The newsletter of the Society for Wildlife Forensic Science

Vol. 5 No. 2 | July 2020

SWFS NEWS

Inside this edition: Feather Atlas, Wildlife Forensics in India, Capacity Building in Zimbabwe

The Feather Atlas of North American Birds is the Internet's premier resource for feather identification, and has just received a major upgrade.

Pepper Trail And Matt Trott

The Service's National Fish and Wildlife Forensics Laboratory in Ashland, Oregon is renowned as the nation's leading facility for the identification and analysis of evidence in wildlife crime investigations. It also hosts one of the Service's most successful public education and outreach projects: the Feather Atlas of North American Birds. www.fws.gov/lab/featheratlas

Since its 2006 debut, the Feather Atlas website has grown to illustrate the flight feathers of more than 400 species, more than half of the birds known to breed in the United States. Species represented range from the largest North American bird, the California condor, to one of the smallest, the ruby-throated hummingbird.

The Feather Atlas is the brainchild of the lab's senior forensic ornithologist, Pepper Trail. His primary job is to identify bird species that are part of investigations by the Service's Office of Law Enforcement (OLE). Over the course of more than two decades, Trail has identified tens of thousands of feathers representing hundreds of species of birds.

The website grew out of classes Trail teaches in feather identification to new OLE special agents and wildlife inspectors. "I realized it was unreasonable to expect field officers to retain the fine points of feather ID. They rarely have access to specimens, and bird field guides don't provide enough detail to allow the identification of individual feathers," says Trail. "What we needed was a way to make accurate, high-quality feather images available to everyone."

The solution was the Feather Atlas: a curated online feather image database.

Feathers for the Atlas come from salvaged dead birds with plumage in good condition, which Trail obtains from an extensive network of contacts. No birds are killed to provide feathers for the Atlas.

To keep the project manageable and because body

continued on page 4

Welcome from the SWFS President

Dear SWFS Members,

Welcome to the Ninth edition of the SWFS Newsletter.

I hope this Newsletter finds everyone healthy and well. With everything that is happening this year, I can only imagine that everyone is becoming well versed in the use of online meetings platforms and virtual hangouts. It will also be no surprise to anyone to find a shorter than usual newsletter this time as recent events have forced a slower pace for many of us. That being said, there are a few notable items that the SWFS board has been working on during this time.

The SWFS board has been working on a new SWFS travel grant. This grant is to provide financial support to SWFS members seeking to visit collaborators in order to exchange knowledge and skills relating to wildlife forensic science. The purpose of this funding will be to enable travel that is not supported by other research grants or institutional funding. We are particularly keen to support travel costs of the early career scientists, or scientists looking to establish new wildlife forensic facilities. The availability of this grant will come as international travel begins to open. For now, the Society would like to take advantage of the travel shutdowns and use our "virtual" time wisely to test out a SWFS Webinar Series.

The series is in its infancy planning phase. We are looking for feedback and ideas from our members to gauge how to proceed. Currently, the thought is to have a three-month series consisting of one episode a month that rotates across time zones. We will use a virtual platform that will allow the series to be recorded for those who cannot attend. Please read on page 17 to provide input on the SWFS webinar series.

Thank you to everyone who participated in the SWFS 2021 workshop survey. Your insights and thoughts will allow us to prioritize the meeting initiatives and move forward in the planning process with an increased focus on what is important to our members.

Welcome from the SWFS President

SWFS will be hosting the next conference at the Skukuza Rest Camp in Kruger National Park, Skukuza South Africa July of 2021. At this time, the meeting date has moved to July 19-23. This will allow us to better monitor the international travel situation before opening the meeting registration. Once this is done we will circulate an email with a new save the date. Professor Antoinette Kotze of the South African National Biodiversity Institute (SANBI) and her laboratory staff are working through the details of the date change.

As always, I would like to extend my gratitude and thanks to all of you that have contributed to the SWFS Newsletters, as well as to the production team that puts this wonderful work together.

Cheers

Tasha Bauman

IN THIS ISSUE

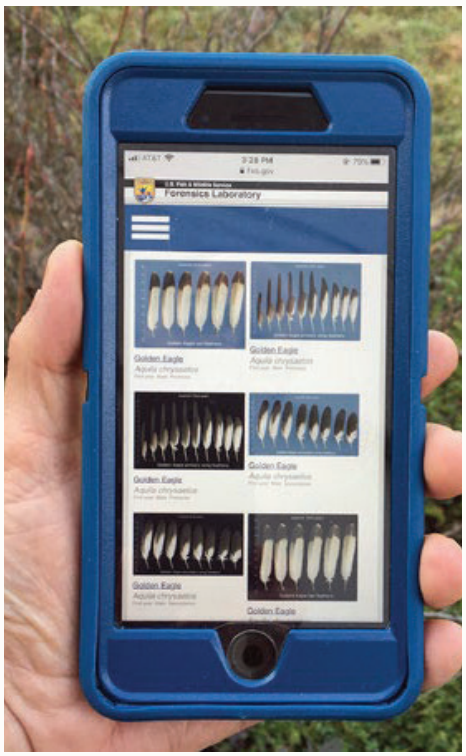
The Feather Atlas of North American Birds is the Internet's premier resource for feather identification, and has just received a major upgrade.

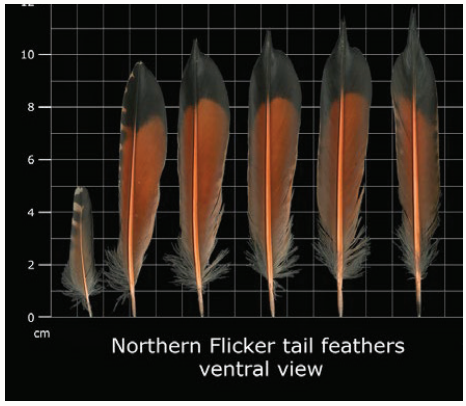
continued from front page

feathers are rarely seen in the illegal feather trade— only the wing and tail feathers are included in the Atlas. Each feather is carefully scanned by volunteer extraordinaire Sue Polich. Without the thousands of hours she has devoted to scanning, the project would not exist. Typically, she prepares three scans for each bird: one including all the outer wing feathers (primaries), one for the inner wing feathers (secondaries) and one for right-side tail feathers.

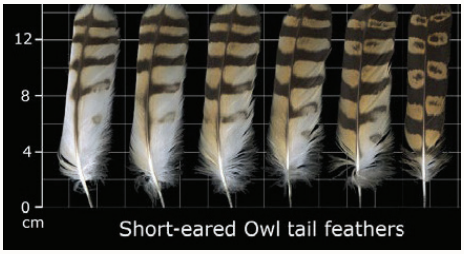
Left-side tail feathers aren't included because they are mirror images of the right side.

Polich places each digital image on a standard grid with either a blue or black background (depending on feather color) and records feather measurements and specimen information in a data table. For everyone involved, the Feather





Northern Flicker tail feathers ventral view



Short-eared Owl tail feathers

Atlas is a labor of love, worked on as their primary duties permit—a great example of Service employees going above and beyond. ››

Legal Aspects—It's Complicated

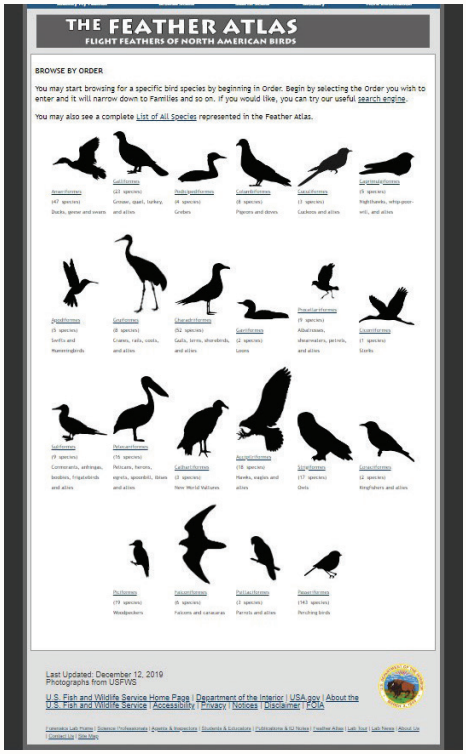
The Migratory Bird Treaty Act (MBTA) protects almost all native U.S. bird species, making it illegal to possess such feathers without a permit. Consequently, the Feather Atlas homepage and feather identification pages display this statement in bright red letters: Important Reminder – Feathers are Protected.

A link takes the viewer to a page titled "Feathers and the Law," which provides a summary of MBTA regulations, links to the list of MBTA-protected species, information on how to apply for a permit to possess feathers, and links to the Feather Atlas FAQ page.

New 'Identify Feather' Features for 2020

In 2006, the Feather Atlas contained only six species, all raptors. By the end of 2019, the site featured 404 species and a total of 1,825 scans. The Atlas received more than 1.65 million page views in 2019, with a total of more than 13 million visits since 2006. To build on the website's success, Trail has just completed a major update, optimizing the site for mobile devices and expanding search capabilities to help users answer the question: "Whose feather is this?" The design and maintenance of the original Feather Atlas website was by Forensics Lab information technology specialist Brad Foster. Computer help desk specialist Toby Greenfield spearheaded the improvements,

with input from Trail and the lab's other ornithologist, Ariel Gaffney. The recent upgrade included an



The Feather Atlas of North American Birds is the Internet's premier resource for feather identification, and has just received a major upgrade.

continued from page 4

improved search function to help users sift through the range of images. It allows users to choose up to five feather attributes: pattern, color, size, position (primary, secondary or tail) and type of bird, an increase from the previous two attributes.

A Universe of Users

Originally envisioned as a tool to help OLE agents and inspectors identify feathers, the Feather Atlas has been discovered by birders, artists, teachers, academic researchers and even video game designers. Since 2006, the site has been viewed by users from every country in the world except two (Western Sahara and Guinea-Bissau). Yes, someone in Vatican City has checked out the Feather Atlas!

What are the most commonly viewed species? In 2019, the feathers of six species were viewed more than 10,000 times: red-tailed hawk, bald eagle, Cooper's hawk, golden eagle, great horned owl and wild turkey, with red-tailed hawk topping the list at 37,783 views.

The Feather Atlas is an ongoing project, continually adding species as suitable material becomes available. With half of all U.S. birds now represented, it is of course becoming more challenging to find specimens of new species. The Feather Atlas team continues its outreach to locate specimens of unrepresented birds, particularly focused on shorebirds and on species restricted to the southwestern and southeastern United States. Their next goals are to reach 500 species and 2 million annual page views. It may take another few years, but Trail is confident: "With feathers, the sky's the limit!"

Volunteer Sue Polich scans in feathers.

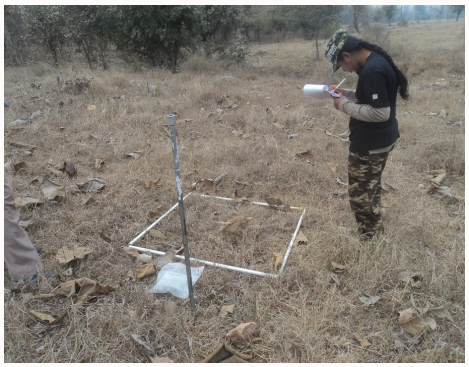
Molecular Biodiversity Lab – A newly emerged Wildlife Molecular Forensic Laboratory in the Tamil Nadu, India.

Raveendranthanpillai Sanil & George Nittu

Molecular Biodiversity Lab is the center for Molecular Wildlife Forensics and Biodiversity Research located in the Hill District of the Nilgiris in the Western Ghats, Tamil Nadu, India. The laboratory is started 11 years before, as a center for molecular wildlife research in the Department of Zoology and Wildlife Biology at Government Arts College Campus, Ooty. The laboratory acquired all the modern facilities for molecular research with the funding of the Tamil Nadu government and the autonomous agencies of the Government of India. Initially, the

Molecular Biodiversity Lab – A newly emerged Wildlife Molecular Forensic Laboratory in the Tamil Nadu, India.

Continued from page 5



laboratory handled forensics cases form the Nilgiri district alone, but at present, the laboratory is handling approximately 30-40 cases annually from the various districts from the states of Tamil Nadu and Karnataka. Most of the cases are the identification of the species and sex of the seized samples. Dr. M. Easwaramurthi, the Principal of the college is the Director of the Laboratory, and the research team includes 10 members under the headship of Dr. R. Sanil, who is an Associate Professor in the Department of Zoology & Wildlife Biology. At present Ms. Nittu George is the laboratory in charge and handling wildlife molecular forensics.

In most cases, the samples we received are either cooked meat or seized fresh flesh of a wild herbivore like Sambar deer (Rusa unicolar), Spotted deer (Axis axis), Barking deer (Muntiacus munjac) or Wild Indian Gaur (Bos gaurus). Let me share two interesting stories at this moment. The forest department seized cooked meet based on information from the upper hills of the Nilgiris (around 8000ft from MSL) and samples were brought to our laboratory for the species identification. The initial charge against the suspect was that he poached a barking deer and cooked, the suspect claimed it as beef. The sample on sequencing the COI region was identified clearly as that of a spotted deer. The spotted deer is not there in the nearby high altitude shola forests made the situation complex. On in-depth interrogation, by the officers of the forest department, the actual story came out. He obtained the meat from the village side in Mudumalai Tiger Reserve which is in lower altitude and he purchased it and brought it to his village, where he was caught. Another story is a forensic case where the cat sample was mistaken as a tiger sample. The remnants of a killed carnivore sample were found in the nearby region and the officers mistook it as a tiger cub and the photo flashed in the daily and the social media. Some people raised the question then this is not a tiger and the sample was brought to our laboratory. We found that the sample does not belong to tiger, instead, of a Jungle cat (Felis chaus) and the case was closed. In India, wildlife forensics is very much developed, but still, in such a large country the laboratories handling wildlife molecular forensics are few. The major institutes like Centre for Cellular and Molecular Biology (CCMB) and Wildlife Institute of India (WII) are the major facilities among them. These institutes are mainly involved in technology development and sharing to the regional forensic stations to avoid delay in analyzing the samples.

This year we were trying to develop a network of wildlife forensic laboratories in India and by the meantime due to long lockdowns and pandemic spreading still the idea is in the initial stage.

Capacity Building in Zimbabwe yields successful results for Wildlife Forensics in Africa

Jessica Dawson, Victoria Falls Wildlife Trust, Zimbabwe

Over the last few years the African Wildlife Forensics Network (AWFN) and TRACE have assisted in building the capacity of the Victoria Falls Wildlife Trust (VFWT) based in Zimbabwe. VFWT have a laboratory that now undertakes wildlife forensics case work and the team also works in the field in trying to assist wildlife crime scene investigations. Last year after sponsorship of a staff member to attend the SWFS meeting in Denver that participated in the Morphological Identification of Ivory course, VFWT was able to successfully work with their respective wildlife authority on a case that had confiscated eight pieces of raw elephant ivory and two pieces of raw ivory from Phacochoerus spp (likely warthog). The identification combined with testimony from the police yielded a conviction and nine-year prison sentence for each of the two accused.

VFWT completed its first successful species identification case in November 2018 on a bushmeat sample sent to the laboratory. Subsequently provision of equipment and training of the laboratory team by TRACE has helped to build confidence in conducting species identification case work. Equipment has assisted the lab in being able to hold and process forensics samples in line with SWFS International Guidelines and Standards. Case outcomes and penalties for the species identification work have varied depending on the species, which is in line with the law in Zimbabwe. One thing is clear and that is that this testing has helped make a significant impact on casework for the country.

In an effort to improve the outcomes in wildlife crime cases in Zimbabwe, TRACE, the Netherlands Forensics Institute (NFI) and VFWT hosted a Wildlife Crime Scene Investigation (WCSI) Course for Wildlife Investigators in October 2019. Twenty-Eight participants attended the six-day short course on WCSI from more than 15 stations throughout the country. Most participants had never taken a forensics sample and were not familiar with the procedures to do so, or what a laboratory can test for. This course has since resulted in new casework being submitted by participants to the VFWT wildlife forensics lab.

VFWT has been working with investigations on local wildlife crime cases to continue building capacity of investigators in the field. In Zimbabwe, many of these cases include malicious poisoning of elephants for ivory. Sometimes it also involves live animals. In June 2020, a Temmicks ground pangolin was brought to VFWT (who also have a rescue, rehabilitation and release facility), after being sold for the illegal wildlife trade. Over the course of a week, wildlife investigators were able to apprehend the sellers of the animal, and in court the accused received a 9-year sentence (the pangolin has to be held as evidence until the case goes to court). The pangolin was immediately released back into the wild.

VFWT hope to be able to continue to improve capacity building of

continued on page 8

Capacity Building in Zimbabwe yields successful results for Wildlife Forensics in Africa

Continued from page 7

wildlife crime investigators in the field and are working to try and complete casework so the lab team can apply to become SWFS certified forensic scientists. None of this would have been achieved without the assistance of TRACE and the AWFN.

Shark Fin Seizure: Teagen Partin

On January 24, 2020 USFWS Wildlife Inspectors at Miami International Airport seized 18 boxes of suspiciously labeled wildlife products. The boxes, which included over 1,400 lbs of dried shark fins, were intercepted as air cargo from South America en route to Asia. The commercial value of the fins was estimated between $700,000 and 1$ million USD placing this seizure among the largest in the US to date. The Wildlife Inspectors were joined by Forensic Scientist Teagen Partin from the USFWS National Fish and Wildlife Forensic Laboratory who provided expert assistance with species identification of the dried fins. Teagen worked closely with the wildlife inspectors to sort over 5,000 individual shark fins, morphologically identifying CITES species, and collecting samples for further genetic analysis. Initial estimates show that 76% of the total shipment was comprised of three CITES Appendix II listed species, including great hammerhead sharks (Sphyrna mokarran), scalloped hammerhead sharks (Sphyrna lewini), and silky sharks (Carcharhinus falciformis). Preliminary genetic analysis suggests the sharks were sourced regionally within the southwest Atlantic Ocean.

Order of Australia Honours for two SWFS members.

Greta Frankham and Sherryn Ciavaglia

On 8 June 2020, the Governor-General of Australian announced the Queen's Birthday 2020 Honours List. This accolade recognised 933 Australians who have shown outstanding service or exceptional achievement and have contributed to their community, to Australia globally or domestically. Two SWFS members were among those recognized; Dr Rebecca Johnson, who was appointed a Member of The Order of Australia (AM) for significant service to wildlife forensic science and to young women scientists; and Professor Adrian Linacre, who was awarded the Medal of The Order of Australia (OAM) for his service to the forensic sciences. SWFS extends our congratulations to both Rebecca and Adrian for this recognition. For those members not familiar with their work, below we have highlighted just a few of their important contributions to the field of forensic sciences in Australia and abroad.

Dr Rebecca Johnson & Professor Adrian Linacre

Dr Rebecca Johnson AM:

In March of this year, Rebecca was appointed the Chief Scientist and Associate Director of Science at the Smithsonian National Museum of Natural History. Prior to this, she spent 16 years at the Australian Museum (AM) developing and promoting wildlife forensic science in Australia. While DNA lab manager at the AM (2003-2014) Rebecca spearheaded the AM's wildlife airstrike identification program, which now provides species identification services to civil and military airports and airlines around Australia. During this time, she also recognised the need for a dedicated wildlife forensic service provider in Australia. In 2012, Rebecca launched the Australian Centre for Wildlife Genomics (ACWG) and by 2013, the ACWG was the first ISO 17025 accredited wildlife forensics laboratory in the Southern Hemisphere and Rebecca was one of the few SWFS certified wildlife forensic practitioners globally. In 2015, Rebecca became the Chief Scientist and Director of the Australian Museum Research Institute (AMRI); the first female Chief Scientist in the Museum's 188-year history. In this role Rebecca continued her research outputs in both wildlife forensics and wildlife conservation genomics, supervising and mentoring students and as chief investigator of the Koala Genome Consortium, which has significantly advanced scientific knowledge and conservation management of this iconic species. Under Rebecca's leadership, the ACWG established itself as the go-to laboratory in Australia for state and federal agencies tasked with overseeing

Order of Australia Honours for two SWFS members.

Continued from page 9

environment, biosecurity, and animal welfare legislation across the country. The ACWG has, and continues to, assist with some of the highest profile wildlife crime prosecutions in the country.

Rebecca has also always been actively involved in promoting wildlife forensic science to both other scientists as well to the wider community. She is currently the Director of Membership & Outreach for SWFS and has served as the New South Wales Branch President of the Australian and New Zealand Forensic Science Society (ANZFSS) from 2016-2020. In 2017 Rebecca was announced as an inaugural Superstar of STEM, as a Superstar Rebecca took part in activities aimed at improve the public visibility of women in science in the media to provide role models for young women and girls interested in STEM.

For more information on Rebecca's award, please see her citation https://honours.pmc.gov.au/honours/awards/2007321

Professor Adrian Linacre OAM

Adrian began his career in the forensic sciences taking up a lectureship in the Centre for Forensic Science at the University of Strathclyde in Glasgow in 1994. During his 16-year tenure, Adrian became a registered forensic practitioner in the areas of body fluids, blood pattern analysis and DNA typing. He has provided extensive service to the British justice system as an expert witness, including high profile cases such as the Massereene Barracks shooting and other activities related to the Irish Republican Army history. Adrian has conducted forensic casework for the Thai Royal family, which on one occasion led to an entire shopping mall being closed so he could buy a gift for his wife.

Adrian was appointed the inaugural South Australian Justice Chair in Forensic Science in 2010. This position is held in partnership between the College of Science and Engineering at Flinders University and the South Australian Government. Since arriving at Flinders University, Adrian has been instrumental in promoting the Forensic Science programme and integrating forensic biology and DNA methods into the previously chemistry focused teaching curriculum. He is the head of the Flinders University Forensic DNA Laboratory, which is a teaching and research facility dedicated to both wildlife and human forensic DNA applications. His own research interests are diverse, with recent focus particularly on getting more information from less evidence at crime scenes. Adrian collaborated closely with the UK Forensic Science Service in Britain and continues to collaborate heavily with South Australia's forensic service provider, Forensic Science SA.

Adrian has published over 100 papers in various international, peer reviewed journals has many years of experience as an associate editor of Forensic Science International: Genetics, and is also a member of the editorial board of the journal Investigative Genetics. He is co-author of the texts 'An Introduction to Forensic Genetics' and 'Wildlife DNA Analysis: Applications in Forensic Science', editor of 'Forensic Science in Wildlife Investigations' and contributes a chapter in the 'Handbook of Forensic Genetics: Biodiversity and Heredity in Civil and Criminal Investigation'.

Adrian is actively involved with a range of forensic science societies around the globe including SWFS, most recently as a member of the organising committee for the 2019 meeting in Denver. He served as the South Australian branch President and National President (2016-2020) of ANZFSS, as well as Scientific Chair for the 2014 ANZFSS Symposium. Adrian was President of the 25th Congress of the International Society of Forensic Genetics (ISFG) in 2013, bringing this international symposium all the way to Australia for the first time. He was also Chair the ISFG Commission on the use of non-human DNA in the criminal justice system.

For more information on Adrian's Citation please see https://honours.pmc.gov.au/honours/awards/2007322

Meet the board: Nadja Morf

What's your current position?
I'm a biologist at the department of Forensic Genetics at the Institute of Forensic Medicine in Zurich, Switzerland. It's been 11 years that I started in the field of Human Forensics, but three years later, in 2012 our Institute was asked to do species identification of bushmeat, confiscated at Swiss airports. At that time our department was only working with human casework, so someone had to develop and validate a species identification assay to analyze the bushmeat samples. Luckily, I got the chance to do so and that's how I got first involved in Wildlife Forensics.

Can you give me a brief overview of what it is you do in your work?
At our institute, I am responsible for any casework involving animals. This includes individual identification of dogs and roe deer using STR analysis, mtDNA-based species identification and morphological identification of ivory. Additionally I coordinate the implementation and validation of new techniques according to the needs of our clients within the animal forensic field.

What would you say most motivates you to do what you do?
My love for animals and my sense for justice. After high school, I lived and worked in an animal rescue center in the middle of the Ecuadorian rainforest for almost a whole year. Taking care of confiscated wild animals and reintroducing them back into their natural habitat was a very rewarding thing to do. Nowadays, I get my motivation by being able to supply law enforcement with tools to prosecute crimes involving animals.

What were you doing before you began your current position?
I studied Anthropology at the University of Zurich, where I investigated the dispersal patterns in a wild orangutan population in Central Kalimantan, Borneo for my master's thesis. I extracted DNA from fecal samples of the orangutans, and used STRs to analyze the relatedness between the individuals. The results confirmed previous behavioral observations and showed that females were more closely related to each other than males, providing strong evidence that females are the more philopatric and males the more dispersing sex in orangutans. Three years later, after working with smelly fecal samples for almost a year, I got the opportunity to finally go to Borneo and see the orangutans in real life, which was a breathtaking experience.

What's next for you in your work?
What are you looking forward to?
We just published a study, which demonstrates that it is possible to extract DNA from precious coral skeletons used in the jewelry industry. This method is "quasi non-destructive" and allows taxonomic identification of a cut, carved and polished coral object, without compromising its value. Since the different species of worked coral samples can be extremely difficult to distinguish, a DNA based identification can be very helpful for law enforcement. The colleague, which developed this approach is currently working on the validation of the method, and I'm really looking forward to offer this service in future to our clients.

What do you find most challenging about Wildlife Forensics?
The field of Wildlife Forensics is so interesting and incredibly diverse that it feels like there are billions of questions that could be answered, but since time and resources are limited, you have to choose an area to put your focus on. For me, that area was obviously genetics, but even within genetics, there are so many cool and new techniques, and I wish I had more time to explore these for potential applications within Wildlife Forensics.

What do you do when you aren't working?
Besides my employment at the Institute of Forensic Medicine, I have a side job at the Zoo of Zurich, where I give guided tours. Giving these tours, teaching kids and adults about animals, and making them aware of the importance of wildlife conservation, complements the work in the lab and office. When I'm not working at the institute or the zoo, I enjoy being outside, jogging in the forest or going on hikes with the dog.

The African Wildlife Forensics Network

Armand A. Biko'o, Coordinator of the African Wildlife Forensics Network

The early development of the African Wildlife Forensics Network (AWFN) until 2018 was reported in the July 2018 SWFS newsletter by Dr Stephanie Pietsch. Since then, the AWFN has grown significantly with increasing levels of engagement, coordination and impact. In July 2019 I was recruited as the AWFN coordinator, funded through the USAID VukaNow programme, and this article describes some of the things we've been organizing under the AWFN since then.

Mr Frank Banka interacting with his Malaysian counterparts during a lab exchange visit to the National Wildlife Forensic Laboratory (NWFL) in Kuala Lumpur, Malaysia in November 2019

International forensic lab exchange

To support international collaborations and help the development of regional labs, the AWFN helps to coordinate international lab exchanges. In November 2019, Mr Frank Banda, the lead Zambian wildlife forensic scientist from the Central Veterinary Research Institute (CVRI) Zambia, conducted a 1-week visit to the wildlife forensic laboratory in Kuala Lumpur, Malaysia, at the invitation of the Department of Wildlife and National Parks (Photo 1). Hosted by Frankie Sitam, Frank spent the week interacting with the Malaysian counterparts and experienced a full range of wildlife DNA forensic laboratory techniques (Photo 2). Such lab exchanges facilitate the transfer of technological experiences between laboratories in the network and create a collaboration platform between wildlife forensic scientists. The AWFN will continue supporting such exchange visits in future.

2020 and 2021 annual meetings

One of the key activities of the AWFN coordinator is to organise our annual network meeting. The 2019 meeting in Livingstone was previously reported in the SWFS News February 2020 issue. The 2020 annual meeting was scheduled to be held in Kilimanjaro, Tanzania, but due to COVID-19, this has now been changed into an online meeting, with sessions to be held between the 12th and 15th October 2020. We're currently busy planning this meeting; not being in Tanzania is a shame, but we hope one advantage of being online is that more people can attend.

The 2021 AWFN annual meeting will coincide with the SWFS meeting to take place in Kruger National Park, South Africa, hosted by SANBI. This should be a great opportunity to bring everyone together into the same place at the same time.

The AWFN Wildlife Crime Scene Guide

A highlight of the 2019 Livingstone meeting was the launch of the Wildlife Crime Scene Guide (Photo 3). Following assessment of the current gaps in wildlife crime scene investigation, the guide was successfully produced, targeted towards frontline officers needing to secure, search and collect evidence. The guide is available as a hard copy upon request to the UNODC from:

The African Wildlife Forensics Network

Continued from page 12

https://www.unodc.org/documents/Wildlife/Wildlife_Crime_Scene_Guide_restricted.pdf.
The guide was produced in collaboration with the UNODC's Global Programme for Combating Wildlife and Forest Crime and the European Commission, through funding from the Government of France, and with technical guidance from the Netherlands Forensic Institute and TRACE Wildlife Forensics Network.

Wildlife Crime Scene Training Manual
To increase the wildlife crime scene capacity, there is an increased effort to roll out effective train-the-trainer material. Following the production of the AWFN Wildlife Crime Scene Guide, the network decided that a training curriculum and manual based on the contents of the guide would help facilitate such capacity development.

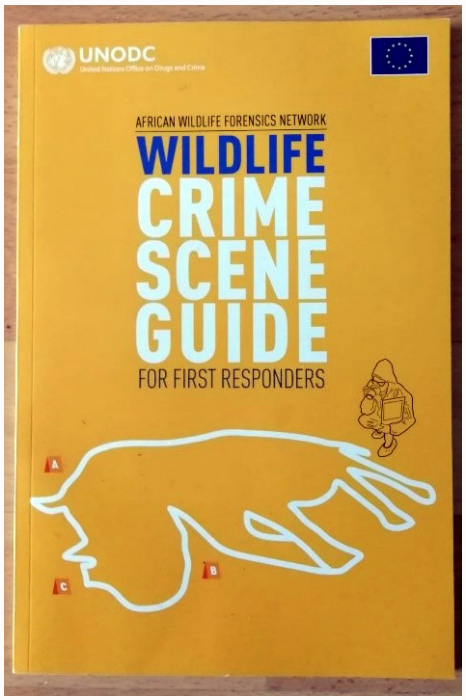
Thus, a training manual is currently in development that aims to outline all key aspects and competency requirements for training, as well as providing a number of practical exercises that can be run to practice and test student's skills.

Lion Localizer Software Tool
At the lion traceability workshop supported by USAID in November 2018, the development of a coordinated set of protocols for the DNA traceability of lions across the African continent was initiated. Central to this initiative is the creation of a single database of lion DNA sequence data to allow all countries to access reference data for assigning seized lion samples to their geographic origin.

This online traceability tool will allow scientists to map their lion DNA sequences of unknown geographic origin back to haplotypes with associated geographic location information. The "lion localizer" will mirror the Loxodonta Localizer web tool (https://www.loxodontalocalizer.org/) that uses the same type of data to trace the origin of African elephant ivory. The domain for 'lionlocalizer.org' has been secured, the database of existing DNA sequence data has been curated and the web tool is currently under construction – watch this space.

That brings me to the end of this quick AWFN round-up. As a network we are always keen to hear from the wildlife forensics community, especially if you are active in Africa. You can contact me at any time (armand.bikoo@tracenetwork.org) and you will be able to see more updates from our AWFN website, coming soon!

Mr Frank Banda practicing all workflow steps for forensic species ID during a lab exchange visit in Malaysia



Cover of the Wildlife Crime Scene Guide

Update from the TWG and another opportunity to join!

Kelly Morgan, TWG coordinator

2020 will forever be remembered as the year of Zoom, of working on the couch and of getting to know your dog and family members maybe a little too well. This was no different for the members of the Technical Working Group of SWFS, better known as the TWG, a group of people living across 6 time zones and residing in 4 countries. In April 2020, we all met over Zoom, some joining just as they woke up, others during the night, to discuss relevant SWFS issues. We all had time.

Some of the TWG team at the Denver SWFS meeting in 2019 – Trey Knott, Kathy Moore, Rebecca Johnson (who has now left the building!), Lucy Webster, Mary Burnham-Curtis, Kim Frazier and Frankie Sitam

One of the main topics of discussion was having the SWFS standards and guidelines (S&G) translated into other languages. A good first step for new or existing wildlife forensic laboratories is to be compliant with these standards, as achieving accreditation under ISO/IEC 17025 can be a bit difficult to manage, not to mention expensive. The S&G are specifically tailored for wildlife forensic laboratories. However, SWFS has member labs all over the world, many of whom have employees whose first language is not English, which can make compliance with the S&G harder. From a survey sent to members of SWFS last year, the most requested languages were Spanish, Malay, Thai, Mandarin, Portuguese and French. Some volunteers within TWG are working on these translations but hopefully we can get more volunteers (or funding opportunities) to transcribe them into other languages. If you feel able to contribute to translations into any language, please contact the TWG.

We hope in the near future the updated S&G will be accessible to many different countries, and not to just English-speaking personnel.

An updated SWFS Quality Manual template is being drafted to reflect the changes in the ISO/IEC: 17025 standards since 2017. A Quality Manual forms the basis of any laboratory Quality Management System (QMS). Laboratories will be able to use the template and tailor the document to their QMS, adding new procedures if they wish to become compliant with ISO/IEC:17025.

The make-up of the TWG is evolving. Following the last newsletter, I applied for the position of TWG coordinator and was appointed at the end of March to help Lucy Webster keep the group in check! We have also lost Dr Rebecca Johnson who has recently taken the role of Associate Director for Science with the Smithsonian – thank you Rebecca for all of your contributions to the TWG and all the best with your new job! This leaves a gap on the TWG and we are inviting interested parties to contact us by email indicating your experience in wildlife forensic science, your field of specialism and the country where you are based. We are looking to increase the number of countries represented, and it would be nice to also increase the number of fields if possible. Please contact us by September 14th to register your interest.

We shall meet again soon, at the same wild times to discuss progress made over the last few months. If you have any recommendations for the TWG, please let us know. Stay safe and stay home.

To contact the TWG please email Lucy Webster (lucy.webster@sasa.gov.scot) and myself (kelly.morgan@tracenetwork.org).

The Florida Fish and Wildlife Conservation Commission Establishes Forensic Science Partnership with the University of Florida

Eileen Roy-Zokan, Ph.D

Florida's unique sub-tropical environment provides for one of the most biodiverse locations in the continental United States of America. With habitats ranging from dense forests to scrub to coral reefs, the state is home to over 16,000 species of native fish, wildlife, and invertebrates, with 13 vertebrate species and over 1700 invertebrate species considered endemic. Florida's geographical location also provides seasonal habitats to migrating birds and marine species and is an entry point for commercial and exotic species that enter the country by legal and illegal means. Over 100 species and subspecies in Florida are protected by state and federal laws, including 89 species that are federally protected by the Endangered Species Act (ESA) and 44 species that are state protected by the Florida Administrative Code. Additionally, there are a number of commercially and recreationally important species that are regulated at the state level.

The FWC and University of Florida have entered into a five-year collaborative project and the FWC forensics laboratory officially moved to Gainesville, FL in the beginning of 2020. Pictured from left to right: Eileen Roy-Zokan, Ph.D. (FWC), Jason Byrd, Ph.D. (UF), and Ginger Clark, M.S. (FWC/UF).

The Florida Fish and Wildlife Conservation Commission (FWC) is tasked with patrolling, protecting, and managing Florida's 8,400 miles of coastline, 12,000 miles of fishable rivers, streams, and canals, 7,800 lakes, 175 state parks, and 34 million acres of public and private lands. The primary mission of FWC is to protect and conserve Florida's fish and wildlife resources for their long-term well-being and the benefit of people. The FWC's Division of Law Enforcement first began using DNA for wildlife forensics cases in 1996 when the University of Florida developed DNA assays for deer poaching cases. In 1999, the FWC Forensics Research Laboratory was officially established to provide FWC officers with scientific analyses of physical evidence and to provide the agency with the additional tools needed to enforce the management of Florida's fish and wildlife resources.

The FWC is now expanding their forensic science program with the ambition of becoming nationally recognized as a premier wildlife forensic sciences program partnering with governmental and private entities to effectively meet the needs of the FWC. The FWC plans to provide access to these forensic sciences services to outside agencies and states that do not have wildlife forensics capabilities of their own. As such, the agency has entered a collaborative agreement with the University of Florida, and together they are striving to become a leading full-service wildlife forensics facility with access to analytical capabilities at the University of Florida in the areas of DNA and molecular biology, entomology, botany, pathology, osteology, and toxicology. The current capabilities of the FWC forensic laboratory include species identification of most encountered terrestrial species and many marine species, sex identification, and DNA fingerprinting for a variety of species such as white tail deer, black bears, turkeys, canids, and felids. "Making this long-standing relationship between FWC and the University of Florida an official partnership is very exciting. We are confident this unit will provide our officers and

continued on page 16

The Florida Fish and Wildlife Conservation Commission Establishes Forensic Science Partnership with the University of Florida

Continued from page 15

investigators with timely forensic capabilities that will augment our criminal case preparations. We must do all we can to stay one step ahead of those who choose to steal Florida's valued fish and wildlife resources," said Lieutenant Colonel Gregg Eason, FWC's Division of Law Enforcement.

The University of Florida project is managed by Jason Byrd, Ph.D., and Ginger Clark, M.S. Each have over 25 years' experience in the application of the forensic sciences to wildlife crime. Newest to join the team is Eileen Roy-Zokan, Ph.D., who began with FWC as a research scientist in April 2020. Dr. Roy-Zokan fills the FWC forensic scientist position that was held for 33 years by Hector Cruz-Lopez, Ph.D., who passed away in August 2019. Eileen obtained her M.S. in marine biology at the College of Charleston, where her project focused on the population genetics of black sea bass (Centropristis striata). She then moved to the University of Georgia to pursue a Ph.D. in genetics, focusing on the molecular evolution of gene families. Since then, she has worked on a diverse array of projects such as behavioral genetics of burying beetles and population genomics of an invasive grass species. "I am honored to be given the opportunity to help FWC bring their vision of the wildlife forensics program to reality. The loss of Hector was a major setback to the FWC forensic sciences program, and I am going to do my best to pick up his mantle and carry on his work and legacy to the best of my ability. I am also looking forward to getting to know, and collaborating, with everyone within the wildlife forensics community."

Eileen Roy-Zokan, Ph.D., joined FWC as a research scientist in April 2020. While new to wildlife forensics, she does bring 16 years of genetics and molecular biology experience with her.

Both the FWC and the University of Florida are looking forward to the future possibilities of this new and expanding partnership, and are hopeful that it can be a model for wildlife agencies and university collaborations throughout the United States.

The FWC and University of Florida are jointly working on building a genetic database for the individual identification of alligators. This will enable FWC to track alligator farms and identify which farms particular alligators came from and whether certain farms are poaching eggs or animals from the wild.

SWFS Webinar Series Feedback

As mentioned in the president's letter SWFS would like to start a webinar series. To do so we would like your feedback on several questions:

1. Would you be interested in attending a 45 minute SWFS Webinar Series?
2. Would you be interested in presenting a SWFS Webinar Series?
3. What topics would you like to see covered in a SWFS Webinar Series?
4. Would you be a moderator for a SWFS Webinar Series?
5. What virtual platforms have you used that would work well for the SWFS Webinar Series?
6. Any advice you can give to help promote the planning process will be greatly appreciated.

Please send all responses and interest to Lucy Webster at lucy.webster@sasa.gov.scot by 27 August 2020.

Recent publications:

In this section we provide a list of recent wildlife forensic publications pulled from web of science. This list covers the period from January 2020 to June 2020. We aren't commenting on their quality or advocating their application, hopefully you will have you own opinions on this. If you know we've missed something, particularly one of your papers (!), please let us know and we'll include it in the next edition.

Wildlife Forensics:

Hutchinson, A, Roberts, DL (2020) Differentiating captive and wild African lion (Panthera leo) populations in South Africa, using stable carbon and nitrogen isotope analysis. BIODIVERSITY AND CONSERVATION, 29; DOI 10.1007/s10531-020-01972-0

Bourret, V, Albert, V, April, J, Cote, G, Morissette, O (2020) Past, present and future contributions of evolutionary biology to wildlife forensics, management and conservation. EVOLUTIONARY APPLICATIONS; DOI 10.1111/eva.12977

Tembe, D, Mukaratirwa, S (2020) Forensic entomology research and application in southern Africa: A scoping review. SOUTH AFRICAN JOURNAL OF SCIENCE, 116; DOI 10.17159/sajs.2020/6065

Singh, G, Srinivas, Y, Kumar, GC, Singh, A, Sharma, CP, Gupta, SK (2020) Identification of selected wild felids using hair morphology and forensically informative nucleotide sequencing (FINS): Wildlife forensics prospective. LEGAL MEDICINE, 44; DOI 10.1016/j.legalmed.2020.101692

Rajani, CV, Patki, HS, Simanta, P, Surjith, K, Deepa, PM, Pradeep, M (2020) Histomorphological differentiation of the skin of leopard (Panthera pardus), leopard cat (Prionailurus bengalensis), Bengal tiger (Panthera tigris), and golden jackal (Canis aureus). VETERINARY WORLD, 13; DOI 10.14202/vetworld.2020.827-832

Ueland, M, Brown, A, Bartos, C, Frankham, GJ, Johnson, RN, Forbes, SL (2020) Profiling Volatilomes: A Novel Forensic Method for Identification of Confiscated Illegal Wildlife Items. SEPARATIONS, RI ; Ueland, Maiken/G-7873-2017, 7; DOI 10.3390/separations7010005

continued on 22

Recent publications:

continued from page 17

Wildlife Forensics continued:

Matuszewski, S, Hall, MJR, Moreau, G, Schoenly, KG, Tarone, AM, Villet, MH (2020) Pigs vs people: the use of pigs as analogues for humans in forensic entomology and taphonomy research. INTERNATIONAL JOURNAL OF LEGAL MEDICINE, 134; DOI 10.1007/s00414-

Gonzalez, BA, Agapito, AM, Novoa-Munoz, F, Vianna, J, Johnson, WE, Marin, JC (2020) Utility of genetic variation in coat color genes to distinguish wild, domestic and hybrid South American camelids for forensic and judicial applications. FORENSIC SCIENCE INTERNATIONAL-GENETICS, 45; DOI 10.1016/j.fsigen.2019.102226

Piaggio, AJ, Shriner, SA, Young, JK, Griffin, DL, Callahan, P, Wostenberg, DJ, Gese, EM, Hopken, MW (2020) DNA persistence in predator saliva from multiple species and methods for optimal recovery from depredated carcasses. JOURNAL OF MAMMALOGY, 101; DOI 10.1093/jmammal/gyz156

Casali, F, Ciavaglia, SA, Gannicliffe, C, Lidstone, N, Webster, LMI,AF Casali, F. (2020) Validation of presumptive tests for non-human blood using Kastle Meyer and Hemastix reagents. SCIENCE & JUSTICE, 60; DOI 10.1016/j.scijus.2019.10.003

Potoczniak, MJ, Chermak, M, Quarino, L, Tobe, SS, Conte, J (2020) Development of a multiplex, PCR-based genotyping assay for African and Asian elephants for forensic purposes. INTERNATIONAL JOURNAL OF LEGAL MEDICINE, 134; DOI 10.1007/s00414-019-02097-y

Morice, BD, Lord, WD, Barthell, JF, Jourdan, TH, Morris, TL (2020) Necrophagy in Honey Bees (Apis mellifera L.); A Forensic Application of Scent Foraging Behavior. JOURNAL OF THE KANSAS ENTOMOLOGICAL SOCIETY, 92; DOI 10.2317/0022-8567-92.2.423

Ewart, KM, Lightson, AL, Sitam, FT, Rovie-Ryan, JJ, Mather, N, McEwing, R (2020) Expediting the sampling, decalcification, and forensic DNA analysis of large elephant ivory seizures to aid investigations and prosecutions. FORENSIC SCIENCE INTERNATIONAL-GENETICS, 44; DOI 10.1016/j.fsigen.2019.102187

Meredith, EP, Adkins, JK, Rodzen, JA (2020) UrsaPlex: An STR multiplex for forensic identification of North American black bear (Ursus americanus). FORENSIC SCIENCE INTERNATIONAL-GENETICS, 44; DOI 10.1016/j.fsigen.2019.102161

Willows-Munro, S, Kleinhans, C (2020) Testing microsatellite loci for individual identification of captive African grey parrots (Psittacus erithacus): a molecular tool for parentage analysis that will aid in monitoring legal trade. CONSERVATION GENETICS RESOURCES; DOI 10.1007/s12686-019-01127-6

Zhao, K, Ishida, Y,, Green, CE, Davidson, AG, Sitam, FAT, Donnelly, CL, de Flamingh, A, Perrin-Stowe, TIN, Bourgeois, S, Brandt, AL, Mundis, SJ, van Aarde, RJ, Greenberg, JA, Malhi, RS, Georgiadis, NJ, McEwing, R, Roca, AL (2020) Loxodonta Localizer: A Software Tool for Inferring the Provenance of African Elephants and Their Ivory Using Mitochondrial DNA. JOURNAL OF HEREDITY, 110; DOI 10.1093/jhered/esz058

continued on 19

Recent publications:

continued from page 18

Fish Forensics:

Rodrigues, LFD, Feitosa, LM, Nunes, JLS, Palmeira, ARO, Martins, APB, Giarrizzo, T, Carvalho-Costa, LF, Monteiro, ILP, Gemaque, R, Gomes, F, Souza, RFC, Sampaio, I, Sales, JBD (2020) Molecular identification of ray species traded along the Brazilian Amazon coast. FISHERIES RESEARCH, 223; DOI 10.1016/j.fishres.2019.105407

Lopez-Oceja, A, Lekube, X, Ruiz, L Mujika-Alustiza, JA, De Pancorbo, MM (2020) CYT B L15601 and H15748 primers for genetic identification of cetacean species. FORENSIC SCIENCE INTERNATIONAL GENETICS SUPPLEMENT SERIES, 7; DOI 10.1016/j.fsigss.2019.10.171

Timber Forensics:

Dormontt, EE, Jardine, DI, van Dijk, KJ, Dunker, BF, Dixon, RRM, Hipkins, VD, Tobe, S, Linacre, Lowe, AJ (2020) Forensic validation of a SNP and INDEL panel for individualisation of timber from bigleaf maple (Acer macrophyllum, Pursch). FORENSIC SCIENCE INTERNATIONAL-GENETICS, 46; DI 10.1016/j.fsigen.2020.102252

He, T, Marco, J, Soares, R, Yin, YF, Wiedenhoeft, AC (2020) Machine Learning Models with Quantitative Wood Anatomy Data Can Discriminate between Swietenia macrophylla and Swietenia mahagoni. FORESTS, 11; DOI 10.3390/f11010036

Ng, CH, Ng, KKS, Lee, SL, Tnah, LH, Lee, CT, Zakaria, NF (2020) A geographical traceability system for Merbau (Intsia palembanica Miq.), an important timber species from peninsular Malaysia. FORENSIC SCIENCE INTERNATIONAL-GENETICS, 44; DOI 10.1016/j.fsigen.2019.102188