

Non-Human/Wildlife Forensic Laboratories and Capabilities



Society for Wildlife Forensic Science
June 2012

STATE	GENETIC LABORATORY	CONTACT NAME	EMAIL		PHONE	LAB CAPABILITIES
Alabama	No in-state lab	Mark Rouleau	Mark.Rouleau@dcnr.alabama.gov	AL	(334) 242-3467	N/A
Alaska	Alaska State Crime Laboratory	Kimberlee Beckmen	kimberlee.beckmen@alaska.gov	AK	(907) 459-7257	Revising protocols
Arizona	No in-state lab	Jodi Niccum	Jniccum@azgfd.gov	AZ	(928) 341-4044	N/A
Arkansas	No in-state lab	Rachel Banister	rnbanister@agfc.state.ar.us	AR	(501) 223-6359	N/A
California	UC Davis Veterinary Genetics Laboratory, Forensics Unit	Christina Lindquist	lindquist.christina@gmail.com cdlindquist@ucdavis.edu	CA	(530) 752-2211	individualization, sequencing/ species ID
California	California Department of Fish & Game	Jeff Rodzen Erin Meredith (taking over for Jeff 4/22/11)	jrodzen@dfg.ca.gov emeredithe@dfg.ca.gov	CA	(916) 928-1887	individualization, gender typing, species ID
Colorado	No in-state lab	Bob Thompson	bob.thompson@state.co.us	CO	(303) 291-7342	N/A
Connecticut	No in-state lab	Ryan Healy	Ryan.Healy@ct.gov	CT	(860) 434-0316	N/A
Delaware	No in-state lab	James Graybeal	James.Graybeal@state.de.us	DE	(302) 739-9913	N/A
Florida	Fish and Wildlife Forensics Research Laboratory	Hector Cruz-Lopez	Hector.cruz-lopez@myfwc.com	FL	(561) 625-5122	species ID, sequencing, some individualiation

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Georgia	No in-state lab	Chad Welch	Chad.Welch@dnr.state.ga.us	GA	(706) 557-3019	N/A
Hawaii	No in-state lab	Paul Conry	Paul.J.Conry@hawaii.gov	HI	(808) 587-0166	N/A
Idaho	Idaho Fish and Game Department, Wildlife Health Lab	Tricia Hebdon	tricia.hebdon@idfg.idaho.gov	ID	(208) 454-7638	STR individualization, species ID, gender typing
Illinois	No in-state lab	Mark Ernst	MarkErnst@Illinois.gov	IL	(217) 782-4944	N/A
Indiana	No in-state lab	Zach Mathews	zmathews@dnr.IN.gov	IN	(317) 232-4011	N/A
Iowa	No in-state lab	Jason Sandholdt	Jason.Sandholdt@dnr.iowa.gov	IA	(515) 281-6154	N/A
Kansas	Was not able to obtain information			KS		
Kentucky	Was not able to obtain information			KY		

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Louisiana	No in-state lab	Dr. Jim LaCour DVM	jmlacour@wlf.la.gov	LA	(225) 765-0823	N/A
Maine	University of Maine, Molecular Forensic Laboratory	Irving Kornfield	IRVK@maine.edu	ME	(207) 356-2306	STR individualization, gender typing, species ID
Maryland	No in-state lab	Art Windemuth	Awindemuth@dnr.state.md.us	MD	(410) 260-8850	N/A
Massachusetts	No in-state lab	Tom French		MA	MA F&W (508) 389-6300	N/A
Michigan	Michigan State University DNA/ Genetic Laboratory	Kim Scribner	scribne3@msu.edu	MI	(517) 353-3288	TBD
Minnesota	Was not able to obtain information			MN		
Mississippi	Mississippi State University?	Tim Brinkley	timb@mdwfp.state.ms.us	MS	MS F&W (601) 432-2400	TBD
Missouri	Missouri Department of Conservation	Jeffery Koppleman	koppej@mail.conservation.state.mo	MO	(573) 882-9909 Ext.3230	N/A
Montana	Montana State Crime Lab (Dept. of Justice)?, Michigan State?	Neil Anderson	nanderson@mt.gov	MT	(406) 994-6358	N/A
Nebraska	Was not able to obtain information	Dave Oates	doates@ngpc.state.ne.us	NE		

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Nevada	No in-state lab	Peregrine Wolff	pwolff@ndow.org	NV	(775) 353-3753	N/A
New Hampsh	No in-state lab	Robert Bryant	Robert.Bryant@wildlife.nh.gov	NH	(603) 271-3127	N/A
New Jersey	No in-state lab	Bill Stansley	bill.stansley@earthlink.net	NJ	(908) 236-2118	N/A
New Mexico	No in-state lab	Dan Brooks	daniel.brooks@state.nm.us	NM	(505) 476-8066	N/A
New York	No in-state lab	Kevin Hynes	kphynes@gw.dec.state.ny.us	NY	(518) 478-3034	N/A
New York	Therion International, LLC	William Gergits	gergits@theriondna.com	NY	(518) 584-4300	species ID, individualization
North Carolin	No in-state lab	Jack Staley	Jack.Staley@ncwildlife.org	NC	(919) 707-0030	N/A
North Dakota	Was not able to obtain information			ND		
Ohio	No in-state lab	Ronald Ollis	Ron.Ollis@dnr.state.oh.us	OH	(614) 265-6315	N/A
Oklahoma	DNA Solutions, Inc. Analytical Research Laboratory	Brandt Cassidy	bcassidy@dnasolutionsusa.com	OK	(405) 271-6033	sequencing, individualization, gender typing
Oregon	No in-state lab	Andy Heider	andy.heider@state.or.us	OR	(503) 9340223	N/A
Pennsylvania	Northeast Wildlife DNA Laboratory	Jane Huffman	jhuffman@po-box.esu.edu	PA	(570) 422-7892	genotyping, sequencing
Rhode Island	No in-state lab	Steven Hall	steven.hall@DEM.RI.GOV	RI	(401) 222-2284	N/A

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South Carolina	Was not able to obtain information			SC		
South Dakota	Black Hills State University, CCBP/ WestCore Lab	Carolyn Ferrell	Carolyn.ferrel@bhsu.edu	SD	(605) 642-6854	species ID, genotyping
Tennessee	Tennessee Wildlife Resources Agency	Mike Stockdale	Mike.Stockdale@tn.gov	TN	(731) 593-3568	STR individualization, genotyping, species ID, sequencing
Texas	Texas Parks and Wildlife Department	Beverly Villarreal	beverley_villarreal@tpwd.state.tx.us	TX	(512) 353-3483	DNA analysis & individualization
Utah	No in-state lab	Mike Fowlks	mikefowlks@utah.gov	UT	(801) 538-4884	N/A
Vermont	No in-state lab	Richard Watkin	rwatkin@dps.state.vt.us	VT	(802) 368-7302 (802) 257-7101	N/A
Virginia	No in-state lab	Mike Clark	Mike.Clark@dgif.virginia.gov	VA	(804) 367-0234	N/A
Washington	Washington Department of Fish and Wildlife	Todd Kassler	Todd.Kassler@dfw.wa.gov	WA	(360) 902-2722	species ID, sequencing, STR individualization, gender typing
West Virginia	No in-state lab	Bret Preston	wildlife@wvdnr.gov	WV	(304) 558-2771	N/A

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Wisconsin	No in-state lab	Jennifer Niemeyer	Jennifer.Niemeyer@wisconsin.gov	WI	(262) 884-2380	N/A
Wyoming	Wyoming Game & Fish Department Wildlife Forensic and Fish Health Lab	Dee Dee Hawk	dhawk@uwyo.edu	WY	(307) 766-5616	species ID, sequencing, individualization

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Last Name	First Name	Institution	Address	City	State	Zip Code	Country	Phone	Fax	e-mail
Abdelhakim	Dina	Trent University Wildlife Forensic DNA Laboratory	2140 East Bank Drive	Peterborough	Ontario	K9J 7B8	Canada	705-748-1011 ext 7687		dabdelhakim@nrpfc.ca
Albert	Vicky	Provincial Government of Quebec Laboratoire d'Expertise Biologique	9530 Rue de la Faune	Quebec		G1G 5H9	Canada	418-528-9099	418-644-5652	vicky.albert@mrnf.gouv.qc.ca
Asbrink	Jessica	National Veterinary Institute		Uppsala		SE-75189	Sweden	+46 18674659		jessica.asbrink@sva.se
Baker	Barry	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	barry_baker@fws.gov
Bauman	Tasha	Wyoming Game and Fish Wildlife Forensic Laboratory	Dept. 3312, 1000 E University Ave.	Laramie	WY	82071	USA	307-766-5628	307-766-5630	tlarsen@uwyo.edu
Baumgardner	George	Nevada State Museum	600 North Carson Street	Carson City	NV	89701	USA	775-687-4810	775-687-4168	gbaumgardner@nevadaculture.org
Beckert	Jason	Microtrace, LLC	790 Fletcher Drive Suite 106	Elgin	IL	60123-4755	USA	847-742-9909	847-742-2160	Jbeckert@microtracescientific.com
Bell	Lynne	Simon Frazier University, School of Criminology	8888 University Drive	Burnaby	BC	VGA 156	Canada	777-782-7240	778-782-4140	lynneb@sfu.ca
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Boggia	Janet	Educator-Volunteer working for BCY	818 Palmer Rd	Ashland	OR	97520-3357	USA	541-488-5016		jboggia@ashlandhome.net
Bowman	Cherril	Washington State Department Fish and Game	600 Capitol Way N	Olympia	WA	98501-1091	USA	360-902-2595		Cherril.Bowman@dfw.wa.gov
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Broadwater	Maragaret	National Ocean Service Marine Forensic Laboratory	219 Ft. Johnson Rd.	Charleston	SC	29412	USA	843-762-8535	843-762-8700	maggie.broadwater@noaa.gov
Brown	Tom	Center for Accelerator Mass Spectrometry (CAMS), LLNL	7000 East Avenue	Livermore	CA	94550	USA	925-423-8507	925-423-7884	tabrown@llnl.gov
Bunce	Michael	Murdoch University, School of Biological Sciences and Technology	South Street 7th Floor OS	Murdoch	WA		Australia	61893607649		m.bunce@murdoch.edu.au
Burke	Lindsey	Alberta Fish and Wildlife Forensic Unit	Longman Building, 6909	Edmonton	AB	T6H 4P2	Canada	780-644-1509	780-644-2687	laburke@ualberta.ca

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Cain	Forrest	Black Hills State University, CCBR/West Core	University St., Unit 9053	Spearfish	SD	57799	USA	605-642-6854	605-642-6762	Forrest.Cain@bhsu.edu
Carrabba	Mary	Southern Oregon University	Chemistry Dept	Ashland	OR	97520	USA	541-552-6405		carrabbam@sou.edu
Cassidy	Brandt	DNA Solutions, Inc. Analytical Research Laboratory	840 Research Parkway, Ste 551	Oklahoma	OK	73104	USA	405-271-6033	405-271-1174	BCASSIDY@DNASOLUTIONSUSA.COM
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Changtragoon	Suchitra	Biotechnology Group, Forest and Plant Conservation Research Office Dept of National Parks, Wildlife and Plant Conservation	61 Phaholyothin Road, Chatuchak	Bangkok		10900	Thailand	662 56142923 ext440,441	662 56142923 ext441	suchitra@mozart.inet.co.th, suchitra.changtragoon@gmail.com
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Drago	Caroline	East Stroudsburg University	12 Kettle Ridge Drive	Stroudsburg	PA	18360	USA	570-856-1451	570-620-2371	cgdrago@gmail.com
DuBois	Jean-Francois	Environment Canada, Wildlife Enforcement Directorate	200 Sacre-Coeur Boulevard	Gatineau	Quebec	K1A 0H3	Canada	819-934-1250	819-994-5836	Jean-Francois.Dubois@ec.gc.ca
Dyer	David	University of Montana	Biological Services	Missoula	MT	59812	USA	406-243-4743	406-243-4184	dave.dyer@mso.umt.edu
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Ferrell	Carolyn	Black Hills State University, CCBR/West Core	1200 University St., Unit 9053	Spearfish	SD	57799	USA	605-642-6854	605-642-6762	Carolyn.ferrell@bhsu.edu
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Forward	Benjamin	Research and Productivity Council (RPC)	921 College Hill Rd	Fredericton	NB	E3B 6Z9	Canada	506-452-1365	506-452-1395	ben.forward@rpc.ca
Foster	Brad	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	brad_foster@fws.gov
Fox		Colorado State University	1619 Camputs Delivery Dept.3312, 1000 E University	Fort Collins	CO	80523	USA	970-420-3418		karen.fox@colostate.edu
Frazier	Kimberly	Wyoming Game and Fish Wildlife Forensic Laboratory	Dept.3312, 1000 E University	Laramie	WY	82071	USA	307-766-5629	307-766-5630	kimmsa@uwyo.edu
Gila	Kahila	Hebrew University of Jerusalem	PO Box 12	Rehovot			Israel	972(0)894898 88	972(0)894679 40	bargal@agri.huji.ac.il
Garceau	Micheline	Provincial Government of Quebec	Einstein, Suite C	RC		G1P 3W8	Canada	418-528-0391	418-644-5652	micheline.garceau@mmf.gov.ac.c a
Gerdin	Jodie	Cornell College of Veterinary Medicine	508 Adam Ave.	Ithaca	NY	14850	USA	607-253-3319	607-253-3357	jag56@cornell.edu
George	Jami	NCSU-CVM Clinical Pathology Lab	1060 William Moore	Raleigh	NC	27607	USA	919-513-6553	919-513-6556	georvt@hotmail.com; jngeorge@ncsu.edu
Giles	Jenny	University of Queensland, School of Biological Science	157 N Main Street	Ashland	OR	97520	Australia	954-593-8093		Jenny.Giles@uq.edu.au
Gillespie	Doreen	Clontech Laboratories	20th St Ste F1, #58	Bellevue	WA	98007	USA	425-591-5424	888-745-4823	doreen_gillespie@clontech.com
Gillette	Ena	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	ena_gillette@fws.gov
Gleeson	Dianne	EcoGene Lancare Research	PB 92170	Auckland			New Zealand	+64-9-5744121	+64-9-5744101	gleesond@landcareresearch.co.n z
Goddard	Ken	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	ken_koddard@fws.gov
Gonzales	Michael	California State University, Fresno	1910 Cougar Lane	Clovis	CA	93611	USA	909-838-9935		mgonz013@csufresno.edu
Hadas	Lia	Koret School of Veterinary Medicine, Hebrew University of Jerusalem; Animal and Veterinary Science	PO Box 12	Rehovot			Israel	972(0)894898 88	972(0)894679 40	liahadas@yahoo.co.uk
Hamlin	Brian	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	brian_hamlin@fws.gov

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Harper	Cindy	University of Pretoria, Equine Research center, Veterinary Genetics Laboratory	Private Bag XO4 Pretoria	Pretoria	South Africa	0110	South Africa	27125298450	27125298310	cindy.harper@up.ac.za
Hawk	Dee Dee	Wyoming Game and Fish Wildlife Forensic Laboratory	Dept.3312, 1000 E University Ave.	Laramie	WY	82071	USA	307-766-5618	307-766-5630	dhawk@uwyo.edu
Heacker	Marcy	Smithsonian Institution, Feather Identification Lab	10714 Howerton Ave.	Fairfax	VA	22030	USA	202-633-0791	202-633-8084	heackerm@si.edu
Hegdhal	Darrell	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	darrell_hegdahl@fws.gov
Hellack	Jenna	University of Central Oklahoma	100 N.University Drive, Box 89	Edmond	OK	73034	USA	405-974-5729	405-974-5726	jhellack@uco.edu
Hendrickson	Paulette	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	paulette_hendrickson@fws.gov
Hoesch	Bob	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	bob_hoesch@fws.gov
Hoesch- Hebdon	Tricia	Idaho Fish and Game, Wildlife Forensics Program	16569 S 10th ave.	Caldwell	ID	83607	USA	208-454-7638	208-454-7667	tricia.hebdon@idfg.idaho.gov
Horne	Brian	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	brian_horne@fws.gov
Huffman	Jane	East Stroudsburg University, Northeast Wildlife DNA Laboratory	200 Prospect Street	East Stroudsburg	PA	18301-2999	USA	570-422-7891	570-422-3724	jhuffman@po-box.esu.edu
Hynes	Kevin	New York State Department of Environmental Conservation, Wildlife Pathology Unit	108 Game Farm Road	Delmar	NY	12054	USA	518-478-3034	518-478-3035	Kphynes@gw.dec.state.ny.us
Jarman	Pamela	Research and Productivity Council (RPC)	921 College Hill Rd	Fredericton	NB	E3B 6Z9	Canada	506-460-5778	506-452-1395	pamela.jarman@rpc.ca
Jobin	Richard	Alberta Fish and Wildlife Forensic Unit	7th Floor OS Longman Building, 6909- 116 Street	Edmonton	AB	T6H 4P2	Canada	780-422-3194	780-644-2687	rick.jobin@gov.ab.ca
Johnson	Rebecca	Australian Museum, DNA Laboratory	6 College Street	Sydney		NSW 2010	Australia	61293206454		rebecca.johnson@austmus.gov.au
Kerr	Emily	Wildlife Forensic Laboratory- NRDPFC	2140 East Bank Drive	Peterborough	ON	79J 7B8	Canada	705-748-4011 x. 7687	705-748-1132	ekerr@nrdfpc.ca
Kirms	Mark	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	mark_kirms@fws.gov

Last Name	First Name	Institution	Address	City	State	Zip Code	Country	Phone	Fax	e-mail
Knott	Trey	National Ocean Service Marine Forensic Laboratory	219 Ft. Johnson Rd.	Charleston	SC	29412	USA	843-762-8621	843-762-8700	Trey.Knott@NOAA.GOV
Koenigs	Craig	University of Central Oklahoma	100 N.University Drive, Box 89	Edmond	OK	73034	USA	405-974-5729	405-974-5726	ckoenigs@uco.edu
Kornfield	Irv	University of Maine, Molecular Forensic Laboratory	5751 Murray Hall	Orono	ME	04469-5751	USA	207-356-2306	207-581-2548	IRVK@MAINE.EDU
Kramer	Katharina	National Veterinary Institute	Tungasletta 2	Trondheim		7485	Norway	47 73 580767	47 73 580788	katharina.kramer@vetinst.no
Kreitais	Natasha	University of Western Australia	Terrance Road	Perth			Australia	61 8 6488 7255	61 8 6488 7285	kreitn01@student.uwa.edu.au
Kung	Charles	Hong Kong CITES Office, Agriculture, Fisheries and Conservation Department	5-7/F, Cheung Sha Wan Government Offices, 303 Cheung Sha Wan Road	Kowloon, Hong Kong	Hong Kong Special Administrative Region		Hong Kong	852-21506988	852- 23774413	sfoep1@afcd.gov.hk
LaCour, DVM	James	Louisiana Department of Wildlife and Fisheries	Po Box 98000	Baton Rouge	LA	70898	USA	225-765-0823	225-763-5456	jmlacour@wlf.la.gov
Lam	Timothy	Hong Kong CITES Office, Agriculture, Fisheries and Conservation Department	Sha Wan Government Offices, 303 Cheung Sha Wan Road	Kowloon, Hong Kong	Hong Kong Special Administrative Region		Hong Kong	852-21506982		timothy_fn_lam@afcd.gov.hk
Lancaster	Cady	National Fish and Wildlife Lab	1361 Quincy St., #6F	Ashland	OR	97520	USA	541-281-7700		lancaster.cdy@gmail.com
LeMay	Jim	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	jim_lemay@fws.gov
Leung	Angela	WWF Canada	Suite 1588, 409 Granville St.	Vancouver, BC		V6C 1T2	Canada	604-678-5152		
Lewis	Cara	FWS Conservation Genetics Laboratory	1011 E Tudor Rd	Anchorage	AK	99503	USA	907-786-3336	907-786-3978	cara_lewis@fws.gov
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Lindquist	Christina	Veterinary Genetics Forensic Laboratory, University of California,	One Shields Ave.	Davis	CA	95616-8744	USA	530-752-8798	530-309-4309	cdlinquist@ucdavis.edu

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Martin	David	Canorus Ltd.	5669 Snell Ave. #297	San Jose	CA	95123	USA	925-989-7617		martin@canorusltd
Martinez	Edith	Washington State Department Fish and Game	600 Capitol Way N	Olympia	WA	98501-1091	USA	360-902-2595		edith.martinez@dfw.wa.gov
McClure	Pam	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	pam_mcclure@fws.gov
McEwing	Ross	TRACE Wildlife Forensics Network c/o The Royal Zoological Society of Scotland	12 Brewery Close	South Queensferry, Midlothian		EH309LN	Scotland, United Kingdom	44 0 131 314 0317		ross.mcewing@tracenetwork.org
Menotti-Raymond	Marilyn	National Inst. Of Health	Bldg 560, Room 11-38, Ft Detrick, NCI	Frederick	MD	21702	USA	301-846-7488		raymondon@mail.nih.gov
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Moon	JoJane	NFWFL	1490 East Main Street	Ashland	OR	97520	USA	541-482-4191	541-482-4949	jojane_moon@fws.gov
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SWG WILD



Scientific Working Group for Wildlife Forensic Science:

Providing essential standardization for the scientific analysis of evidence in cases involving wild and domesticated fauna and flora



Wildlife Crime – A Global Crisis

Wildlife forensic scientists are at the forefront of domestic and global investigative initiatives targeted at wildlife crime, and the detection, identification, and prevention of national security and public health threats.

Bio-Terrorism and Domestic Security

At JFK, inspectors from the Fish and Wildlife Service open the luggage of a passenger arriving from West Africa. Inside, they find the butchered carcasses of eight monkeys - potential sources of AIDS-related diseases and other critical threats to public health.

Organized Crime

Federal wildlife investigators disrupt a multi-million dollar black market caviar operation directed by international organized crime syndicates in violation of federal law and global treaties.

Animal Abuse

Veterinary forensic scientists assist in bringing down brutal dog-fighting rings around the country through the establishment of canine DNA databases.

International Terrorism

Terrorist groups in Africa are financing their weapons purchases and operations by selling the tusks and horns of slaughtered elephants and rhinoceros.

Poaching

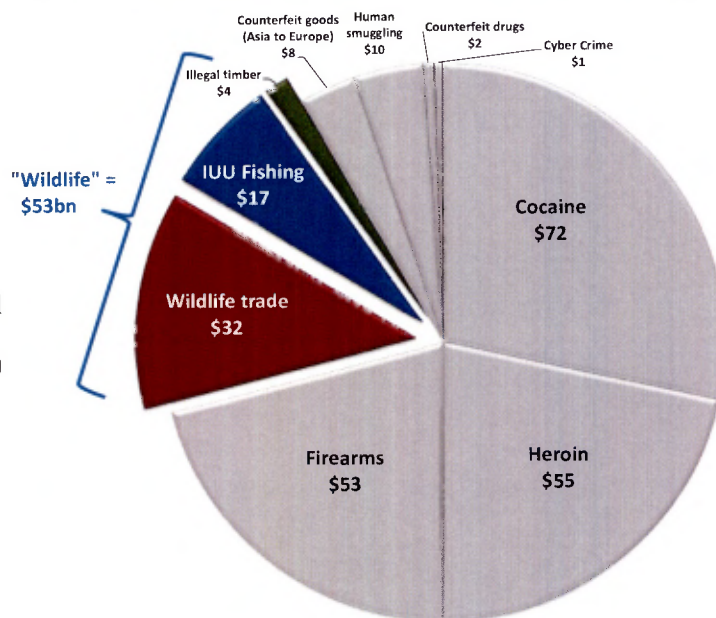
Wyoming Game and Fish breaks up a ring of poachers who have killed more than 30 elk, denying hunting opportunities to licensed and ethical hunters - and the economic resources they provide to local communities.

Food Security

NOAA Special Agents discover half a million pounds of fraudulently labeled seafood destined for US markets, threatening public health and consumer confidence in this multi-million dollar industry.

Estimated Value (USD billion) of Major Categories of Transnational Organized Crime

(Agnew et al. 2009, EUROPOL 2011, UNODC 2010)



Executive Summary

SWGWILD's mission is to provide a certification pathway and rigorous consensus-based standards for the unique needs of wildlife forensic science.

Wildlife forensic science applies an array of scientific sub-disciplines to legal cases involving non-human biological evidence. These disciplines include genetics, morphology, chemistry, pathology, and veterinary sciences. The diverse array of wildlife forensic practitioners' disciplines worldwide is represented in the Society for Wildlife Forensic Science (SWFS).

Existing forensic working groups do not adequately address the complex issues facing wildlife forensic practitioners. For that reason, experts formed the Scientific Working Group for Wildlife Forensic Science (SWGWILD) in 2011. The mission of this group is to provide a certification pathway and rigorous consensus-based standards for the unique needs of wildlife forensic science. Without such leadership, development of wildlife forensic science will be hindered and existing laboratories could be threatened with closure, resulting in the loss of those resources to the law enforcement community. The US Fish and Wildlife Service and the National Oceanic and Atmospheric Administration, as well as various state and international agencies, maintain forensic laboratories dedicated to wildlife crimes. The USFWS National Fish and Wildlife Forensics Laboratory also acts as the designated analytical facility for INTERPOL and the Convention on International Trade in Endangered Species (CITES).

SWGWILD is seeking a reliable source of federal support.

Wildlife forensic scientists are at the investigative forefront of emerging threats to

- Homeland security
- Sustainable use of international resources
- Public health
- International commerce
- Animal welfare
- Threatened and endangered species
- Domestic food supplies
- Legal hunting of game species

Crimes involving non-human evidence encompass virtually the entire biodiversity of the planet. Wildlife forensic scientists must develop, validate, and apply tools to identify an increasing variety of species in a manner that will withstand judicial scrutiny. These analysts are commonly called upon to perform species identification, cause of death determination, the identification of pesticides and poisons, and to link individual animals to wildlife crime scenes. Cases range from the taking of protected plant and animal species, to oil spills, animal cruelty, and bio-terrorism, to the analysis of animal hairs and other trace evidence in crimes such as rape and homicide.

Stakeholder groups related to wildlife forensics (Appendix I) are also extremely varied. Law enforcement agents for state and federal management agencies comprise the largest group, and many wildlife forensic laboratories also work with local law enforcement and natural resource officers and animal welfare organizations. Prior to 1988, wildlife law enforcement officers had limited or no access to wildlife-specific forensic services. Wildlife crime laboratory analytical services and expert witness testimony for wildlife and natural resource-related crimes have enabled successful prosecutions of serious violations of wildlife laws (see Appendix II).

All fields of forensic science are currently receiving increased scrutiny, as a result of the critical National Academy of Sciences report in 2009. Although wildlife forensic science was not directly addressed in the report, this field, along with other forensic disciplines, will undoubtedly face increasingly stringent requirements imposed by the courts and the Federal Government. SWGWILD is committed to anticipating these requirements and developing rigorous best practices for the array of disciplines included under wildlife forensic science.

Scope of the Problem

Wildlife forensic science deals with activities whose potential value has been estimated to total up to **\$53 billion a year** – including illegal traffic in protected wildlife, illegal, unregulated, and unreported fisheries, and the illegal timber trade. Taken together, these activities comprise the third largest form of illegal international trade, after drugs and weapons. Some wildlife crime activities are also known to be linked with other forms of organized crime.

The variety of wildlife forensic cases is vast, with evidence potentially encompassing the entire biodiversity of the planet. It can range from a van full of boots made from the hides of endangered sea turtles, to shipments of elephant tusks, coral jewelry, and shark fins, to trophy elk, oil-soaked birds, wild ginseng, or blood from a dog fighting pit. In cases of seafood fraud, evidence can consist of an entire vessel-load of frozen fish. Some common areas of wildlife forensic casework are examined in more detail below.

"It is our task in our time and in our generation, to hand down undiminished to those who come after us...the natural wealth and beauty which is ours." – U.S. President John F. Kennedy

Illegal Wildlife Trade

The legal trade in wildlife is estimated to be a \$300 billion dollar industry (Engler and Parry-Jones 2007) with the majority of its value in timber and fisheries products, but it is the illicit trade that is decimating wild populations and funding illegal activities. Illegal, unreported and unregulated (IUU) fishing is estimated to account for an additional **\$10-25 billion a year** (Pauly et al. 2002, MRAG 2005, Agnew et al. 2009). Furthermore, the endangered species trade fuels organized crime and the illicit drug and arms trades, and is alleged to fund terrorist activities (Zimmerman 2003, Warchol 2004, U.S. Department of State 2009). Links between human trafficking, public corruption and illegal fishing have also been reported (US Senate Foreign Relations Committee 2009). Forensic science is critical for the successful monitoring, control, surveillance, and enforcement of the illegal harvest and trade in wildlife products.

Violent Crimes

Crime-scene evidence such as shed hair, saliva and feces from house pets has been used successfully in the prosecution of individuals charged with murder, rape, burglary, and terrorist threats. There are approximately 78 million dogs and 94 million cats in the United States. With 62% of homes having one or more pets, domestic animal biological evidence is frequently present at human crime scenes. The same techniques are now being used to solve "cold case" investigations when other investigative leads have been exhausted. Domestic animal DNA has been analyzed for the Innocence Project, an organization responsible for the exoneration of over 200 wrongfully convicted prisoners.

Animal Cruelty

When animals are the victims of human cruelty, the investigation and prosecution of those cases identifies people who may pose a danger to others. There is an established link between animal cruelty and domestic violence, with more than 80% of women arriving at domestic violence shelters reporting animal abuse in the home¹. Serial killers have long been known to experiment with torturing and killing animals as children or adolescents (Ressler *et al.* 1988; Langevin 2003), so the early identification of those individuals through forensic science can help to bring them into the justice system.

¹ <http://www.aspca.org/fight-animal-cruelty/domestic-violence-and-animal-cruelty.aspx>

The crime of dog fighting is now a felony in every U.S. state, and rings—such as Michael Vick's Bad Newz Kennels—are another significant target for investigators using veterinary forensic testing. Dog fights are commonly associated with the exchange of large amounts of money from gambling and the sale of illegal drugs and weapons.

Illegal Hunting: Poaching an American Pastime

While the illegal wildlife trade and dog fighting often make the front page of the newspaper, the effects—both financial and ecological—of poaching game species should not be underestimated. Many western States rely upon hunting opportunities to provide jobs and income to their communities. Hunting is much more than a traditional American pastime; it creates more than 700,000 jobs nationwide. New studies show that annual spending by America's 14 million hunters amounts to **\$25 billion**. Hunting generates an additional **\$17 billion** in salaries and wages as well as creating sales and state and federal income tax revenues for government agencies and the people they serve. If it were hypothetically ranked as a corporation, these figures would put hunting in thirty-fifth place on the Fortune 500 list of America's largest businesses².

Poaching diminishes fish and game resources and decreases opportunities for legitimate hunters to draw a license and participate. Poaching can take various forms, but in general it is the illegal hunting, killing or capturing of animals. This can occur in a variety of ways including taking without a license or permit, taking over the limit, trespassing, use of a prohibited weapon or trap, taking outside of the designated time period or inside of a park, and taking of a prohibited sex or life stage. This results in a loss of revenue to the community and to the management agency responsible for the license sales.

Beyond local poaching, professional poachers can be associated with the international trade of animal parts. Although statistics on poaching can be dated and are not well documented, it has been estimated "about 60 percent of poachers are people who are involved in other criminal activities such as trafficking in drugs and smuggling contraband" (Canadian Geographic 1999).

Exploitation of Rare and Endangered Plants

Non-human crimes are not limited solely to wild and domestic animals, but also include thefts of rare plants (including orchids and cacti) and commercially, ecologically, and culturally important timber species. The high profit and low fines associated with this type of crime has drawn the attention of organized crime. It is believed that organized crime is responsible for the growing sophistication of the operations and distribution systems.

² <http://www.dfg.ca.gov/wildlife/hunting/econ.hunting.html>

Budgetary Considerations

SWGWILD is seeking a reliable source of federal support to fund two annual meetings. To date, SWGWILD has operated at the expense of the participating agencies and through a grant administered by the Wyoming Game and Fish Department, but these funds are now exhausted. This funding covered the first year of meetings which produced a vast amount of consensus-based guidance concerning best practices and certification. However, additional funding is critical to sustain and expand these efforts. Meetings will occur twice annually over a 3-day period at cost-effective locations agreed upon by attendees. Between meetings, information is exchanged electronically, but in-person attendance has proven to be the most efficient and cost-effective means of achieving SWGWILD goals and mandates.

Estimated costs

ITEM		AMOUNT
Airfare		\$500
Lodging	3 days	\$450
Per diem	3 days	\$180
Total, per attendee		\$1130
SWGWILD Members	17	\$19,210
Subject Matter Experts	4	\$4,520
Total travel, per meeting		\$23,730
Incidentals (room, A/V rental)	Per mtg	\$500
Meetings per year	2	\$48,460

Summary

The field of wildlife forensics is essential to effective enforcement of laws protecting wildlife, fisheries and the public. Without such scientific support, many cases simply could not be pursued. Sound forensic science is based on valid standardized practices performed by highly trained and experienced practitioners. The Society for Wildlife Forensic Science relies upon SWGWILD to provide the structure necessary for guidance and standardization in an extremely diverse discipline that has previously not been covered by other SWGs.

A reliable source of Federal funding is essential to continue SWGWILD's work in support of wildlife forensic science. SWGWILD held its first three meetings in 2011. In this time, the SWG drafted standards and guidelines for both DNA and morphology – its two major sub-disciplines - a certification program for wildlife forensic scientists, and two major publications. SWGWILD's grant funding has now been exhausted, and without Federal support, the work of the SWG will not be able to continue. SWGWILD has demonstrated significant initiative in the absence of official recognition and support, establishing the value of this organization to the scientific community, stakeholders, and the national interest. Federal sponsorship will allow SWGWILD to continue this essential work.

Appendices

Appendix I. Examples of cases involving wildlife and non-human forensics cases.

Marine Mammal Protection Act Violations

Forensic scientist identifies the origin of smuggled ivory, resulting in a sentence of nine months in prison and the deportation of a Ukrainian national, in addition to 30 days confinement and probation for another defendant. [Department of Justice – Mikhalyov](#) or [Department of Justice - Manghis](#)

Forensics supports search warrant that uncovers illegal sale of Sei whale in a US sushi restaurant. [Department of Justice](#) or [NY Times](#)

Dog Fighting

Canine Combined DNA Index System generated by forensic scientists used to help track dog fighters and breeders. [National Public Radio](#) or [UC Davis website](#)

Seafood Fraud

Forensic analysis reveals that lower quality Coho salmon was being substituted for the more valuable Chinook salmon, resulting in a guilty plea that involved a year in prison and a community service payment of \$347,202. [Department of Justice](#) or [Bellingham Herald](#)

Fisheries forensics shows that Lake Victoria perch and farm-raised Vietnamese catfish were being sold as many other higher-value species. The plea agreements resulted in a total of 70 months in prison for the three defendants. [Department of Justice](#)

Endangered Species Act Violations

Endangered Species Act violations involving steelhead prosecuted with various types of forensic evidence. [Department of Justice](#)

Black Market Caviar Trade

Forensic DNA testing revealed that eggs from the protected American Paddlefish were being sold as the more valuable Sevruga caviar, resulting in a two year prison term and over \$136,000 in fines. [Department of Justice](#)

Poaching of protected white sturgeon for the black market caviar trade revealed by forensic analysis. [LA Times](#) or [Seattle Times](#)

Wildlife Poaching

Forensic scientists work to unravel tough cases of moose and deer poaching. [Canadian Geographic](#) or [Aberdeen News](#)

International Trade in CITES Listed Timber

Scientists in the UK develop a method for distinguishing the CITES-protected Brazilian rosewood from other non-regulated species in trade, preventing its overexploitation. [Kew Royal Botanical Gardens \(UK\)](#)

Appendix II. Representative stakeholders.

DOMESTIC	
Society for Wildlife Forensic Science	US Department of Agriculture
Federal Bureau of Investigations	US Customs
Natural Resource Officers	US Department of Homeland Security
Forestry Officers	US Department of Justice
Environmental Protection Agency - Environmental Officers	US Department of State
Wildlife Officers: USFWS Special Agents and State Conservation Officers/Game Wardens	US Fish and Wildlife Service Conservation Genetics Community of Practice
National Oceanic Atmospheric Administration (NOAA) Special Agents and Marine Conservation Officers	Animal Welfare Agencies: ASPCA, Humane Society, Animal Control Officers, Humane Officers
Domestic Breed Registries	Police and Sheriffs
Horse Racing and Livestock Boards/Investigators	Veterinarians

INTERNATIONAL	
INTERPOL	Metropolitan Police (New Scotland Yard)
TRACE Network	Royal Canadian Mounted Police
The approximately 175 countries that have signed the United Nation's CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) Treaty	International Laboratories: Canada, United Kingdom, South Africa, Brazil, Malaysia

NON-GOVERNMENTAL ORGANIZATIONS	
American Bird Conservancy	Rocky Mountain Elk Foundation
Foundation for North American Wild Sheep	Safari Club International
Innocence Project	Sierra Club
International Game Fish Association	The Animal Defense League
International Union for the Conservation of Nature	The Nature Conservancy
	WildAid
Mule Deer Foundation	Wildlife Conservation Society
Natural Resources Defense Council	World Society for the Protection of Animals
Oceana	World Wildlife Fund/TRAFFIC

Appendix III. SWFS Member Laboratories.

FEDERAL	
Fish and Wildlife Service, Conservation Genetics Laboratory	U.S.
Fish and Wildlife Service, National Forensic Lab*	U.S.
Lawrence Livermore National Laboratory, Center for Accelerator Mass Spectrometry	U.S.
NOAA National Seafood Inspection Laboratory	U.S.
NOAA, Marine Forensic Laboratory	U.S.
NOAA, National Marine Fisheries Service, Northwest Fisheries Science Center	U.S.
Smithsonian Institution, Feather Identification Lab	U.S.
USDA Forest Service Rocky Mountain Region	U.S.
STATE	
Black Hills State University, CCBP/West Core	U.S.
California Department of Fish and Game Forensics Laboratory	U.S.
California State University, Fresno	U.S.
East Stroudsburg University, Northeast Wildlife DNA Laboratory	U.S.
Idaho Fish and Game, Wildlife Forensics Program	U.S.
Southern Oregon University	U.S.
Tennessee Wildlife Resource Agency	U.S.
Texas Parks and Wildlife, A.E. Wood Fish Hatchery*	U.S.
University of California, Berkeley, Napa	U.S.
University of California, Davis, Veterinary Genetics Forensic Laboratory*	U.S.
University of Central Oklahoma	U.S.
University of Colorado, Boulder	U.S.
University of Maine, Molecular Forensic Laboratory	U.S.
University of Washington, Biology	U.S.
University of Washington, Department of Biostatistics	U.S.
Washington State Department Fish and Game	U.S.
Wyoming Game and Fish Wildlife Forensic Laboratory	U.S.
PRIVATE	
Canorus Ltd.	U.S.
DNA Solutions Inc., Analytical Research Laboratory	U.S.
Microtrace, LLC	U.S.
Stoney Forensic	U.S.

* Accredited laboratories

INTERNATIONAL	
Australian Museum, DNA Laboratory	Australia
Murdoch University, School of Biological Sciences & Biotechnology, Wildlife Genetics Laboratory	Australia
University of Queensland, School of Biological Science	Australia
Laboratorio de Biologia Evolutiva e Conservacao de Vertebrados SOS, Fauna Cidade Universitaria, Fauna Cidade Universitaria	Brazil
Alberta Fish and Wildlife Forensic Unit	Canada
Environment Canada, Pacific & Yukon Laboratory for Environmental Testing	Canada
Environment Canada, Wildlife Enforcement Directorate	Canada
Lethbridge Community College	Canada
Pacific Biological Station, Dept.of Fisheries and Oceans	Canada
Research and Productivity Council, Fredericton, NB	Canada
Simon Frazier University	Canada
Trent University Wildlife Forensic DNA Laboratory	Canada
University of British Columbia, Cowan Vertebrate Museum, The Beaty Biodiversity Museum	Canada
WWF Canada	Canada
Hong Kong CITES Office, Fisheries and Conservation Department	Hong Kong
St. Xavier's College	India
EcoGene Lancare Research	New Zealand
University of Pretoria, Veterinary Genetics Laboratory, Equine Research center	South Africa
National Veterinary Institute	Sweden
CITES Enforcement Task Force	Switzerland
Forest and Plant Conservation Research Office Dept of National Parks, Wildlife and Plant Conservation, Forest Genetics and Biotechnology Group	Thailand
TRACE Wildlife Forensics Network c/o The Royal Zoological Society of Scotland	United Kingdom

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