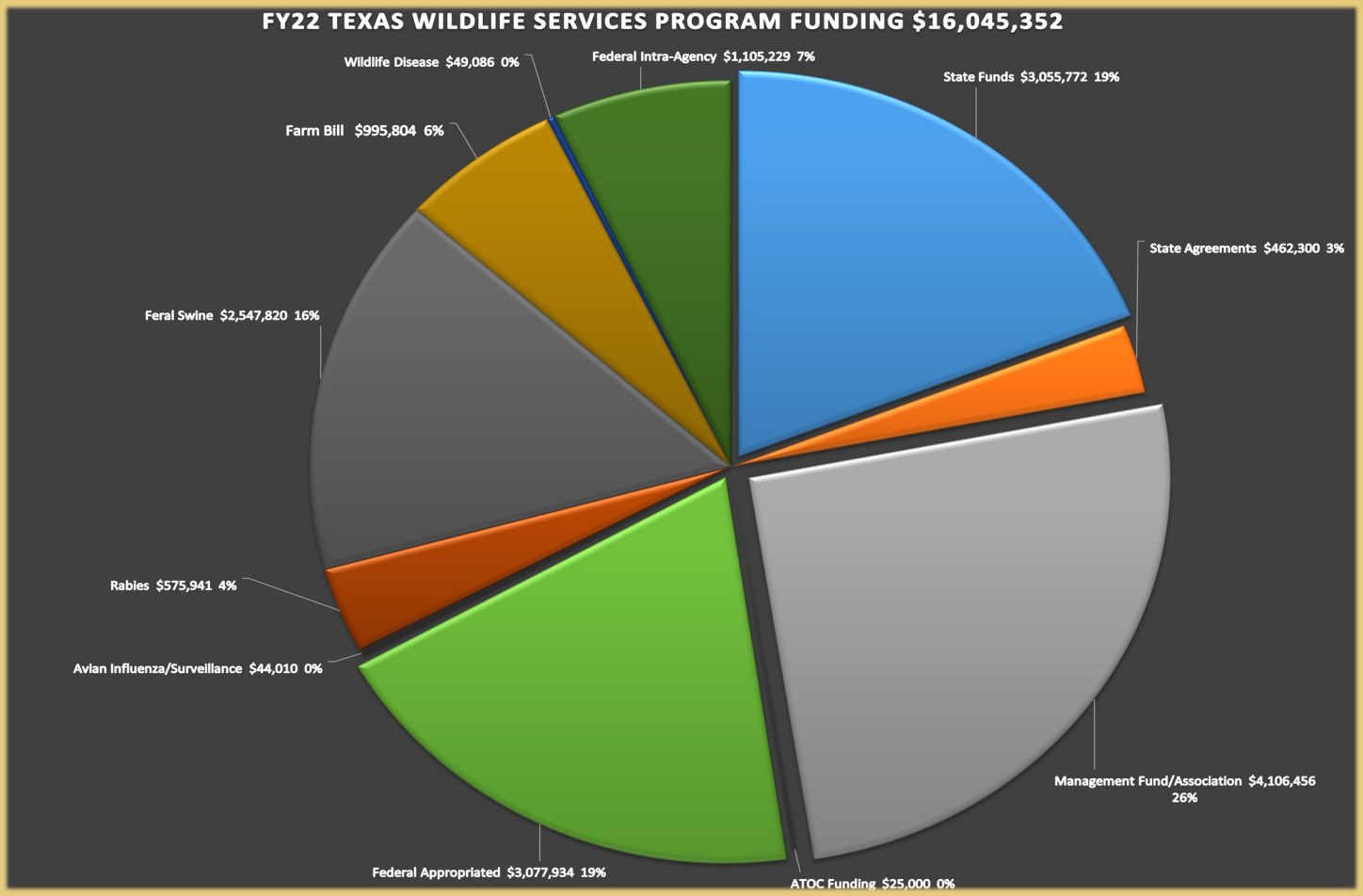
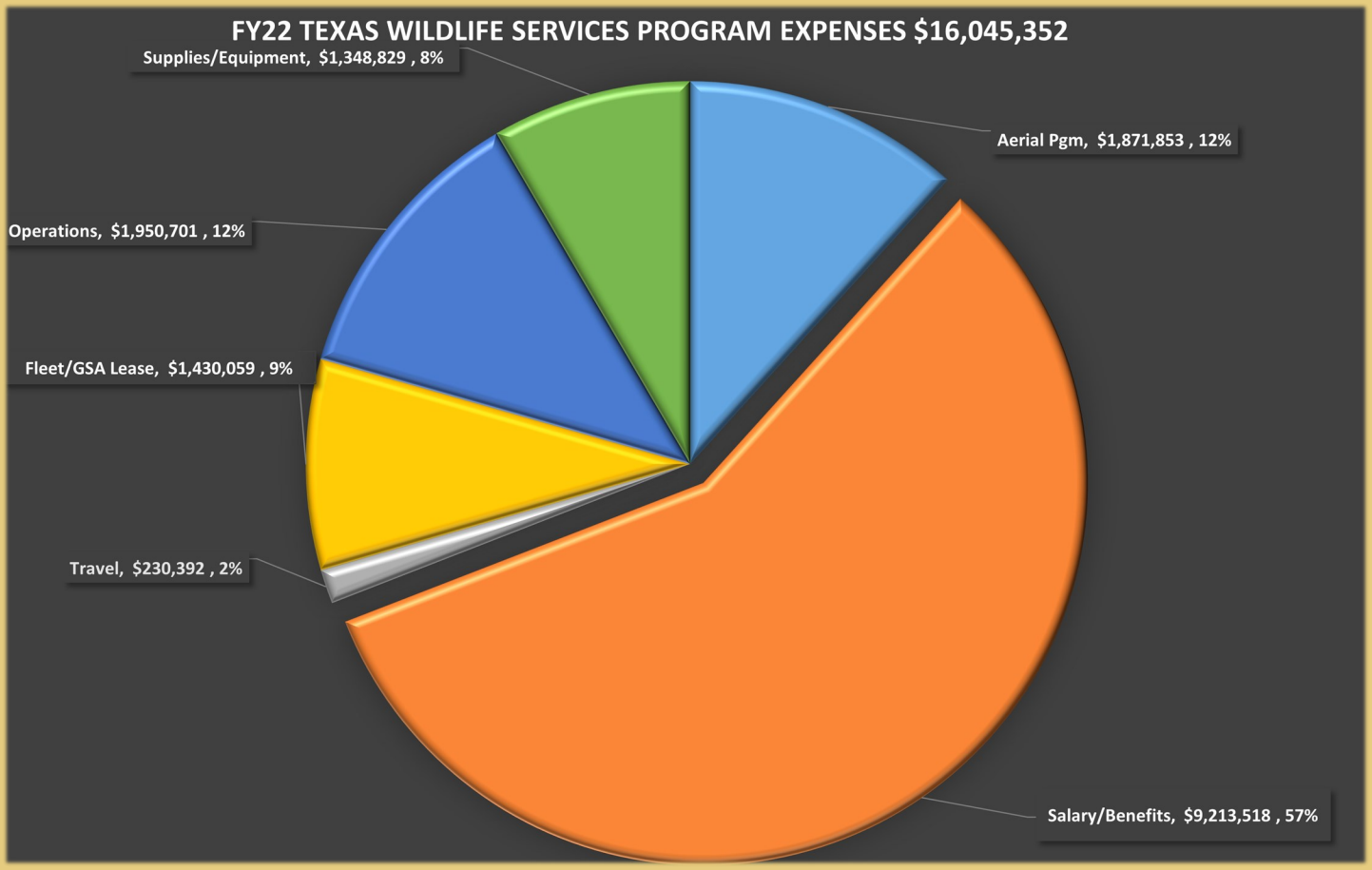
Texas Wildlife Damage Management Association

Texas A&M AgriLife Extension Service

USDA-Animal & Plant Health Inspection Service—Wildlife Services

2022 STATE REPORT


FY22 TEXAS WILDLIFE SERVICES PROGRAM FUNDING $16,045,352
Wildlife Disease $49,086 0%
Federal Intra-Agency $1,105,229 7%
State Funds $3,055,772 19%
Farm Bill $995,804 6%
State Agreements $462,300 3%
Feral Swine $2,547,820 16%
Rabies $575,941 4%
Avian Influenza/Surveillance $44,010 0%
Management Fund/Association $4,106,456 26%
Federal Appropriated $3,077,934 19%
ATOC Funding $25,000 0%


FY22 TEXAS WILDLIFE SERVICES PROGRAM EXPENSES $16,045,352
Supplies/Equipment, $1,348,829 , 8%
Aerial Pgm, $1,871,853 , 12%
Operations, $1,950,701 , 12%
Fleet/GSA Lease, $1,430,059 , 9%
Travel, $230,392 , 2%
Salary/Benefits, $9,213,518 , 57%

From the Director

Michael J. Bodenchuk, State Director

This is the sixth Texas Wildlife Services Program Annual Report. It is our attempt to showcase the wide range of projects accomplished by the dedicated employees of the program. In each report, we report on the many different types of projects and services we conduct, typically grouping them along the lines of the damage we're managing. This report is no different. In it you will see reports on the major issues we address: Predation Management, Airport Safety, Beaver Damage Management, Feral Hog Damage Management and Disease Surveillance and Management. This year, we're emphasizing disease issues as a special focus in the Annual Report.

While it's easy to catalog our efforts into these different project areas, I want to stress that the Texas Wildlife Services program is an integrated program. Our employees are all trained in multiple disciplines and, while their day-to-day activities typically focus on one or two project areas, they support all of the areas of the program. And we use all areas to support the employees.

As an example, the bulk of our employees are supported by cooperative funding from counties or landowner associations. These funding agencies are concerned largely with one or two types of damage: mostly predator management for livestock and wildlife protection. But everyone in the state works on feral hogs, and our employees remove hogs to protect livestock from diseases and from predation, to protect range and crops from damage, and to prevent disease pathogens from getting into wetlands and rivers. In addition to the cost-share funding we get from the counties and landowner associations, we receive federal funds to manage feral hogs damage and that funding is used to offset the cost of operations for those employees who do hog work (e.g. while the cost-share dollars support the employees salary and benefits, federal feral hog funding is used to cover vehicle expenses and aerial hunting costs when hogs are targeted on agreements).

Similarly, the main job of our airport biologists is to keep birds and other wildlife out of the airport operations areas. In some cases, they must lethally remove birds. Those birds are valuable sources of wildlife disease samples and we're able to utilize the employees skills to get samples which might not otherwise be available.

I should add here that while our main job is protecting agriculture, natural resources and human health and safety, we cooperate with researchers at the National Wildlife Research Center and at several universities to develop better methods for resolving problems or to better our understanding of ecology and diseases.

It is tempting to button-hole the various project areas: Wildlife Diseases, Feral Hogs, Predation Management, Airports. But that's a mistake. We may get specialty funding for these categories, but the most efficient programs coordinate resources, blend programs and utilize their financial and human resources effectively. I'm proud to be part of a program that serves so many Texans so effectively.

This noted above, we're focusing this report on disease issues. That is not to say that other aspects of the program aren't as important as ever. In particular, predation management is essential to the survival of the sheep and goat industry and, increasingly, to the cow-calf producer. We continue to provide effective predation management where we have cooperative funding and support. But as if to underscore how issues are connected, the emergence of Rabbit Hemorrhagic Disease (RHD) in wild rabbits in the US has increased predation on livestock in areas where the disease has reduced rabbit populations. RHD is considered a foreign animal disease and prior to 2020 was only occasionally found in domestic rabbits. A wild rabbit mortality event was discovered by a Texas WS employee near El Paso in March 2020 and rabbits were later diagnosed with RHD in

(From the Director continued on page 4)

From the Director

southern New Mexico. Since that time, RHD has spread widely, including confirmed cases in wild rabbits as far as Nevada and Colorado.

Where RHD has hit, wild rabbit populations have been greatly reduced. Coyote pup survival is directly linked to the amount of food available to the adults, and rabbits have typically buffered coyote predation. In the absence of rabbits, adult coyotes are aggressive in killing livestock. There aren't any more coyotes than before, but they are mean!

Bobcats are especially dependent on rabbits and in the absence of cottontail rabbits, bobcats are frequently involved in sheep and goat depredation. While bobcat numbers may decline during this epidemic, bobcat predation is still high.

I want to call your attention to the section of this report that addresses the emerging role of feral hogs in anthrax and CWD. These new connections were the direct result of Texas Wildlife Services employees collecting samples and collaborating with researchers to understand the implications. There still a lot of science to be conducted, but the revelations here are important news and something for landowners to consider!

As always, my thanks go out to the dedicated employees of the Texas Wildlife Services Program. All of the accomplishments you see in this Annual Report are the results of hard work on their part and none of this would be possible without them.

Mike Bodenchuk

State Director

Feral Hogs and Anthrax

We have long known that feral hogs are a reservoir for several diseases of concern to the livestock industry. Feral hogs have a particular species of bacteria that causes brucellosis (the old "Bangs Disease" in cattle). The bacteria, *Brucella suis*, is different that the bacteria that causes the disease in cattle (*Brucella abortus*) but the two are close enough that cattle exposed to *B. suis* will test positive for *B. abortus*, possibly causing property quarantines until livestock health officials can determine it's not the cattle strain. In fact, the diseases are so close in nature that following the last case of *B. abortus* in cattle in Texas WS employees were able to document *B. abortus* in feral hogs.

We have long understood that anthrax is an endemic disease of livestock and wildlife in certain areas of the state. Anthrax is a soil-borne bacterial disease that will lay latent in the soil until environmental conditions are such that the spores become infective. The endemic area includes parts of the western Hill Country, much of it traditional sheep and goat range. Anthrax is fatal to livestock and deer. While producers can vaccinate livestock against anthrax, costs are expensive and may not be needed in those years where the environmental conditions don't favor the bacteria. To date, there is no effective vaccine for wildlife.

We've long expected feral hogs have a role in anthrax. Feral hog rooting in the soil can potentially expose the bacterial spores and will favor forb production, which can cause other wildlife to feed in these microhabitats. Feral hogs also eat carrion, possibly feeding on animals killed by anthrax and moving the bacteria around the landscape. For several years, we attempted to collect hogs in areas of anthrax outbreaks, but were always a bit late in getting information about an ongoing outbreak (when producers vaccinate their livestock a disease outbreak is limited to deer and exotics and can be hard to diagnose or detect). That changed when anthrax started

(Feral Hogs and Anthrax continued on page 12)

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

- South Texas Coyote Home Range and Movement Study (rabies implications)
- Beaver Genetics (University research)
- Feral Hog Euthanasia Data Collection (NWRC)
- Feral Hog Genetics (NWRC)
- Vulture Diseases (CKWRI & CBP)
- Vulture Movements (CKWRI &CBP)
- OnRab Coyote Vaccination (NRMP)
- Anthrax/Feral Hog Research (NFSDMP and CSU)
- ASF Mock Exercise (NFSDMP and NWRC)
- Feral hog disease issues (CSU)
- Pasturella in feral swine (NFSDMP, TDSHS and attending physicians)
- Gray Fox Genetics (NWRC & NRMP)
- Economics of Feral Hog Damage- Farm Bill (NWRC)
- Economics of feral hog damage to wetlands (NWRC and USACOE)
- 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 sodium nitrite (NWRC)
- Warfarin-based feral hog toxicant use by ranchers (TDA, TAMU and manufacturer)
- Non-lethal Predator Management
- Fencing (Internal at this time)
- Data collection for feral swine modeling (NWRC)

Texas WS By the Numbers FY2022

- 3,833 Properties Worked
- 13,107,171 Acres Worked
- 13,363 Coyotes Removed
- 42,333 Feral hogs Removed
- 3,856 Surveillance Samples Collected
- 269,381 Non-lethal Dispersals
- 19,240 Technical Assistance Sessions
- 22,614 Technical Assistance Sessions by species
- 31,699 Parties Consulted
- 15,255 Leaflets Distributed

Value of Resources Protected

- 1,687 aircraft valued at $15,856,800,002.00
- 5,238,471 acres of pasture and rangeland valued at $4,266,096,585.00
- 80,255 acres of wetlands valued at $17,332,271,731.17
- 438,627 head of cattle valued at $540,007,389.50
- 290,189 head of goats valued at $149,698,806.11
- 297,368 head of sheep and lambs valued at $31,366,925.04
- 8,012 Domestic White-Tailed deer valued at $143,697,648.46
- 38,005 Exotic livestock valued at $59,285,579.94
- 1,386,920 acres of food crops and gardens valued at $567,352,975

Program Overview

The Texas Cooperative 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 control of feral hog damage in Texas has increased in importance. Research, led by Texas A&M University and the National Wildlife Research Center has estimated damage in excess of $500M in Texas annually. The Cooperative program represents the efforts of both the State of Texas and USDA in managing the damage by this invasive species.

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 those coyotes or bobcats which are within striking distance of vulnerable livestock.

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 Texas 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 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 these strains may still be 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.

The combined program also addresses beaver damage, wildlife conflicts with aviation (we have 13 employees at military and civilian airports) and migratory bird damage. As an example, through the Texas Wildlife Damage Management Association, landowners can get sub-permits to address black vulture conflicts with livestock.

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. Other agencies include the Wildlife Services program in their 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.

Feral Hogs

Using a double barrel corral trap in Eastland County, part of the Upper Leon River Project Area

Increasingly, feral hogs are demanding more and more of the Texas Wildlife Services Program. Certainly, feral hog funding has increased over time and the Farm Bill Pilot Project has initiated more intense work in the 6 Texas project areas. **Feral hog damage in FY2022 was $1,1436,356** Texas WS started 3 Farm Bill Pilot Project areas in FY 2020, at the height of the COVID pandemic. The projects started slowly due to restrictions on meetings and travel. A second round of projects were approved in FY 2021 and, because these have a shorter life span, were intentionally designed to protect crops for the 2022 and 2023 growing seasons. At the time of this writing, there are six (6) Pilot Projects in Texas; the Canadian River Project, the Red River Project, the Upper Leon River Project, the Dallam County Eradication Project, the Milam/ Williamson Counties Crop Protection Project and the Nueces/Bee/San Patricio Counties Crop Protection Project. All projects are slated to end with the expiration of the current Farm Bill in September 2023. Texas WS operates 5 helicopters, two of which are dedicated to feral hog management. One helicopter is funded through the National Feral Swine Damage Management Program (NFSDMP) and is available to any of the Wildlife Services Western Region States, though most of the flying is conducted in Texas. The other is dedicated to the Farm Bill Projects. The number of hogs removed skyrocketed in FY 2021 due to the addition of the Farm Bill helicopter. Overall, Texas Wildlife Services removed **42,333 (a 17% decrease from FY 2021)** feral hogs in FY 2022, with **over 55%** of these removed by aerial shooting.

Feral Hogs and CWD prions

In a study presented in May, 2023 at a Chronic Wasting Disease Conference, scientists disclosed that feral hogs can have CWD prions and may be able to move these around the landscape.

Texas WS was a partner in this study, where we collected feral hogs from counties in the panhandle where the disease is emerging in free-ranging deer and elk. For our part, we collected brains and lymph nodes from adult hogs in three counties (one of our Farm Bill Project areas) on our first efforts to work these areas. One-half of the brain and one half of the lymph nodes were sent to contracted scientists and the other half of the samples were held as reference samples. None of the pigs exhibited symptoms of CWD. However, the researchers did identify prions in the samples and then introduced those prions to laboratory mice genetically bred to mimic cervids (deer). The mice developed pathological symptoms similar to CWD.

The researchers conclude that feral hogs may become exposed to CWD prions and can pick up the prions but do not develop CWD themselves. However, they are capable of moving the prions across the landscape. It's yet uncertain if they amplify the prions, if they shed them during their life of just how many prions may be contained in a pig carcass when it dies. However, this connection between feral hogs and the prions that cause CWD in deer is going to have a number of landowners rethink their position on keeping feral hogs on the landscape. More research is certain to follow.

African Swine Fever

Aerial capture of a corn field needing to be replanted after feral hog damage (darker vertical lines) in Wichita County of the Red River Area of

African swine fever (ASF) is a viral disease of pigs which is endemic in sub-Saharan Africa. It does not affect wild pigs there (warthogs, bush pigs, etc.) but is typically **99% fatal to domestic pigs**. The virus itself is very environmentally stable and can exist on pork products (cold smoked sausage, jerky, etc.) as well as loose in the environment. The virus can travel on dust particles and on vehicles , shoes and clothes and can be spread by ticks. In early cases, ASF was actually spread between European farms by the veterinarians who drove their vehicles from one infected farm to another.

ASF has cropped up in Eastern Europe in starting in 2007 in Georgia and Russia and spreading, largely by human movements of infected pig carcasses or contaminated pork products, across parts of Europe. By 2012 it was found in Ukraine, by 2018 in Belgium and in 2020 was found in Germany. ASF spread across Asia, including China and most SE Asian countries between 2018 and 2020. In 2021, ASF was identified in the Caribbean in the Dominican Republic and Haiti.

While the US Pork Industry has exceptional biosecurity in place for commercial pork producers, the risk of ASF in the US includes the potential closure of export markets should it ever be found here. The potential cost to Agriculture is in the billions of dollars. Because feral swine pose a possible reservoir for ASF, USDA has initiated several surveillance projects to try to identify an outbreak early and to assure our trading partners we are looking for the disease.

Texas Wildlife Services employees have been instructed to identify suspicious mortality events and work with animal health officials in testing suspect cases. To date, we have investigated several instances and collected samples in one case where ASF was suspected. Fortunately, that pig had not been exposed to the disease.

Feral hogs working a silage bag in a 6 foot high corral trap in Comanche County, in the Upper Leon River Project Area

USDA also identified human movement patterns from the Caribbean to identify areas where travelers may overlap with feral hog populations. The concern is that a traveler may have ASF virus on luggage, boots or other surfaces and it may be spread to feral hogs. Four states, including Texas, were identified and within these states WS has initiated surveillance within specific counties where travelers frequent. Fortunately, to date no ASF has been identified.

(African Swine Fever continued on page 9)

African Swine Fever continued from page 8

Recently, USDA has revisited the issue of border migrants and the risks of ASF from people crossing the border with Mexico. Frequently, these migrants will cross at night and stage somewhere in the border county for a day or so before moving on. Ranches along the border are littered with discarded items which could contain ASF virus and feral swine in these areas would potentially be infected. Border surveillance has been started in FY 23 for all border counties with feral swine populations. Arizona, New Mexico and California have started ASF surveillance as a result of this initiative.

Utilizing advancing technology in monitoring and managing traps has been integral at places like this trap in Eastland County

Texas Wildlife Services has also conducted a mock ASF response during operational activities. Should ASF be identified, a rapid response would be necessary to contain the disease. Using one of the Farm Bill project areas as a treatment site, Wildlife Services employees conducted extensive aerial operations to remove as many pigs as possible, imitating the type of response that would be implemented should an outbreak occur. Two helicopters and 5 ground crew teams worked three days to eliminate hogs in a 3-kilometer radius of an imaginary outbreak site. In our case, we were able to track the reduction in hog numbers (our take per hour declines predictably) to provide an estimate of the number which would have to be removed to eliminate the disease.

In a real-life response, hogs removed would need to be picked up to prevent the virus from being left in the field. During the mock response, we were able to gather data on the amount of time needed to reach and recover carcasses, which gave us an idea of the number of people needed to recover the carcasses. In total, we were able to gather several types of data that will better inform disease response models and make sure USDA

Along those lines, should an ASF outbreak (or any other foreign animal disease) occur in the domestic pig industry, large scale culling would be necessary in a short period of time. In the case of a single domestic pig facility, this could amount to 10,000 or more animals which need to be killed in a short period of time. Humane euthanasia could involve firearms, but the lack of ammunition could make firearm euthanasia impractical. Texas Wildlife Services employees collected data from feral hogs shot in corral traps to identify the safest and most humane firearm caliber/bullet combination for euthanasia.

(African Swine Fever continued on page 12)

Comanche County, damage from Hogs eating 2 acres of a peanut field one evening in May, Upper Leon River Project area.

Texas Wildlife Services in the field

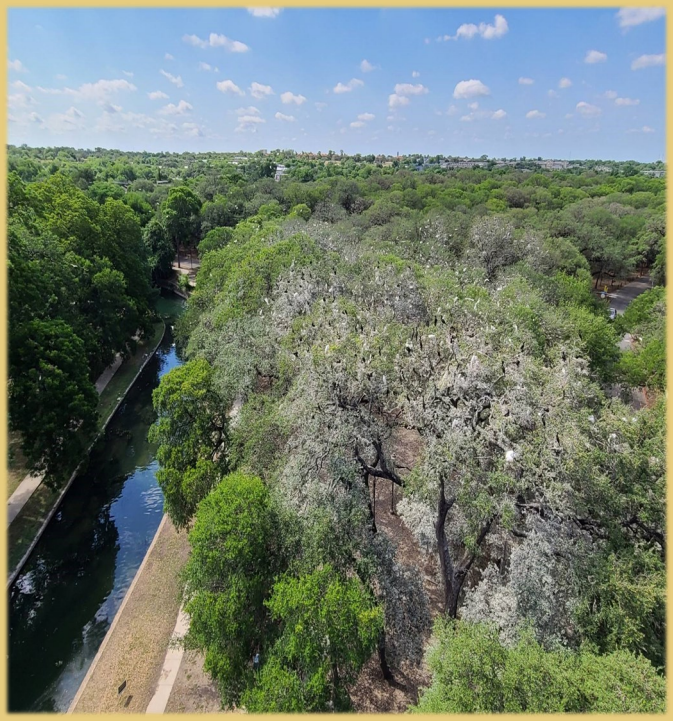
WS personnel sampling for HPAI in hunter harvested ducks

WS helicopter working ORVP Collections in Kinney County

Refueling the helicopter for operations concerning feral hogs in the Upper Leon River Project Area

WS personnel setting equipment for predator management in McLennan County

WS personnel with CSU researchers collecting feral hog samples



WS stock image of a colonial nesting bird relocation project in central Texas

WS crewmembers and instructors at the range for the ATOC aerial gunner recertification training

WS personnel embracing technology and planning for a upcoming project

Feral Hogs and anthrax from page 4

occurring in new areas in Sutton County in 2019. Texas WS was able to fly affected ranches and collect several feral hogs during the outbreak.

Blood from the hogs was sent to the National Feral Swine Damage Management Program where researchers collaborated with scientists at Colorado State University (CSU). All of the feral hogs had antibodies to anthrax, indicating that they had been exposed, but did not die from the disease. That triggered 2 separate studies to better understand anthrax in feral hogs.

In the first study, we selected blood samples from counties where anthrax outbreaks had occurred in the past and samples from counties where there was no known anthrax. We submitted these to the same group of scientists without telling which was which and they correctly identified 100% of the samples from anthrax areas by finding positive antibodies. This project identified feral hogs as a sentinel animal for anthrax, which will not only help livestock producers and animal health officials, but will serve as a baseline for investigations into agriterrorism or the possible use of anthrax as a weapon of terrorism.

Following that study, we knew that feral hogs seroconvert (develop antibodies) to anthrax, but don't die from the disease. We then had questions regarding the role of feral hogs moving the disease around the landscape. Again, using Texas WS employees to collect hogs, some 40 feral hog subadults (about 40 lb. pigs) were trapped in Burnet County and driven to CSU in Ft. Collins CO to be studied in a bio secure facility. Researchers there exposed to pigs to anthrax and were able to document that 100% of the pigs seroconverted. They also were able to capture anthrax bacteria from the nose of infected pigs. This means that feral hogs may possibly amplify anthrax bacteria during an outbreak and can certainly move it around from one water source or one property to another. These new scientific studies were all the results of questions asked by Texas WS employees and landowners and will serve to better manage the disease in the future.

African Swine Fever Continued

Large bore centerfire rifle bullets, while very humane, typically exited medium to small hogs and would not be safe for euthanasia in a farm setting. Twenty-two (.22) rimfire cartridges were also humane and pigs shot from specific angles did not exhibit signs of duress. The data from this study will be written up and presented at a wild pig conference in the future.

Nighttime activities: hogs foraging in a producer's field, Eastland Co

Once the most effective ammunition was identified, Wildlife Services also initiated an "Ammo Bank" to assure that ammunition is available for an emergency response, whether the response is in feral hogs or to assist in domestic swine depopulation. Anyone purchasing ammo during the last 2 years would know that it may be hard to assemble 10,000 or more rounds at any time, so having a bank of ammunition to draw from is critical to making sure US producers can take the appropriate action in a timely manner.

In FY 2022, Texas Wildlife Services collected 2,361 feral hog samples for genetic and disease surveillance, including 525 separate samples for ASF. While it's unlikely that we'll discover the disease, having the Wildlife Services program continue to conduct the surveillance is critical to keeping export markets open.

Black Vultures

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 livestock producers the resolution to the conflict is much more complicated. 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. 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).

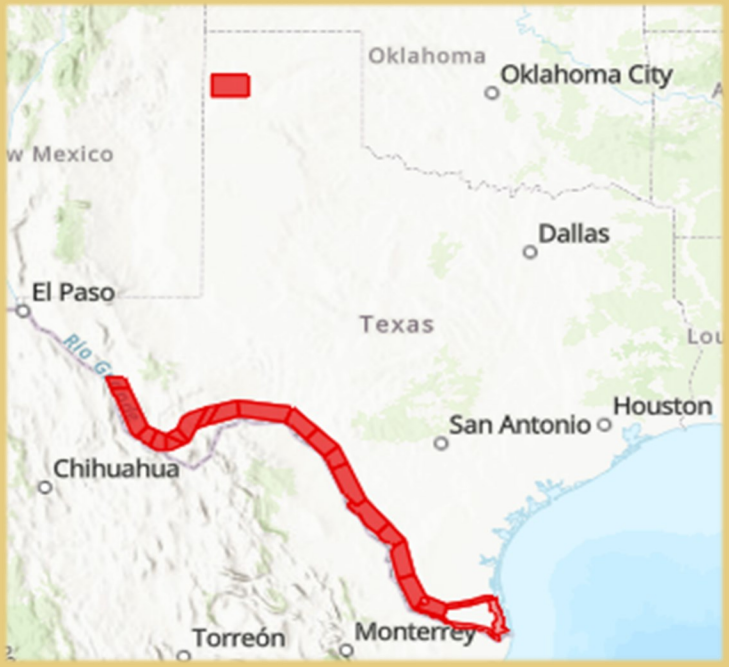
Another option is available to livestock producers: The Texas Wildlife Damage Management Association (TWDMA) Livestock Protection Pilot Program.

TWDMA Permit USFWS renewed the TWDMA for lethal removal of black vultures (BLVU) to protect livestock for FY 22. The permit allows the TWDMA to grant sub-permits to livestock producers for the protection of their livestock. By FWS rule, only 5 BLVU can be available per sub-permit. The initial permit limits the total take to 750 BLVU, so TWDMA could issue a maximum of 150 sub-permits for 5 BLVU each.

To apply, contact a Texas Wildlife Services District Office (locations are on the back of this 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 State Office review and approval, the Form 37 then becomes the application and is sent to the Association Treasurer who will issue the sub-permit within 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. While TWDMA administers the Livestock Protection Pilot program permit, this process involves coordination and required reporting to the US Fish and Wildlife Service providing the accountability to continue developing the pilot project for the benefit of as many producers as possible.

Black vultures on a calving Cow in Anderson County

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 TWS 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 2022, TWS continue s to partner with the Texas Department of State Health Services in the distribution of **836,000** Oral Rabies Vaccine (ORV) baits along 19 counties (9.1 million Acres) of 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.

In addition to the ORV zone along the border, Texas Wildlife Services Program and the National Rabies Management Program have been implementing a field trial for a new vaccine (OnRab) in coyotes. The OnRab vaccine has proven effective in eastern efforts to manage raccoon rabies but it's potential as a canine vaccine remains untested. In 2020, Texas WS dropped OnRab vaccine baits in South Texas, near the border maintenance zone. However, the results were confounded by proximity to the existing border zone as well as a lack of access to many ranches due to ongoing quail hunting season. In FY 2021, TWS met with landowners in the Texas panhandle and identified a more suitable site and baits were distributed in February of 2022 and 2023. This project will continue for one more additional year. The efforts to manage rabies in wildlife, and ultimately wildlife-vectored rabies in humans, must be adaptable to be effective. However, rabies management is expensive and adaptive strategies may identify less costly management options. All options require some risk, and along with biological assessments, disease risk assessments and economic analysis is necessary to best balance resources and risks. Adaptive management strategies are being developed and may be tested to get better data on efficacy and risk.

WDMB Adam Henry retrieves specimens to sample for rabies in Brewster County

Predation Management

WS personnel setting predator management equipment at a Texas A&M Research Facility experiencing calf losses.

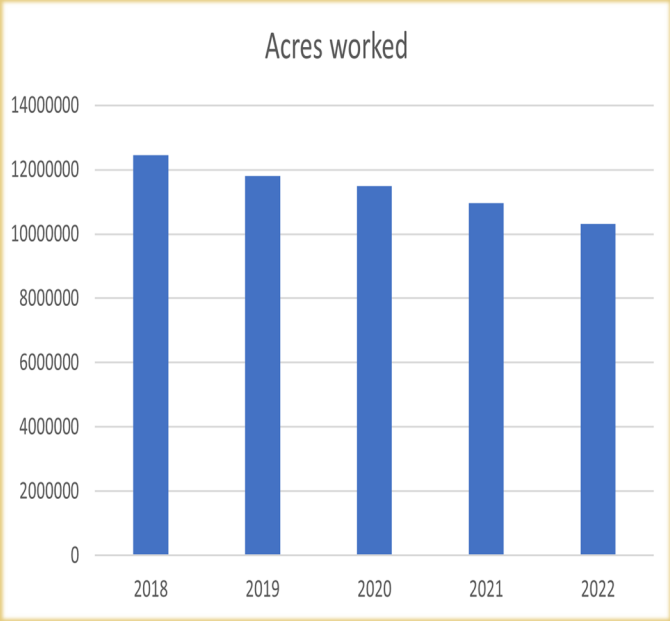
Predation management is one of the core businesses of the Texas Wildlife Services Program. Wildlife is a public trust and regulations are in place to protect wildlife. However, when the public wildlife damages private property, there is a public obligation to rectify the damage. The Wildlife Services Program is the accountable program to address conflicts, in this case predators killing livestock and other wildlife.

Domestic sheep and goats are vulnerable to predation year-round and require protection from coyotes, bobcats, mountain lions and black vultures. Over the past 2 decades, the number of sheep in Texas has declined, and the area where Texas Wildlife Services has conducted predation management activities has contracted considerably. During this time also the change to hair breeds of sheep (from wool breeds) has also changed the dynamics of predation management. Wool breeds were frequently bred to lamb in either early spring (for fall markets or feedlots) or in fall (for the Easter market). The development of "ethnic markets" involving live sheep of light to medium weight has produced a demand for lambs year-round. As a result, many producers leave bucks out year-round and lambing season now extends into every month of the year.

Cattle are not immune to predation issues. As sheep and goat numbers decline, the predation management that was in place declines. Cattle producers often see themselves the target of opportunistic predators and losses to calves have been on the increase over the past 10 years. Calf losses are often seasonal, as calves quickly outgrow their vulnerability to predators. The Texas Wildlife Services Program conducts cattle protection in all 8 Districts.

There has been a lot of emphasis on non-lethal methods of predation management. For some very vocal members of the public, the objective is to never have to kill a predator. For producers, the interest is to effectively protect their livestock. But let's be clear: if "non-lethal measures" are effective, they reduce predator populations. Removing habitat from a predator (as guard animals or effective fences do) means a smaller predator population. Predators are evolutionarily designed to adapt. Harassing predators only leads to sneakier predators. Texas Wildlife Services supports the use of non-lethal methods ***where effective and economical.***

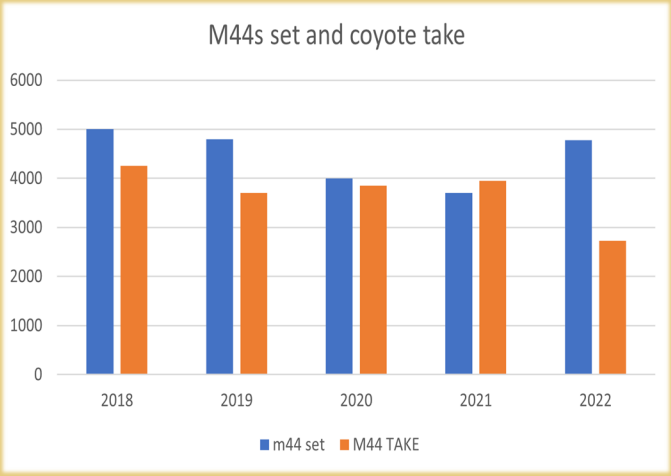
(Predation management continued on page 16)



Predation management acres worked for the last 5 years

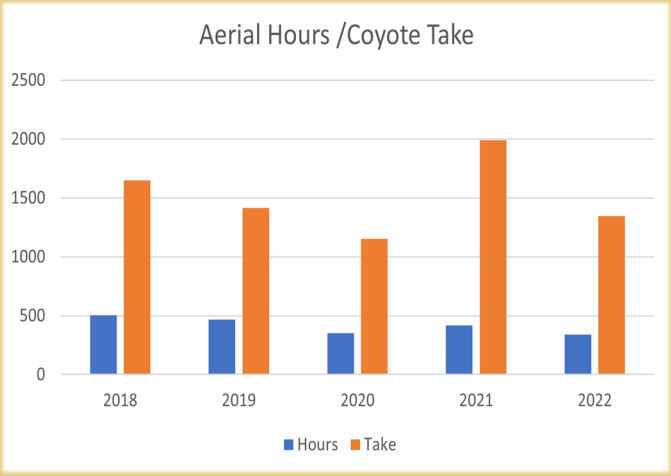
Predation Management from page 15

We recently completed an exercise where we looked at a multi-ranch, chronic predation area in Edwards County. Good, fairly-effective fences existed on 2 sides of the triangular-shaped area due to highway fences. To build new, net-wire fence across the third side would involve building 10-11 miles of fencing. We estimated the cost of the fence and examined the pattern of predation to estimate the number of livestock saved if effective fences were built. In short, the landowners involved cannot save enough money in livestock saved to justify the cost of the fence, even when amortized over 50 years and even when discounting fence maintenance costs. And if the fence was 100% effective at reducing predation, it would save an estimated 11 coyotes per year.



The number of M44's set and coyote take for the last 5 years

This exercise showed us 2 important points: First, the predation prevention benefits from a fence cannot be the only benefits of a fence for a producer to justify building one. Second, if society at large expects the government (or for that matter the ranchers themselves) to kill fewer predators, they need to invest in the improvements to do so. Similar analyses need to be conducted for additional non-lethal methods and the livestock industry needs to be looking at additional funding sources to implement these.



A look at the past 5 years of Aerial Hours working predator projects and the number of coyotes taken

Neck snares and M-44 devices have been a critical components in the management of predation. Neck snares, when safely set, can prevent untold losses to livestock. The M-44 device is one of the most cost effective tools for a trapper to use. However, it's use is not without controversy. Restrictions put on the placement of devices by APHIS and EPA have decreased M-44 use in recent years. This trend of decreased use of the M-44 device not only increases the cost of management, but likely increases livestock losses.

Aerial operation removal of coyotes remains low- only 10% (**1,345 out of 13,636** coyotes taken) were removed with aerial hunting. That's not to say these weren't important! Aerial operations are critical to supporting the trapper trying to stop a problem. To keep it in perspective, M-44's removed **2,724** coyotes (20%) and neck snares removed **7,428** coyotes (54%).

Financially, the available Federal funds for responsive predation management have declined over the years. While overall Federal funding has been stable to slightly increasing, all new funding has been earmarked, mostly for wildlife disease or feral hog work. The cost of predation management has increased and the Federal funding available to do this work has declined. State funding, approved by the legislature, has similarly been stable, with the only increases been earmarked for feral hog management. Cooperators contribute towards predation management through cost-share funding into the Wildlife Damage Management Fund.

Beaver Damage Management

Bell County beaver dam causing agriculture field damage

Bell County beaver dam causing structural damage

Trap set up of beaver causing flooding to roads in Dallas County

During FY 2022, Texas Wildlife Services Program worked **352** properties totaling **699,512** acres (a 49.2% increase in acreage) for beaver damage management. Overall, the actual damage caused by beavers in FY 2022 increased to **$2,498,915** (a 44% increase from FY 2021 of $1,733,934). The greatest amount of damage (**$929,476**) was to timber. The value of trees and crops damaged by beavers may depend on their economic, ecological, aesthetic, cultural, or historical importance. The damming of one small stream; however, may cause potential harm to human life and overshadow all other values. In eastern Texas, roads remain especially vulnerable to beaver damage. Beavers typically will build a dam in a culvert or under a bridge and back water up on the upstream side. When this water reaches the level of the roadbed, it causes instability which can cause the roadbed to collapse. Texas WS has a cooperative agreement with several counties and TxDOT to protect county and state roads from beaver damage. Documented road damage in FY 2022 was **$384,450** but the damage could have been much worse had the program not been in place. Public outreach remains a critical part of beaver damage management. Teaching landowners how to avoid beaver conflicts is an effective way to minimize losses. In FY 2022, Texas WS personnel conducted **384** outreach projects reaching **1,163** people.

Protected Resources Highlights

- **1,100** dikes, dams or impoundments
- **27,533.07** acres of timber protected
- **11** miles of roads protected
- **122** bridges and **2** RR trestles protected
- **$480,534,619.00** total value of the resources protected from beaver damage (a **35%** Decrease from FY21)

Texas Beaver Management Program Spotlight

TWS was contacted by a cooperator in Washington County who reported beavers were damaging trees around their pond and reported the dam was sinking in places. Upon inspection, it was determined that the beavers had constructed a lodge in the dam of the pond. The beavers had greatly undermined the ponds dam and caused it to begin leaking. It was estimated the cost of repairing the damage to the dam would be $20,000. After meeting with the landowner equipment was placed to remove the beavers. Body-grip traps and neck snares were placed in runs and trails, in and around the pond. Three beavers were removed in body- grip traps. All damage has stopped and there has been no new activity.

Surveying damage, setting equipment in Mclennan Co

WDMB T. J. Muir completed a beaver project for a cooperator in Austin County. The property owner was concerned about beavers plugging the water control structure on a lake where he and several others owned lake houses. He was also worried that there was possible damage to the dam of the lake. T. J. arrived at the property and inspected it for damage. He didn't find any damage to the lake dam and estimated the damage to the water control structure at $500. T. J. used thermal equipment, conibears, and snares to remove five beavers and one nutria. He thought the project was completed until the cooperator reported that another beaver had been seen by fishermen on the lake. T. J. expanded his search and found an additional lodge on an island he had previously overlooked. Additional conibears were set and a final beaver was removed. No other activity was seen, and the equipment was pulled.

WDMS Brian Falkenberg traveling to the dam site

TWS worked a place for TXDOT in Upshur County where the beavers had backed up water on about 40 acres of hay meadow. TXDOT cost of damages were $5000, and the landowner lost about $25,000. Five beavers have been removed and no additional damage has been reported.

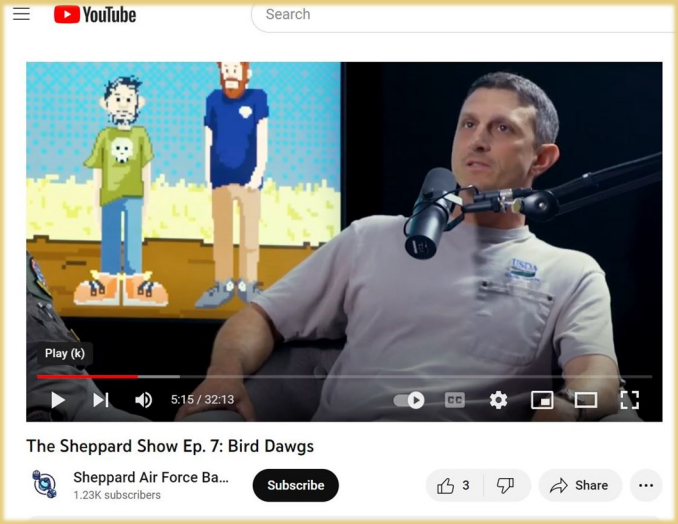
**These are just some snapshots of the Texas WS program management strategies. If you would like more information or are experiencing wildlife damage, please contact your local biologist or district office for further assessment and directory.

Aerial capture of beaver dam causing road flooding hazards in Henderson County.

Airport Wildlife Hazard Program (AWHP)

Scouting for hazardous birds in the sky on JBSA Randolph, WB Michael Pacheco stands at the end of the runway.

When we share the skies with birds, especially large ones, the intersection can cause catastrophic events. WS is tasked with reducing the risk of wildlife strike hazards to the community and aircrafts, while working directly with airports and military installation airfields. WS provides crucial support during litigation in the aftermath of any significant strike event that might occur. In addition to protecting human lives, WS is tasked with reducing the economic impact to aircraft and equipment in civil and military airports alike. Wildlife strikes cost the civil aviation industry in the USA an estimated minimum of $196 million annually, 1990-2019 (Dolbeer et al, 2021). Efforts to reduce wildlife strikes need to focus on the airport environment because about 72% of all reported bird strikes with civil aircraft in USA occur at less than 500 feet above ground level (Begier, Dolbeer, Washburn. USDA-Wildlife Services Assistance at Airports, 2020).



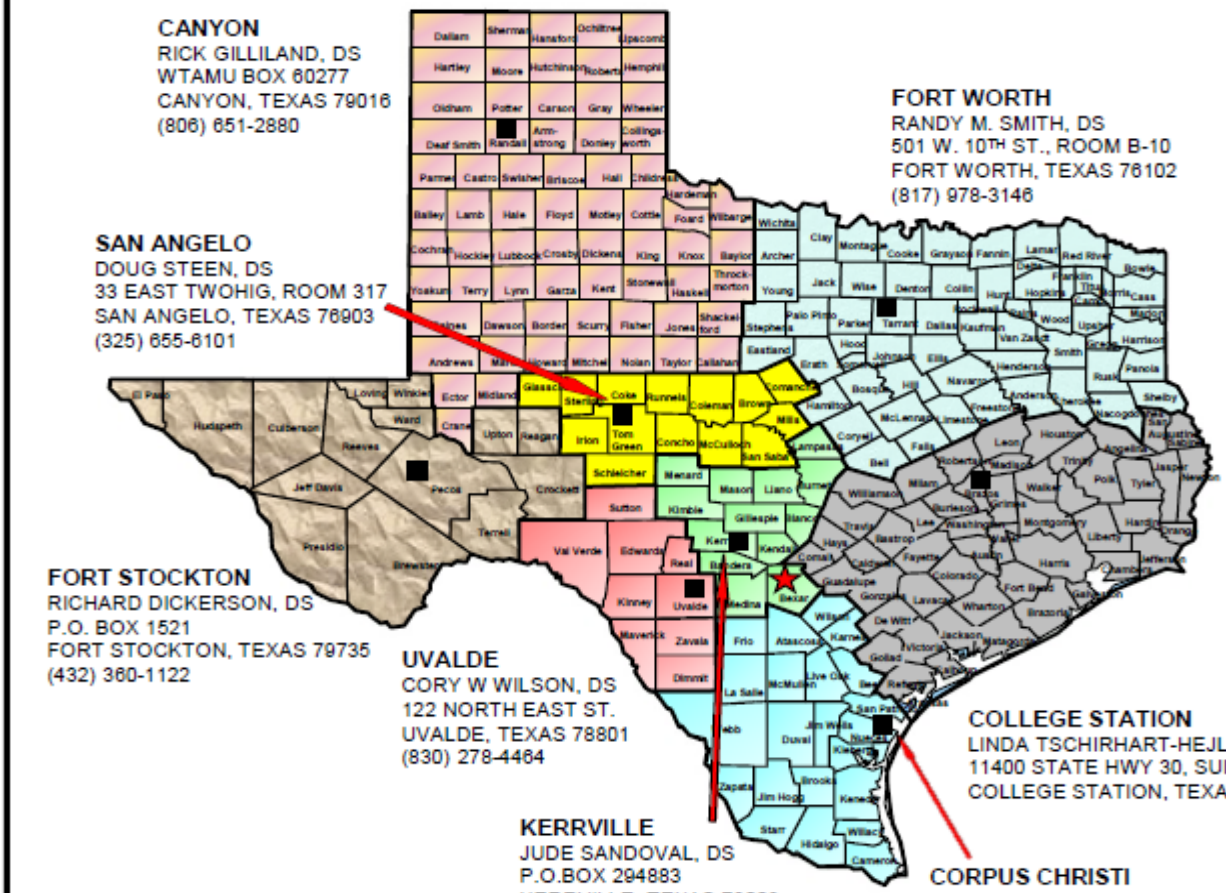
WB Ted Pepps is featured online spreading BASH awareness through The Sheppard Show, Youtube

Texas WS biologists provided a wide range of technical and direct management assistance at airports. Technical work consisted of consultations with airport authorities regarding wildlife issues, training of airport personnel in wildlife identification and control methods, continued monitoring of wildlife, development and revisions of Wildlife Hazard Management Plans, Environmental Assessments, and Wildlife Hazard Assessments. Direct management assistance included lethal removal of hazardous wildlife, nonlethal dispersal of hazardous wildlife, modification of habitats to discourage wildlife, and capture and translocation of wildlife away from the airport. Lethal control of protected species was done under state and federal permits as a last option after solely nonlethal options had been determined to be ineffective or impractical. In addition to work done on airport property, WS biologists provided technical and direct management assistance regarding off-airport wildlife attractants. Effective management of wildlife to reduce strikes is based on principles from wildlife ecology, physiology, and behavior. Airport wildlife hazard biologists consider how these disciplines interact particularly with an understanding of regulatory guidance, non-wildlife related airport safety priorities, and strike data. In 2022, Texas WS provided service at **27** airports or military installations, with **19,980** staff hours, including training **2,576** airport personnel- resulting in a **reduction, suppression,** and **prevention** of hazardous conditions caused by wildlife.

Deploying pyrotechnics to ward off birds occupying the grasses of the airfield, a T-38 waits until the hazard is dispersed to launch.

TEXAS WILDLIFE SERVICES PROGRAM

USDA



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04/06/19

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