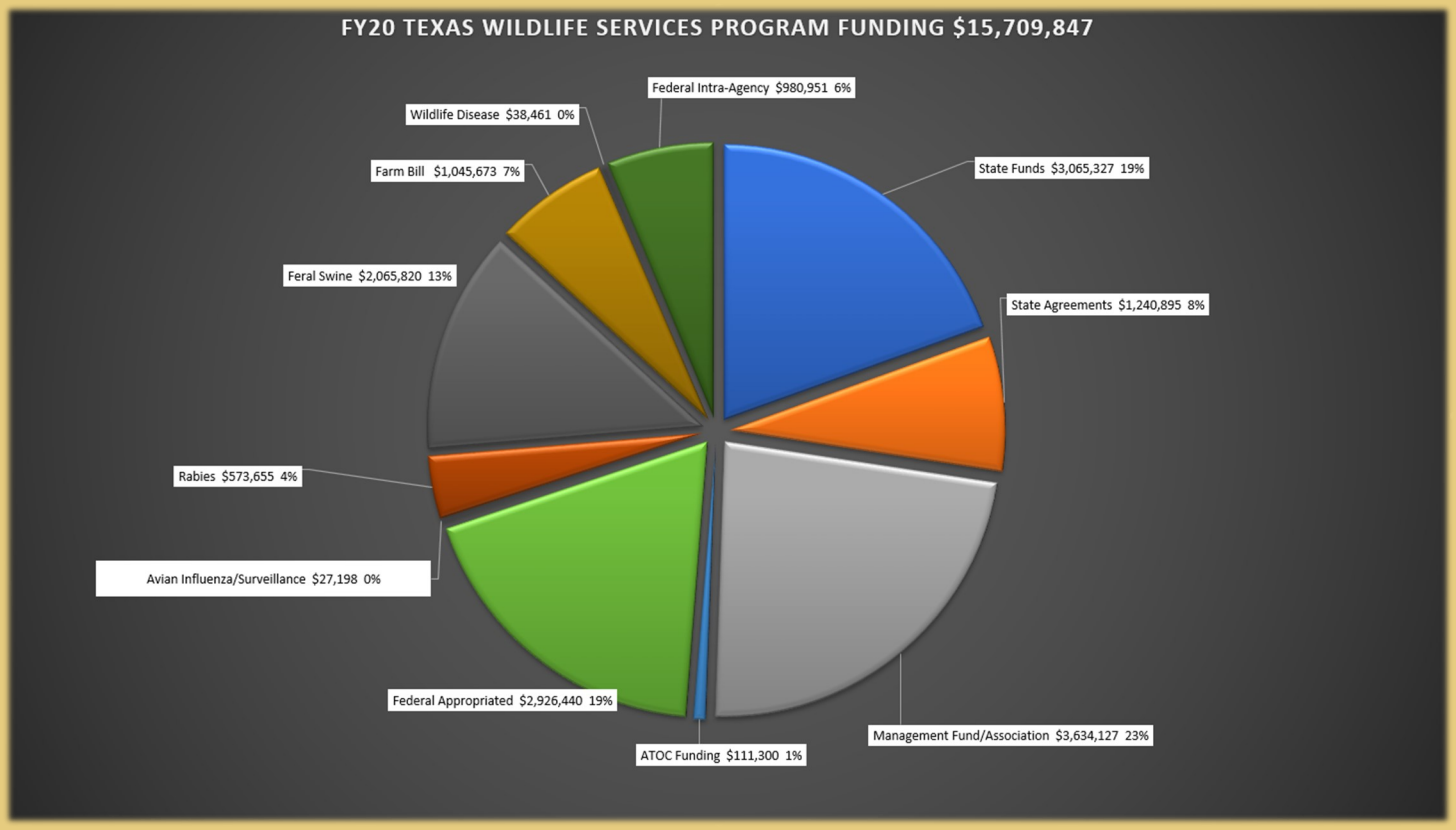
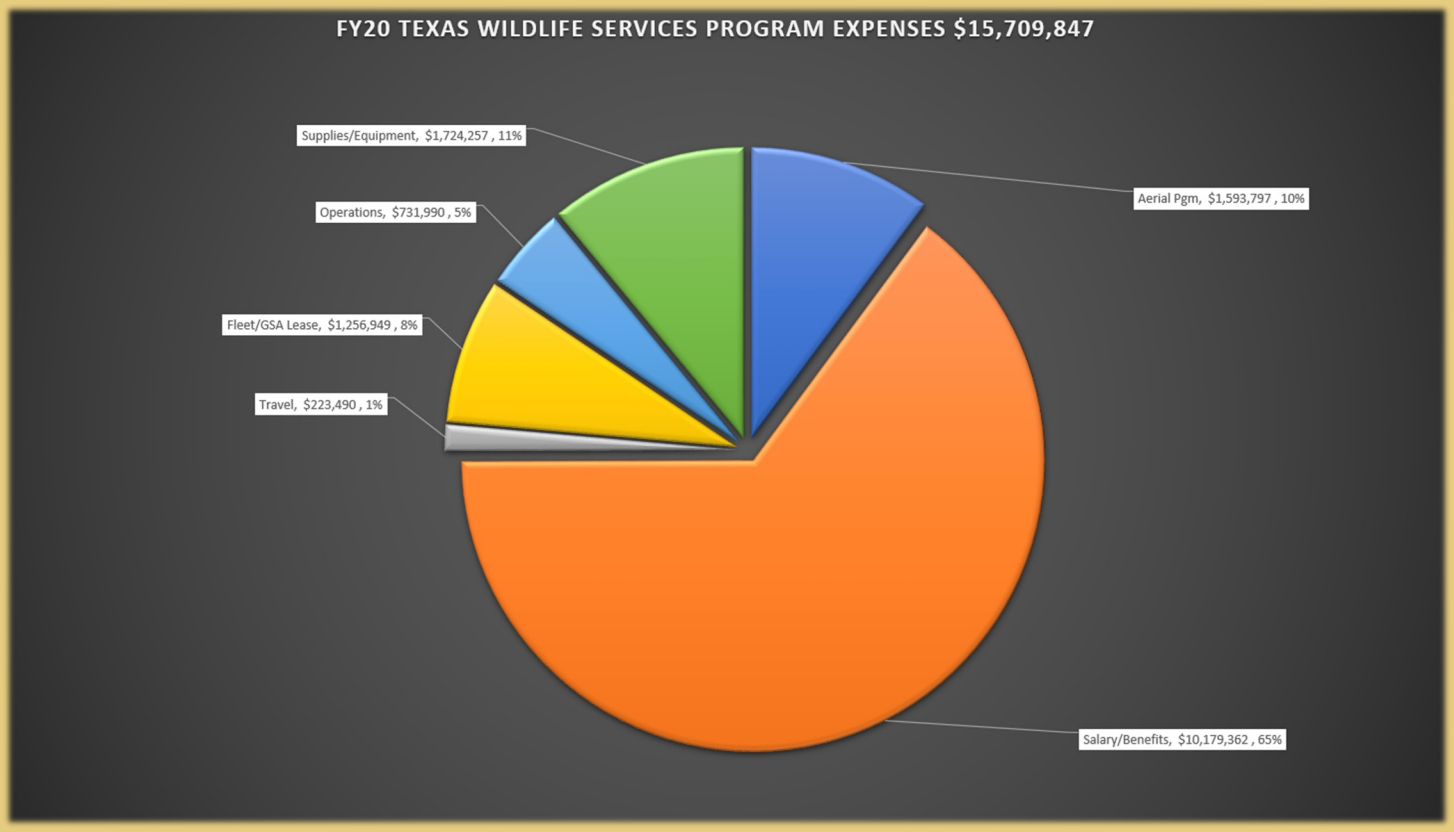
2020 STATE REPORT

USDA-Animal & Plant Health Inspection Service—Wildlife Services

Texas A&M AgriLife Extension Service

Texas Wildlife Damage Management Association


FY20 TEXAS WILDLIFE SERVICES PROGRAM FUNDING $15,709,847
Federal Intra-Agency $980,951 6%
Wildlife Disease $38,461 0%
Farm Bill $1,045,673 7%
State Funds $3,065,327 19%
Feral Swine $2,065,820 13%
State Agreements $1,240,895 8%
Rabies $573,655 4%
Avian Influenza/Surveillance $27,198 0%
Federal Appropriated $2,926,440 19%
Management Fund/Association $3,634,127 23%
ATOC Funding $111,300 1%


FY20 TEXAS WILDLIFE SERVICES PROGRAM EXPENSES $15,709,847
Supplies/Equipment, $1,724,257 , 11%
Aerial Pgm, $1,593,797 , 10%
Operations, $731,990 , 5%
Fleet/GSA Lease, $1,256,949 , 8%
Travel, $223,490 , 1%
Salary/Benefits, $10,179,362 , 65%

From the Director

Michael J. Bodenchuk, State Director

Wow, what a year!

The year 2020 will go down in history as an incredible exercise in human resilience. Certainly, some of us lost loved ones to the pandemic. Most of us suffered financial setbacks caused by supply and demand economics. And everybody wondered who was hoarding the toilet paper! From the tragic to the comic, there has never been another year like 2020.

I'm proud to report that the essential services of the Texas Wildlife Services Program continued throughout the pandemic. For our employees, there were many changes, but probably the safest place to be was out in the pasture checking traps and they went about their business in a professional manner. We had some employees who tested positive and others who self-isolated due to contact with a family member who tested positive. But the employees pulled through and kept working. When you look at the challenges they each faced, that they kept their focus and continued to provide services is remarkable. Not every government agency or program was able to do that.

In the early days of the pandemic, when a lot of focus was on government "stay-at-home" orders, we made a decision that certain services were "essential", and we were able to get these approved at the State and federal levels. Key to this was the protection of human health and safety, including our Oral Rabies Vaccination Program, our response to aggressive animals and our efforts at airports to protect the flying public. Even in the face of reduced flights, our employees kept aircraft and wildlife apart by providing professional hazing and removal at airfields; all the while providing habitat management advice to prevent the creation of wildlife attractants.

Right up there with human health and safety was the protection of agriculture. Predation management services had to be continued, as predators never take a holiday. Likewise, the pandemic hit right at planting season and feral hogs damage crops during this season as well as at maturity. We continued feral hog control without interruptions. It was almost comical to see how some in government expected to apply some of the guidelines to the work we conduct. It's hard to social distance in a helicopter or Supercub!

That's not to say we didn't have problems. Congress funded the Feral Swine Pilot Project through the Farm Bill and as we attempted to roll out that project we had numerous problems. In a pre-COVID environment, we would have been able to meet with County Judges and Commissioners and explain the program. Following that, we would have held public meetings in the affected counties and signed up properties through this method. As it was, we traded emails and had to meet with landowners one-on-one- a painfully slow way to get business done. Part of the Farm Bill Project includes administering a trap-loan program in conjunction with the local Soil and Water Conservation Boards. While the Boards ordered equipment as soon as they could, supply-chain holdups prevented the delivery of the traps and cameras. We hired technicians as quickly as we could, but some of these quit even before traps were delivered! It was a different time.

Still, work continued. Within just a few percentage points either way, we worked the same acres, flew the same number of hours and removed the same number of predators as in FY 19. We did, however, remove more feral hogs than every before- over 37,000 which is an incredible 30% increase over the previous year.

(From the Director from page3)

The Texas Wildlife Services Program is the only program in the country, to our knowledge, that produces an Annual Report. Most of us became biologists and trappers because we liked being out in the open, away from people and where we can observe the natural world. But the need to communicate is greater than ever. We traditionally have been good at telling our customers what we did on their property, but few actually got to see what the program does across the entire State. In this report, you'll see highlights from our beaver and predator damage management programs, our airport protection program and some highlights regarding aerial operations.

This is the fourth Annual report for the program and we're changing it up a bit to include some of the new, upcoming issues as well as reporting on FY 2020 results. There are some exciting things happening in FY 2021 as well.

For example, after years of discussion, the US Fish and Wildlife Service has granted a "blanket permit" (our words, not theirs) to the Texas Wildlife Damage Management Association, our partner in the Cooperative program to assist landowners experiencing black vulture depredations to livestock. Livestock producers can be issued a sub-permit which will allow them to legally shoot black vultures to reinforce the non-lethal hazing of vultures. This is a quick, legal way for producers to help protect their own livestock. You can learn more about the program on pages 12 and 13.

Also, while the three Farm Bill Pilot Projects (Upper Leon, Red River and Canadian River) will continue through the end of FY 2023, we have been approved to start new projects in additional areas. The first of these is in Dallam County, a key corn producing county and where pigs have been removed in the past. Our objective for Dallam County is complete eradication. Another "Phase II" project area is the eastern side of Williamson County and adjacent Milam County. These counties also produce significant grain crops and have multiple watersheds running through them which provide pig habitat. The third area is a 3-county project in Nueces/Bee/San Patricio Counties. The funding streams for these Phase II projects is still underway as of this writing, but given the shortened timeline for these projects we are focusing on crop protection in the latter two projects. We will be removing hogs from all landowners, but focusing on significant aerial work before planting and again as crops mature. FY 21 is the base year against which we will compare results in FY 22 and FY 23. You can see the "Phase II" Farm Bill Project maps on page 19.

Finally, the Cooperative Texas Wildlife Services Program assists in the development of new methods and collaborates with research projects nationwide and internationally. On page 19, you'll see the titles of some 20 research and product development projects we are or have been involved in recently. If you are interested in any of these topics, we can call the State Office and I'd be glad to fill you in on the project and, as available, the results.

I hope you enjoy this 2020 Annual report for the Texas Wildlife Services Program.

Mike Bodenchuk

State Director

Integrated Predation Management In Texas

Predation management, as opposed to predator control, recognizes that the process of protecting resources is about preventing predation and not just about killing predators. To be certain, in many cases, the Texas Wildlife Services Program employs lethal predator removable as part of an integrated predation management approach.

"Integrated predation management" has become a buzz word in many circles and in some places it is synonymous with "non-lethal predation management." There are organizations who make their living vilifying livestock producers and the Federal Wildlife Services program, preferring a completely non-lethal approach to managing predation. The problem is, the predators don't read the script.

In Texas, Integrated Predation Management recognizes the partnership between the Cooperative Wildlife Services Program and livestock producers to protect livestock. Producers implement non-lethal animal husbandry practices as they are affordable and effective to prevent predation. Some practices are growing in popularity, such as guard dogs. Part of this popularity is due to changes in the livestock industry, with smaller operations now making up the bulk for the producers. Guard dogs are generally more effective on smaller properties. Producers also build and maintain fences, change breeding seasons to match markets and minimize predation and regularly check their herds to detect and respond to predation threats.

Texas Wildlife Services Program can provide a lot of information to producers on non-lethal methods, including information on fencing, site-specific predation risks, sources of guardian animals and a host of research results. Ultimately, it is the responsibility of the producer to identify his or her personal acceptance of risk and whether or not the operation can cost-effectively implement some or all of the predation management tools available to the producer.

The essential service Texas Wildlife Services can provide is the selective removal of individual predators which pose a risk to livestock. Wildlife is a national treasure and Congress, in establishing the program, recognizes that society needs professionals managing the conflicts between humans and wildlife. While some people do not want their tax dollars spent on killing predators, having an accountable program which performs this function when and where necessary is in the public interest.

While integrated pest management integrates mechanical, cultural, biological and chemical methods to minimize insect damage to crops, Integrated Predation Management also must integrate the resources to be protected. When we remove predators, it can have a positive or a negative effect on native wildlife populations in the area. The Texas Wildlife Services Program integrates predation management within the agreements we work by considering the wildlife management objectives of the State and the landowners. In most cases, landowners are as concerned about deer fawn survival, pronghorn restoration or quail productivity as they are about lamb

or calf predation. Decisions on the ground are made based not only on integrated methods, but integrated resources as well.

The last piece of the Integrated Predation Management puzzle is the research and development necessary to manage the problem now and into the future. The National Wildlife Research Center serves as a research think tank for developing methods and conducting the research necessary to defend current methods. Much of their time is spent on development of new, non-lethal methods, but research into new predator toxicants, reproductive inhibitors and improved capture methods is necessary for the program to remain effective.

The Texas Wildlife Services Program recently went through a planning process to investigate the cost: benefit of new fencing to reduce predation. We all know that good fences make good neighbors, but good fences can also discourage predation by excluding all but the most determined predators from entering the production area. Good, tight boundary fences may be an effective non-lethal predation management solution, but we were uncertain if they would be cost-effective. In reviewing losses on some core properties in the western Hill County, we identified a hot spot for predation. The cost of building fence- even on just one side of a ranch- exceeded the benefit in terms of reduced livestock losses. We have even looked at several adjacent ranches being blocked together, splitting the cost of the fence and it is still not economically justifiable based on reduced predation alone. In this case, if society wants to reduce the number of coyotes killed, then society needs to cost/share with the producers for fencing. The exact cost share ratio is still under investigation, but so far this analysis has pointed out the costs and benefits of non-lethal management.

Texas livestock producers and the Texas Wildlife Services program has been implementing Integrated Predation Management, under one name or another, for over 100 years and we will continue to serve the industry with professional assistance, education and research for another 100.

Texas WS By the Numbers FY20

- **$68M Saved in livestock losses in FY 20**
- **3898 Properties Worked**
- **13,731,546 Acres Worked**
- **65,805 Person Day Visits**
- **15,415 Coyotes Removed**
- **37,252 Feral hogs Removed**
- **1,135 Fox Removed**
- **4,548 Surveillance Samples Collected**
- **240,703 Non-lethal Dispersals**
- **15,766 Technical Assistance Sessions**
- **34,229 Parties Consulted**
- **8,747 Leaflets Distributed**
- **108 Species Conflicts were Discussed**

Value of Resources Protected

- **1454 aircraft valued at $14,481,800,002.00 resource protected**
- **1,985,247 acres of pasture and rangeland valued at $1,823,312,587.80**
- **60,250 acres of wetlands valued at $11,242,400,454.00**
- **478,172 head of cattle valued at $747,470,032.94**
- **179,946 head of goats valued at $32,510,166.32**
- **202,506 head of sheep and lambs valued at $17,243,979.18**
- **36,692 Domestic White-Tailed deer valued at $119,070,335.37**

Program Overview

The Cooperative Texas Wildlife Services Program is a joint effort between USDA-APHIS-Wildlife Services, the Texas A&M AgriLife Extension Service and the Texas Wildlife Damage Management Association. A three-party Memorandum of Understanding establishes that the USDA program shall operate the day-to-day management, integrating Federal, State and Cooperative funds and employees into one seamless program. The authority for the program rests in several Federal and State codes.

The program has been in existence for over 100 years, providing assistance to landowners with predation problems, rodent damage to rangeland and pastures and other wildlife conflicts. The history of the program charts the history of human/wildlife conflicts. Initially created to address predators and rodents, the program has evolved with conservation success in Texas.

As an example, when the program began, beavers were limited in number, suffering from unregulated trapping. However, beavers were successfully reintroduced into many areas by the Texas Game, Fish and Oyster Commission and regulated trapping allowed the beaver to thrive. More beavers and more roads created and improved, means more conflict and beaver damage is now a prominent part of the cooperative program's efforts.

Similarly, the passage of the Migratory Bird Treaty Act made it illegal to "take" a number of what are now considered common species. Hawks, vultures, gulls and other large birds have increased in abundance with protection, and major efforts to restore goose populations have led to record numbers of some species. At the same time, aircraft travel has increased significantly as has the speed of commercial aircraft. While a slow airplane might dodge a collision with a goose or vulture, larger, faster aircraft cannot. The risk of collision has increased with both bird populations and the speed and design of aircraft. In 2006 we had 6 positions protecting airfields. In 2020, we have 13 full-time employees performing aircraft/wildlife damage avoidance.

The program continues to support predation management for the livestock industry. Changes in landownership and land use has created areas within the historic sheep and goat country where predators are now abundant. In Edwards County, for example, the Wildlife Services program works on only about 33% of the land. With limited access, our strategy must be one of preventing predators' access to livestock. Or program works with cooperating landowners, constantly looking for only those coyotes or bobcats which are within striking distance of vulnerable livestock.

Finally, wildlife-borne disease continue to emerge as significant issues. Diseases such as plague, brucellosis, toxoplasmosis CWD and rabies are always foremost on our minds as we handle and sample wildlife. The importance of wildlife diseases cannot be overstated- the COVID-19 pandemic which ground the global economy nearly to a halt had origins in wildlife. Whether we looking for production diseases such as brucellosis, wildlife hosts for human diseases such as rabies or foreign animals diseases that have the potential to impact global trade, the disease portion of the Cooperative Wildlife Services Program will likely increase in intensity and importance over the next decade.

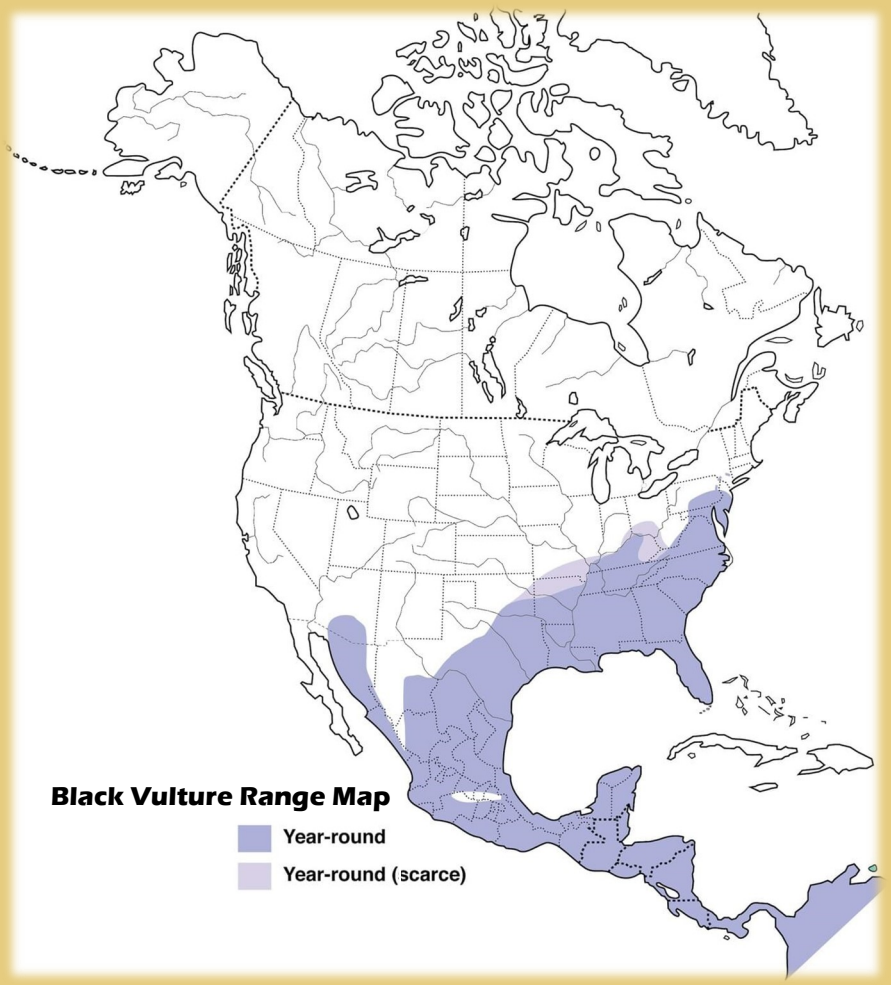
Rabies management, for the protection of humans, remains an important component of the Texas Wildlife Services Program. Two terrestrial strains of rabies, the Texas gray fox strain and the Coyote/Canine strain, have been eliminated from the US due to oral rabies vaccination (ORV) campaigns. Because public health officials suspect both strains are still circulating in northern Mexico, we continue to maintain the border ORV project with partners from the Texas Department of State Health Services and the Texas National Guard. ORV in Texas is the only project in the US which has completely eliminated specific rabies strains and supports the North American Rabies Plan objectives of the elimination of terrestrial rabies in North America.

(Program Overview continued on page 13)

BLACK VULTURES

Vultures, including black vultures and turkey vultures, provide essential ecosystem services and are a part of the landscape in Texas. By cleaning up dead livestock and wildlife, vultures reduce bacterial loads in soil and water, reduce disease threats and move nutrients around the landscape. Vultures are a fascinating animal. Their bald head is an adaptation to feeding on carrion- it prevents bacteria from growing on feathers which could later infect the bird. The turkey vulture has an incredible sense of smell and can smell a decaying carcass from more than a mile away. Their wings are connected to their body in a dihedral configuration which makes soaring more effective. The black vulture, while lacking the acute sense of smell that the turkey vulture has, keys in on food sources by sight, sometimes following turkey vultures to a decomposing carcass.

Black vultures are one of the more successful species and one which has expanded its range over the past two decades. Black vultures have increased in abundance and increased their overall range, now extending northward throughout East and Central Texas and well up into the Panhandle. Outside of Texas, the bird is expanding as well, and is now found as far north as Ohio. While some of the expansion may be due to warmer temperatures, much of it can be explained by human-caused habitat changes. More roads mean more roadkill and more wind generated electricity means more transmission towers which serve as both roosting and nesting structures.



Pre-1972 black vultures are reported to have declined during the use of DDT and many speculate that the insecticide thinned eggshells. However, during the same period vultures and other raptors were not specifically protected and could be shot in much of their range. Following protection, populations slowly began to recover and in the past decades have shown annual increases approaching 5%, essentially doubling over 20 years. It's now estimated that there are at least 2 million black vultures in the US and at least 20 million world-wide.

While we can all be thankful that black vultures clean up roadkill and other carrion, livestock producers are noting the increased livestock predation, especially on newborn calves, lambs and goats. Occasionally, when a mother is down giving birth, they will also eat into the female causing blood loss and death. The old cartoon- where one vulture says to another "patience heck- I'm going to kill something"- has come true for many Texas producers.

Other Vulture Issues

Besides livestock predation, black vultures (and occasionally turkey vultures) can damage property by pecking at synthetic rubber used around windshields on cars and windows on buildings. On hot days, chemicals from must smell like those in a rotting carcass because the vultures will peck and pull until they compromise the weatherproofing of the material. In extreme cases, they have damaged roof-top coatings to the point that the entire roof had to be repaired.

Vultures depend on wind and thermals to soar to an elevation where they can detect their food. As such, they prefer a high elevation perch to roost for the night. Transmission powerline poles make excellent perches and you can frequently find large concentrations of vultures on power poles. The newly constructed transmission lines that bring West Texas wind energy to San Antonio and Austin have expanded roost sites for vultures across the state. Similarly, cell towers and the old-style municipal water tanks serve as roost sites for vultures. Workers who climb these towers are at risk for disease pathogens found in the droppings that accumulate under the tower and on the metal. Vultures will also perch and roost on grain elevators where their droppings not only damage metal structures but potentially contaminate feed and grain.

Soaring vultures are also a huge risk for bird/aircraft collisions. Rapidly moving jet aircraft cannot react quick enough to avoid a soaring vulture. With a wingspan of 5 feet and a weight of 4-6 lbs. vultures pose a significant risk if they are ingested into a jet engine. Engine failure on takeoff is especially dangerous and keeping the aircraft operations area free of vultures and vulture attractants is critical to ensuring the safety of military and civilian aircraft.

Finally, urban roosts threaten a number of resources. Roosts above parks and homes threaten public health due to the accumulation of droppings. Vultures at public zoos threaten the animals within the enclosures, some of which may be critically endangered. Vultures have been responsible for power outages which threaten not only homes but manufacturing facilities. The damage to manufacturers can run into the hundreds-of-thousands of dollars for a single incident.

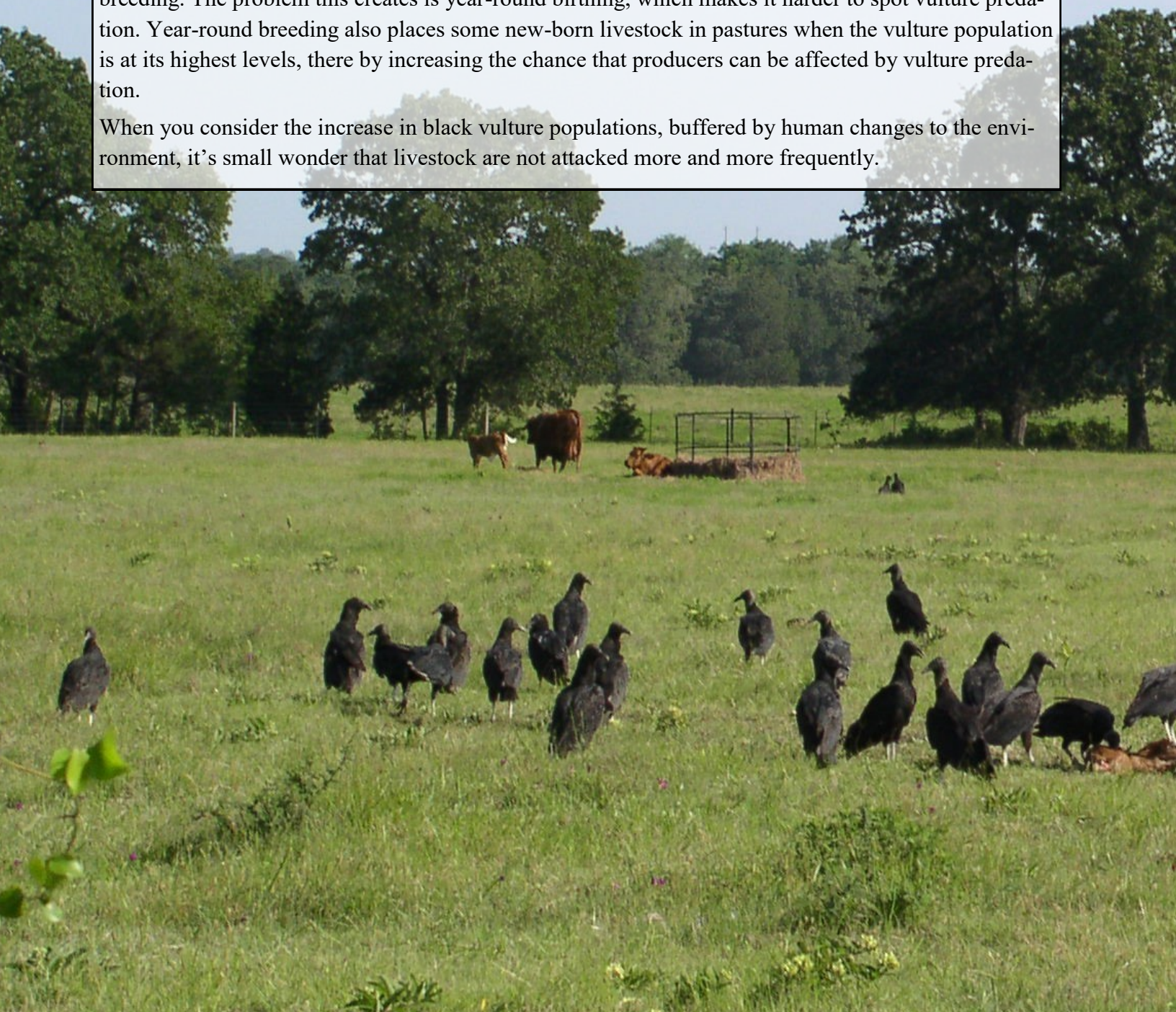
Livestock Predation

Many factors combine to become problems for livestock producers. In Texas, black vultures breed starting at about 3 years of age, so in any given year there are a number of non-breeders which can soar about without returning to nest sites. Black vultures who do nest will lay 1-3 eggs (2 the most common) once a year. While that most frequently occurs in March and April, nesting may occur throughout the summer into late August. Both parents feed the young for 75 days, so there can be adults feeding young anytime between April and September.

While black vultures tend to migrate south for the winter, much of Texas is considered winter range and, in fact, the expansion of range northward includes expanded winter range.

Changes in livestock production also may affect vulture predation rates. The number of Angora goats and wool breeds of sheep have declined over the past 20 years. These have been offset with an increased demand of meat goats and hair sheep. However, where Angora goats and wool sheep required synchronized breeding to optimize fiber production, meat breeds can be optimized by year-round breeding. The problem this creates is year-round birthing, which makes it harder to spot vulture predation. Year-round breeding also places some new-born livestock in pastures when the vulture population is at its highest levels, there by increasing the chance that producers can be affected by vulture predation.

When you consider the increase in black vulture populations, buffered by human changes to the environment, it's small wonder that livestock are not attacked more and more frequently.



Resolving Vulture Conflicts

Despite the problems, the benefits vultures provide outweigh the damage and solving problems should focus on those vultures causing the damage. For airports, the risk of a catastrophic incident requires managers to act quickly.

For damage caused by roosting birds, dispersing the roost is the most frequently used solution. Multiple harassment methods can be put in place to move vultures from structures where they roost. In an urban setting, you need to have a large group of observers available to prevent the displaced vultures from roosting in a new, undesirable location.

Effigies can be dead vultures, taxidermized mounts of a vulture or an artificial vulture placed to scare away other vultures. As odd as it seems for an animal that eats other dead animals, vultures do not like to be around dead vultures, so the effigies can be effective. In livestock pastures, they can be placed at prominent perching sites or hung on fence posts where vultures can see them. Effigies are less effective in open range situations.

Integrated techniques for resolving conflicts with vultures may include use of real or constructed effigies.

Lethal Control

Vultures are protected under the Migratory Bird Treaty Act (MBTA) and under State law. “Take” as defined by the MBTA does not include harassment. The non-injurious harassment of vultures does not require a permit. Texas Parks and Wildlife Code states that it is a violation of State law to kill a migratory bird (other than game birds within season) without a Federal permit. If you have the Federal permit, you do not need a State permit.

Since turkey vultures are rarely, if ever, involved in killing livestock, lethal take for livestock protection is limited to black vultures. The purpose for lethal take is to reinforce the non-lethal harassment. With repeated exposure to harassment, vultures become accustomed to harassment and will not leave the pasture or, if they do, they will immediately return. By shooting a vulture (one at a time) while conducting harassment, you can extend the efficacy of harassment and save livestock.

In extreme cases, vultures may be trapped and lethally removed. The Wildlife Services program has a permit to remove vultures and can set up a vulture trap if significant losses occur and high numbers of vultures are involved.

Livestock producers can apply for a Federal permit via the US Fish and Wildlife Service (FWS) website. A WS Form 37 is required. The Form 37, as well as assistance with the application can be obtained by contacting the Texas Wildlife Services District Office near you (contact numbers on the back of this report). Another option recently became available to livestock producers: The Texas Wildlife Damage Management Association (TWDMA) Livestock Protection Pilot Program.

TWDMA Permit

After years of discussions, the FWS granted a permit to the Texas Wildlife Damage Management Association (TWDMA) for lethal removal of black vultures to protect livestock. The permit allows the TWDMA to grant sub-permits to livestock producers for the protection of their livestock. By FWS rule, only 5 black vultures can be available per sub-permit. The initial permit limits the total take to 750 vultures, so TWDMA can issue a maximum of 150 sub-permits for 5 birds each.

To apply, contact a Texas Wildlife Services biologist through the District Office (back of the report) and ask to be included as a TWDMA vulture sub-permittee. The biologist will collect the information necessary to complete the WS Form 37 and forward that form the WS State Office. Upon review, the form becomes the application and is sent to the Association Treasurer who should be able to issue the sub-permit within one or two business days.

Because of the limit on the number of sub-permits which can initially be issued, TWDMA and WS will prioritize those experiencing current depredations and those still having newborn livestock. This process will be less expensive and faster for livestock producers and provides a legal, accountable way for producers to protect their livestock.

Compensation

Congress has also noted that livestock can be killed by wildlife protected by Federal laws and established that those animals confirmed as killed can be compensated under the Livestock Indemnification Program administered by the farm Services Agency (FSA). Confirmed kills from vultures, crested caracaras and other raptors qualify for this program. FSA has established rules for compensation and the proof necessary to verify these losses may vary between counties. Contact your FSA County Office to see how to qualify for compensation under this program.

Program Overview from page 7

By integrating Federal, State, County and private funding into the program, Wildlife Services is poised to address problems as they occur. Because we have the cooperative relationship, we can deploy personnel, equipment and other resources when and where needed. The Texas Wildlife Services program has operational plans for emergency activities, as we have personnel and resources available throughout the State whenever the need arises. Emergency activities have increased and personnel from the cooperative program serve in that role often.

Beaver Damage Management

During FY 20 Texas WS worked 363 properties/sites for beaver damage (compared with 370 in FY 19). By comparison to long term data, 2020 appears to be below average.

Beaver caused damage was down, but Texas WS documented $1,933,593 in damage in FY 20. By far, the greatest amount of damage was to dams and impoundments. In much of Texas, beavers dig into the soil just at or below the waterline creating “bank dens.” These bank dens weaken the dam. Repairs are necessary for flood control dams and complete failure of a stock pond dam is not unusual. Texas WS documented over $581,050 in damage to dams alone in FY 20.

Roads remain especially vulnerable to beaver damage since beavers often plug road culverts backing up water against the road base. Texas WS has a funding agreement with TxDOT to support beaver dam removal statewide. In practice, most of this occurs in the Ft. Worth and College Station Districts. While only $ 387,250 in actual road damage was documented in FY 20, it was because WS was available to respond and drain the water, preventing considerable additional damage.

Public outreach remains an important part of the Texas WS program. Teaching people how to avoid beaver damage is critical to avoiding losses. In FY 20, Texas WS conducted 337 beaver outreach projects, including individual consultations, presentations and demonstrations reaching 644 people.

Protected Resources Highlights

- **733** dikes, dams or impoundments and **169,190** acres of timber protected from beaver damage
- **96** miles of road, **83** bridges and **1** railroad trestle protected from beaver damage
- **1,000** miles of irrigation and drainage ditches protected
- **$151,530,770** value of resources protected from beaver

Airport Wildlife Hazard Program (AWHP)

"Strikes" are when birds or other animals collide with an airplane. This may occur when the airplane is taking off, landing, or while it is in the air. Wildlife strikes have increased in the past 30 years because of a combination of expanding populations of many wildlife species that are hazardous to aviation and increasing numbers of aircraft movements (Dolbeer and Eschenfelder 2003). For example, 13 of the 14 largest (>8 lbs) bird species in North America have shown significant population increases in the past 30 years. These species include Canada geese, white and brown pelicans, sandhill cranes, wild turkeys, and bald eagles.

Managing bird and other wildlife hazards at airports is a complex, and public-sensitive endeavor involving many species of wildlife governed by the Migratory Bird Treaty Act and other Federal, State and local regulations. Because of the complexity and sensitivity involved in managing wildlife hazards, airports are required to employ professional biologists trained in wildlife hazard management at airports (14 CFR Part 139.337 and FAA Advisory Circular 150/5200-36a [FAA 2012]) to assess hazards, provide training, and to assist in the development, implementation, and evaluation of wildlife hazard management plans. Such professionally developed and implemented management plans minimize the likelihood of catastrophic or major-damage wildlife strikes on an airport and provide crucial support during litigation in the aftermath of any significant strike event that might occur.

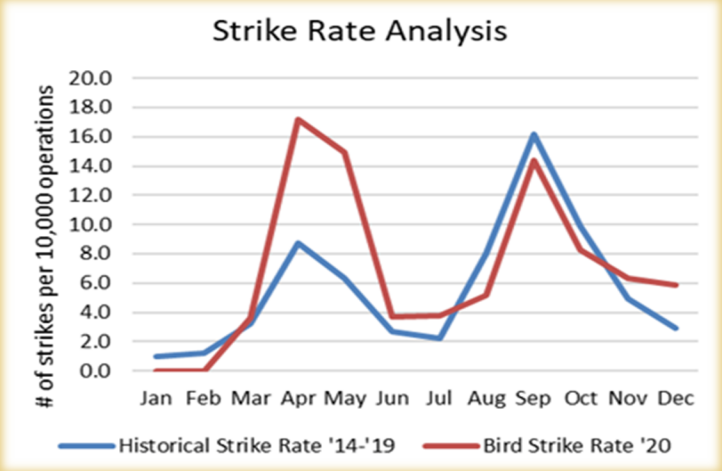
In recognition of WS' expertise and accountability, the Federal Aviation Administration (FAA) entered into a Memorandum of Understanding (MOU) with WS, which encourages airports to "request technical and operational assistance from WS to reduce wildlife hazards." The Department of Defense executed a similar MOU to address wildlife conflicts at military installations. In 2013, a MOU between WS, the National Association of State Aviation Officials (NASAO) and the FAA was signed, fostering cooperation between the signatory parties to reduce wildlife hazards at airports in every state.

WS provides protection of Airport Resources and Human Health and Safety associated with the protection of aircraft, runways, and taxiways. This category includes human safety protection and response related to wildlife-aircraft collisions on runways or birds strikes in the air.

Texas Wildlife Services provided technical assistance or direct management assistance at 36 "Part 139"-certificated airports, non-certificated airports, and military airbases (15 civil and 8 military). This assistance resulted in a reduction, suppression, or prevention of hazardous conditions caused by wildlife. Due to this complexity and number of airports assisted, Texas WS provided 17,741 hours of assistance to the 23 airports across 34 counties in the 8 districts of the Texas Wildlife Services Program.

Airport Program Spotlight

The Texas Wildlife Services Program Airport Biologists at Naval Air Stations conduct a yearly program review and present the findings to their respective Bird Hazard Working Group (BHWG). Members of the BHWG including the Air Operations Officer and Commanding Officer. These yearly reviews included historical strike rate data showing both yearly and seasonal trends, and hotspot mapping to depict point count survey observation data taken throughout the year.



A Risk Analysis was developed using local strike data along with species hazard scores taken from Pfeiffer et al 2018 “Quantification of avian hazards to military aircraft and implications for wildlife management”. Using a formula developed by DeVault et al 2018 “Estimating interspecific Risk of Bird Strikes with Aircraft” a list of most hazardous species can be developed and used to prioritize management efforts. A SMS risk analysis has been completed for Naval Air Stations as well using strike data provided by the Smithsonian. The list below covers the Top 10 list for Naval Air Stations. Data set covered from Jan. 2010 – Dec. 2020. There were 990 birds and mammals struck and ID to species with 166 different species in the data set.

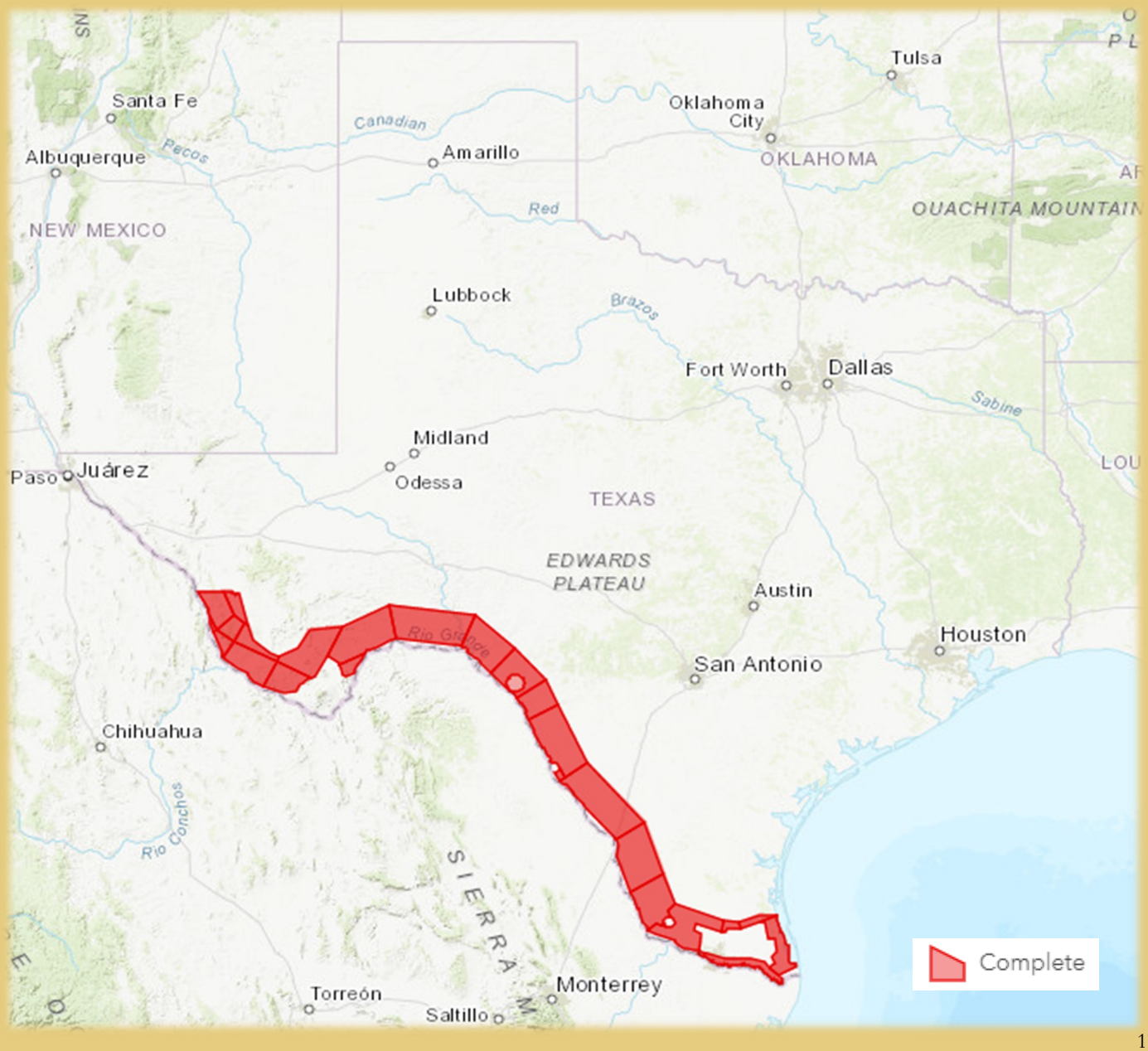
Species Risk Profile 2010-2020

Species	Total Strikes	Scaled Strikes	SSSQ	RHS	RHS Squared	Risk (SSSQ*RHSS)	Proportion of Risk
Turkey Vulture (Cathartes aura)	16	25	625	60	3,600	2250000	26.81%
Laughing Gull (Leucophaeus atricilla)	35	54.6875	2990.723	21.69	470	1407003.717	16.77%
Black Vulture (Coragyps atratus)	10	15.625	244.1406	72	5,184	1265625	15.08%
Mourning Dove (Zenaida macroura)	64	100	10000	9	81	810000	9.65%
Broad-winged Hawk (Buteo platypterus)	17	26.5625	705.5664	26.72	714	503745.0625	6.00%
Red-tailed Hawk (Buteo jamaicensis)	8	12.5	156.25	43	1,849	288906.25	3.44%
Redhead (Aythya americana)	7	10.9375	119.6289	39.1	1,529	182889.8682	2.18%
Barn Swallow (Hirundo rustica)	38	59.375	3525.391	6	36	126914.0625	1.51%
Ruby-throated Hummingbird (Archilochus colubris)	38	59.375	3525.391	6	36	126914.0625	1.51%
Cave Swallow (Petrochelidon fulva)	19	29.6875	881.3477	10	100	88134.76563	1.05%

Rabies Management

Oral rabies vaccination (ORV) has been in use in the United States since 1990, in Canada since 1985 and in Europe since 1980. Currently there are 16 states distributing oral vaccines for raccoons in the U.S., while Texas WS distributes baits for gray fox and coyote. The ORV baits are distributed by air and ground personnel. Fixed-wing aircraft are the most effective means for distributing large numbers of the ORV baits. Hand-baiting is important for reaching urban areas where there may be safety risks associated with distributing baits by air and to reduce the possibility of people and domestic animals coming into contact with the baits. WS's federal authority includes management of wildlife which serve as vectors for zoonotic diseases. APHIS-WS is a signatory party to the North American Rabies Management Plan, which calls for the elimination of terrestrial rabies on the continent. Successful programs for the vaccination of companion animals have greatly reduced the risk of human rabies from domestic dogs or cats, but wildlife rabies still remains a significant concern. In FY 20, Texas WS partnered with the Texas Department of State Health Services in the distribution of **1,180,200 Oral Rabies Vaccine (ORV) baits** along the international border to prevent the reintroduction of canine and Texas grey fox rabies from Mexico. The lack of surveillance or management of wildlife in Mexico makes maintenance of the border zone crucial.

FY20 ORV Distribution Areas



Other significant rabies management events include:

Texas WS Vampire Bat efforts

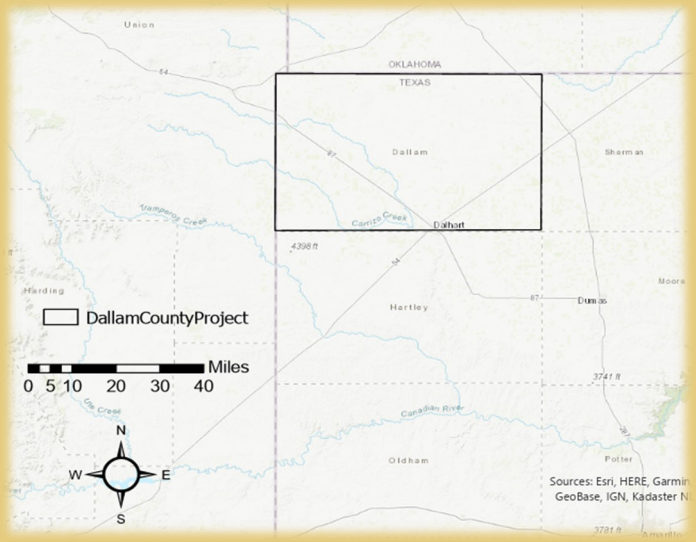
- **59 day visits by employees**
- **2,899 cattle inspected for bat bites**

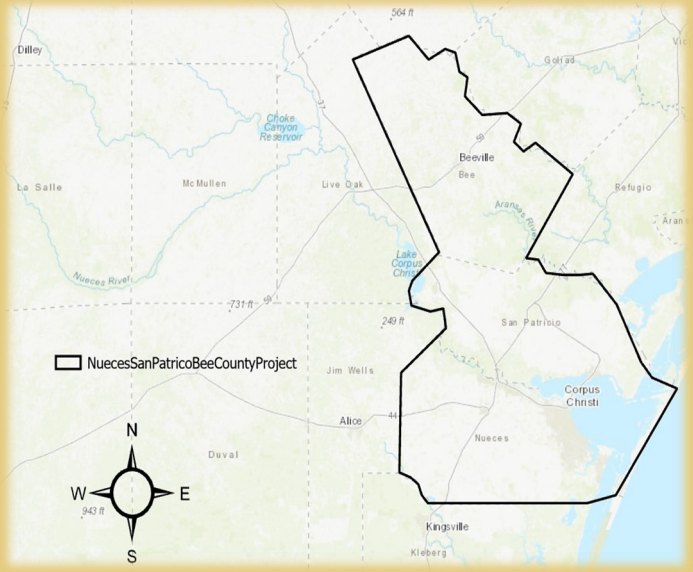
- Common vampire bats have expanded their range northward within Mexico and are now approaching the international border with Texas. Texas WS partnered with APHIS-International Services to train employees in vampire bat identification and trapping techniques. APHIS-IS and Texas WS also produced a 5 minute DVD in English and Spanish for distribution to landowners, veterinarians and wildlife officials on both sides of the border to increase awareness of the pending arrival of vampire bats and to educate people as to the signs of rabies in livestock. The DVD was debuted at the Rabies in the Americas Conference at the beginning of FY 17 and by the end of the year more than 1000 copies had been provided to people in the affected area.

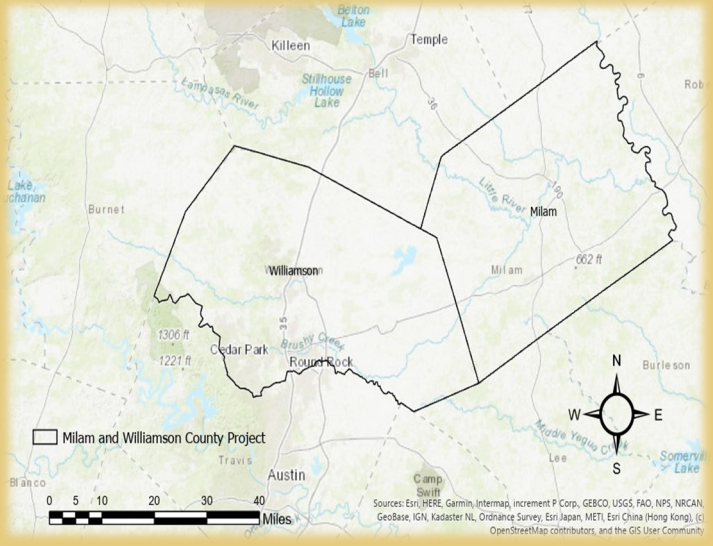
- In 2020, the National Rabies Management Program and National Wildlife Research Center hosted an expert Blue-ribbon Panel to discuss risk assessment and best practices related to vampire bat rabies virus surveillance and monitoring. The panel included 34 experts representing 20 agencies and organizations. Outcomes from the event included a report summarizing the experts' opinions on a range of issues, including: the likelihood that vampire bats will expand to the US in the future, the main risk posed by vampire bats, the surveillance methods most likely to detect vampire bats and the vampire bat rabies virus variant, and the potential vampire bat management methods.

- Texas WS conducted significant surveillance for terrestrial rabies in FY 20 using Federal funding from the National Rabies Management Program. State and Federal employees combined to collect 680 biological samples to test for vaccine efficacy and to determine the presence of rabies in suspect cases. With shrinking budgets, maintaining an effective surveillance program continues to be difficult.

Farm Bill "Phase II" project areas.





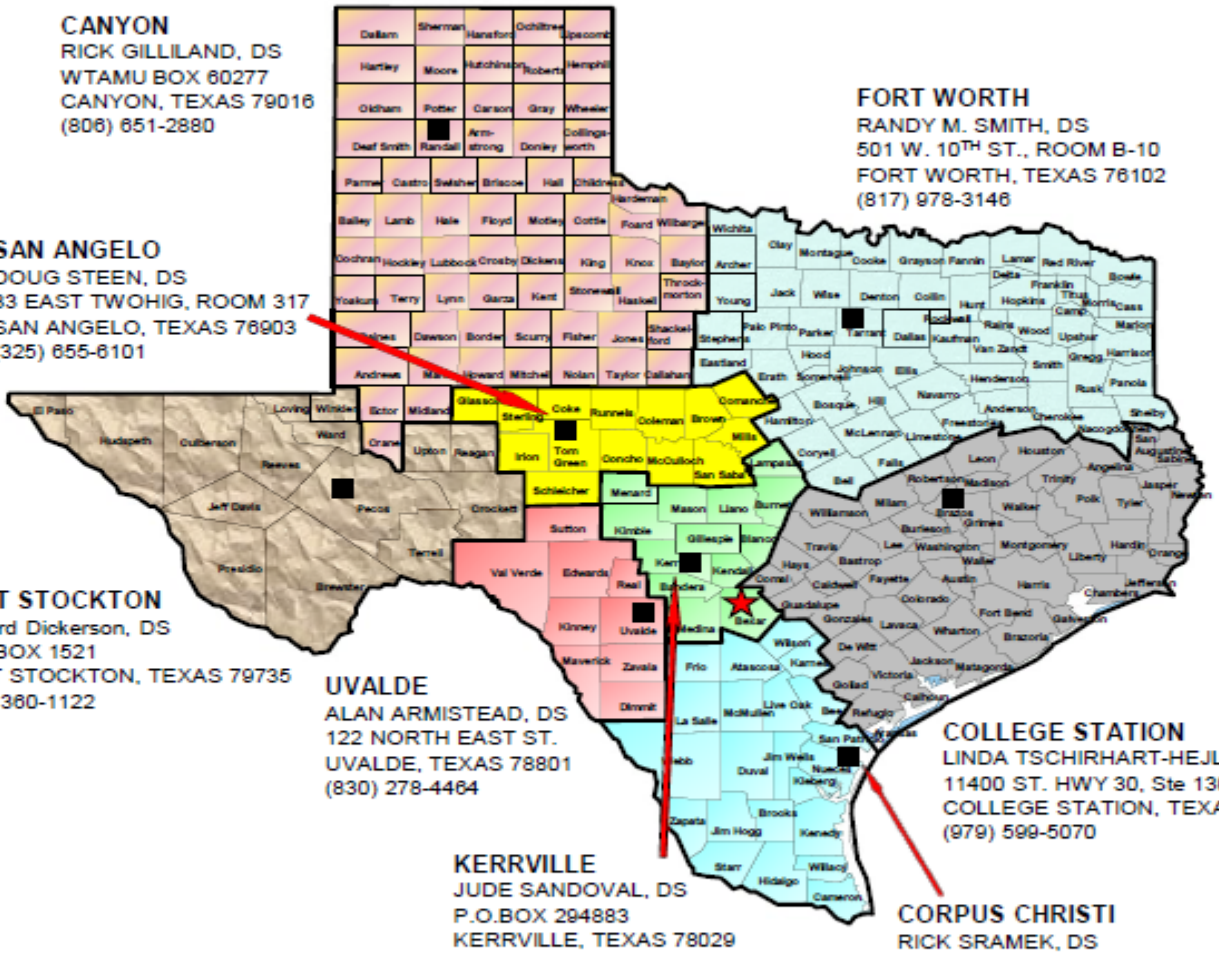


Methods Development

Texas WS conducted or collaborated with researchers on the following projects:

- **Feral Hog Disease Surveillance on the US/ Mexico Border (SB and TB)**
- **South Texas Coyote Home Range and Movement Study (rabies implications)**
- **Beaver Genetics (University research)**
- **Gull Genetics (University research)**
- **Feral Hog Euthanasia Data Collection**
- **Disease Protection- Lime/Carcass Study**
- **Feral Hog Genetics (NWRC)**
- **Vulture Diseases (CKWRI & CBP)**
- **Vulture Movements (CKWRI &CBP)**
- **OnRab Coyote Vaccination**
- **Anthrax/Feral Hog Research (NFSDMP and CSU)**
- **Gray Fox Genetics (NWRC & NRMP)**
- **Economics of feral hog damage- Delta County (NWRC and TAMU-K)**
- **Economics of Feral Hog Damage- Farm Bill (NWRC)**
- **Vampire Bat Surveillance (NRMP)**
- **Vampire Bat use of Feral Hogs as a Food Source (NWRC & NRMP)**
- **Raccoon Genetics (NRMP)**
- **Feral Swine and Prion Diseases (NFSDMP and UT-Health)**
- **Toxicant Development and Testing (NWRC and multiple manufacturers)**
- **Non-lethal Predator Management- Fencing (Internal at this time)**

TEXAS WILDLIFE SERVICES PROGRAM



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