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The IUCN SSC PDSG is hosted by:

Cover photo: Blue-eyed Ground Dove (Columbina cyanopis)
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Dear PDSG members,

We are delighted to be writing an introduction to this, the first ever issue of the IUCN SSC Pigeon and Dove Specialist Group newsletter. The distribution of a biannual newsletter has been a stated goal of the group since its inception in 2022, but slipped down the priority list as we got stuck into the work of convening expertise for the conservation of imperilled Columbiform species. We are happy to be able to rectify this now, and to highlight stories from some of the projects being led by PDSG members. This edition features a report on the search for the Manumea in Samoa, an account of the use of camera trap by catch data as a tool for monitoring ground-dwelling Neotropical doves, an introduction to the EAZA Extinct Pigeon and Dove Ex-Situ Programme, exciting updates from the team working to establish a captive insurance population of Blue-eyed Ground Doves and a short communication on conservation efforts for Tuxtla Quail-Doves.

We hope that regular newsletters will be an effective way of catalysing yet more collaboration between people and organisations working with threatened Pigeons and Doves, and that the opportunity to share information and observations here will help facilitate the transfer of expertise. As we all know, lessons learned with one taxon are very often applicable to others! On that note, we would urge you to consider contributing articles for publication in subsequent editions. These can be on any subject which you think might be of interest to our membership (see guidelines and details on how to submit below).

Finally, we would like to extend our sincere thanks to all those who give up their time to make the work of the PDSG possible, particularly those members who currently serve on the group's Steering Committee. A debt of gratitude is also due to the team at the SSC Chairs' Office for all their invaluable assistance, and to our host organization, the Toledo Zoo, for their unfailing support.

Joe Wood

Joe Wood
Co-Chair, IUCN SSC Pigeon and Dove Specialist Group

Chuck Cerbini

Chuck Cerbini
Co-Chair, IUCN SSC Pigeon and Dove Specialist Group

Article Submission Guidelines
Articles should typically be no longer than 2000 words (exceptions may be made under some circumstances). References must be included where applicable, and should be in the Harvard author-date style. Any photographs must credit the author. Articles should attached to a brief cover email sent to Jonathan Beilby, PDSG Communications Lead (jonathan@beilby.gotadsl.co.uk).

Membership Applications
The PDSG is proactively trying to grow our membership, with a particular focus on increasing representation from the global south. We encourage all members to spread the word amongst their networks. Interested parties are requested to contact Joe Wood (joe.wood@toledozoo.org), ideally with a brief biography and CV.

Toledo Zoo Grant Opportunities
Toledo Zoo, as the PDSG's host organization, have set aside funding for allocation to projects focused on the conservation of Columbiformes. The PDSG Steering Committee is therefore inviting applications from organizations or individuals engaged in work which aims to tackle the threats facing threatened Pigeon and Dove populations or increase knowledge of little-studied taxa. Grants of up to $20,000 USD are available. Applications or requests for additional information should be submitted to Joe Wood (joe.wood@toledozoo.org).

The Search for the Manumea

Joe Wood, PDSG Co-Chair

The Manumea (or Tooth-billed Pigeon - Didunculus strigirostris) is a monotypic Columbiform endemic to the forests of Samoa. Despite being the cause of much excitement in the scientific community when first described in 1845 (primarily due to certain phenotypic similarities with the extinct Dodo, Raphus cucullatus) it remains shrouded in mystery. Collar (2015) did an excellent job of piecing together the shreds of information which do exist, while highlighting major gaps regarding some of the most basic aspects of the species' biology.

What can be said with a degree of certainty is that Manumea are now very rare, and may well be on the brink of extinction. This is reflected in their uplisting to Critically Endangered following an IUCN assessment in 2014 (Birdlife International, 2016). The last concrete proof of a living Manumea is a series of photographs, obtained in 2013, showing a juvenile bird perched in a hotel garden hedge in the town of Salelologa on Savai'i. The exact causes of decline are also poorly understood, but probably include hunting, anthropogenic habitat loss and fragmentation, extreme weather events and predation by exotic mammals. Historic conservation efforts have tended to focus on raising awareness of the risk to Manumea posed by hunting (specifically, accidental killing as bycatch by hunters targeting Pacific Imperial Pigeons, Ducula pacifica).

Given the level of threat, the significant knowledge gaps, and the evolutionary distinctiveness of Manumea (which currently rank 15th out of all birds when assessed using the EDGE framework; EDGE 2019), it was clear from the beginning that they would top the list of PDSG priority species.

Coincidentally, the establishing of the group roughly coincided with the launch of a new 10-year Recovery Plan for Manumea (MNRE and SCS, 2020), which made recommendations with which we wholeheartedly agreed. We were particularly encouraged by Objective 6, which stated an intention to 'explore and evaluate the option of captive breeding'. However, we were concerned that the timescale proposed for this (a detailed feasibility study and risk assessment produced within 3-5 years with recommendations implemented within 6-10 years) was too long. We were also mindful that a previous recovery plan period (2006-2016) lapsed without significant progress being made towards mitigating any of the key threats (Serra, 2017).

In October 2021, a decision was therefore made to submit an official IUCN SSC Intervention Letter to the Samoan Ministry of Natural Resources and Environment (MNRE). This letter laid out our concerns regarding the status of the Manumea, and extended an offer of technical and scientific support. Specifically, we volunteered our assistance in coordinating the captive breeding feasibility study referred to in the recovery plan. The letter was well received, and within two months had led to the establishing of a Memorandum of Understanding between the Specialist Group and MNRE. Our involvement in this work was captured in two group targets:

Based on existing EDGE and IUCN Red List priorities, assist with the implementation of the Manumea Recovery Plan (SCS and MNRE, 2020), with an emphasis on mounting a large-scale search for Didunculus Strigirostris by 2023 and progressing the other set goals.

Produce a feasibility study relating to an ex situ programme for Manumea (Didunculus Strigirostris) by 2022.

In September 2022, following the lifting of COVID travel restrictions, I travelled to Samoa for in-person meetings with MNRE, the Samoa Conservation Society (SCS) and other stakeholders. I was also able to visit sites where sightings of Manumea had periodically been reported, including the 2,500ha Uafato Conservation Area (at the Eastern end of Upolu) and the forest around Salelologa.

This first-hand experience of the conservation landscape in Samoa was invaluable when finalizing the Captive Breeding Feasibility Study, which had been drafted with input from members of the specialist group with expertise in this area and was subsequently submitted to MNRE. The full document is too lengthy to reproduce here, but interested parties are welcome to contact me and request a copy.

In 2023, in Partnership with Birdlife International and SCS and with funding from Toledo Zoo and the Waddesdon Foundation (via the Zoological society of London), it was at last possible to initiate a coordinated search. Vilikesa Masibalavu (an expert Fijian ornithologist, responsible for the 2003 rediscovery of the Viti Levu Long-legged Thicketbird, Megalurulus rufus) was hired as a consultant by and led a field team including staff from SCS and MNRE. Hundreds of hours, often in very challenging conditions, were spent scouring areas of lowland forest across Upolu and Savai'i. Jeremy Dominguez, then Toledo Zoo's Birding Outreach Coordinator, and I joined the team for an August search of the Uafato reserve (accompanied for a few days by Corey Wyckoff, the Zoo's Videographer). Another last-minute addition was Kasper Berg, a Danish birder who had self-funded an expedition to Samoa to undertake his own search for Manumea.

Unfortunately, as the year ended, we were forced contend with the fact that we had failed to obtain any evidence of a living Manumea. Worse, the camera traps deployed in the forest had recorded a full contingent of invasive mammals – rats, wild pigs and, most worryingly, numerous feral cats. Our despondency was only slightly alleviated by data indicating that other forest Columbiformes were both widespread and reasonably abundant. Interestingly, these included the Shy Ground Dove (Pampusana stairi), a species recently thought to be expatriated from the main islands of Samoa but which we recorded at every site surveyed.

Faced with an undeniably bleak situation, we were thrown a lifeline when we were approached by Colossal Biosciences with an offer of additional funding to continue the search. Even more excitingly, they suggested that they might contribute their considerable expertise in AI and machine learning towards finding a solution to one of our biggest hurdles; the close similarity of Manumea calls to those of the far more common Pacific Imperial Pigeon. In February 2024, a written agreement was established between Colossal, PDSG and Birdlife international. This captured a commitment to collaborate on future conservation efforts for Manumea, as well as on work to biobank samples from other Columbiform species.

In March 2024 our luck finally changed when Vilikesa obtained a clear and unambiguous sighting of a Manumea in forest on the edge of the Uafato Conservation Area. In his subsequent report he noted that:

“It happened at about 3:10pm, when a dark pigeon flew from the back of the ridge and dropped down to perch on an exposed Lopa (Adenanthera pavonine) branch beside a fruiting Asi Toa tree. It sat still for about 5 seconds, looking around before walking along the Lopa branch to the fruiting tree. The sighting was so clear that I did not have any shadow of doubt whatsoever. It was a large, dark pigeon with a heavy red bill and brownish wing. It did not have the greyish head of a Pacific Imperial Pigeon or the white throat of a Metallic Pigeon.”

No photograph was obtained and, despite intensive searches of the area, the bird could not be located again in the following days. Eventually, a decision was made to move on and revisit sites on Savai’i, all of which again drew a blank. Another expedition to Uafato in August 2024 saw Vilikesa and team joined by Kasper Berg - now under contract as a Birdlife International consultant - and Stephinie Kerrisk (a Conservation Biologist recruited from New Zealand). No further sightings were forthcoming, but Kasper and Stephanie did succeed in forging a trail across the middle of the Conservation Area. They found that the forest in these interior valleys appeared to be relatively pristine, but that feral cats were nonetheless recorded on camera traps.

In planning our next moves as we continue our efforts to locate and conserve Manumea, we are cognizant of the valuable lessons learned so far. While delighted to have confirmation that at least some birds are managing to hang on, we are also conscious that the threats facing them, particularly from feral cats, are severe and that time is likely running out.

Barring significant developments elsewhere, Uafato will be the sole focus of our efforts in 2025 and beyond. A team will be deployed there for six weeks in July/August, and plan to return in October. They will be testing a new AI call classifier, developed by Colossal with the help of Moeumu Uili from SCS. This classifier was trained using just three calls recorded from a captive bird during the 1980’s, but early results indicate that it has an accuracy rate of 95% (Yeo, 2025). We will be eagerly awaiting the results from this field trial, and are hoping that this new technology will be a game-changer in improving detection rates for Manumea.

The Specialist Group has also assisted with compiling a protocol for the proper care of any Manumea which might be captured in the mist nets being used by the team, or brought into captivity via any other means. Initially, the emphasis was on fitting captured birds with radio telemetry transmitters, so ensuring that they could be tracked and behavioural data recorded following their prompt release. This remains a priority, but we are also working to ensure that we can obtain and store the samples needed for biobanking and the establishment of cultured cell lines. Given the rate of progress currently being made in the fields of genetic engineering and reproductive technology, this seems like a crucial way of preserving future options. Despite all our efforts, it may be that conventional conservation techniques are simply inadequate to save a species so close to extinction. These pioneering approaches could offer a vital glimmer of hope.

Above: The field team at Uafato, August 2023 © Samoa Conservation Society

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Above: Manumea specimen at the Natural History Museum, Tring, UK. © Joe Wood

In the spotlight: camera trap by catch data is a valuable tool for monitoring ground-dwelling Neotropical doves

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Camera trapping is widely recognised for its effectiveness in studying mammals and also provides fascinating insights into ground-dwelling birds 1, 2, 3. Many bird records from camera trap studies, especially those involving ground-dwelling species, arise as bycatch from broader mammal-focused research 4, 5. Surprisingly, ground-dwelling doves remain largely underrepresented as primary subjects of such studies 6,7,8,9.

Information on ground-dwelling doves in the Neotropics is scarce, primarily due to their elusive nature and low population densities. Most available literature is based on incidental observations rather than dedicated studies, a gap especially pronounced for forest-dwelling species. Their preference for dense vegetation makes direct observation challenging, limiting our understanding of their ecology and behaviour.

Twenty-one species of ground-dwelling doves have been documented in Ecuador. Given the potential wealth of information hidden within mammal-focused camera trap data, we analysed bycatch records from four projects conducted on the northwestern slopes of the Andes in Ecuador. Remarkably, ground-dwelling doves emerged as the most frequently recorded avian group in these studies, appearing at nearly every surveyed site. Moreover, all five expected ground-dwelling dove species in the region were detected: Pallid Dove Leptotila pallida, White-tipped Dove Leptotila verreauxi, White-throated Quail-Dove Zentrygon frenata, Ruddy Quail-Dove Geotrygon montana, and the endangered Purple Quail-Dove Geotrygon purpurata (Fig 1).

The Purple Quail-Dove (Fig. 2) stood out among these species due to its frequent appearances across multiple sites. This strikingly colourful species, endemic to the Chocó region of southwestern Colombia and northwestern Ecuador, is the only Ecuadorian dove globally threatened. With an estimated population of just 600–1700 mature individuals, its limited range is increasingly threatened by habitat loss due to logging, expansion of the agricultural frontier and mining 10, 11. It is considered a low-density species, and little is known about its ecology or population status in either Colombia or Ecuador 10.

Our preliminary results raise important questions that will guide future research on G. purpurata and other ground-dwelling doves detected in our camera trap bycatch project. Key questions include: What are their ecological preferences? How abundant are they, and can we estimate their populations? When are they most active? What threats do they face? Our following studies will focus on spatial occupancy, local abundance, habitat preferences, ethology, and seasonal activity patterns—elements that have been successfully studied in other dove species using camera traps 6,8, 9. Furthermore, analysing the activity patterns of potential predators could provide further ecological insights, particularly on the impact of feral dogs and cats. Such research would deepen our understanding of this elusive species and contribute key data for assessing its vulnerability and guiding conservation efforts within its rapidly changing habitats.

We hope these initial findings highlight the untapped potential of camera trap bycatch as a valuable tool for monitoring ground-dwelling bird populations and encourage its broader adoption as a mainstream method for studying these species. For bird enthusiasts and scientists, these “accidental” observations may hold the key to uncovering novel aspects of avian ecology, reinforcing the importance of continued camera trap studies in Neotropical forests.

Researchers from Mashpi Lodge and Universidad San Francisco de Quito USFQ developed the camera trap projects that provided the ground-dwelling dove records for these studies.

Figure 1: *Photographs of ground-dwelling doves obtained with camera traps at the Mashpi Reserve, northwestern Ecuador (from upper left clockwise): White-throated Quail-dove Zentrygon frenata, Pallid Dove Leptotila pallida, Purple Quail-Dove Geotrygon purpurata, and Ruddy Quail-Dove Geotrygon montana.*

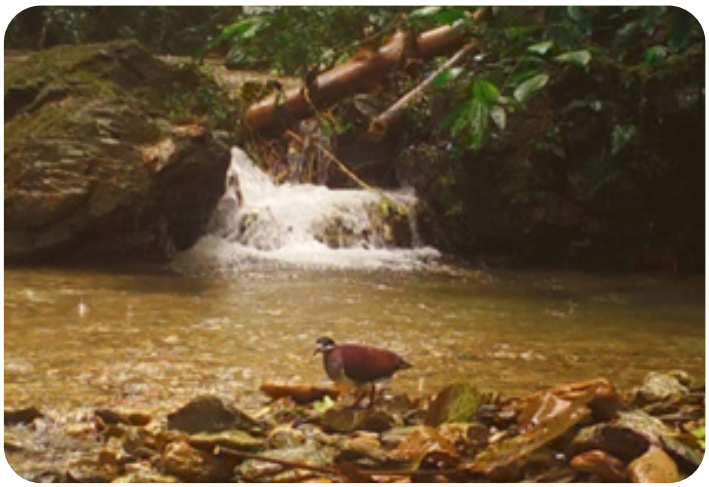

Figure 2: *The endangered Purple Quail-Dove Geotrygon purpurata photographed with a camera trap at the Mashpi Reserve, northwestern Ecuador.*

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Breeding Recommendations for an Extinct Bird Species?

Of course not. This is not what the EAZA (European Association of Zoos and Aquariums) Extinct Pigeons & Doves EEP (Ex-situ Programme) stands for. And it is not what an EEP should be reduced to. An EEP should embrace the 'One Plan Approach', covering all aspects of the species (or group of species) it deals with.

An EEP should not be a mere partnership portal to find the appropriate mate pairing for a given animal. The so-called 'New Style' EEPs raise awareness, give information and provide data, support (and, of course, breeding recommendations) to secure the future existence of a species.

The Extinct Pigeons & Doves EEP deals with a group of birds that rank among those with most extinct species and populations in recent times (covering a period from the 16th century to today) and many species still on the brink of extinction or Critically Endangered. While breeding programs for the endangered species (e.g. the Socorro dove EEP) must focus on the building of a stable population, the Extinct Pigeons & Doves EEP focusses on the lessons to be learned from past mistakes.

The EEP has identified 10 Columbid species that have died out since the unfortunate demise of the dodo *(Raphus cucullatus)* in the 17th century. None of these species were lost to natural causes. Alongside these species, the number of extinct sub-populations is legion; most of them died out as a result of human activities.

While human activity has undoubtedly been the main cause of extinction in Columbiform species in recent times, the exact circumstances are often unclear. While hunting has been regarded as a major driver of extinction from the 16th to 18th century, habitat destruction or fragmentation has been the initiator in more recent times. But again, that cause alone doesn't explain the extinction process in every case.

Let us for example examine one of the most iconic extinct animals ever, the passenger pigeon *(Ectopistes migratorius)*. The species was once considered the most numerous bird species in the world with flocks consisting of millions of individuals. It surely was one of the most abundant birds in the eastern half of North America prior to the 20th century. The main reason for its extinction has been identified as hunting. However, the ultimate causes of decline lie deeper.

These birds were always hunted by indigenous people across their range. They were also hunted by the early settlers, and by the first American and Canadian citizens. But that did not significantly impact the abundance of the species. The birds even adapted to deforestation, readily switching to field crops. However, as the cities grew and the need for meat supplies increased, people developed new methods of hunting with firearms and large ariel nets to catch the flock of birds in flight. They even felled breeding trees to harvest eggs and squabs. Over hunting was therefore the next step on the path to extinction.

But, still, the birds were so numerous that even contemporary scientists considered it unlikely that the species was threatened by these actions. Then came the advent of the train. With better transport connections from the east coast to the west coast, demand for cheap pigeon meat increased even further and the rate of over hunting became severe. And so, very quickly, numbers of passenger pigeons dwindled, flocks grew smaller and by the turn of the century the species had died out (apart from a few single

specimens like the unfortunate ‘Martha’, the last known living specimen in Cincinnatti Zoo). How could this happen? There were passenger pigeons in zoos worldwide; there should have been breeding efforts to save the species.

Well, times were different then. Breeding programs, like modern day EEPs or SSP (Species Survival Programs), did not exist. Coordinated efforts between zoos were rare and, besides, who was interested in breeding ‘the most abundant bird in the world’? Another reason was that Passenger Pigeons needed to breed in large colonies – the smaller the group, the lower the number of juvenile birds. Combined with other causes (such as disease) this might have been the last straw on which the survival of the passenger pigeon depended.

The fate of the passenger pigeon is just one of the many examples of a whole chain of factors which ultimately leading to the extinction of a species.

Social or historical incidents are often commented upon with: ‘This must never happen again’. This, then, is the mantra of the Extinct Pigeons & Doves EEP: this must never happen again!

A New Chapter for the Blue-eyed Ground Dove

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The conservation program for the Critically Endangered Blue-eyed Ground Dove *(Columbina cyanopis)* made important progress in 2025, with the hand-rearing of three chicks from wild eggs, and the first ever chick to be reared from an egg laid in human care, at Parque das Aves – important milestones in the establishment of a conservation breeding program.

The Blue-eyed Ground Dove was a species shrouded in mystery, with no confirmed records for more than 70 years, until its rediscovery in 2015. Initial conservation actions, led by SAVE Brasil, focused on habitat protection, with the establishment of the Blue-eyed Ground Dove Reserve and the Botumirim State Park in Minas Gerais, Brazil. The only known population was small and vulnerable (the latest census is of 11 wild adults), and so the possibility of establishing a conservation breeding population soon started to be considered.

In 2019, a workshop was organised by Parque das Aves, the IUCN SSC Conservation Planning Specialist Group (CPSG) and SAVE Brasil to identify priority conservation actions for the Blue-eyed Ground Dove. Among these was to establish an insurance population for the species, as a backup in face of the various threats the dove faces in its natural environment, including habitat loss, human-caused fires and climate change.

Work started the same year at Parque das Aves with a model species, the Ruddy Ground Dove *(Columbina talpacoti)*, to refine methods and develop the skills of the technical team. Fieldwork focused on reproductive

biology was also a priority, and it was confirmed that the species was capable of laying replacement clutches when eggs were predated, an important consideration for minimising the impact of egg removals from the wild population.

By 2023, everything was in place and the first eggs were removed from the wild. A clutch of two eggs was successfully incubated and the chicks hand-reared. In 2024 a further chick was hand-reared, and in 2025, three more, bringing the nascent insurance population to six birds.

The first pair was formed, with the female from 2023 and the male from 2024. They quickly bonded as a pair, but it took them some time to show signs of reproduction. When they did, they built a beautiful nest and laid two eggs – on the coldest day of the winter. From these eggs, one offspring was hand-reared – the first of a new generation of the species to be reared from eggs laid in human care. We are hopeful that they will continue to breed and produce more young.

These advances bring new hope for this rare species and demonstrate the power of working in partnership for conservation. They depend on the collaboration of a diverse team from Parque das Aves, SAVE Brasil, Toledo Zoo, Chester Zoo and Bronx Zoo, including specialists in hand-rearing, reproductive biology, veterinary science, nutrition, conservation biology, communication, animal care and animal welfare.

The full list of project partners is as follows: SAVE Brasil (BirdLife International in Brazil), Parque das Aves, Toledo Zoo, Chester Zoo, Bronx Zoo, The National Centre for Bird Conservation (CEMAVE), of the Chico Mendes Institute for Biodiversity Conservation (ICMBio), the Centre for Species Survival Brazil, part of the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN), Instituto Claravis, the Grande Sertão Institute, BirdLife International, the Municipality of Botumirim, the Minas Gerais State Forestry Institute (IEF), Durrell Wildlife, Vogelpark Marlow, the University of Brasília, Laboratory of Genetics and Molecular Evolution of Birds (LGEMA) and Luiz de Queiroz College of Agriculture at the University of São Paulo. Additional financial support is provided by the American Bird Conservancy, BirdLife International Species Champion - Bruce Peterjohn, the Brazilian Ministry of the Environment, the Mohamed bin Zayed Species Conservation Fund, Keidanren Nature Conservation Fund/BirdLife International Tokyo and Neotropical Birding and Conservation

(Left to right)

Tony and Gledison following egg collection in Botumirim

Victoria, Gledison, Vitória, and Chuck during the 2024 field campaign

Joe, Bianca, and Ben during the 2023 campaign

Bianca and Analy with chicks from the 2025 campaign being transferred to an enclosure at Parque das Aves

(Left to right)
Egg showing embryonic development

Hatching of the first chick from a pair under human care

Chick approximately 10 days old

Columbina cyanopis pair in an enclosure at Parque das Aves

Community-based research and the Tuxtla Quail-Dove

For more than 15 years, the group of community monitors known as “Red de Monitoreo Comunitario de Aves Huilotl Toxtlan” has performed actions to promote the study and conservation of the birds of Los Tuxtlas, in Veracruz, Mexico. The group’s name references the indigenous term for the Tuxtla Quail-Dove *(Zentrygon carrikeri)*, a poorly studied, endangered, and microendemic species of Mexico. The monitors have contributed to the conservation of the species by carrying out environmental education activities across the region. Moreover, they have generated information about the natural history of the dove. In 2025, with the support of Toledo Zoo and the PDSG, this group will be engaged in collaborative research with the National Commission of Natural Protected Areas (CONANP). Two researchers, Rubén Ortega-Álvarez and Rafael Calderón-Parra, will aim to calculate the population size of the species and the remaining extent of its habitat. Such information will be key to assess the status of the Tuxtla-Quail-Dove and enhance local actions to protect it.

Above: Shy Ground Dove (Pampusana stairi), Samoa, © Kasper Berg