

# **PATHOLOGY - A TOOL FOR TEXAS WILDLIFE<sup>1</sup>**

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## **ABSTRACT**

A Game Department was added to the Texas Fish and Oyster Commission in 1907, and three functions branched from this department. Law Enforcement was formed first, with wildlife restoration following and becoming sophisticated by the addition of wildlife pathology in 1963. In these 9 years, some 2,000 necropsies have been performed on various species of wildlife to develop disease backgrounds. The benefits of pathological study have been: (1) background data on diseases (2) game management implications as related to disease study and implementation of disease controls (3) forensic pathology development which has proven valuable to Law Enforcement for convictions of game violators.

Game was plentiful in Texas in 1821 but declined drastically during the ensuing 50 years due to uncontrolled hunting (Texas Game, Fish, and Oyster Commission, 1927). Public concern over dwindling wildlife resources caused legislation to be enacted providing for game warden to be employed. With this protection from the wardens coupled with public protection from landowners and hunters alike, game populations gradually increased until a new problem was encountered. Overpopulation replaced overharvest, and large losses of game became common. In 1945 and 1947 major deer die offs occurred in Texas (Taylor, 1947, Hahn and Taylor, 1950). Annual losses of 80 per cent in quail populations were considered normal (Jackson, 1969).

Adjusted game harvests and regulations failed to stop mortality rates occurring in game animals. These losses potentially result in decreased revenue to landowners and a loss of recreation and meat to the sportsman. Deer losses were more noticeable than those of other game populations because more work was being done on white-tailed deer. Almost 62,000 deer were lost on 350,000 acres of Llano County due to "natural mortality" in a 7-year period (Marburger and Thomas, 1965). These losses made it evident that something more than law enforcement or current management practices was needed for efficient wildlife management.

In 1963 an agreement was signed by the Texas Parks and Wildlife Department and the Veterinary Pathology Department of Texas A&M College to diagnose diseases of deer in Texas. This experimental study showed great potential and a new contract was designed to include not only deer but also pronghorns. In 1968 the scope of the program was further expanded to include all species of wildlife. Almost 2,000 animals have been examined under this program. Whitetail deer (467), exotic deer (111), and mourning doves (526) comprised the bulk of the submissions. Noncontract work also included a variety of unusual species (Table 1). From this background data, the need for intensive study of specific

<sup>1</sup>A contribution of Texas Pittman-Robertson Project W-93-R

problems became apparent, and special attention was focused on aspects of disease which suggests controls and/or implications of management significance (Margurjer, *et al.*, 1970).

Table 1. Sample Cases Submitted to Pathology for Examination

Land Mammals (Native)		
Whitetailed deer	<i>Odocoileus virginianus</i>	467
Mule deer	<i>Odocoileus hemoinus</i>	6
Pronghorn antelope	<i>Antilocapra americana</i>	46
Elk	<i>Cervus canadensis</i>	1
Javelina	<i>Tayassu tajacu</i>	8
Armadillo	<i>Dasyopus novemcinctus</i>	3
Raccoon	<i>Procyon lotor</i>	77
Opossum	<i>Didelphis marsupialis</i>	7
Cottontail rabbit	<i>Sylvilagus floridanus</i>	3
Jack rabbit	<i>Lepus californicus</i>	5
Coyote	<i>Canis latrans</i>	111
Gray fox	<i>Urocyon cinereoargenteus</i>	4
Gray squirrel	<i>Sciurus carolinensis</i>	10
Fox squirrel	<i>Sciurus niger</i>	7
Domestic goat	<i>Capra hircus</i>	2
Red wolf	<i>Canis niger</i>	1
Wood rat	<i>Neotoma floridana</i>	1
Cottonrat	<i>Sigmodon hispidus</i>	1
Domestic cow	<i>Bos albifrons</i>	4
Red fox	<i>Vulpes fulva</i>	2
Bighorn sheep	<i>Ovis canadensis</i>	9
White mice	<i>Mus muscus</i>	9
Nutria	<i>Myocastor coypus</i>	1
Norway rat	<i>Rattus rattus</i>	36
Bobcat	<i>Lynx rufus</i>	6
Domestic dog	<i>Canis familiaris</i>	1
Domestic sheep	<i>Ovis aries</i>	2
Skunk	<i>Mephitis mephitis</i>	1
Domestic cat	<i>Felis catus</i>	7
Free-tailed bat	<i>Tadarida brasiliensis</i>	1
Land Mammals (Exotic)		
Sambar deer	<i>Cervus unicolor</i>	2
Axis deer	<i>Axis axis</i>	53
Barbados sheep	<i>Ovis aries</i>	4
Fallow deer	<i>Dama dama</i>	3
Mouflon sheep	<i>Ovis Musimon</i>	1
Red deer	<i>Cervus elaphus</i>	1
Grants gazelle	<i>Gazella granti</i>	1
Tahr	<i>Hemitragus spp.</i>	1
Blackbuck	<i>Antilope cervicapra</i>	18
Nilgai	<i>Basephalus tragocomelus</i>	26
Tiger	<i>Pantheria tigris longipilis</i>	1
Indian elephant	<i>Elephas maximus</i>	1
Wallaroo	<i>Macropus robustus</i>	1
Llama	<i>Lama pervana</i>	1

Jaguar	<i>Panthera onca</i>	1
Rhino	<i>Ceratotherium simum</i>	1
Hamster	<i>Mesocricetus auratus</i>	4
Guinea Pig	<i>Cavia spp.</i>	2

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Birds (Native)

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Turkey	<i>Meleagris gallopavo</i>	39
Mourning dove	<i>Zenaidura macroura</i>	526
Inca dove	<i>Scardafella inca</i>	2
White-winged dove	<i>Zenaida asiatica</i>	62
Geese	<i>Chen spp.</i>	39
Ducks	<i>Anas spp.</i>	7
Bobwhite quail	<i>Colinus virginianus</i>	19
Scaled quail	<i>Callipepla squamata</i>	4
Meadowlark	<i>Sturnella magna</i>	1
Grackle	<i>Cassidix mexicanus</i>	33
Pheasant	<i>Phasianus colchicus</i>	1
Snowy egret	<i>Leucophyox thula</i>	3
Prairie chicken	<i>Tympanuchus cupido</i>	55
Cedar waxwing	<i>Bombycilla cedrorum</i>	2
Sandhill crane	<i>Grus canadensis</i>	1
House sparrow	<i>Passer domesticus</i>	6
Domestic pigeon	<i>Columba livia</i>	3

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Birds (Exotic)

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Coturnix quail	<i>Coturnix coturnix</i>	5
Peachface lovebird	<i>Agapornis roseacollis</i>	1
Humboldt penguin	<i>Spheniscus humboldti</i>	1
Roseate spoonbill	<i>Ajaia ajaja</i>	1
Louisiana heron	<i>Hydranassa tricolor</i>	1

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Reptiles

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Alligator	<i>Alligator mississippiensis</i>	42
Snakes	species mixed	4

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Aquatic Animals (Mammal)

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Pilot whale	<i>Globicenphala melaena</i>	1
Pacific killer whale	<i>Orcinus rectipinna</i>	1
Atlantic bottlenose dolphin	<i>Tursiops truncatus</i>	5
Spotted dolphin	<i>Stenella plagiodon</i>	1
Dolphin	<i>Stellea sp.</i>	1
Elephant seal	<i>Mirounga angustirostris</i>	1
Harbor seal	<i>Phoca vitulina</i>	2
California sea lion	<i>Zalophus californianus</i>	6
Bull shark	<i>Carcharhinus leucas</i>	1
Lemon shark	<i>Negatrimon brevirostris</i>	1

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Aquatic Animals

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Lamprey	<i>Ichthyomyzon gagei</i>	2
Shrimp	<i>Penaeus autecus</i>	3
Leopard frog	<i>Rana pipiens</i>	1

Bull frog	<i>Rana catesbeiana</i>	1
Longnose gar	<i>Lepisosteus osseus</i>	1
Threadfin shad	<i>Dorosoma petenense</i>	1
White crappie	<i>Pomoxis annularis</i>	1
Red fish	<i>Ocellata</i>	2
Sheepshead	<i>Archosargus probatocephalus</i>	1
Speckled trout	<i>Cynosion nebulosis</i>	15
Golden coraker	<i>Micropogon undulatus</i>	3
Striped mullet	<i>Mugil cephalus</i>	2
Amaxon catfish	<i>Corydoras aeneus</i>	8
Gourami	<i>Osthronemus goramy</i>	1
Guppy	<i>Lebistes reticulatus</i>	4
Black bass	<i>Micropterus salmoides</i>	3
Silverside shiners	<i>Notropis shumardi</i>	4
Rainbow trout	<i>Salmo gairdneri</i>	10
Blue catfish	<i>Ictalurus furcatus</i>	12
Platyfish	<i>Xithothorus maculatus</i>	2
Killifish	<i>Fundulus spp.</i>	3
Channel catfish	<i>Ictalurus punctatus</i>	28
Goldfish	<i>Carassius auratus</i>	6
Bigmouth sole	<i>Hiptoglossina stomata</i>	1
Curlfin turbet	<i>Pleuronichthys decurrens</i>	1
English sole	<i>Parophrys vetulus</i>	1
Cow rock fish	<i>Sebastes levis</i>	2
Vermillion rockfish	<i>Sebastes miniatus</i>	1
Dober sole	<i>Microstomus pacificus</i>	26
Sea horse	<i>Hippocampus hudsonius</i>	1

Law Enforcement officials began to submit challenges for the laboratory. Deer hair, taken from a pool of blood in a suspected game violator's vehicle, was submitted for analysis. The hair was examined, photomicrographed, and compared with hair specimens from various known species of wild and domestic animals, and was proven conclusively to be white-tailed deer hair. This proved to be a milestone in Texas game law enforcement. Proceedings are presently underway to publish photographs of the hair of several species in a bulletin to be presented to game wardens for aid in identifying hairs in cases of game law violations.

Plans are underway to provide a complete program in 1973 for forensic pathology to aid Texas Game Management Officers. Hyperimmunized rabbits will be used to produce serum for tests to identify deer meat or blood. This procedure can be used to detect venison in commercially prepared hamburger meat or to identify blood found in a trunk, pickup bed, camphouse, etc. This field may prove to be extremely productive and is open to a vast array of challenges and plans. Thus the circle is complete: pathology ties biological science to law enforcement, resulting in an intergrated team approach to the problem of wildlife management.

Not only has the Wildlife Disease Project been useful in providing basic knowledge for the functions of disease in game animal populations, but it also has been a training ground for interested biologists and veterinarians. Graduate study in Veterinary Pathology utilizing wildlife diseases as research material is available, and wildlife students and biologists have functioned as important members of the research team. The project at the present time utilizes the efforts of two full-time biologists, a histotechnician, one full-time and two part-time veterinarians, and one veterinarian pursuing graduate studies. An introductory course in wildlife disease is presently being offered each spring to wildlife

students by the Wildlife Disease Project, and an additional course is available to senior veterinary students.

We hope that the success of this project in both practical application and in basic support of the knowledge of fluctuating wildlife populations may spread to more State agencies concerned with the regulation of our native game species. We feel that such projects are essential to success in game management.

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### THE INFLUENCE OF WEATHER ON HUNTER-DEER CONTACTS IN WESTERN VIRGINIA<sup>1</sup>

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#### ABSTRACT

The influence of weather factors on the number of hunter-deer contacts was investigated. Findings indicate that moderate rainfall contributes to an increase in deer sightings per hunter hour.

An important aspect of modern deer herd management is the identification of and, ultimately, an expression of the relative importance of the many factors

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