To study emerging methodologies, intelligence tools and forensic science to investigate wildlife crime.

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Signed:    Dated:
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INTRODUCTION

I readily acknowledge that environmental crime, including wildlife crime, was not on my radar until relatively recently. For eighteen years I pursued criminals of a different kind - those involved in volume crime (car theft, burglaries, drugs, etc.) or major crime (armed robberies, sex crimes and homicide). In around 2003, while with Victoria Police, I did a small amount of work with the Department of Sustainability and Environment and the Department of Primary Industries – assisting them to investigate the illegal wildlife and fisheries trade.

In mid 2008 I moved to New South Wales and joined the Specialist Investigations Unit (SIU) in the Department of Environment and Climate Change, now the Office of Environment and Heritage (OEH). The SIU is a dedicated group of investigators similar to many of the groups, crews or squads I have had the privilege to work in over the years. While the SIU conducts investigations into wildlife crime, it also assists the whole agency and Environment Protection Authority in administering over 50 pieces of legislation. As a consequence, SIU does not have the capacity to provide full time resources to effectively tackle wildlife crime and gather any real intelligence on the subject. This is reflected in other jurisdictions of Australia. Being awarded a Winston Churchill Fellowship has given me an opportunity to meet with people leading the field of wildlife crime investigation, learn from them and hopefully make a difference in Australia.

Thanks to the panel members and the Winston Churchill Memorial Trust who had faith in my project and awarded me the Fellowship. I would also like to thank the people who assisted me in my application and subsequent travel: Mr. Jason Bentley and Mr. Rick Birkett (my referees); Mr. Ian Parks (2007 Churchill Fellow); Ms. Lynne Chalilnor (NSW Churchill Fellows Association); and Mr. Grant Pink (DSEWPaC). Although I visited many cities and saw fantastic sights, the study was made all the easier because of the great people I met along the way that gave very generously of their time. In particular, thanks to Ms. Karen Hunter from PAW Scotland, Scottish Executive who organized a fantastic itinerary for me in Scotland and Mr. Mark Webb and his wife Kathy who helped me with my itinerary in the US and were extremely generous with their hospitality.

A few people I met don’t get a mention in the main body of the report so I’ll mention them now. Dr Rob Ogden, Program Director of the TRACE Wildlife Forensics Network gave me an insight into the world of forensics and history of funding for wildlife crime forensics in the UK. Dave
Joly and Chandra Iwasaki showed me around the FBI office in Denver CO and shared their views of collaboration between federal agencies in the US. Although not strictly related to wildlife crime, I met with a number of people from the US EPA – Ted Owens and Kalani Beatty in Washington DC and Eric Nottingham, Brian McKeown and T. Craig Carlton at the National Enforcement Investigations Centre in Denver CO. It was great to compare notes (and the occasional war story) with them.

Finally, very special thanks to my wife and children who shared the whole (amazing) journey with me.

Note: Opinions in this report represent those of the author unless otherwise indicated.
EXECUTIVE SUMMARY

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“To study emerging methodologies, intelligence tools and forensic science to investigate wildlife crime.”

Australia’s vast array of flora, fauna and landscapes is unique and special in many ways. This uniqueness helps create and shape Australia’s national and natural identity. This attracts many tourists to Australia and helps contribute to the multi-billion dollar tourism industry. The aim of Australia’s wildlife crime investigators is not to jealously guard or protect wildlife to the exclusion of others but to maintain the rich biodiversity for the enjoyment of everyone. Australia’s unique plants and animals are highly sought after in Australia for the domestic market and extremely sought after overseas.

Environmental crime, including wildlife crime, struggles to capture the attention of the public in a lot of countries. While environmental crime makes the occasional headline, it is not considered mainstream and in the day of the 24-hour news cycle and fixed political terms, it is often difficult to maintain the attention of the decision makers.

Although still relatively young, the Partnership for Action against Wildlife crime (PAW) Scotland is an excellent example of Government agencies, non-Government organisations and the community working together to combat wildlife crime. Support is provided at the highest levels of Government with the Minister for the Environment chairing the Executive Committee of PAW Scotland.

The model of wildlife crime law enforcement in the United States of America (US) is the envy of many other countries – a network of federal and state agencies, working cooperatively with resources identical to many police forces. The US has a population base to support such a program but there are many aspects achieved at state level in the US that Australia could achieve at a national level.

Wildlife crime investigators in jurisdictions of Australia have developed a good working relationship through the Australasian Environmental Law Enforcement and Regulators neTwork (AELERT) but lack a coordinated intelligence network, something mainstream policing has enjoyed for some time.
The clear difference between wildlife crime investigation in Australia and some agencies overseas is the use of overt and covert methodologies, intelligence management, digital evidence recovery and forensic science more like mainstream criminal investigation. Wildlife crime is discussed openly with the community who are considered part of the solutions as much as they are part of the problem.

Some aspects of investigation methodologies I observed overseas (particularly covert investigation) cannot be discussed in a public document such as this, however they may be made available to interested parties upon application.

**Key Recommendations**

The ability and combined effect of Australian environmental agencies to combat wildlife crime can be enhanced by:

- Establishing a national network of dedicated wildlife crime investigators;
- Establishing a network of dedicated wildlife crime intelligence analysts;
- Establishing a national wildlife crime intelligence database;
- Promoting wildlife crime as significant and mainstream;
- Establishing a national reporting system for wildlife crime; and
- Establishing a secure funding source for forensic analysis of DNA for wildlife crimes and associated research.
27 – 29 March 2012

France
• Interpol, Lyon

2 – 10 April 2012

Scotland, UK
• Partnership for Action against Wildlife Crime (Scotland)
• Scottish Natural Heritage
• Game & Wildlife Conservation Trust
• Royal Society for the Preservation of Birds (Scotland)
• UK National Wildlife Crime Unit
• Science and Advice for Scottish Agriculture
• TRACE Network
• Loch Lomond and The Trossachs National Park

23 April – 29 May 2012

United States of America
• Bryan Christy – Journalist / Author – Philadelphia PA
• US Fish & Wildlife Service - Branch of Investigations, Arlington VA
• US Environmental Protection Agency – Washington DC
• US Fish & Wildlife Service – Digital Evidence Recovery Unit, Jacksonville FL
• Florida Fish and Wildlife Conservation Commission – Division of Law Enforcement, Tallahassee FL
• US Fish & Wildlife Service - Southeast Region, Lacombe LA
• US Fish & Wildlife Service – National Wildlife Property Repository, Denver CO
• Federal Bureau of Investigation – Denver CO
• US National Parks Service – Rocky Mountain National Park CO
• US Environmental Protection Agency - National Enforcement Investigations Centre, Denver CO
• US Fish & Wildlife Service – National Wildlife Refuge System, Denver CO
• Colorado Division of Parks & Wildlife – Fort Collins CO
• Society for Wildlife Forensic Science – Triennial Meeting, Jackson Hole WY
• Wyoming Game & Fish Department – Jackson Hole WY
• US National Parks Service – Grand Teton National Park WY
• US Fish & Wildlife Service – Pacific Southwest Region, Los Angeles CA
Wildlife Crime

- Global

Wildlife crime takes many forms across the globe and not one of the six animal groups (invertebrates; fish; amphibians; reptiles; mammals; and birds) is spared. Wildlife crime is unique amongst environmental crime, in that it deals with a potentially high value commodity that, in many cases, is easily concealed and transported. This differs from other forms of environmental crime (waste dumping, timber clearing, and pollution) and puts it more in the category of other forms of mainstream crime such as firearms and drugs trafficking.

There are many motives for committing wildlife crime ranging from sustenance to commercial gain or greed. While there has been much speculation over the years on the monetary value of wildlife crime worldwide (figures range from $5 billion to $20 billion annually), the true value is unclear. What is clear is that the cost of wildlife crime is much more than the commercial value attached to an animal or the price of an animal product. Destruction or damage to habitat, removal of breeding stock and the introduction of alien or invasive species are all hidden costs attached to wildlife crime. Unfortunately, the fundamental economic concept of supply and demand dictates that the most threatened or vulnerable species are the most sought after and therefore the most valuable. This is because animals have been hunted to the brink of extinction because of properties they possess or are simply popular because of their rarity. Animals and animal products have become a commodity to be sold and exchanged like currency or shares. Wildlife crime in many cases is theft and it robs local inhabitants of their resources or natural heritage.

The ease of global trade and international travel has assisted those intent on committing any transnational crime, and wildlife crime is no exception. The Convention on International Trade on Endangered Species of wild flora and fauna (CITES) is the main tool used to combat the illegal trade in threatened or vulnerable species. The aim of CITES is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. There are currently 175 parties (member countries) to CITES.

There are many global and regional organisations (Government and non-Government) establishing programs aimed at protecting wildlife and its habitat. Some include United Nations, Interpol,
World Bank, International Fund for Animal Welfare (IFAW) and World Wide Fund for nature (WWF).

While some of these organisations have a presence in Australia their activities do not extend to investigation or compliance, with the possible exception of the Royal Society for the Prevention of Cruelty to Animals (RSPCA).

- Australia

Australia is unique in many ways. The accepted number of species in Australia is about 570,000 with 93% of reptiles, 87% of mammals, 94% of frogs and almost 92% of vascular plants being unique\(^1\). Australia has one of the worst rates of extinction in the world with 22 mammals becoming extinct in the past 200 years and Australia accounting for 30% of the world’s known mammal extinction since the year 1600\(^2\). In New South Wales, there are currently 13 species of amphibian, bird and mammal listed as critically endangered; a further 71 species of amphibian, reptile, bird, mammal and marine mammal are listed as endangered; while 166 species of amphibian, reptile, bird, mammal and marine mammal are listed as vulnerable\(^3\).

Australia does not possess the large game animals found in Africa, Asia and North America although there are populations of introduced species such as rabbit, fox, deer, goat and a number of bird species that provide game for recreational hunters. In Australia, wildlife crime is not about rhinos and tigers; it’s about geckoes and cockatoos. That’s a very simplistic view, however unique reptiles of Western Australia, South Australia, Northern Territory and far north Queensland and birds from all over Australia are highly sought after in the southeast of Australia (where the majority of the human population lives) and extremely sought after overseas. There are also reports of reptile and bird species held commonly in private collections being taken from the wild from all over Australia for sale in the already saturated domestic market.

This is partly due to the desire to possess or breed the next best thing – specimens that are albino; hypomelanistic; natural state; or displaying scale or colour variations. “Candy” coloured Corn snakes (Pantherophis guttatus guttatus) are quite common and there are various efforts underway to produce blue coloured Leopard geckoes (Eublepharis macularius).

\(^1\) A. Chapman, Numbers of Living Species in Australia and the World. 2\(^{nd}\) ed. Aust Biological Resources Study 2009.
\(^2\) A. Burbidge, Australia’s biodiversity and climate change/Will Steffen …[et al.].
\(^3\) Schedules 1, 1A and 2 Threatened Species Conservation Act 2005 (NSW)
Manipulated breeding of reptiles worldwide has occurred for some time and is now extending to many Australian species. Decades ago it was common for kids to collect the odd snake, turtle, frog or lizard from the nearby bush and take it home. But things have changed and now some of those “kids” have grown up and are looking for animals to make them money.

The high demand for Australian animals overseas is evident. A simple search of the internet will reveal large numbers of Australian animals, including birds and reptiles, for sale overseas. This includes threatened species not readily available to private collectors in Australia. Surprisingly, Australia’s bearded dragon (Pogona genus) is one of the most popular pets in the UK and US.

Illegal hunting of protected native fauna in Australia for sport may not have the same appeal as trophy hunting overseas, but it does occur. Other forms of wildlife crime occurring in Australia include illegal commercial fishing, destruction or clearing of habitat through illegal timber harvesting or development activities, and the illegal introduction of alien and invasive species. While there are a number of natural factors influencing rates of vulnerability or extinction, all these forces combined are certain to put additional pressure on already threatened species.

Advances in technology allow criminals to communicate, share information and conduct bank transactions without delay from any part of the world. This same technology allows wildlife traffickers to share information such as perceived weaknesses in Australia’s border protection, ineffective regulation or compliance, methods of concealment or precise locations (GPS reference points) of where to find animals.

Wildlife crime investigation in Australia

Australia has a constitution that allows its states or provinces to establish a government and make their own laws over matters not controlled by the Commonwealth. Wildlife crime is dealt with on many levels of government within Australia with varying degrees of response. The Australian Government Department of Sustainability, Environment, Water, Populations and Communities (SEWPaC) is responsible for regulating the movement of wildlife and wildlife products into and out of Australia. Having said that, the Australian Customs Service (Customs) and the Australian Quarantine and Inspection Service (AQIS), both Australian Government agencies, carry out border control, conducting inspections and investigations into the illegal movement of wildlife and

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4 Nephrurus deleani - UNEP-WCMC (2009) Review of non-CITES reptiles that are known or likely to be in international trade (five additional species) A report to the European Commission. UNEP-WCMC, Cambridge.
wildlife products. Customs and AQIS are the first (import) and last (export) lines of defence. SEWPaC is responsible for investigation and enforcement, largely through the administration of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act allows SEWPaC to uphold Australia’s obligations regarding CITES listed species; regulate exotic species movement and possession; and protect federal listed threatened species.

Each state and territory of Australia has its own legislation protecting wildlife and then an agency or agencies to enforce it.

In New South Wales (NSW) the main pieces of wildlife and habitat legislation are the *National Parks and Wildlife Act 1974* (NPW Act), the *Threatened Species Conservation Act 2005*, and the *Fisheries Management Act 1994* (Fisheries Management Act). Other acts that are related to animals (not necessarily wildlife) include the *Prevention of Cruelty to Animals Act 1979* (administered by the RSPCA) the *Game and Feral Animal Control Act 2002* (administered by the Game Council) and *Companion Animals Act 1998* (administered by local government). The Department of Primary Industries administers zoos and other like facilities under the *Exhibited Animals Protection Act 1986*.

Hunters and hunting of game animals on private land and most public land is regulated by the Game Council, which has 7 inspectors across the state. The majority of terrestrial wildlife and marine mammals in NSW come under the jurisdiction of The Office of Environment and Heritage (OEH) within the Department of Premier and Cabinet. The National Parks and Wildlife Service (NPWS) is part of OEH and is responsible for enforcing provisions of the NPW Act relating to protected fauna. While the NPWS has rangers and field staff managing the national park system, law enforcement is only a part of their work and wildlife crime enforcement is a small part of that.

OEH has a small number of investigators, including some dedicated to NPWS, but there are currently no dedicated wildlife inspectors or wildlife crime investigators (excluding fish) in NSW. OEH does not have an intelligence officer or analyst, nor does it have an intelligence management system for wildlife crime.

In Australia, like many jurisdictions around the world, fish are seen for their commercial value as much as they are for their conservation value. Compliance and enforcement of fisheries legislation in NSW is the responsibility of Fishing and Aquaculture (NSW Fisheries) in the
Department of Primary Industries. There are currently 92 compliance and enforcement officers in NSW Fisheries which includes general duties officers, supervisors, intelligence officers and two teams of investigators - a Statewide Operations Investigations Group (SOIG) & Conservation & Aquaculture Group (CAG). SOIG has 3 investigators that primarily focus on organised crime syndicates, which generally target abalone, rock lobster and other high value species. CAG has 4 investigators that manage conservation matters, which includes investigations into activities resulting in key threatening processes or involving endangered species, populations and ecological communities offences.

The 2003-2004 review of illegal fishing for commercial gain or profit in NSW conducted by former Federal Police Commissioner Mick Palmer⁵ resulted in a number of changes to the compliance programs of NSW Fisheries. The review highlighted the impact of illegal fishing in NSW and the inadequate resource capacity of Fisheries NSW at the time to deliver effective compliance. The review was quite critical of the penalties for non-compliance, which were seen to be inconsistent with the financial gain that can be achieved by the offending conduct – “a lot of people do not think they are going to get caught, and if they do, they are not worried about the penalties – the opportunities are presently seen as outweighing the risks”.

The review made a number of recommendations including:

- **Ensuring the early implementation of a credible, uniform case management system that will enable the timely and efficient collection, analysis and exchange of information and intelligence, effectively support and inform the planning and management of compliance operations and activities, identify operational priorities and accurately measure performance; and**

- **Establishing as a matter of urgency, through a combination of targeted recruitment, in-service training and system development, an effective criminal intelligence capacity sufficient to provide a sound and accurate basis upon which crime trends and crime group targets can be identified and compliance operations appropriately prioritised, targeted, resourced and conducted**

With such a focus on fisheries it’s not surprising that the Fisheries Management Act is the only piece of wildlife and animal legislation in New South Wales to contain indictable offences, which means the possibility of higher penalties.

⁵ Report on Illegal Fishing for Commercial Gain or Profit in NSW – Mick Palmer, May 2004
The Australasian Environmental Law Enforcement and Regulators Network (AELERT) started out as a wildlife crime working group - investigators from different jurisdictions of Australia coming together to discuss targets and investigations. The network has grown to include a number of committees including the Operations Cluster, which is still dominated by representatives of wildlife crime enforcement agencies. This has ensured a good level of communication amongst wildlife crime investigators from the various Australian agencies but many agencies don’t have a criminal intelligence analyst and there is not a central repository for criminal intelligence.

Australia is fortunate to have a number of forensic scientists passionate about reducing the incidence of wildlife crime and are conducting research and developing techniques to assist in the investigation of wildlife crime. Australia was well represented at the recent triennial meeting of the Society for Wildlife Forensic Science in Jackson Hole WY, with representatives from Australia’s museums and universities. This is good from a research perspective but it highlights that there is no Government-funded forensic facility dedicated to wildlife crime, unlike services available to many police forces in Australia. This means that wildlife crime matters compete with other research and projects of busy museum and university laboratories and with varying scales of cost recovery.
THE STUDY

Overview
During the course of the Churchill Fellowship study I spent three days at Interpol in Lyon, France; five days in Scotland with members of the Partnership for Action against Wildlife crime (PAW); and thirteen days in the United States of America (US) with representatives of the US Fish and Wildlife Service (US FWS), National Parks Service (NPS), Environment Protection Agency (EPA) and state based agencies. I also took the opportunity to speak with Bryan Christy (author of “The Lizard King”) and attend the Triennial Meeting of the Society for Wildlife Forensic Science in Jackson Hole WY, participating in a workshop for wildlife crime scene examination.

Interpol
David Higgins, an Australian, is the manager of the Environmental Crime Programme at Interpol. I met and spoke with David briefly at the 1st International Chiefs of Environmental Compliance and Enforcement Summit held between 27 and 29 March 2012. I was fortunate to be given observer status and allowed to attend, which provided me with an opportunity to meet with a number of senior officials from countries and organisations I was not visiting during my Fellowship travel.

Established as the International Criminal Police Organization (ICPO) in 1923, Interpol is the world’s largest international police organization, having 190 member countries. Interpol is not an enforcement agency. The role of Interpol is to facilitate co-operation between the police forces, whether national or provincial, of member countries. Each member country operates a National Central Bureau (NCB), usually a function of the national police. Australia’s NCB sits in Canberra and is a function of the Australian Federal Police.

Interpol provides intelligence support to member countries by maintaining databases on a number of crime types including child sex offences, stolen and lost travel documents, firearms, and stolen works of art. Interpol also maintains databases for investigative tools including fingerprints and DNA.

One benefit of Interpol is that it provides secure communication between member countries and operates 24 hours a day, 7 days a week. In operation, if an investigator in New South Wales wants
information or intelligence from another country, the investigator could either make a request through normal diplomatic channels or to the NCB in Canberra.

In many countries, including Australia, the police do not enforce environmental law and crimes against the environment are not generally considered as a mainstream crime. Investigators of environmental crime in many jurisdictions around the world do not have access to many resources that police enjoy including legislation to support investigations; training; equipment; criminal intelligence tools; and forensic science.

In 1992 an Environmental Crime Committee was formed to assist Interpol in identifying emerging patterns and trends in the field of environmental crime enforcement. Two working groups, the Wildlife Crime Working Group and the Pollution Crime Working Group, support the Environmental Crime Committee. In 2009 Interpol established the Environmental Crime Programme. This could be seen as an acknowledgement of the seriousness of environmental crime as a crime type and recognition of emerging links between environmental crime and other crime types including organized crime.

Interpol currently lacks a free flow of intelligence on environmental crime from its member countries. Reasons for this may include the lack of criminal intelligence analysts and databases in the field of environmental crime investigation and a disassociation between environmental crime investigators and the police that operate their NCB.

The Environmental Crime Programme is taking an active role in gathering intelligence by leading global and regional projects. Member countries are encouraged to participate in operations that support the projects, tackling crimes such as illegal logging, traditional medicines, and the illegal trade in endangered reptiles and amphibians. Australia has participated in a number of these operations (where operational capacity has permitted) including Operation RAMP and Operation TRAM.

Interpol is committed to establishing a better link between enforcement agencies that investigate environmental crime (generally environmental, customs and border control agencies) and NCBs (the police). To that end, Interpol has developed a model of National Environmental Security Taskforces (NEST). Interpol describes a NEST as a national multi-agency force formed of experts from dedicated law enforcement agencies, police, customs revenue departments, health agencies
and prosecutors (Fig. 1). While aspects of the NEST are appealing, any model relies on the presumption that already under-resourced Australian police and other specialized enforcement agencies are prepared to commit resources to a crime they have no responsibility for. In practice, a NEST might work better in countries that are still developing their environmental agencies or countries that don’t have the network of national and provincial agencies that Australia does.

For most environmental crime, the states and territories of Australia self regulate, with little involvement of the Commonwealth. State and territory environmental agencies work closely on matters of domestic wildlife trade within the framework of their respective licensing systems and legislation. A NEST will only be effective if the state and territory agencies of Australia have capacity to provide accurate and timely intelligence to a national network, then to its international partners. Australia already has an established network of environmental regulators (AELERT), to which an intelligence capacity could be added, or linked in with local policing organisations such as the Australian Crime Commission.

Fig. 1 NEST structure - Interpol
1st International Chiefs of Environmental Compliance and Enforcement Summit.

The summit was hosted by Interpol and the United Nations Environment Programme (UNEP) and the themes included Investigative Assistance and Operation Support; Information Management; Capacity Building Standards; and Effective Networks. Delegates were generally heads of agencies or senior government officials although I was given observer status and permitted to attend. In addition to the plenary sessions, attendees were invited to participate in working group meetings to discuss issues such as fisheries, pollution and wildlife crime.

Some of the discussions were quite spirited and many delegates made a point of expressing the view that environmental crime is not given high enough status by the governments or judiciary of their country. The overwhelming majority of delegates indicated that they did not have capacity to gather or effectively use criminal intelligence. Only a very small number of delegates indicated they had criminal intelligence analysts and even fewer indicated they had a criminal intelligence database. Many countries do not have access to forensic services, while others lack proper training and equipment to carry out their work effectively. High-level corruption remains a barrier to effective regulation of environmental law in some developing countries where multi-national companies seek to exploit an abundance of natural resources. Another observation made during the summit was the need to recognise wildlife crime is well organized, well financed and countries need to have a response commensurate to the threat it poses.

The summit resulted in a number of outcomes, conclusions and recommendations. Importantly the summit recognised:

- The need to continue raising awareness and integrating environmental crime into mainstream crime, not isolating it;
- To combat environmental crime efficiently and effectively, environmental law enforcement needs to adopt a more pro-active intelligence-led approach, allocating resources to support information activities.

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6 Summit Report – 1st ICECE Summit, Interpol / UNEP 2012
“There is little doubt that those who work to protect and preserve the wildlife community are committed, hard working and passionate about their work. They have to be to remain so focused in the face of so much ambivalence.” House of Commons Environmental Audit Committee 2003-2004

Summary

There are a number of reasons why the Partnership for Action against Wildlife Crime (PAW) Scotland shouldn’t work, but many compelling reasons why it does. It might seem an unusual sight to see groups representing landowners, land managers and hunters sitting at a table with groups representing conservation and law enforcement, but they do. It might seem even more unusual to find them talking about wildlife crime and species and habitat conservation, but they do. This is all largely responsible because of the level of commitment PAW Scotland receives from the highest levels of Scottish Government. Also, the tireless work of the non-Government organisations cannot be under-estimated and without their support (including financial) PAW would inevitably collapse.

Wildlife crime fails to capture and maintain the attention of the media and public in most areas of the world but they manage to achieve it in Scotland. The education programs by PAW Scotland and its partners keep wildlife crime in the media and in the minds of the public.

PAW Scotland is fortunate to have a great deal of science available from many credible sources. This not only includes the scientific research conducted by Government and non-Government organisations but the forensic science available to investigators at Science and Advice for Scottish Agriculture (SASA).

Importantly, wildlife crime in Scotland (and the UK for that matter) seems to be considered as a mainstream crime – by the Government; the police (with certain offences now being a reportable crime); and the public.

Incidentally, we were in Scotland over the Easter period and stayed in a small village in the central highlands. One morning I got the car bogged in the only patch of snow on the road for miles and ended up getting a local farmer to tow us out with his tractor. We later met the farmer’s wife and I
raised the issue of wildlife crime with her (before she knew the purpose of my study). We learned how they had issues with the local wildlife – buzzards, otters, mink and foxes – taking their farm animals including ducks, chickens and lambs. The farmer’s wife then spoke of the local game warden “relocating” some of the troublesome animals. On the other hand, the farmer’s wife indicated she was well aware of the offence provisions and the existence of wildlife crime officers within the local police forces. Then I told her the purpose of my study…

In order to understand where Scotland is placed today as far as wildlife crime investigation goes, it’s important to reflect on where it has come from.

As most people would know, Scotland is a part of the United Kingdom (UK) by virtue of the Union of the Parliaments in 1707. It was not until two years after a successful referendum in 1997 that the Scottish Parliament reconvened. Consequently, Scotland is self-governing to a degree and, in this regard, is similar to the states and territories of Australia. Scotland is about twenty percent larger in size than Tasmania but has a population more like Victoria - 5.22 million in Scotland compared to 5.57 million in Victoria. Scotland has two national parks (Cairngorms National Park and Loch Lomond & Trossachs National Park), which comprise nearly 6400 km² of land between them. Seventy-five percent of the population of Scotland lives within 2 hours of Loch Lomond & Trossachs National Park, which results in high visitation and the associated problems of anti-social behavior, damage to park infrastructure and litter.

It is believed that just over 1200 landowners, including the Royal Family, own two thirds of Scotland. Despite the fact that much of the land is in private hands, the Scottish Outdoor Access Code (SOAC) provides the right of access to most land and inland water for recreation, education and going from place to place. This uniquely allows public access to privately owned land (generally known as estates) for activities such as hiking and camping but not hunting, shooting, fishing or illegal activity. There are limitations on access to buildings and their immediate surroundings, dwellings and crops but the SOAC allows investigators (Government and non-Government) access to land in order to investigate criminal offences, including wildlife crime.

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7 Based on data from Scottish Government [http://www.scotland.org/facts/] and Geoscience Australia
8 General Register Office for Scotland, 2010
9 Australian Bureau of Statistics, end of Dec quarter 2011
11 The Land Reform (Scotland) Act 2003
The majority of estates are run as commercial operations providing food in the form of crops or livestock, timber products, tourism and recreation. Management of land for hunting is relatively new and hunting for sport has become more accessible since the introduction of trains and industrialization. All manner of animal can be hunted including wild boar, pheasant, grouse, partridge, duck, a number of species of deer and many fish. Although the lands may be more accessible, hunting in many respects remains a sport for the wealthy with it costing anywhere upwards of £10,000 a day to hunt red grouse on sporting estates.

Land must be carefully managed for hunting grouse. Landowners employ gamekeepers (one gamekeeper per 2000-3000 hectares of land) to manage the land in order to maintain good numbers of grouse by removing predators such as hen harriers, red kites and golden eagles. This puts landowners and gamekeepers at odds with conservationists and the law as some of the birds of prey have been targeted to the brink of extinction and are listed as threatened.

Scotland currently faces a number of high priority wildlife crime issues including raptor persecution; poaching and damage to fresh water pearl mussels; badger baiting; and poaching other wildlife – hare, deer, salmon, grouse, etc. Badger baiting is a particular concern as it usually involves links to other crime – illegal carriage or use of firearms, animal cruelty and illegal gambling. Like other countries, Scotland has its fair share of non-native invasive species including American Signal Crayfish, American Mink and Grey Squirrel.

Scotland and the UK have legislation to protect the environment in keeping with domestic policy and to enforce the international treaties and conventions the UK is a party to. As member of the European Union (EU), the UK has a responsibility to comply with EU Directives such the Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC). According to many, Scotland is not currently meeting EU conservation targets on birds of prey due to illegal activity.

Although various departments are responsible for the protection of the environment, overall responsibility for investigating wildlife crime in the UK rests with the police. There are currently eight separate police forces in Scotland although they are set to merge into a single police service in the near future. The Royal Society for the Preservation of Birds (RSPB) and the Scottish Society for the Prevention of Cruelty to Animals (SSPCA) also conduct investigations (including covert investigations) however the police lay any charges and the investigators from the RSPB and SSPCS become witnesses in the prosecutions.
Approximately 140 agencies, organizations and groups have come together to form the UK Partnership for Action against Wildlife crime (PAW), administered by the Department for Environment Food and Rural Affairs (DEFRA).

**PAW Scotland**

PAW Scotland is administered within Scottish Executive, in Edinburgh. I met with Karen Hunter, the Wildlife Crime Police Officer for PAW Scotland and a group of staff that work with her.

PAW Scotland remains a part of UK PAW but in 2008 the structure was revised as a result of a recommendation of the Natural Justice Report of that year. The Natural Justice Report was commissioned following Parliamentary debate on wildlife crime prompted by widespread public concern about wildlife crime in Scotland. The report was a product of a joint thematic inspection carried out by Her Majesty’s Inspectorate of Constabulary for Scotland (HMICS) and the Inspectorate of Prosecution in Scotland (IPS). Nearly all of the twenty-four recommendations of the report have been implemented.

A number of the key recommendations include:

- *That those forces that do not already have a full-time wildlife crime coordinator post, create one and appoint a police officer to that role;*

- *That the chair of PAW (Scotland) through an appropriate sub-group, administers a fund to support certain high priority investigations and the development of more effective practices to combat wildlife crime; and*

- *That PAW (Scotland) consider the greater use of Crimestoppers as a means of reporting wildlife crime.*

PAW Scotland has approximately 35 members including the eight police forces of Scotland; Forestry Commission Scotland; Game & Wildlife Conservation Trust (GWCT); Royal Society for the Protection of Birds (RSPB); Scottish Natural Heritage (SNH); Scottish Lands and Estates (SLE); Science & Advice for Scottish Agriculture (SASA); and the Scottish Society for the Prevention of Cruelty to Animals (SSPCA). One of PAW Scotland’s strengths is the high level of support it enjoys from the Scottish Government with the Minister for the Environment the current chair of its Executive Group.
PAW Scotland and its partners combine resources to undertake:

- Conservation projects aimed at ensuring the survival of protected or threatened species;
- Management of land used for agriculture, sport and recreation;
- Protection of habitat;
- Eradication and control of alien species;
- Investigation of criminal offences; and
- Science to assist conservation projects, land management, and investigations.

PAW Scotland is supported by eight Area Groups (each of the current police districts); a number of sub-groups (funding, training and awareness, media, forensics, etc.); intelligence and investigation support from the National Wildlife Crime Unit (NWCU); and a wildlife crime targeting and coordinating group (Fig. 2). The NWCU is a national resource that is currently based in Scotland.

Fig. 2 The 2008 revised structure of PAW Scotland
The need for a national wildlife crime intelligence database was discussed and recommended by the House of Commons Environmental Audit Committee in the 2003-2004 session of parliament\textsuperscript{12}.

The committee received written and oral evidence and was quite critical of many sections of Government including DEFRA and the Home Office for what amounts to a lack of understanding, will, resources and legislation to support those who investigate wildlife crime.

Some of the 41 conclusions and recommendations of the Committee include:

- \textit{The Government must re-state its commitment to tackling wildlife crime;}
- \textit{We see this refusal to accept wildlife crime as an issue deserving of committed police resources as especially short-sighted given the many links made between wildlife crime and serious and organised crime;}
- \textit{We believe that a centrally managed, national database which records all incidents of wildlife crime, as well as the details of all successful and unsuccessful prosecutions mounted, must be established as a matter of priority. The location of the database would seem to most naturally sit in the National Wildlife Crime Intelligence Unit (NWCIU) within NCIS;}
- \textit{Given the advent of illegal internet trade, the links to serious and organised crime, and the threat posed by those who use this method to trade in endangered species, we believe that the level of resource allocated to this work by DEFRA is simply not sufficient and must be reviewed as a matter of urgency. At the same time resources within the NWCIU must also be reviewed and the monitoring of the illegal internet trade in endangered species must be central to the tasking for this unit;}
- \textit{The absence of any clear, national view of the scale of wildlife crime has a direct impact on the ability of those charged with enforcing current legislation. If the scale and nature of the problem is not known it is unlikely that the correct level of resources can ever be allocated to deal with it; and}
- \textit{We believe that the link between wildlife crime and other serious crimes, the clear and growing involvement of organised crime, and the increased reliance on the internet for illegal trade in protected species makes the argument for spending time and resources on this area of crime compelling.}

PAW Scotland operates similarly to many hierarchical networks found around the world. A small team of staff located in Scottish Executive carries out the administrative functions of the network and coordinates local and regional projects. The eight Local Force Area Groups and Sub-Groups meet every six months or so and report back to the Executive. Additional high priority sub-groups focusing on the issues of raptor persecution and fresh water pearl mussels meet every six weeks.

Another of PAW Scotland’s strengths is the amount of science that supports the process. Both SNH and SASA conduct research to support the functions of their respective Government agencies, some of which aids PAW Scotland. SASA also carries out analysis on poisons and pesticides and DNA for wildlife crime investigations. Charity organisations RSPB and GWCT have their own research centres and conduct research that supports their respective conservation projects. Science is used to support information gathered by the NWCU to produce strategic and tactical intelligence and inform the UK Tasking and Coordinating Group.

Each year the NWCU produces a Tactical Assessment of wildlife crime. This is used to inform the UK Tasking and Coordinating Group as well as drive the business of the NWCU, the police and their partners. The analysis and assessment not only looks at wildlife crime as a whole, but drills down to the various priority areas such as badger persecution, CITES listed species, deer poaching, fish poaching, bat persecution, raptor persecution and freshwater pearl mussels. The analysis looks at variations in the incidence of the various priority area crimes, the seasonality and location of offences, progress of the action plan of the relevant group and issues of funding and resources.

Legislation and policy also supports the activities of PAW Scotland. Cross compliance legislation imposes a mandatory set of requirements and standards on land managers in order for them to receive support scheme payments. Consequently, a land manager (farmer or game keeper) that fails to meet the requirements by committing an offence (such as wildlife crime) risks losing all or part of the support payments they receive.

Scotland has recently introduced vicarious liability provisions to offences designed to protect wild birds, their nests and eggs. As a result, simply doing nothing is not an option for landowners and gamekeepers. Landowners, including absentee landowners, must now take reasonable and practical steps to ensure that their employees, gamekeepers or sporting tenants do not commit any of the relevant offences contained in the *Wildlife and Countryside Act 1981*. Scottish Lands and
Estates, the body representing landowners, opposed aspects of the amendments but is now working hard with landowners to ensure compliance with the new provisions.

Scottish Natural Heritage
Scottish Natural Heritage (SNH) is a Government agency that aims to promote nature, conservation, recreation and enjoyment of Scotland’s natural heritage. I met with Professor Des Thompson, Principal Advisor on Biodiversity, producer of many publications and editorial Board member of several international journals.

SNH supports many activities of Government including planning, marine management, rural enterprise and tourism. SNH provides advice and assists landowners on a number of wildlife related issues including management of species, conservation of habitat and eradication of alien and invasive animals. Research conducted by SNH covers fifteen themes resulting in an average of fifty commissioned research papers each year13.

SNH supports PAW Scotland in many ways but primarily through science and advice. SNH is proactive in its approach to wildlife crime, preferring prevention to reaction. Like other agencies and organisations, SNH conducts wildlife monitoring programs (E.g. working with farmers to determine the cause of stock losses). In addition, SNH produces extensive written material and provides Internet based information on protected areas and species. SNH’s website contains links to many of its PAW Scotland partners, information on how to report wildlife crime and other PAW Scotland activities. SNH supports its staff providing intelligence to the police and if necessary supporting enforcement action.

Game and Wildlife Conservation Trust
GWCT is a conservation and research charity in the UK that conducts extensive scientific research and develops game and wildlife management techniques. I met with Dr Adam Smith, Director Scotland of GWCT and Executive Group member of PAW Scotland at his office in the control tower of Perth Airport.

GWCT carries out research on a wide range of conservation topics and has a 333-hectare property that it farms and uses to carry out projects in support of its research. They actively work with farmers and gamekeepers to develop land management strategies based around conservation.

13 Scottish Natural Heritage [http://www.snh.gov.uk/publications-data-and-research/research/]
However, GWCT see their main role is ensuring legislation keeps up to date and fitting the current ecological climate. GWCT uses science to support its position and regularly meets with Ministers, Members of Parliament and Government agency staff.

GWCT believes the science community can (and should) advise law enforcement agencies on current issues and conservation priorities. To that end, GWCT contributes to PAW Scotland by providing scientific data that adds value to intelligence that then helps develop policies and strategies to tackle wildlife crime. GWCT believes the core strength of PAW Scotland is its open-handed view of wildlife crime and its acceptance as a mainstream crime type.

**Royal Society for the Preservation of Birds**

The RSPB is a charity organisation and one of the largest landowners in Scotland. It owns and manages over 200 nature reserves in the UK, many of which contain education centres open to the general public. I met Duncan Orr-Ewing, Head of Species RSPB (Scotland) and Executive Group member of PAW Scotland at their headquarters in Edinburgh and then travelled with him to the RSPB reserve at Loch Leven.

RSPB has about 1,000,000 members in the UK (85,000 in Scotland), which makes them a powerful lobby group. RSPB quite enjoys the ability to be vocal on bird issues thanks to its NGO status. The organisation employs nearly 250 staff in Scotland, which includes 3.5 investigator positions and up to 12 science related positions. RSPB has a vast network of volunteers that conduct field survey and it’s often one of these volunteers that discover a crime or crime scene. Despite having its own investigators, RSPB sees itself as an advisor, not an enforcer. Their investigators lack the statutory powers of police but they can generally access crime scenes by virtue of the Scottish Outdoor Access Code. RSPB investigators can also provide expert evidence to police and prosecutors and assist with crime scene examination and evidence collection if required.

The scientific research conducted by RSPB mostly deals with populations, population trends and conservation of species. The data obtained from the research is used to produce maps, similar to the birds of prey poisoning map produced by the Scottish Government. The data they collect supports scientific research carried out by other organisations to support the assertion that declines in bird populations is linked to wildlife crime.
RSPB supports PAW Scotland in a number of ways. Like GWCT, RSPB provides scientific data that adds value to intelligence products. RSPB educates the public through its media centre and nature reserves and works with Scottish Lands and Estates to educate landowners and land managers about new laws. RSPB works closely with police and provides advice and training to officers involved in investigation of wildlife crime.

**UK National Wildlife Crime Unit**

The NWCU is a resource of the UK police forces, providing intelligence products, analytical support and guidance for the investigation of wildlife crime. The unit is headed by Nevin Hunter, a Police Inspector and comprises analysts, intelligence officers and investigative support officers. I met with Nevin and Charlie Everitt (Investigative Support Officer) at their headquarters in Livingston. I also had the opportunity to speak with Shona McJannett and Kate Fleming, prosecutors with the Crown Office and Procurator Fiscal Service who made the trip up from Edinburgh.

The NWCU was formerly part of the wider UK police intelligence body but moved to its current location (a former police station) in 2007. The unit works to the National Intelligence Model (NIM), a business process that ensures consistency and compatibility of records, data security, and provides the structure for strategic and tactical tasking and coordination group meetings. NIM is the standard that all police and law enforcement agencies aspire to work to in the UK. The NWCU tactical tasking and coordination group meets every six months (or more frequently if required) to discuss current intelligence and its priorities.

At present, all police forces have Wildlife Crime Coordinators. Some are dedicated to the role full-time, but most complete the role over and above their normal policing duties. Coordinators act as the single point of contact for each force area and work with operational officers spread across each force area. These Police Wildlife Crime Officers are also mainly volunteers. They are encouraged to take action themselves and can attend training on the subject of wildlife crime investigation – a two day entry level course or five day advanced course. Only certain wildlife crime offences are reportable, which makes recording crime statistics difficult. However intelligence and incident information is passed to the NWCU on a continual basis and feeds the NIM process. This information can be accessed by all police and can be monitored by crime managers and supervisors.
The NWCU is in the enviable position in that it has nearly 140 partners in PAW, all potential sources of information and intelligence. The NWCU also receives information and intelligence from non-partner sources including the public. In the period April 2009 – March 2010 the unit processed 3477 intelligence logs – an average of 9.5 a day. In addition, the NWCU can seek out intelligence, requesting intelligence requirements to the police forces on specific issues. Being police, the NWCU also has the ability to access police intelligence at all levels within the UK and has direct access to their NCB and Europol.

In Scotland, the Crown Office and Procurator Fiscal Service (COPFS) has recently appointed two specialist prosecutors to deal with environmental crime and wildlife crime. This has resulted in greater consistency in the approach to environmental crime and better communication between prosecutors and investigators. Both prosecutors and investigators have seen an increased use in victim impact statements for wildlife crime matters, using science to support conclusions on conservation value and impact of crimes. The situation in the rest of the UK is reliant upon nominated prosecutors in police force areas who may or may not have good understanding of conservation legislation.

**Science and Advice for Scottish Agriculture**

SASA is a division of the Scottish Government Agriculture, Food and Rural Communities Directorate and their laboratories are located on the outskirts of Edinburgh, near the airport. I spoke with Dr Lucy Webster, Senior Molecular Biologist and Elizabeth Sharp, Senior Analyst at the labs.

As the name suggests, SASA provides scientific services and advice on a wide range of issues in support of Scotland’s agriculture.

Historically, poisoning (whether accidental or intentional) was the main wildlife crime issue SASA dealt with. Misuse of pesticides is still common in Scotland. SASA receives about 230 referrals per year regarding wildlife and regularly uncovers the use of pesticides that have been banned for decades. SASA records and collects data on the possible misuse of pesticides and poisoning of animals through its Wildlife Incident Investigation Scheme. Data from the scheme (and the three other similar schemes operating in the UK) can trigger a review of the registration status of the pesticide concerned. The data can also provide evidence or valuable intelligence to wildlife crime investigators.
In January 2011 SASA appointed Dr Webster to conduct analysis on non-human DNA for wildlife crime investigations. The majority of her work is to determine the species from an evidential sample. This could be to identify the species of the target animal, an animal used for bait or dog DNA recovered from a mauled animal. The result can determine whether or not an offence has been committed (i.e. CITES listed) or the level of offence if the animal is from a threatened species or population.

Forensic testing was previously carried out at university research laboratories and more recently at the UK Forensic Science Service (FSS). The introduction of full cost recovery at FSS made the use of forensic testing for wildlife crime prohibitively expensive\(^\text{14}\). Scotland has a unique system to fund the wildlife forensic testing carried out by SASA as both pesticide analysis and wildlife DNA forensic testing are carried for Scottish enforcement free of charge. Outwith Scotland, there is a PAW Forensic Analysis Fund (FAF), with contributions from the UK government, RSPCA, SSPCA and RSPB. This fund can contribute 50\% of analysis costs for all types of forensic testing in wildlife crime investigations, putting the costs more within reach for operational policing.

SASA supports PAW Scotland by conducting forensic testing (toxicology and DNA testing) during the investigation process; providing data and statistics which add to the intelligence; and by participating in the recently created Scientific Working Group. They also provide training to police on an ad-hoc basis and are looking to produce a range of training material on crime scene examination and evidence collection.

**Loch Lomond and Trossachs National Park**

Loch Lomond and Trossachs National Park was established in 2002 and comprises 1865 sq. km. The park uniquely includes urban communities (residential, commercial, education etc.), rural landscapes and bush. Approximately 15,600 people live in the park\(^\text{15}\). Loch Lomond is the largest fresh water lake in the UK (by surface area); is a spawning ground for Atlantic salmon; and contains about 30 islands. One of the islands is home to a colony of Australian wallabies. I met with Police Constable Paul Barr who has the enviable position of wildlife crime investigator based in the park at the National Park headquarters in Balloch.

\(^{14}\) R. Ogden, Forensic science, genetics and wildlife biology: getting the right mix for a wildlife DNA forensic lab, 2010

\(^{15}\) Loch Lomond & Trossachs National Park [http://www.lochlomond-trossachs.org/learning/key-facts/menu-id-109.html]
The park employs its own rangers to carry out enforcement activities in support of the Loch Lomond Byelaws. The rangers tend to deal with volume crime (damage, litter, noise), which allows PC Barr to deal with more complex criminal investigations. PC Barr has a number of wildlife crime issues to deal with including habitat disturbance, poaching (deer and salmon), animal cruelty (under-calibre firearms used to hunt) and raptor persecution. One challenge of investigating wildlife crime PC Barr often faces is the remote nature of the crime scene – somewhere on a 10,000 hectare property with no witnesses. As with other crimes, there are often multiple scenes – where the offence was committed (place where a firearm was discharged from), another where the deceased is (the target animal) and yet another where the nexus evidence is (firearm in vehicle).

In addition to the forensic DNA services offered by SASA, PC Barr has access to the full range of forensic and technical services available to all police – from ballistics and fingerprints to covert and technical surveillance. PC Barr works closely with the community, rural crimes investigators and probationary Constables to educate them on wildlife crime issues and enforcement. PC Barr works very closely with the national park staff (often with them) – particularly on matters of wildlife crime and wildlife and habitat conservation.
“The man who achieves makes many mistakes, but he never makes the biggest mistake of all -
doing nothing.” Benjamin Franklin

Summary

It’s hard to deny that the United States of America (US) takes law enforcement very seriously. Their approach to wildlife crime law enforcement is no different. On a national level, the US has many agencies that are responsible for the environment, including the enforcement of federal environmental legislation. The most well known agencies are the Environmental Protection Agency (EPA), the US Fish & Wildlife Service (US FWS), and the National Parks Service (NPS).

Both the US FWS and NPS are agencies within the Department of the Interior while the EPA is not a cabinet department (or within one) and is headed by an Administrator who reports directly to the President.

The US FWS and NPS manage vast amounts of land between them. The US FWS manages the National Wildlife Refuge System, comprising over 600,000 km² while the NPS manages nearly 340,000 km² of National Parks. In addition, the Bureau of Land Management (BLM) manages over 1 million km² of public land and the US Forest Service manages just over 780,000 km². In comparison, South Australia comprises just less than 980,000 km²; New South Wales comprises just over 800,000 km²; and Victoria around 227,000 km². In fairness though, Australia also has vast amounts of land set aside in national park, reserves, forests and vacant Crown land.

Quite a number of departments and agencies within the US have responsibility for investigation of wildlife crime. The US FWS deals with wildlife that the federal government asserts control over including migratory birds, wild bird conservation, endangered species and marine mammals that have a land nexus (i.e. polar bears, sea otters and dugong). The NPS manages wildlife on their land while both the US Forest Service and Bureau of Land Management (BLM) have law enforcement officers and have the capacity to conduct wildlife crime investigations. The National Marine Fisheries Service (NMFS), which sits within the National Oceanic and Atmospheric Administration (NOAA), manages fisheries, including marine mammals such as cetaceans and pinnipeds (with the exception of walrus).
Each of the agencies already mentioned – US FWS, EPA, NPS, BLM, US Forest Service and NMFS - have a law enforcement and investigation capacity. Investigators within those agencies are known as Special Agents and are in the same federal criminal investigator series (classification 1811) as Special Agents in the Federal Bureau of Investigation (FBI), Drug Enforcement Agency (DEA), and Naval Criminal Investigation Service (NCIS) to name a few. Many investigators with the US FWS, EPA and NPS have transferred from “mainstream” criminal investigation agencies.

The main pieces of federal wildlife crime legislation include the *Lacey Act 1900* (Lacey Act), the *Endangered Species Act 1973*, *Marine mammal Protection Act 1972* and several protecting migratory birds. The Lacey Act (named after its sponsor – John F Lacey of Iowa) established offences of transporting illegally captured or prohibited animals across state borders. In 1935 the Lacey Act was extended to include wildlife illegally imported from abroad.

Each state and territory has its own agencies administering sovereign legislation and protecting locally endangered species that may not be on federal lists. And while the offences in state and territory legislation are predominantly misdemeanors (summary offences), the offences in the federal legislation are felonies (indictable offences).

For example, a person apprehended after illegally taking an animal (whether a threatened species or an animal out of season) in Colorado and remains in Colorado could be prosecuted by Colorado Division of Parks and Wildlife under state legislation. If the person crosses into Wyoming with the animal, the person potentially commits an offence against the Lacey Act and faces a more serious offence and exposure to a greater penalty. The same applies to illegally taken fish or birds, traded between states or from another country to the US. This allows federal agencies to investigate wildlife crime just as they would a stolen car racket.

Being such a large and diverse country, there is a multitude of wildlife crime issues facing agencies in the US at present. They include the illegal importation of CITES listed species, interstate and international trade of locally endangered species, illegal trophy hunting, poaching, fishing (commercial or recreation) and enforcing legislation protecting migratory birds. The US is not immune to the introduction of alien and invasive species suffered by many other countries around the world, including Australia.
**US Fish & Wildlife**

The US FWS is probably the most widely known wildlife agency of its type in the world. Their primary responsibility is the conservation of the nation’s fish, wildlife and plants. This is done through management of fisheries and habitat, threatened and endangered species and alien and invasive species, all supported by an extensive science program. The US FWS also manages the National Wildlife Refuge System and Landscape Conservation Cooperatives.

The US FWS Office of Law Enforcement is considered a small part of their overall work despite having about 100 wildlife inspectors and 200 investigators. The inspectors work in uniform, mostly at ports, and work side by side with customs officers. The investigators – Special Agents – conduct criminal investigations into breaches of federal legislation. I met with Kevin Garlick, Special Agent in Charge of the Branch of Investigations at his office in Arlington VA.

The US FWS is divided into 8 regions that represent the 53 states and territories of the US. The Office of Law Enforcement (OLE) may not have a presence in each state or territory but they are represented regionally. Some states may have 6 or more investigators depending on the geographic location, number of ports and volume of crime. The US FWS also calls on support from state and territory agencies (as well as other Federal agencies) through cooperative agreements. This results in the US FWS divesting authority to those agencies and substantially increases the number of effective inspectors working for them. For example - US FWS has two investigators in the state of Kansas while the state Department of Parks, Wildlife and Tourism may have 100 Game Wardens. A cooperative agreement between them means there are potentially 102 law enforcement officers capable of enforcing federal legislation in Kansas. The benefit of the cooperative agreements is mutual. The US FWS gets eyes and ears in areas they don’t have a presence while access to federal legislation provides greater power (and in some cases resources) to the states and territories. In many cases the US FWS officers work side by side with their state or territory counterpart.

Other US FWS programs such as the Digital Evidence Recovery Unit, the US FWS Forensics Laboratory and Intelligence Unit support the work of the OLE. The Digital Evidence Recovery Unit was formerly a part of the labs but separated about 3 years ago. Although the US FWS headquarters is in Washington DC, many of its national programs are based regionally. The Digital Evidence Recovery Unit is in Jacksonville FL, the National Wildlife Property Repository is in Denver CO and the labs are in Ashland OR.
I had the opportunity to meet with investigators in the Regions, meeting with Stephen Clark, Resident Agent in Charge in Larcombe LA and Mona Iannelli, Special Agent in Los Angeles CA. Stephen supervises investigators and investigations in four states including the 5 Special Agents based in Louisiana. The issues faced in Louisiana are varied and some are unique to that region of the US. They include migratory bird related offences, commercial alligator hunting and fish illegally transported interstate. The port in New Orleans LA exports the largest number of turtles in the US, mostly bound for the Asian food market. US FWS has two inspectors stationed at the port full time and are about to post an investigator there. Despite their location, Stephen and his team have access to covert investigations and surveillance, digital evidence recovery, forensic science and intelligence. In contrast, the main work for investigators in Los Angeles is the illegal importation and exportation of CITES listed species through the airports and shipping ports. While many ports in the US face this issue, the difference is the product type and the source country or destination. Ports in California generally see the product of trading with Mexico and Asian countries while ports on the other side of the country in New York see the product of trading with European countries.

- Intelligence Unit
The US FWS Intelligence Unit is a national program based regionally, albeit as part of the Branch of Investigations in Arlington VA, less than 10 kilometres from the national headquarters. The Intelligence Unit currently comprises 4 intelligence analysts including a supervisor and has been operating for around 10 years. I met with Christina Kish, the Supervisory Intelligence Analyst who has a background in mainstream law enforcement and spent a period of time in Australia on secondment.

The OLE has its own purpose built case management system, which also incorporates the intelligence database used by the Intelligence Unit. All OLE inspectors and investigators have access to the system and can update cases, interrogate the database and add information reports as required. The Intelligence Unit also uses i2, intelligence and investigation management software developed by IBM (considered by many to be the leading intelligence management software), but only use it for mapping and charting. The unit mostly provides tactical intelligence support as opposed to strategic or operation support products (E.g. an investigator asks for information, intelligence or background checks on a person or company and the intelligence unit makes those enquiries). Currently all import and export permits for CITES listed species in and out of the US are scanned and the details manually entered into the database by a contractor. As a result the unit
self generates a lot of intelligence, allowing them to pick up on crime trends and patterns. The unit receives information from a number of other sources including state agencies, international agencies, internal sources (E.g. scientists), informers and the general public through a link on the US FWS website. The Intelligence Unit is in regular contact with similar units in other federal agencies and has a permanent desk at the Interpol NCB in Washington DC. With all the contacts, networks, sources and resources available to it, there is very little the US FWS Intelligence Unit would not be able to discover.

- Digital Evidence Recovery Unit
The US FWS has a dedicated unit that conducts forensic examinations of mobile telephones, digital storage devices and computer devices in their many forms. I met with Ed Lewis, Special Agent in Charge of the unit at their Jacksonville FL office. Formerly part of the US FWS labs, it was decided to create a dedicated unit in order to keep up with the accelerating rate of technology. To that end, the forensic investigators at the unit regularly attend training, workshops and seminars to maintain the currency of their knowledge base. Ensuring their equipment is also able to accommodate that change complements this. The unit also houses a section dedicated to building or acquiring covert surveillance equipment and then deploying it where required around the country. This section, like the Digital Recovery Unit, would rival (if not surpass) similar units in police forces around the world.

Sharing floor space with the US FWS Digital Evidence Recovery Unit is the equivalent units of the US Environmental Protection Agency. Although both agencies occupy the same floor there is a level of security that affords the appropriate level of operational security. Although the units maintain a degree of separation they complement each other by sharing knowledge, techniques and (occasionally) equipment.

- National Wildlife Refuge System
The US FWS manages the National Wildlife Refuge System (NWRS), which is separate to the National Parks Service, state parks and state conservation areas. Although not the main focus of the NWRS, a 2006 analysis estimated that they received 34.8 million visits for the 2006 financial year resulting in $1.7 billion in sales. The NWRS comprises 556 national refuges, 38 wetland management areas and partnerships with local communities and private landholders. The refuges alone comprise over 376,000 km² with the FWS being the largest landowner in Alaska.
The NWRS also acquires and manages conservation easements on private property as well as purchasing the development rights on areas of private property containing conservation value. For example, the NWRS might purchase a wetland in the middle of a farmer’s property or simply purchase the development rights to prevent any development of the area.

I had the opportunity to visit Okefenokee National Wildlife Refuge in Georgia and Rocky Mountain Arsenal National Wildlife Refuge in Colorado. I spoke with Gregory Langer, Regional Chief, Office of Refuge Law Enforcement at his office in Denver CO. Greg oversees law enforcement in the Mountain-Prairie Region that takes in the states of Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. Greg sees law enforcement as the most fundamental tool in protecting the refuge system and has 6 uniformed law enforcement officers based in Colorado. They work closely with the 3 US FWS investigators in Colorado, their uniformed colleagues in the other 7 states of the region, and their state counterparts.

The uniformed law enforcement officers undergo a 17 week policing course followed by a 3 week basic wildlife course and 10 weeks of field training. The officers are provided with additional training of 40 hours (1 week) per year. The 17 week component of the training is the same training provided to law enforcement officers with the NPS and BLM.

The Office of Refuge Law Enforcement supports the agency’s enforcement of international treaties and conventions, the Lacey Act and legislation protecting migratory birds and species at risk. The NWRS is continually acquiring and adding lands to the existing refuge network. This is done through purchase, non-possessory easements or leases. The NWRS manages around 22,000 easements in the 8 state Mountain-Prairie region, adding another issue to monitor and police. Enforcement of the easements is largely done by aerial surveys, ensuring the easements are still intact or haven’t been developed or otherwise damaged.

- Laboratories
The US FWS labs were established over 30 years ago and it took many years of lobbying by investigators and the support of some influential politicians to get them off the ground in the first place. The labs were the first dedicated wildlife labs in the world and are still the only “one-stop shop” labs for wildlife crime. Established in 1979 by Dr Ken Goddard (the current Laboratory Director), the labs currently employ 34 staff covering branches of science including chemistry, genetics, morphology, pathology and criminalistics (which includes fingerprints, ballistics, tool
marking and trace evidence). These services make the labs the envy of many other labs and police forces, not just others investigating wildlife crime.

**US National Parks Service**

“*The role of a US Park Ranger is to protect the park from the people, the people from the park and the people from each other.*” Mark Magnuson Chief Park Ranger, Rocky Mountain National Park

Unlike the FWS, the primary focus of the NPS is recreation. Conservation is still a main concern for the NPS, for without conserving nature the attraction wouldn’t be there for the 275 million visitors per year. Like the US FWS, the NPS has their own law enforcement officers and a network of about 30 investigators. I visited Rocky Mountain National Park in Colorado and spoke with Chief Ranger Mark Magnuson and Grand Teton National Park in Wyoming and spoke with Chief Ranger Michael Nash.

Rocky Mountain National Park covers just over 2000 km² and attracts 3.2 million visitors per annum. Park staff have exclusive federal jurisdiction in the park but receive excellent assistance from other agencies when they request it. The park employs 18 full time rangers with an additional 26 employed during the high visitation period of May to September. Rangers cover all aspects of law enforcement (traffic management, general crime, and wildlife crime) as well as emergency medicine and rock climbing rescue. In fact, the park is in the top 5 for number of rock climbing rescues and 6 of the rangers are employed especially for their rescue skills.

The rangers and investigators conduct covert investigations, use surveillance devices such as optical and tracking devices and deploy decoy animals to catch hunters illegally hunting out of season or in areas not set aside for hunting. The NPS has limited intelligence and forensic capabilities, however they work closely with other agencies such as the US FWS, FBI, DEA and the US State Department, who are better resourced.

Grand Teton Nation Park in Wyoming covers 1256 km² and attracts around 2.5 million visitors per annum. However, Grand Teton National Park is only 16 kilometres south of Yellowstone National Park (the world’s first national park) which covers 8987 km² and attracts an extra 900,000 visitor per annum. Grand Teton National Park employs 23 law enforcement officers year
round (another 25 during the peak visitation period) who have access to 3 investigators based at Yellowstone National Park.

Speeding vehicles is the number one law enforcement issue in Grand Teton National Park. Around 150 large animals get struck by speeding vehicles every year. Apart from the obvious traffic hazard, carcasses on the side of the road attract bears and bears attract people, causing bear jams (traffic that stops suddenly and often dangerously). Michael and his team also deal with volume crime (theft from cars), the occasional murder-suicide and an average of one drug matter a week. Forensics is used as a matter of course, matching a discarded pile of guts to a trophy animal illegally hunted. As with most national parks, general hunting is not permitted in Grand Teton National Park although limited hunting of elk is permitted to maintain control of population size. Law enforcement officers also have to contend with guided outfitters who like to hunt on the boundary of the national park. All this keeps Michael and his team very busy.

**Florida Fish and Wildlife Conservation Commission**

Florida has a population of just over 19 million\(^{16}\), making it the fourth most populous state of the US. Being the most aggressive fish and wildlife agency in the country is a tag Florida Fish and Wildlife Conservation Commission (Florida FWC) is very happy with. Incidentally, Florida’s Department of Environment Protection is known as the most aggressive agency of its type in the US. I spoke with Major Curtis Brown, Special Operations Coordination, Division of Law Enforcement, Florida FWC in his office in the state capital, Tallahassee.

Eleven thousand people are employed by Florida FWC, 850 of them sworn uniformed law enforcement officers. The agency has branched out over the years and now regulates fishing, hunting and boating in addition to managing and protecting wildlife and habitats through conservation programs. Florida FWC also has emergency response capabilities, provides marine safety in cooperation with the US Coast Guard and assists the FBI with manhunts in remote and inaccessible areas of the state. Florida FWC has cooperative agreements with the US FWS and NOAA and they work closely with their colleagues in other agencies in Florida and neighbouring states.

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\(^{16}\) US Census Bureau 2011 estimates
The issues faced by Florida FWC are as diverse as Florida’s environment. Anything that can be taken and there’s a market for, will be taken. That includes fish (incl. shell fish and eel), deer, turtles and cultural heritage artefacts. Florida also has its share of invasive animals, Red-eared Slider turtle and Burmese python being the most notable.

The 850 sworn law enforcement officers are supported by a network of investigators, 16 dealing with captive wildlife crime and a further 22 dealing with other crime. Two of the investigators are dedicated forensic investigators, dealing with the biology of wildlife crime as well as the technical equipment they use. Like many law enforcement agencies, Florida FWC has full surveillance capability – audio, video, tracking and remote sensing.

Florida FWC likes to have a visible presence in the community, including their investigators, and enjoys a high level of recognition. The agency has a media officer in each of the 6 regions and has a plethora of information on their website, specifically on wildlife crime. A weekly arrest report is posted on their website which gets interest from the local media. The public can report wildlife crime a number of ways - in person, by telephone, email or online form. Like in other states, people providing information in Florida can take part in a reward system – earning up to $1000 for information.

**Colorado Division of Parks & Wildlife**

In contrast to Florida, Colorado has a population of just over 5 million\(^{17}\) which puts it between Victoria and Queensland\(^{18}\) in comparison to Australian states. The Colorado Division of Parks and Wildlife sits in the Department of Natural Resources and is the result of a recent merger between Colorado State Parks and Colorado Division of Wildlife. I met with Investigator Percy Pope and Forensic Investigator Ken Shew in Fort Collins CO. The law enforcement capabilities of the two agencies is yet to merge so Percy and Ken spoke of their roles in the former Division of Wildlife. The main wildlife crime issue faced by the Division of Wildlife is illegal outfitters. An outfitter is a commercial hunting operator and all businesses that conduct trips where participants will hunt or fish require a licence. Licences aren’t transferrable and the cost varies for residents and non-residents. The Division of Wildlife investigates the on-selling of licences, non-residents

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\(^{17}\) US Census Bureau 2011 estimates

\(^{18}\) Victoria 5.57 million and Queensland 4.5 million - Australian Bureau of Statistics end of Dec quarter 2011
declaring themselves as residents to avoid paying the higher licence fee, hunting in the wrong area or operating as an outfitter without a licence at all.

The Division of Wildlife has about 150 uniformed (commissioned) field officers known as district wildlife managers. In addition, they have 6 investigators, which includes a forensic investigator whose job is to recover digital evidence, manage their surveillance equipment and manage their case management system / intelligence database.

While Colorado doesn’t have a wildlife laboratory of its own, the Division of Wildlife has a contract with the Wyoming Fish and Game Department labs. The Division of Wildlife staff receive training on collection methods and will even take samples from road kill in order to build up the databases of the lab.

In addition to illegal outfitters, the Division of Wildlife investigates illegal trophy hunting and commercial poaching, conducting overt and covert investigations. Like many states, Colorado operates a reward system for people prepared to report wildlife crime. Colorado has Operation Game Thief (which operates in many states) which is a not for profit organisation administered by a committee. Similar to other crime reporting systems, people can provide information by phone or email and remain anonymous. Like other states, Colorado promotes Operation Game Thief widely and provides information to hunters and the general public alike.

**Wyoming Game and Fish Department**

In stark contrast to Florida and Colorado, Wyoming is the least populous state or territory of the US with a population of only 568,158 people\(^{19}\). Despite this, Wyoming Game and Fish employs 50 (game) wardens and 6 investigators, based regionally around the state. The uniformed wardens dedicate between 30% and 50% of their time to law enforcement and the remainder to species and habitat management. I spoke with investigator Scott Adell from Wyoming Game and Fish while I was at the meeting of the Society for Wildlife Forensic Science in Jackson Hole WY.

Like their counterparts in neighbouring Colorado, illegal outfitting is one of the major issues faced by Wyoming Game and Fish. The big game animals in Wyoming and neighbouring states attract hunters from interstate and overseas, some hunting illegally. In response, they conduct many

\(^{19}\) US Census Bureau 2011 estimates
covert operations, one recent investigation lasting three years. Because of the nature of some wildlife crime (firearms and cross over crimes) they work closely with their state and federal colleagues and like many states, they also have a cooperative agreement with the US FWS.

Wyoming has its own wildlife forensics and fish health laboratories and use their state veterinarians for necropsies. They have access to the Wyoming State Crime Lab for other branches of science and use the state police or their colleagues in Colorado for digital evidence recovery.

Wyoming Game and Fish shares many things in common with their interstate colleagues. Wyoming Game and Fish have an intelligence database (separate to the case management system by design); they have a reward system for information on wildlife crime; and have many ways people can provide information including email and a dedicated phone line. Most of these basic law enforcement tools seem commonplace amongst the agencies investigating wildlife crime in the US.

**Bryan Christy**

Bryan Christy is many things - a lawyer, journalist, investigator and author. Bryan has kept reptiles since a young age and currently has an Australian bearded dragon as a pet. I met and spoke with Bryan in Philadelphia, PA. Bryan is probably most well known in the reptile world for his book ‘The Lizard King: The True Crimes and Passions of the World’s Greatest Reptile Smugglers”. The book follows the path of a few of the most well known wildlife smugglers in the US and Asia and is impeccably researched. Bryan went to extraordinary lengths to get to the truth of his chosen subject and to get to know many of the real life characters of his book. Threaded through the story are glimpses of the poaching of Australian mammals and reptiles, bound for wildlife markets all over the world. And not just recent smuggling, but sustained poaching of Australia’s wildlife over many years. Bryan remains a journalist (contributing to publications such as National Geographic magazine) and is and a keen observer of the reptile trade around the globe. Even now, Bryan says that Australia is considered the Fort Knox of the reptile world – everyone wants to get in and, more importantly, get back out with something. Taking it further, geckoes are the reptile of choice worldwide (including smuggled species) because of the different types, colours, habitat range, size and the ease of keeping them. Bryan also observed that there are
opportunities for environment agencies and law enforcement to work together and where prosecutors get support to enforce environmental law, things tend to improve.

Environment Agency (UK)

Although not strictly wildlife crime, I met Chris Smith, the National Intelligence Manager of the UK Environment Agency at Interpol in Lyon, France and later corresponded with him by email. The size of the intelligence unit within the UK Environment Agency highlights the importance the agency places on intelligence management during the investigation process.

The UK Environment Agency is the lead agency for environmental protection and enforcement of England and Wales. In this regard UK Environment Agency is similar to the environmental protection agencies of the states and territories of Australia. UK Environment Agency has all the normal regulatory and compliance tools available to it, such as criminal prosecution, civil remedies, remedial directions and suspension or revocation of environmental permits and licences.

The intelligence unit sits within the National Environment Service and consists of 13 staff: a National Manager; a National Source Manager; a Team Leader; 6 Senior Intelligence Officers; and 4 Researchers. There are also 4 Crime Analysts that currently don’t report to the National Intelligence Manager. The UK Environment Agency is divided into 7 regions, with an Environmental Crime Team in each. A further Crime Analyst, Intelligence Officer, Field Intelligence Officer (or two) and Researcher supports each of the regional Environmental Crime Teams.

The agency is aiming to work to the National Intelligence Model, broken down to its four cornerstones - People, Knowledge, Sources and Systems – but it has a little way to go yet. The intelligence management system used by the UK Environment Agency is separate to the case management system, with a ‘sterile corridor’ in between. There is currently no plan to change this. Like others around the world, the agency has a dedicated telephone number for reporting environmental crime but, unlike others, they teamed up with Crimestoppers in mid-2011. The intelligence unit has little need to attend their National Central Bureau (Interpol) but they have a very good working relationship with the environment and wildlife crime desk and regularly forward intelligence for importing into Interpol’s I24/7 system.
Environment Canada

As the name suggests, Environment Canada (EC) is the federal environment agency of Canada and, amongst other things, is responsible for the administration and enforcement of federal environment legislation. Similar to Australia, provincial governments in Canada have agencies that enforce sovereign legislation of the respective province or territory. I met and spoke with Sheldon Jordan, Director General of the Wildlife Enforcement Directorate at Interpol and spoke with him again by telephone after arriving home.

On the wildlife side, EC is responsible for the conservation and management of species with an interprovincial or international aspect – i.e. migratory birds and fish. To assist it, EC has about 100 wildlife officers as well as a further 100 parks officers, 200 pollution officers and 600 fisheries offices. Provincial agencies deal with a large proportion of wildlife crime, particularly resident species such as moose, caribou and bear and there is about 1500 provincial wildlife offices spread throughout the country.

Some of the wildlife crime issues faced by EC include the commercialization of migratory birds; illegal importation of reptiles, tropical fish and coral for the pet trade; illegal exportation of wildlife products from Canada (e.g. Narwhal tusks); and the use of Canada as a transit point to the US. Some provincial issues include the illegal hunting of big game species as well as the commercialization of bear for use in traditional Chinese medicines (bile, paws and other parts).

EC wildlife officers are responsible for inspections, investigations and to a lesser extent implementing compliance education programs. An intelligence unit supports wildlife officers with at least one intelligence officer and one intelligence analyst in each of the 5 regions. This number of intelligence staff is mirrored for pollution investigation, if not increased.

EC uses the Royal Canadian Mounted Police (RCMP), Customs or private companies for digital evidence recovery. But while EC has a good relationship with RCMP and Customs, their use is always dependent on their own workloads and priorities. EC has its own laboratory for chemical analysis, however genetic testing for wildlife crime is contracted out to other government laboratories and educational institutions. Like similar agencies in the US, EC is well equipped to conduct covert technical surveillance as well as covert investigations.
CONCLUSIONS AND RECOMMENDATIONS

Australia is fortunate to have a number of very competent and passionate wildlife crimes investigators. But the world of crime is changing and the challenge for environmental agencies is to keep up with the rate of change, the new and emerging methods used by criminals and methods to investigate them. The combined effect of Australian environmental agencies to combat wildlife crime can be enhanced by:

- **Establishing a national network of dedicated wildlife crime investigators**

Specialist investigators are well established in police agencies and organisations, whether it’s a drug squad, homicide squad, organised crime squad or fraud squad. Wildlife crime is no different and requires dedicated investigators to challenge the increasing levels of sophistication, use of technology and organisation seen in criminal groups. While the Australian Government bears the main responsibility of enforcing international treaties and conventions, the states and territories must also contribute. State and territory agencies must be able to adequately investigate criminal activity designed to exploit Australia’s threatened and vulnerable species in their own jurisdictions and in cooperation with their interstate and international partners.

- **Establishing a network of dedicated wildlife crime intelligence analysts**

Intelligence analysts have been a part of mainstream policing in Australia for decades and many environment agencies around the world (and a small number in Australia) now recognise their benefit. Australia will only get an accurate view of the nature and extent of wildlife crime with a network of intelligence analysts, representing each state and territory. Intelligence analysts not only provide valuable tactical intelligence to investigators, but can also provide strategic intelligence products to management, ensuring resources are directed where they are required.

- **Establishing a national wildlife crime intelligence database**

Information and intelligence are the lifeblood of any investigation. The ease of travel into and around Australia; the ease of criminals to operate in multiple jurisdictions; and the demand for wildlife from different parts of Australia highlights the need for a national wildlife crime intelligence database. Australia’s policing agencies understand the benefit of sharing information and contribute to the Australian Criminal Intelligence Database (ACID). More than 25 Commonwealth, state and territory law enforcement and regulatory agencies have access to the
resource. As seen in other jurisdictions, a national wildlife crime intelligence database will also assist agencies in Australia to have a better understanding of the nature and extent of wildlife crime, highlight links between wildlife crime and other crime groups and provide guidance on where to direct resources. While it’s important for Australian agencies to report criminal activity to its international partners, the priority is for Australia to get its own house in order first.

- Promoting wildlife crime as significant and mainstream.
It’s unfortunate that wildlife crime and other types of environmental crime are not considered to be in the same league as mainstream crime. If someone cuts down trees in a national park for firewood, they’re more likely to be charged with damage to the park than they are theft of the timber. Similarly, if someone takes a threatened species from the wild, they are more likely to be charged with a summary offence under environmental law rather than indictable offence of theft under the Crimes Act. There are many more examples of the disparity between environmental crimes and other crimes. Police agencies generally don’t consider environmental crime as mainstream and many police aren’t even aware that nearly every government agency (state, territory and Commonwealth) in Australia has a capacity to investigate, regulate or ensure compliance with the legislation it administers. The awareness of wildlife crime as a significant issue needs to be raised in the consciousness of the Australian community – who are additional eyes and ears for wildlife crime investigators and can provide useful information or evidence.

- Establishing a national reporting system for wildlife crime
Police and other law enforcement agencies have been using informants and information from the public to solve crimes for generations. Crimestoppers is instantly recognizable as a contact point for reporting crime throughout Australia - one telephone number that can be called from anywhere in the country and a single Internet site. A number of environmental agencies in Australia have dedicated telephone numbers to report wildlife crime (or environmental crime) and most have links or provide contact details on their Internet sites. For example, the New South Wales EPA has ‘Environment Line’ and Victoria’s Department of Primary Industries has ‘13FISH’. Australia’s environmental agencies would be better served with a single contact telephone number for reporting wildlife crime – one number that could be promoted around the country. A dedicated Internet site similar to Crimestoppers could also serve as a point of contact for those wanting to report wildlife crime. Australia’s environmental agencies should also consider reward systems similar to those operated by Crimestoppers or agencies overseas.

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- Establishing a secure funding source for forensic analysis of DNA for wildlife crimes and associated research

The majority of forensic analysis associated with wildlife is carried out for research purposes. Australian scientists have developed DNA markers and population databases for a number of species and there seems to be no shortage of forensic scientists (and accredited labs) in Australia. Forensic DNA testing is an essential tool for wildlife crime investigation but can also assist with valuable research. Australia is in a good position to contribute on a domestic and international level to increased association and collaboration between the scientific community and wildlife crime investigators.

At present, the cost of most wildlife crime forensic DNA testing is linked to case or investigation costs. And although forensic DNA testing can often produce the most conclusive evidence it is often ranked low as a priority because of the cost. Secure funding for analysis of DNA for wildlife crime would allow investigators to have more analysis carried out, would provide more reference samples for research and contribute to a DNA database, which in turn assists researchers, investigators and investigations.