176,000 (approximately US\$55,000). Funding provided by the Morobe Provincial Government through the Coffee Industry Corporation's Freight Subsidy Scheme supported 40% of the cost of air freight out of YUS. As one of the only sources of cash income for the participating villages, farmer earnings through the sale of YUS Conservation Coffee help families to pay for their children's school fees, cover health costs, improve

their homes, establish savings, and reinvest in their livelihoods. TKCP works with specialty coffee trading specialists from MTC International Coffee Group, and YUS Conservation Coffee is sold to Seattle's Caffe Vita in the United States and to Jasper Coffee in Melbourne, Australia.

To enable the project's continued growth and to ensure effective quality management, TKCP Coffee Operations Specialist Karl Aglai guided YUS Conservation Coffee farmers to organize into cluster groups with 15-25 farmers each. The cluster arrangement allows for a greater degree of standardization during coffee processing, and establishes a more reliable structure to support the project's management and communication. Aglai also organized a series of technical and management trainings for cluster leaders and village-



level quality inspectors which focused on key improvement areas including centralized production, quality control, traceability, and cluster-level record-keeping systems. During the workshops, Aglai also collaborated with BSP Bank's Rural Banking Program to assist YUS farming families and other community members to establish bank accounts. By linking farmers with bank accounts and facilitating the creation of a community banking ecosystem through BSP's Agent Network, people in YUS will gain better access to financial services and the challenges involved in the coffee payment distributions system will be substantially reduced. Aglai collected bank account applications from all YUS Conservation Coffee farmers during 2018, and will continue to coordinate with BSP Bank to establish the rural banking network.

In August, TKCP's WPZ-based Program Manager Trevor Holbrook visited YUS with Caffe Vita's Green Coffee Buyer



C Clockwise from top left:
Caffe Vita's Mason Sager (left), TKCP's Karl Aglai (2nd from left), TKCP's Namo Yaoro (3rd from left), and coffee farmers in Yopno Zone evaluate the condition of coffee beans drying on beds in the sun. Photo by Trevor Holbrook, TKCP.
A YUS Conservation Coffee farmer turns coffee beans to ensure proper drying. Photo by Gemina Garland-Lewis.
Coffee cherries ripening on the tree in YUS. Photo by Gemina Garland-Lewis.
TKCP's Karl Aglai (center) and coffee farmer Koki Biam (2nd from left) measure the moisture content of coffee beans to ensure quality. Photo by Trevor Holbrook, TKCP.
YUS Conservation Coffee is hand sorted to select only the best quality cherries. Photo by Trevor Holbrook, TKCP.
TKCP's Karl Aglai advises farmers on best practices for selective harvesting and sorting. Photo by Trevor Holbrook, TKCP.



Mason Sager, Zoos Victoria's International Conservation Partnerships Manager Chris Banks, and Aglai ahead of the 2018 coffee shipment. The group visited with YUS coffee farmers, coffee inspectors, and others to review the status of the year's production and consider the needs and priorities for the project's continued development. TKCP intern, YUS resident and recent university graduate Danny Nanne also joined the group to commence his three-month project to develop and refine TKCP's "citizen science" (coffee farmers) monitoring of wildlife in coffee gardens throughout YUS. The group spoke with several farmers about the approaches they take to maintaining wildlife-friendly gardens. Following their visit to YUS, the group traveled to Goroka to discuss plans for the 2018 shipment with project partners including Adventist Aviation Services, New Guinea Highlands Coffee Exports, and the Coffee Industry Corporation. Caffé Vita's Mason Sager, MTC's Harrison Koch, and New Guinea Highlands' Shane Ritchie organized a coffee cupping to evaluate the quality of each cluster's 2018 crop, and provided feedback for continued quality improvement. Aglai then returned to YUS to organize the first qualitative analysis coffee cupping in YUS with inspectors and cluster leads, highlighting the differences observed and discussing the impact of quality control throughout the production process. TKCP is eager to build the technical proficiency of the YUS Coffee Inspectors through increasing exposure to the industry in the PNG Highlands.



YUS CONSERVATION COCOA

While the growth and success of the YUS Conservation Coffee initiative has generated considerable income and benefits for many of the higher-elevation (1,000m+) villages throughout the Yopno, Uruwa, and Som zones of YUS, the low elevation communities in and around the Nambis zone rely primarily on the production of cocoa for their cash income needs. Through a partnership with PNG's Queen Emma Chocolate Company (a subsidiary of Paradise Foods), YUS cocoa farmers are able to sell their crops directly to Queen Emma's warehouse in Madang at a premium price. Queen Emma produces and sells the chocolate as a premium, single-origin bar labeled "YUS Kakao," which is available through multiple outlets across PNG including the Port Moresby airport and grocery outlets in Lae.

In late 2018, TKCP contracted PNG-based conservationist and cocoa specialist Francis Hurahura to carry out a thorough assessment of the production capacity and market conditions in YUS. Hurahura has been instrumental in developing a cocoa cooperative and growing its business in his home province of Bougainville. Following an initial visit to Lae in December to plan the assessment process with TKCP Conservation Officers Timmy Sowang and Chris Max, Hurahura will visit with farmers in the Nambis zone and investigate the cocoa market in Madang in early 2019. TKCP looks forward to expanding its YUS Conservation Cocoa project over the coming year to connect more conservation farmers with the opportunity to increase their incomes.



YUS CONSERVATION COFFEE AND COCOA COOPERATIVE

TKCP's efforts to improve the sustainable livelihoods of families in YUS have spread across the landscape over the last several years, and now provide conservation-based benefits for more than 700 participating families. Looking forward, both TKCP and the YUS communities agree that the ultimate long-term success of this initiative relies on its local ownership and independent management. To achieve this goal, participating farmers are working to organize together under the banner of the YUS Conservation Coffee and Cocoa Cooperative, first established in 2017. To support the Cooperative's development TKCP contracted Anand Aithal, a specialist with extensive experience in establishing agricultural cooperatives. Aithal visited PNG three times during the course of 2018 to develop a thorough understanding of the YUS context and the core needs and priorities of the YUS Conservation Coffee farmers regarding the role of the budding cooperative. Based on these consultations and in close collaboration with the YUS Cooperative's nominated Interim Committee (Dono Ogate, Namo Yaoro, Ningi Intem, Mete Dondon, Rosengke Boram, and Mandrex Yuasi), Aithal facilitated the creation of the cooperative's constitution, advised on the appropriate structure and function according to the cooperative's core purpose, and provided guidance in preparation for the cooperative's first elections in 2019. Throughout the year, Aithal observed and inquired about the operational processes and functions in place supporting the management of the coffee and cocoa businesses. Aithal emphasized that the terrain, geographic isolation, communication constraints, and diverse cultural dynamics across YUS all pose highly unique challenges which must be factored into the structure, management, and operation of the cooperative. TKCP and the YUS Cooperative will continue to work with Aithal throughout 2019 with a focus on a successful election process, targeted capacity-building for the newly-elected management committee, and the gradual transition of operational and financial responsibility.



Left page, from top left:

YUS Conservation Coffee farmers in Yawan village remove the pulp from their coffee beans. Photo by Penny LeGate.

TKCP Conservation Officer and Chair of the YUS Cooperative's Interim Committee, Namo Yaoro. Photo by Chris Banks, Zoos Victoria.

TKCP intern Danny Nanne (center) and YUS coffee farmers discuss the types of birds and animals seen in their gardens. Photo by Gemina Garland-Lewis.

Caffé Vita's Mason Sager (left) and MTC's Harrison Koch (right) cup YUS coffee at New Guinea Highlands Coffee Exports in Goroka. Photo by Trevor Holbrook, TKCP.

Right page, from top:

Anand Aithal (front) led a series of trainings and workshops with the YUS Cooperative's Interim Committee (back) throughout the year. Photo by Daniel Solomon Okena.

The coffee harvest stretches from May to September in YUS. Photo by Lisa Dabek, TKCP.



Healthy Communities

HEALTHY VILLAGE, HEALTHY FOREST

The 50 villages dotting the YUS landscape are some of the most remote and inaccessible locations in Papua New Guinea, a country well known for its largely remote and isolated populations. Recognizing that the standard systems for healthcare delivery are generally incapable of reaching such remote areas, Papua New Guinea's National Department of Health developed its "Healthy Island" concept that aims to inform and empower individuals, families, and communities to take ownership of their own health and to seek community support for health improvements.

By establishing partnerships with the Morobe Provincial Department of Health, PNG Women in Agriculture Development Foundation, PNG Cancer Relief Society, Colgate-Palmolive PNG, and other health-focused organizations, TKCP Healthy Community Coordinator Francisca Yagama is leading the integration of the Healthy Island concept into TKCP's health programming strategy. Throughout 2018, Yagama facilitated a series of workshops across YUS to provide Village Health Volunteers, Village Birth Attendants (volunteer midwives), and YUS Peer Health Educators with key knowledge and skills relating to nutrition and hygiene, disease prevention,



promotion of personal health, and maintaining a healthy natural environment. During a YUS Peer Health Educator workshop in the Nambis (coastal) zone, Yagama organized a major beach clean-up. Yagama used the opportunity to discuss the environmental impacts of non-biodegradable substances and emphasize the importance of a healthy environment in maintaining human health.

In October, Yagama organized a week-long health training workshop and clinic in Sapmanga village, facilitated by TKCP's

Volunteer Physician Team including Dr. Rob Liddell (radiologist), Dr. Emily Transue (internal medicine), Dr. Carolyn Marquardt (physical medicine and rehabilitation), as well as sessions led by the PNG Cancer Society's Grace Ruddaka, TKCP Director Lisa Dabek, and TKCP's Timmy Sowang. Building on similar workshops conducted in 2014 and 2016, the trainings offer a rare opportunity for Community Health Workers, Village Birth Attendants, and YUS Peer Health Educators to gain new knowledge and skills relating to the most significant health concerns affecting people in YUS. In total, more than 200 participants attended the workshop including 86 Village Birth Attendants and 72 YUS Peer Health Educators from all four zones across YUS.

Based on input from YUS Community Health Workers and Village Birth Attendants as well as the observations and needs identified during previous volunteer physician visits to YUS, the workshop agenda included a range of sessions including:

- Respiratory Disease
- Vaccines
- Birth and Delivery
- Nutrition
- Sexually Transmitted Infections
- Domestic Violence
- Family Planning and Reproductive Health
- Cancer
- Malaria
- Musculoskeletal Disorders
- Environmental Health

The trainings were aided by the use of a portable ultrasound machine (provided by the Center for Diagnostic Imaging), providing participants with a rare glimpse of the position and activity of a fetus in utero. During a special session for the Volunteer Birth Attendants, Dr. Liddell demonstrated the use of the machine and discussed the live images with the help of two volunteer pregnant mothers.

Throughout the week, the visiting physicians also offered medical advice, diagnoses, treatment, and referrals to patients in need. Because there are no doctors in YUS and the local aid posts are severely under-resourced, more than 450 people arrived throughout the week to consult with the physicians. To manage the high demand, the Community Health Workers conducted triage consultations to advise on common concerns and enable the physicians to consult on the most serious cases. For the first time, Dr. Liddell also brought a portable x-ray machine to YUS (through generous support from Imaging for a Cause Foundation, with equipment provided by MinXray) which aided in patient diagnosis and referral. The physicians documented their diagnoses and observations of primary health issues, and expressed their continued concern for the high incidence

of tuberculosis and other respiratory diseases as well as an observed increase in water-borne diseases. Dr. Marquardt brought new expertise in the area of muscular-skeletal health and worked with patients on treatments for knee and back pain. She also led general stretching sessions for all health workshop participants that were very popular. With a clear baseline of the current status of human health in YUS developed through surveys and physician consultations with hundreds of patients, Yagama and TKCP will continue to advocate and strengthen its partnerships with the Morobe Provincial Health Department and other organizations providing healthcare services in PNG in order to improve access in YUS on a regular basis.



Dr. Carolyn Marquardt leads a stretching exercise after observing many cases of muscle pain among residents of YUS. Photo by TKCP. TKCP's Francisca Yagama emphasizes the importance of oral health during a workshop in YUS. Photo by Emily Transue.

Dr. Rob Liddell discusses fetal anatomy with volunteer birth assistants (midwives) in YUS using a portable ultrasound machine. Photo by Lisa Dabek, TKCP. Dr. Marquardt and the volunteer physician team provided training for community health workers, volunteer birth assistants, and peer health educators. Photo by Gemina Garland-Lewis. Dr. Emily Transue (right) and Grace Ruddaka (left) present to an attentive audience during TKCP's One Health workshop. Photo by Lisa Dabek, TKCP.



Left page, top to bottom:

From left: Dr. Carolyn Marquardt, Dr. Rob Liddell, Gibson Gala, Dr. Emily Transue, Hartmut Frenzel, Gemina Garland-Lewis, Cathy Ballew, Lisa Dabek, Danny Samandingke, and Francisca Yagama. Photo by TKCP.

TKCP's Francisca Yagama distributes hygiene kits provided by Colgate-Palmolive PNG to kids in YUS. Photo by TKCP.

Dr. Emily Transue and the volunteer physician team consulted with hundreds of patients during TKCP's week-long One Health workshop. Photo by TKCP.

Right page, top to bottom:

TKCP's Gibson Gala (right) leads YUS Junior Rangers in a song about health and their environment. Photo by Emily Transue.

A highly dedicated group of community volunteer facilitators delivers the YUS Junior Ranger Program. Photo by Chris Banks, Zoos Victoria.

TOWARDS A ONE HEALTH APPROACH IN YUS: HUMAN, WILDLIFE, AND ENVIRONMENTAL HEALTH

"Because the YUS Conservation Area is so remote, most resources must come from the landscape, creating a close relationship among the health of humans, wildlife, and the environment. We want to develop local capacity to provide for basic health needs, and help show the links among human, environmental and animal health." – Dr. Rob Liddell, Radiologist and TKCP volunteer physician

By linking our health initiative with our community-based conservation efforts and messaging, TKCP emphasizes the critical importance of maintaining a healthy environment and sustaining biodiversity in order to protect the natural resources and ecosystem services upon which the communities of YUS depend for their own health and well-being.

To gain a deeper understanding of the interactions among people, animals, and the environment as well as the local knowledge and perspectives regarding health risks and remedies, TKCP has developed a partnership with the University of Washington's Center for One Health Research under the leadership of Dr. Peter Rabinowitz. TKCP Healthy Community Coordinator Francisca Yagama traveled to Seattle, USA in June to discuss the partnership with the Center for One Health Research, and to meet with a number of organizations in the global health sphere including PATH and the Global Alliance to Protect Prematurity and Stillbirth. In October, Center for One Health Research representative Gemina Garland-Lewis accompanied the group of volunteer physicians during the Health Workshop in Sapmanga village. During her visit, Garland-Lewis collected information based on initial observations, interviews, and consultations with a range of stakeholders to inform the development and tailoring of a Global Assessment of Zoonotic and Environmental Risks (GAZER) survey appropriate to the YUS context. The GAZER survey tool is designed to identify determinants of healthy coexistence between human and animal populations, including sharing of microbiomes among humans, animals, and the environment. Garland-Lewis investigated the various types of common interactions with animals including dogs, cats, poultry, pigs, and wildlife, as well as interactions with the environment including drinking water sources, hygiene and sanitation practices, waste management, traditional medicines, diet and nutrition, and more.

TKCP and the Center for One Health Research will pursue funding in 2019 to design and conduct a thorough GAZER survey in YUS, in addition to complementary anthropological and microbiome research to capture both the cultural aspects including traditional knowledge as well as scientific data regarding the potential presence of common microbiomes among people and animals.



Education and Capacity-Building

YUS JUNIOR RANGERS

TKCP's Junior Ranger Program fosters an appreciation for the environment and instills the value of stewardship among the next generation of leaders and decision-makers in YUS. Evidenced by its "YUS is Special" tagline, the program engages youth and children in lessons and activities which highlight the beauty, importance, and intrinsic value of the YUS landscape. Incorporating elements of both traditional ecological knowledge and scientific research methods, the YUS Junior Rangers participate in a wide range of community projects relating to conservation including species identification, resource planning, tree planting, and more.

Built upon a strong desire among parents and leaders in YUS to engage children in productive extracurricular activities, the YUS Junior Ranger Program is led by community volunteer "teachers" and tailored to fit the specific priorities and interests of each village. The program has grown and expanded substantially since its inception in 2016, and now boasts more than 425 YUS Junior Rangers participating through 34 classes across all four zones in YUS. While the majority of the YUS Junior Rangers are between the ages of 5 and 10 and participate in addition to their primary schooling, the program is also engaging more than 150 youth ages 11-18 and beyond who are not able to continue their formal education beyond 8th grade. These participants have expressed a great appreciation for the program, as it provides the opportunity



I feel that nothing is more important than working with these kids and spending time with them. I envision a generation of leaders rising up as leaders and stewards of their land, sea, rivers, and wildlife.

Gibson Gala – TKCP Education and Leadership Coordinator



to gain new skills and confidence which will enable them to become positive members and leaders within their communities.

TKCP's Education and Leadership Coordinator Gibson Gala visited all four zones in YUS during 2018 to provide refresher trainings for the 110 volunteer YUS Junior Ranger teachers, to observe their sessions, and to gain a thorough understanding of each community's individual needs and priorities for tailoring the lesson plans in their area. Gala also developed and distributed various supplies and materials including YUS conservation card games and activity booklets to the volunteer teachers to support the YUS Junior Ranger curriculum and lesson plans. Across YUS, the community's level of support for the program is stunning: classrooms have been constructed and beautifully decorated by the volunteer teachers and parents; lessons and field activities are adapted, created, and led by community members; and volunteers continue to dedicate many hours each week to maintain a fun, welcoming, and educational atmosphere in each of the 34 YUS Junior Ranger classes.

The YUS Junior Ranger Program is already garnering interest among other communities and organizations in Papua New Guinea, recognizing its suitability and relevance for many communities throughout the country. As the majority of the country's population lives in rural and remote areas, maintaining both a dependence on natural resources and a strong cultural bond to their landscapes, the program offers a unique approach blending local perspectives with age-appropriate science-based education.



BALOB TEACHER'S COLLEGE SCHOLARSHIP FOR YUS STUDENTS

Since 2002, TKCP has provided financial support for successful student candidates from YUS to earn teaching certificates through Balob Teacher's College in Lae. Originally established in partnership among TKCP, YUS LLG, and Balob Teacher's College, the program was created in response to an alarming shortage of teachers in YUS which had forced the closure of many village primary schools. Through the scholarship program's support, 34 YUS students have received their teaching certification. With the commitment of YUS LLG, Kabwum District, and Morobe Provincial governments, many of these teachers have returned to re-open primary schools throughout YUS, providing children with greater access to educational opportunities. In addition to the financial scholarship provided through TKCP, Balob Teacher's College has also agreed to provide several dedicated enrollment allocations for self-funded students from YUS. In recent years, an additional seven students from YUS have enrolled under this allocation.

TKCP's Balob Teacher's College scholarships are awarded on an annual basis, with candidates selected by a committee comprising YUS landowners and community representatives. In 2018, the following committee members were elected to serve through 2022:

- Gideon Nongi – *YUS Conservation Organization Vice President*
- Posoepe Gue – *YUS Conservation Organization Education Chairman*
- Tapita Berese – *YUS Conservation Organization Women's Representative*
- Fisiyu Rubape
- Sawang Isap
- Yaungkeyu Yapit
- Gibson Sil Gala – *TKCP Education & Leadership Coordinator*
- Dono Ogate – *TKCP Community-Based Organization Coordinator*
- Balob Teacher's College Administrative Representative



YUS-LUMMI CULTURAL EXCHANGE

The culture, heritage, and traditions of indigenous communities in the Yopno-Uruwa-Som (YUS) landscape on the north coast of the Huon Peninsula are an integral part of the YUS ecosystem. Through a deep cultural connection to their landscape and wildlife, the YUS communities have developed traditional methods for maintaining balance and using natural resources sustainably. To gain a greater understanding of the cultural values and perspectives regarding environmental stewardship in YUS, TKCP is collaborating with the Lummi Nation – a Native American tribe in the Pacific Northwest with a strong record advocating for environmental protection and indigenous rights – to facilitate an exchange of cultures, histories, and traditional knowledge.

In October, Lummi Nation representative Cathy Ballew accompanied TKCP and the volunteer physician team to Sapmanga during the health training workshop to initiate the relationship between Lummi and YUS, and to learn about local knowledge and use of traditional medicines. Following her visit, Ballew shared her observations and impressions within the Lummi community and expressed excitement for the opportunities presented by the new relationship. She also extended an invitation for representatives from YUS to join the annual Salish Sea Canoe Journey in July 2019, which will be hosted by the Lummi Nation. To support the integration of culture and traditional knowledge into TKCP's Junior Ranger Program, several volunteer Junior Ranger teachers will participate in the exchange along with other YUS leaders and TKCP staff. ■

Left page, top to bottom:
YUS Junior Rangers in traditional dress for a sing sing welcoming ceremony. *Photo by Trevor Holbrook, TKCP.*
TKCP provides training, curricula, and teaching materials to support the YUS Junior Ranger Program volunteer teachers. *Photo by Lisa Dabek, TKCP.*
The YUS Junior Ranger Program involves classroom lessons as well as outdoor activities. *Photo by Penny LeGate.*
Right page:
Lummi representative Cathy Ballew with Danny Samandingke in Sapmanga village. *Photo by Lisa Dabek, TKCP.*



Operating TKCP

Long-term sustainability of the YUS Landscape and Conservation Area ultimately belongs to the local communities and the government of Papua New Guinea. To support this, TKCP builds local capacities for the leadership and management of conservation efforts. TKCP-PNG serves as a model for community-based conservation, with our approaches and lessons shared for the benefit of local institutions, partners, and the practice of conservation.

Professional and Organizational Development

Woodland Park Zoo continues to provide guidance and support to TKCP's local non-governmental organization (NGO) and implementing partner, TKCP-PNG, in the operational and financial management of the program's activities in PNG. While a substantial portion of TKCP's program funding for PNG is still received and managed through Woodland Park Zoo, TKCP-PNG received direct grant funding for several projects implemented during 2018. With support from WPZ-based Manager Trevor Holbrook, the local NGO successfully completed project implementation and reporting for its grants from the National Geographic Foundation for Science and Exploration – Asia and from the Zoological Society of London's Evolutionarily Distinct and

Globally Endangered (EDGE) Fellowship Program. Both grants supported TKCP's Ecological Monitoring Program including field data collection in 2016-2017 and statistical analyses completed in early 2018.

Having welcomed several new team members to our Lae-based team throughout 2017 and 2018, TKCP's Managers, Coordinators, and Field Officers have demonstrated their excellent abilities in taking ownership of their programs, providing leadership, and supporting the development of a strong sense of teamwork built around their shared passion for conservation and thriving communities. TKCP is eager to provide continued support for our team's professional development and growth over the coming year.


 The Tree Kangaroo Conservation Program team in Ronji village. Photo by TKCP.



Learning and Sharing Our Work

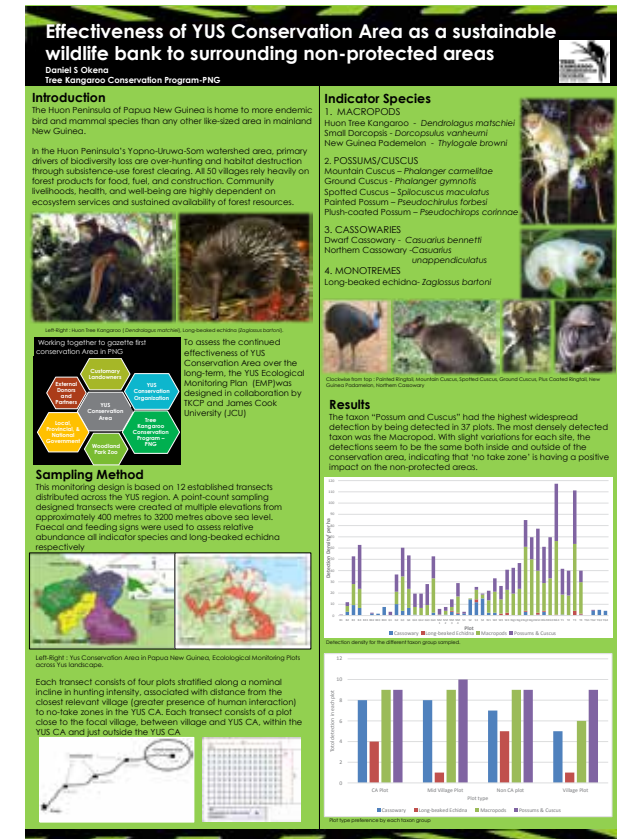
TKCP actively pursues opportunities to share our perspectives with the global conservation community and to learn from the experiences of others. As a champion and leader for conservation in Papua New Guinea, TKCP and its team also serve as strong advocates for local environmental sustainability. In June, TKCP celebrated World Environment Day with students from schools throughout Lae at the Lae Rainforest Habitat. During the event, TKCP staff emphasized the importance of maintaining a healthy environment and shared about the need for responsible consumer choices.

TKCP is eager to expand its presence and influence in Lae in order to increase local awareness and appreciation for Papua New Guinea's incredible wildlife and habitats. The Lae Rotary Club invited TKCP to its meetings in April and November to learn more about our work and to explore possible collaborations. With Rotary International's strong global focus on health, the Lae Rotary Club showed particular interest in TKCP's One Health initiative and its efforts to connect the YUS community with access to health services.

 TKCP's Daniel Solomon Okena presents a poster during the Society for Conservation Biology's Oceania (SCBO) Chapter Congress in New Zealand. Photo by SCBO.

Okena's poster highlights the YUS Conservation Area as a sustainable wildlife bank. Poster by TKCP.

The TKCP team and partners met with the Lae Rotary Club in April to discuss the potential for further collaboration. Photo by TKCP.





In July, TKCP Research & Conservation Manager Daniel Solomon Okena attended the Society for Conservation Biology's Oceania Chapter Congress in Wellington, New Zealand. The Congress brought together scientists, managers, decision-makers, and other conservation professionals from throughout the South Pacific region to share methods, tools, initiatives, and opportunities in conservation science and practice. During the Congress, Okena presented the methods and results of TKCP's Ecological Monitoring efforts with a poster, "Effectiveness of YUS Conservation Area as a Sustainable Wildlife Bank to Surrounding Non-Protected Areas."

Representing our program's YUS Conservation Coffee initiative, TKCP's WPZ-based Manager Trevor Holbrook attended the Communities, Conservation, & Livelihoods Conference in Halifax, Canada, co-hosted by the Community Conservation Research Network and the International Union for Conservation of Nature (IUCN). The meeting served to highlight the important role that local communities play in environmental conservation, explored the various ways in which those communities engage in sustainable livelihoods, and considered how policies and programs can foster and support those efforts. Holbrook shared the unique story of YUS and the conservation commitment made by its customary landowners and local communities, including the impact of the YUS Conservation Coffee initiative as a sustainable conservation-based livelihood incentive.

TKCP Director Lisa Dabek attended the International Tree Kangaroo Summit at Germany's Krefeld Zoo, the AZA Tree Kangaroo Species Survival Plan (SSP) workshop at Santa Fe

Teaching Zoo in Gainesville, Florida, and the Tree Kangaroo SSP meeting during the Association of Zoos & Aquariums' (AZA) conference in Seattle, representing TKCP as the designated in-situ conservation program for the Tree Kangaroo SSP.

At these meetings, Dabek also served as a champion to progress the global tree kangaroo community's support of the proposed rehabilitation and breeding center at the Port Moresby Nature Park. WPZ is highly committed to supporting the development of the center to address a critical gap in Papua New Guinea as well as to enhance the viability of ex-situ conservation and breeding programs for key native PNG species including the tree kangaroo. Port Moresby Nature Park's Michelle McGeorge and Brett Smith visited WPZ in September alongside the 2018 AZA Conference in Seattle to discuss opportunities for strengthening the relationship between the two organizations, including WPZ's leadership in generating support among AZA institutions for a rehabilitation and breeding center.

TKCP-PNG BOARD OF DIRECTORS

TKCP-PNG thanks its Board of Directors for their guidance throughout 2018:

- Chair: Dr. Lisa Dabek, *Woodland Park Zoo*
- Dr. Sangion Tiu, *Research and Conservation Foundation of PNG*
- Dr. Bruce Beehler, *Smithsonian Institution*
- Mr. Zachary Wells, *Conservation International*
- Mr. Rick Passaro, *ex officio, TKCP-PNG*

Left page, from top: TKCP's Trevor Holbrook highlighted the YUS Conservation Coffee initiative as a model at the Community, Conservation, & Livelihoods Conference at Saint Mary's University in Halifax, Canada. *Poster by TKCP.* From left: WPZ President and CEO Alejandro Grajal, Dono Ogata, Timmy Sowang, Gibson Gala, and Nicholas Wari in Yawan village. *Photo by TKCP.* TKCP's Francisca Yagama visited Seattle and Woodland Park Zoo in June to meet with global health organizations and program partners including the University of Washington's Center for One Health Research. Francisca standing by the ZooStore's YUS Conservation Coffee display. *Photo by Lisa Dabek, TKCP.* Right page, from top: Sunset at TKCP's Wasaunon field research site. *Photo by Lisa Dabek, TKCP.* TKCP's Daniel Solomon Okena discusses wildlife conservation with visitors during World Wildlife Day at the Port Moresby Nature Park. *Photo by TKCP.* TKCP Manager Rick Passaro shares about the importance of a healthy environment during World Environment Day at the Lae Rainforest Habitat. *Photo by Daniel Solomon Okena, TKCP.*



When we reduce volumes of plastics by reusing and recycling, we help the environment, especially plants and animals to live in a healthy natural habitat.

Rick Passaro – TKCP Manager

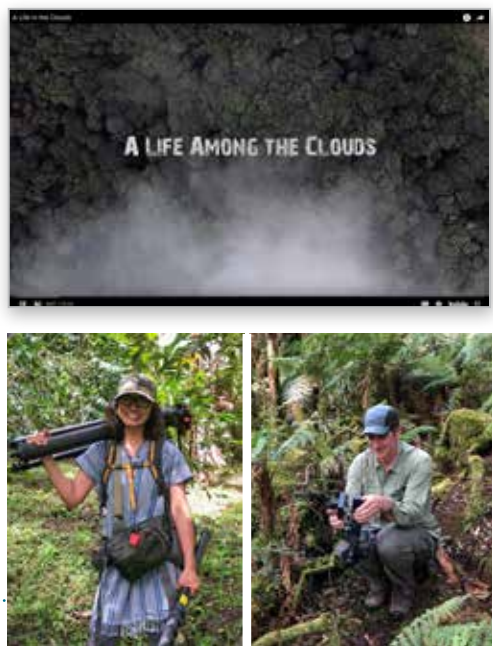
Publications, Media and Storytelling

“A Life Among the Clouds”

<http://youtu.be/9cXdtS8qNnc>

In collaboration with wildlife film producers Joe and Nim Pontecorvo (Pontecorvo Productions, LLC), TKCP released a 10-minute film highlighting YUS and the Tree Kangaroo Conservation Program's groundbreaking research efforts. The film provides excellent exposure for audiences to understand the value of PNG's biodiversity and serves as an excellent example for the development of future films regarding community-based conservation in PNG.

Joe and Nim returned to YUS in April to collect more video content for the production of additional media highlighting TKCP's research and community-focused initiatives including the YUS Conservation Coffee project.

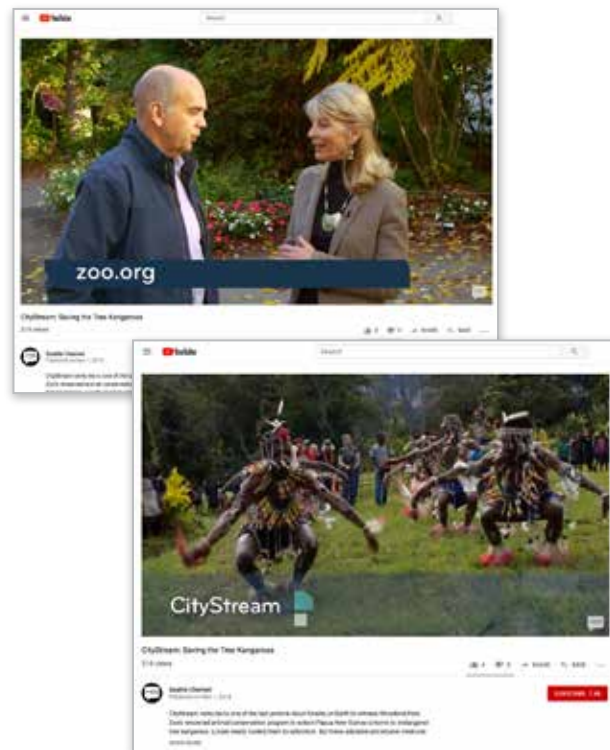
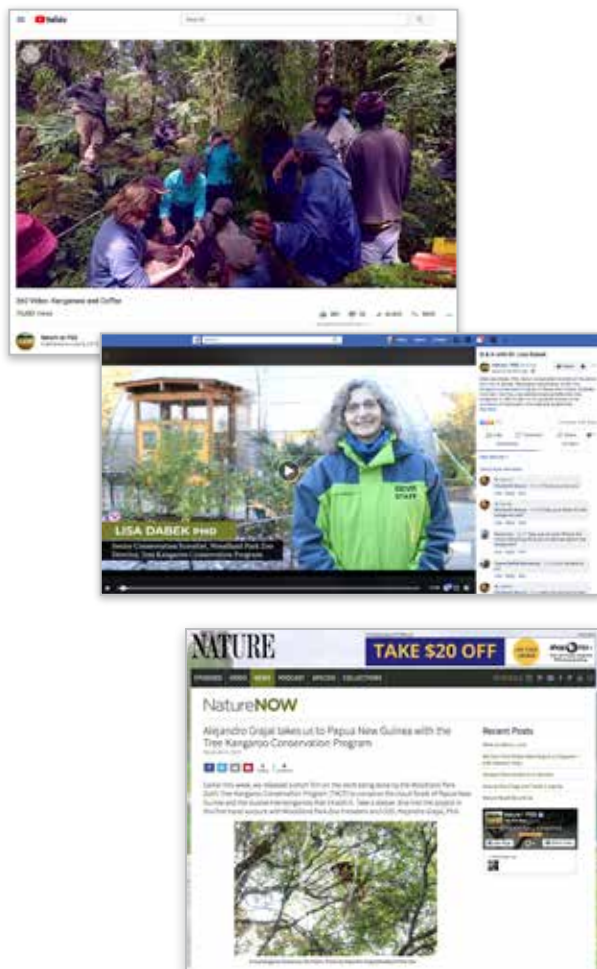


Nim Pontecorvo and Joe Pontecorvo. Photos by TKCP.

PBS Nature Short Film, Facebook Live, 360 VR, and Blog

PBS Nature spotlighted TKCP in a number of coordinated media highlights, sharing the story of TKCP with its audience of millions around the globe:

- Joe Pontecorvo's "A Life Among the Clouds" featured as a PBS NATURE Short Film
www.pbs.org/wnet/nature/a-life-among-the-clouds-a-nature-short-film-full-film/16822/
- PBS Nature hosted a Facebook Live Q&A with TKCP Director Lisa Dabek to discuss the program's unique approach to conservation and its impact for wildlife and people in Papua New Guinea
<https://www.facebook.com/PBSNature/videos/q-a-with-dr-lisa-dabek/327243381199108/>
- A stunning 360° Virtual Reality tour, "Kangaroos and Coffee 360 VR," posted on PBS Nature's YouTube channel immerses viewers in the forests and villages of YUS. The video highlights both TKCP's tree kangaroo research as well as the YUS Conservation Coffee initiative.
<https://youtu.be/4b-nSH6nMZU>
- Woodland Park Zoo President and CEO Alejandro Grajal shared his impressions of TKCP and YUS through a blog on the PBS Nature website following his visit to Papua New Guinea in April.
www.pbs.org/wnet/nature/blog/alejandro-grajal-takes-us-to-papua-new-guinea-with-the-tree-kangaroo-conservation-program/



Seattle Channel's City Stream

<https://www.youtube.com/watch?v=iPMAPrLE4Y>

Seattle-based television journalist and TKCP storytelling partner Penny LeGate traveled to YUS with Lisa Dabek in April. Utilizing footage captured by Joe Pontecorvo, Seattle Channel produced a three-part series featuring TKCP's research and community-focused initiatives, as well as LeGate's personal reflections on her visit to Papua New Guinea. The series was nominated for an Emmy by the Northwest Chapter of the National Academy of Television Arts & Sciences, in recognition of its captivating story and beautiful imagery.

GeekWire: Conservation & Technology

<https://www.geekwire.com/2018/creative-uses-technology-help-conservationists-save-tigers-wolverines-vanishing-species/>

Alongside a special Network for Nature event hosted by Woodland Park Zoo in Seattle, GeekWire highlighted several innovative collaborations between conservationists and the tech industry, including TKCP's partnership with Microsoft engineer Doug Bonham for the development of advanced tracking collars.



Paradise: Air Niugini’s In-Flight Magazine

TKCP is honored to have been featured in Air Niugini’s in-flight magazine several times in recent years. The November/December 2018 edition of Paradise Magazine included an article highlighting the tree kangaroo’s uniqueness and cultural importance for Papua New Guinea, as well as the history and accomplishments of TKCP and the YUS Conservation Area. As the magazine’s release coincided with the 2018 Asia-Pacific Economic Cooperation (APEC) meetings held in Port Moresby, the story reached a particularly wide and diverse global audience.



Wildlife Australia: Saving Species, One Brew at a Time

<image from pdf of article>With the help of Zoos Victoria’s Chris Banks ahead of his 2018 visit to YUS, Wildlife Australia Magazine published a story of the YUS Conservation Coffee initiative in its Spring 2018 edition. The article emphasizes the project’s benefits for both wildlife and for people, and invites its readership to support the YUS community’s commitment to conservation by purchasing YUS Kopi from Melbourne-based Jasper Coffee.



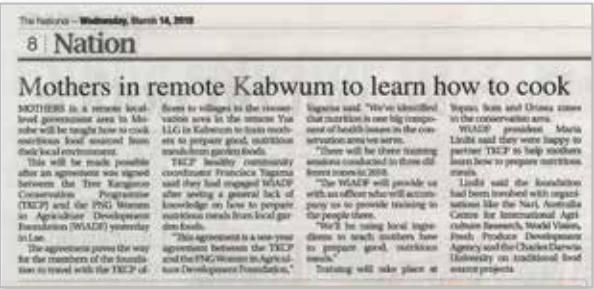
Local and National Media Highlights

TKCP’s efforts were featured in several articles in PNG’s The National newspaper during 2018:

- March: TKCP’s partnership with the PNG Women in Agriculture Development Foundation to provide training for mothers in YUS on the preparation of healthy, nutritious food using locally-available produce.
- June: Students from schools around Lae attended World Environment Day events at the University of Technology’s Rainforest Habitat, discussing with TKCP and other organizations about biodiversity, conservation, and the importance of living in a sustainable manner.
- July: The Nation highlighted TKCP’s holistic, community-based approach to conservation including its focus on fostering a sense of pride and environmental stewardship among the next generation through the YUS Junior Rangers Program.
- August: PNG’s Conservation & Environment Protection Authority invited TKCP’s Rick Passaro, Daniel Solomon Okena, and Warren Jano along with other organizations to participate in a National Biodiversity Strategic Action Planning workshop to review progress and plans toward PNG’s commitments under the Convention on Biological Diversity.

United States Embassy to Papua New Guinea

Alongside a wonderful luncheon hosted by U.S. Ambassador to Papua New Guinea Hon. Catherine Ebert-Gray to welcome TKCP Director Lisa Dabek, Woodland Park Zoo President and CEO Alejandro Grajal, and television journalist Penny LeGate during their April visit, the U.S. Embassy in Port Moresby spotlighted TKCP through a series of facebook posts. The posts highlighted the country’s incredible biodiversity of Papua New Guinea and recognized the importance of community ownership of conservation efforts in Papua New Guinea.



Support

TKCP depends on a global network of people and organizations to help us accomplish our work in YUS. Many of our donors are long-term partners and friends, and we sincerely thank you for your enduring support. Together, we have achieved a great deal of success over the years. We wish to thank our donors throughout the years and thank the following friends of TKCP for their financial and in-kind support in 2018.



\$100,000 and above
Global Environment Facility via UNDP
\$50,000 - \$99,999
National Geographic Society
\$20,000 - \$49,999
Rainforest Trust
Cyndi Wolfe
Zoos Victoria
\$5,000 - \$19,999
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Carl and Renee Behnke
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Columbus Zoo and Aquarium
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Overton and Katharine Dennis Fund
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Detroit Zoological Society
Rob and Marti Liddell
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Morobe Provincial Administration
National Zoo and Aquarium Canberra Australia
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Seattle Rotary Service Foundation
Sedgwick County Zoo
Texas Instruments Foundation



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Cleveland Zoological Society/Cleveland Zoo
Ruth and Terry Lipscomb
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Greater Kansas City American Assn. of Zoo Keepers
The Hoffmann Family
Andrew Poole
Caitlin Roberts
Hannah Sauer
Jason Seivers
Anne Stein
Sunflower Elementary
Jon and Margaret Wheeler
Kristen and Chuck Wilk
Steven Wyler



YUS Junior Rangers in Yopno Zone. Photo by Chris Banks, Zoos Victoria.

The YUS Conservation Endowment

TKCP and WPZ are proud to have established the YUS Conservation Endowment with Conservation International. The endowment provides annual funding support for the management and protection of the YUS CA in perpetuity. TKCP is grateful to all of our supporters who have helped us invest over \$2 million for the creation of the YUS Conservation Endowment. We thank the WPZ Board of Directors for managing the endowment. The investment continues to grow, and since 2013 has partially supported TKCP's annual operating expenses in Papua New Guinea.

\$100,000 and above	Sedgwick County Zoo Maryanne Tagney and David T. Jones Craig Tall and Penny LeGate Gwen and Gail Warren	Robert Bailey Dominique Bideau Richard Biribauer Barbara Birney The Boeing Company Victor Bozzo John Brooks* Mylene Brooks Barbara Christensen and Jeff Meyer Leonard and Sharon Clemeson Susan Cohen Stephan Coonrod and Cheryl Clark Gabriel Cronin Kim Daly-Crews Sophie Danforth Brian Darley James DeBonis Daniel Dechert Patrick Dessalle Scott Dew and Colleen Hanlon Tamara DiCaprio Laurie Ann and C. Bert Dudley George and Barbara Ermentrout Donna and Steve Estes Antebi Charles and Rose Ann Finkel Janice and William Fischel Arianne Foulks Harmony Frazier and Michael Breen Deena Fuller James Galbraith Mary Gillmore Madeleine Hagen Edie and Brian Hall Susan Hall George and Carol Harell Ryan and Heather Hawk Nancy and Paul Hawkes Sheila and Earl* Horowitz Rochelle Howe and Jonathan Greene Ken Katsumoto Jenny Kim and Stephen Sun Jeanne and Jason Kinnard Amy Kitchener Yoko Kobayashi	Nicole Labrecque BJ and Nayna Laird Jacob Langley Monica Lieb Lincoln Children's Zoo David and Lois Madsen Lindsay Malone Christine McKnight Gary Mozel Val and Laird Muraoka Judy Nyman-Schaaf Oaklawn Farm Zoo Darrin O'Brien Anne Palaszewski Christopher Pepin and Ken Miller Craig Pepin Mimi Polk Gitlin Jeremy Potash Helen Ralph Helen Ramirez Roberta Roberts Rohrbach Family Kimberly Sanders Santa Fe College Foundation Carol and Seymour Sarnoff Benjamin Schweinhart Ellen Sciotto Patricia and Scott Sebelsky Judie and Rick Steenberg Anne Stein Laurie Stewart Jonathan and Tiffany Sweet TCS & Starquest Expeditions Steven Thornton and Nancy Ostrander Suzanne Tomassi and Mike Kaputa UBS Financial Services Russ White Kevin and Jo Wilhelm Mike and Jan Williams Ann P. Wyckoff Christy Wyckoff Stacie and Joseph Zane Jacob Zimmerman
\$50,000 - \$99,999	Cammi Libby Jeff Libby George Meyer and Maria Semple Robert Plotnick and Gay Jensen John F. Swift Swift Family Fund Margie Wetherald, Len Barson and Robin Barson	\$1,000 - \$4,999 Anonymous (2) John and Andrea Adams Adobe Systems, Inc. Albuquerque BioPark Jane Alexander and Edwin Sherin Paul Balle Anthony and Lillian Bay Beauval Nature Glen and Susan Beebe Laura Bentley David Brunelle Mark Christiansen Cleveland Zoological Society/ Cleveland Zoo Michael and Lois Craig Richard and Ginger Goldman IBM Corporation Sugi Kana Glenn H. Kawasaki Foundation Rob and Marti Liddell Ruth and Terry Lipscomb Bert and Susan Loosmore Macbeth Family Milwaukee County Zoo Daniel and Meredith Morris Greg Parrott The Reeve Family Patti Savoy Adam and Catherine Schaeffer Gary Smith and Kathleen Kemper Lisa Tiedt Utah's Hogle Zoo Richard Wurdack and Gena Shurtleff Lauren Wyckoff	
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Thanks

The Tree Kangaroo Conservation Program would like to thank all of our partners, supporters, colleagues, and friends who have contributed to the success of the Tree Kangaroo Conservation Program. Your collaboration and support make a tremendous difference for the people and wildlife of YUS.

TKCP is the signature field conservation program at Woodland Park Zoo, and relies on the contributions of many departments and colleagues within the zoo. We express our gratitude to the Woodland Park Zoo Board of Directors, President and CEO Alejandro Grajal, and all of WPZ’s staff and volunteers.

TKCP also appreciates the support of our partners and friends in Papua New Guinea and across the globe. We extend a special thanks to:

Anand Aithal
AZA Marsupial and Monotreme Taxon Advisory Group
Cathy Ballew and the Lummi Nation
Balob Teachers College for their ongoing partnership in our YUS teacher scholarship program, in particular Mr. Jerry Hendingao and Mr. Lengkepe Zongoreng
Chris Banks and Zoos Victoria

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Business Coalition Against HIV/AIDS
Jonathan Byers
Margit Cianelli
Cocoa Board PNG
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Days for Girls International
Dr. Jared Diamond
U.S. Ambassador to Papua New Guinea Hon. Catherine Ebert-Gray and the U.S. Embassy
Bruce Ellestad
Carol Esson
Foundations of Success and the Conservation Measures Partnership
David Gillison and Kit Finlay
Kelly Hampson
Linda Heaney and the WPZ Tree Kangaroo Conservation Cart volunteers
Monica Hinckley
Marisa Howden
Dr. Falk Huettmann
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Imaging for a Cause Foundation, MinXray, and Center for Diagnostic Imaging
James Cook University including Dr. Andrew Krockenberger
Gay Jensen and Robert Plotnick

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David Mitchell
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PNG Cancer Relief Society, especially Ms. Grace Ruddaka
PNG Conservation and Environment Protection Authority with special thanks to Minister of Environment the Honorable John Pundari, Kumaras Kay Kalim, John Michael, Beside Thomas, Barnabus Wilmot, James Sabi, and Madeline Lahari
PNG Forest Research Institute, especially Acting Director Dr. Martin Golman, Mr. Oliver Paul, Peter Hormot Anton Lata, Penniel Lamei, and Robert Kiapranis

Left to right:
One of many incredible waterfalls in YUS. Photo by Gemina Garland-Lewis.
YUS is home to an incredible diversity of flora and fauna. Photo by Alejandro Grajal, WPZ.
Matschie’s tree kangaroo in YUS. Photo by Daniel Solomon Okena, TKCP.

PNG Institute for Biological Research
PNG Institute for Medical Research
PNG Women in Agriculture
Development Foundation, especially Ms.
Albertha Linibi
Port Moresby Nature Park, especially
Michelle McGeorge, Brett Smith, and the
Education team
The Research and Conservation
Foundation (RCF) of PNG
Wasu Local Level Government including
Wasu LLG President, Mr. Petrus Yasing,
the Councillors, and Magistrates
Joe and Nim Pontecorvo
Queen Emma Chocolates, especially
David Peate and Phyllis Toleasa-Ivosa
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Gianluca Rampolla, UNDP Resident
Representative to PNG
Dave Schor and Don Abatecola of
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Management
Vice Chancellor Albert Schram, Joy
Sahumlal, Paul Nongur, and Rachael
Mandali at the University of Technology
of Lae.
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Daniel Shewmaker, Harrison Koch, and
MTC Group
Simon Simboki, Extension Officer with
Wasu LLG
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Society for Conservation Biology –
Oceania and PNG Chapters
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and Marti Liddell, Dr. Blair Brooks, Dr.
Nancy Philips, Dr. Darin Collins, Dr.
Emily Transue, Dr. Joan Castro, and Dr.
Carolyn Marquardt
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Wells Trenfield and Jasper Coffee

The United Nations Development
Programme and the Equator Initiative

United Nations Development
Programme's Edward Vrkic, Joseph
D'Cruz, Johan Robinson, Tamalis Akus,
Christie Mahap, Gwen Maru, Patricia
Kila, and Emily Fajardo

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Gemina Garland-Lewis

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Biodiversity and Protected Areas
Management (BIOPAMA) programme

Trish Watson

Gavin Whyte and the Rotary Club of Lae
Huon Gulf

Steve Winderlich and Anne O'Dea,
Windydea Professional Services and
Consultants

Wildlife Conservation Society - PNG
WPZ's Animal Health Department

WPZ's tree kangaroo team including
Deanna Sharpe, Beth Carlyle-Askew,
Jenny Pramuk, Wendy Gardner, and
Amanda Dukart

Ruby Yamuna

YUS Community Health Workers,
Village Birth Attendants, and Peer
Educators

YUS Conservation Organization

Yus Local Level Government including
Yus LLG President Honorable Epemu
Kiwenu, the Councillors, Magistrates,
and Manager Mr. Fidel Yapenare

YUS Teachers, Headmasters and School
Board

Peter Zahler

ZSL EDGE team of Olivia Couchman,
Dr. Claudia Gray, Dr. Nisha Owen,
Janice Law and Kirsty Richards

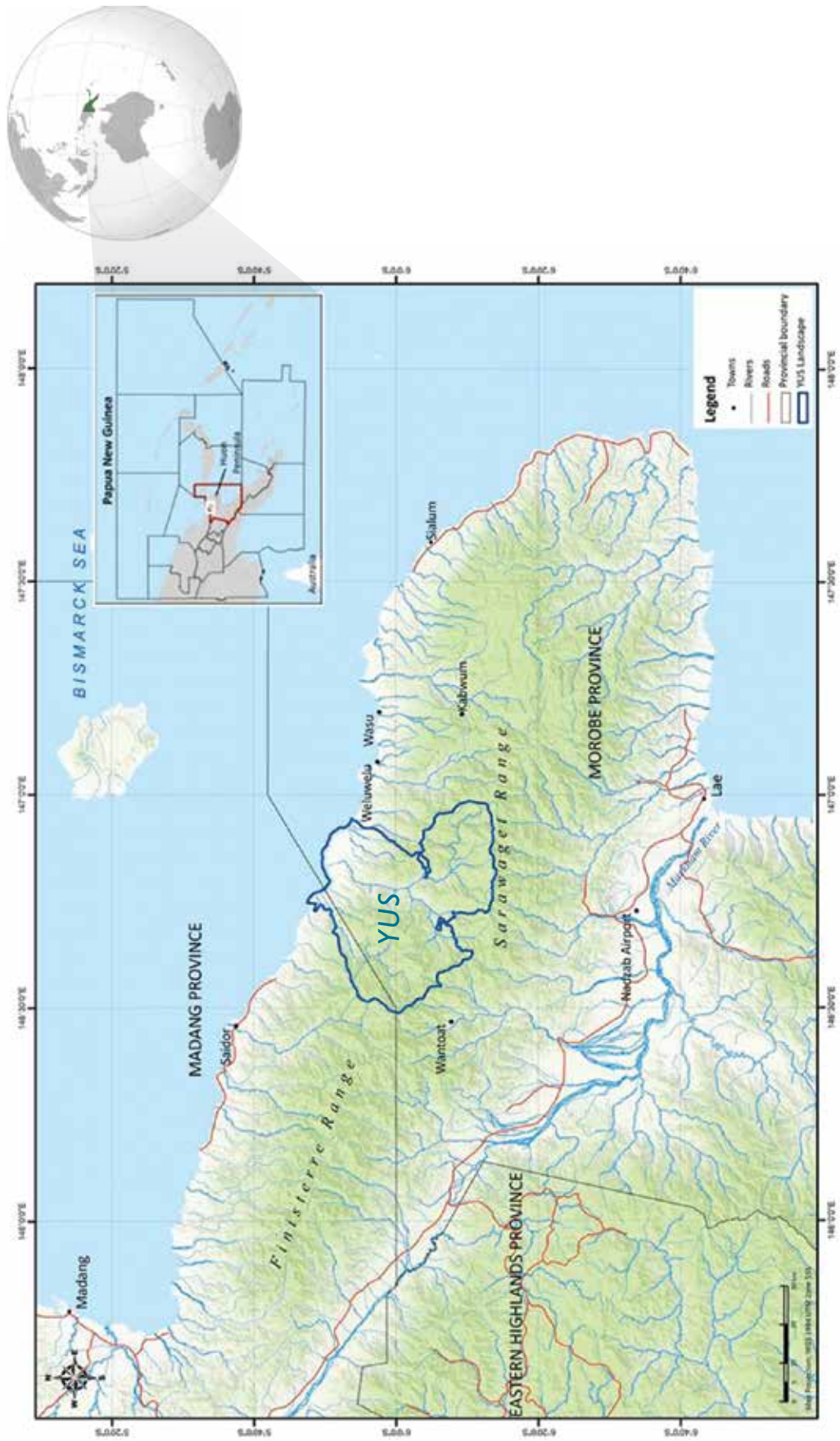
All of the YUS communities, mamas,
carriers, and assistants who support and
make TKCP's work possible while in the
field



**Most importantly, we would like to thank the people of YUS for their
steadfast dedication as stewards of their environment, and for their
gracious hospitality while we are visiting their villages and forests.**

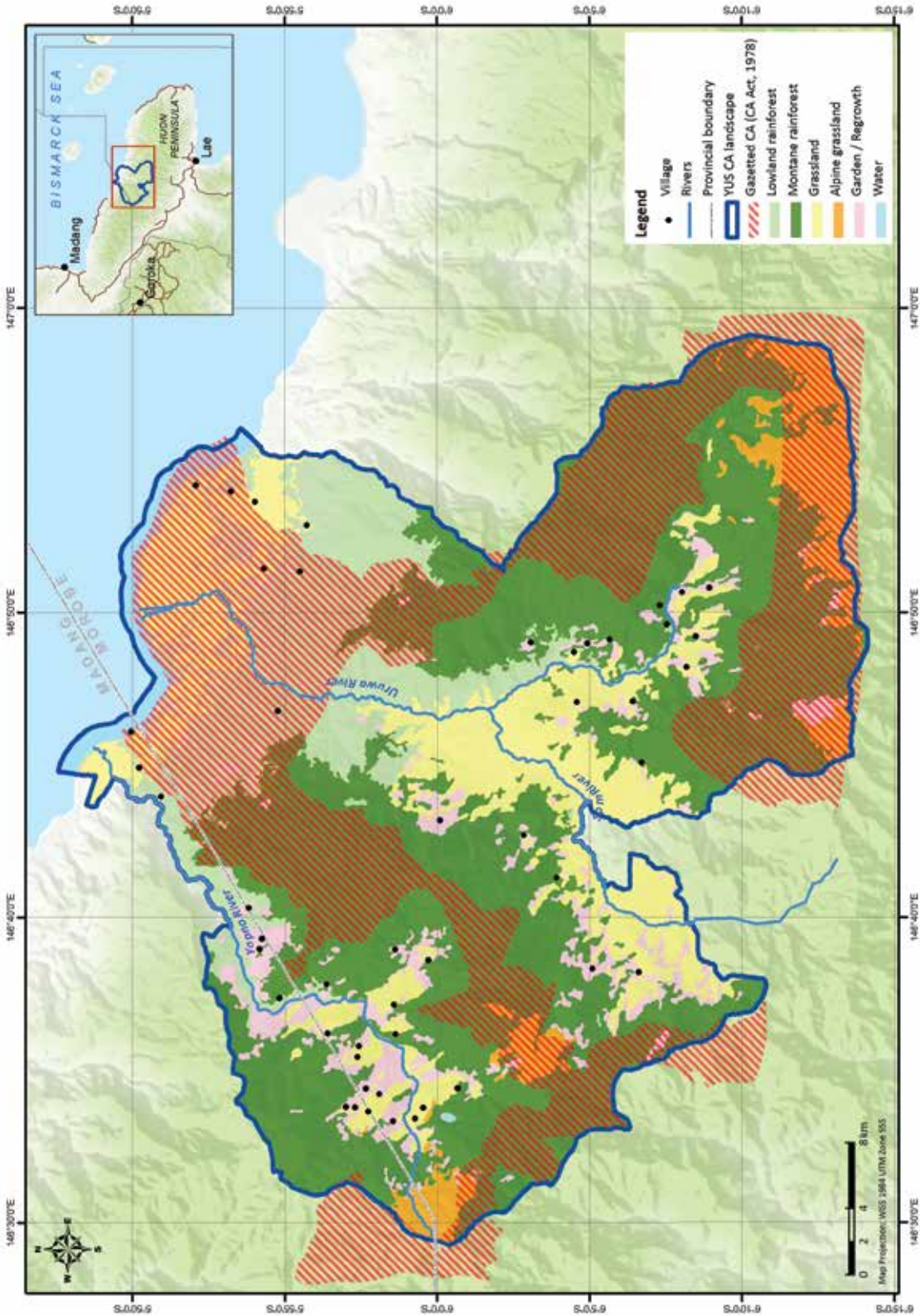
Left page:
Flowers in the YUS Conservation Area. Photo by TKCP.
Right page:
TKCP's One Health workshop is opened with a sing sing in Sapmanga village. Photo by Gemina Garland-Lewis.
Homes in Yawan village. Photo by Penny LeGate.

Huon Peninsula, Papua New Guinea



Map by Karau Kuna, TKCP

YUS Landscape and Conservation Area, Papua New Guinea



Map by Karau Kuna, TKCP



TREE KANGAROO CONSERVATION PROGRAM



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