

Common Management Measures & BMPs To Address Wildlife Related Issues

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Wildlife Management

Leon River



Goal: Reduce deer population in the watershed.			
Description: Diverse wildlife populations live in the forestland, rangeland and riparian corridors throughout the Leon River watershed. This strategy can focus on the overpopulation of deer throughout the watershed by promoting an increase in the acreage of forestland and rangeland operating under Wildlife Management Plans and Wildlife Management Associations. Landowners can receive technical guidance from TPWD on matters pertaining to wildlife habitat management and deer population management. Landowners, with assistance from TPWD, can establish wildlife management associations or co-ops to create wildlife management plans for large contiguous areas. Landowners can also seek to acquire Managed Land Deer Permits from TPWD to allow hunting seasons to be extended. This management strategy requires ongoing commitment and collaboration by landowners in each county. Landowners and deer processing facilities can collaborate to evaluate possible incentives for culling the deer population.			
Implementation Strategy			
Participation	Recommendations	Period	Capital Costs
45% of landowners within forestland and rangeland areas; TPWD	Control deer population through proper deer population management, expansion and establishment of new Wildlife Management Associations, and the use of all legal means and available programs to achieve the recommended deer harvest	2011-2020	NA
Landowners within forestland and rangeland areas; TPWD	Refining and tracking deer census and reporting changes in deer population; identifying incentives for culling deer population (\$10,000 per year)	2011-2020	\$100,000
Load Reduction			
This program is expected to bring a reduction between 61 and 765 x 10 ⁶ orgs/day (a contribution to total load reduction between 3% and 5%) for direct deposition.			

Wildlife (and Exotics) Management Upper Llano

Goal: Increase number of “active” TPWD Wildlife Management Plans in watershed by 2/year to a total of 66 wildlife management plans in 10 years – i.e. increase acreage under wildlife management plan from 85,410 to 125,000

Description: This strategy focuses on the overpopulation of deer (native and exotic) throughout the watershed by promoting an increase in the acreage under Wildlife Management Plans and Wildlife Management Associations. Landowners can receive technical guidance from TPWD on matters pertaining to wildlife habitat management and deer population management. Landowners, with assistance from TPWD, can establish wildlife management associations or co-ops to create wildlife management plans for large contiguous areas. Landowners can also seek to acquire Managed Land Deer Permits from TPWD to allow hunting seasons to be extended. This management strategy requires ongoing commitment and collaboration by landowners in each county. Landowners and deer processing facilities can collaborate to evaluate possible incentives for culling the deer population. .

Implementation Strategies

Participation	Recommended Strategies	Period	Capital Costs
Landowners, land managers, lessees especially in subbasins with riparian areas; TPWD	Evaluate formation of Wildlife Management Association(s)	2016–2025	N/A
	Enroll and continue participation implementation of Wildlife Management Plans	2016–2025	N/A
	Work with TPWD biologists to develop and implement Wildlife Management Programs or Landowner Incentive Programs	2016–2025	N/A
	Voluntarily locate supplemental feeding locations away from riparian areas.	2016-2025	N/A
	Voluntarily participate with professional harvesting services to remove exotics	2016-2025	N/A
LRFS, AgriLife Extension and TPWD	Educate citizens, hunters and landowners on wildlife management and benefits of developing and implementing Wildlife Management Plans, participating in Landowner Incentive Program, and forming Wildlife Management Association(s)	2016-2025	\$2,000/each \$7,500/each traveling event
LRFS, Local Chambers of Commerce and TPWD	Coordinate and facilitate pairing of hunters seeking exotic hunts with landowners, highlighting the potential economic benefits of year-round hunting.	2016-2018	N/A

Estimated Load Reduction

There are no specific loading data for exotics. For comparison, decreasing deer population densities in the riparian zone from one deer per 2 acres to one deer per 10 acres results in nitrogen decreasing 36kg/yr or 16%; phosphorus decreasing 41 kg/yr or 12%; and sediment decreasing 65 tons/yr or 12%.

Hunting Camp OSSFs (Attoyac Bayou WPP)

Pollutant Source: Hunting Camps without OSSFs

Problem: Hunting camps are usually an older building or congregation of travel trailers that are used several days a year. In most cases, these camps do not have proper sewage treatment and disposal devices. As a result, raw sewage is directly discharged to the surface or a nearby drainage.

Objectives:

- Work with landowners and lessors of lands with hunting camps to educate them on proper disposal methods
- Work with landowners to install appropriate sewage treatment facilities at hunting camps

Location: Entire watershed

Critical Areas: Near riparian areas



Goal: To work with landowners with hunting camps on their properties to install sufficient sewage treatment facilities to prevent future discharge of raw sewage to the watershed.

Description: Identify potential locations in the watershed where hunting camps are and where potential direct discharges of untreated effluent are likely. Work with landowners to establish proper wastewater treatment or disposal means.

Implementation Strategies

Participation	Recommendations	Period	Capital Costs
Designated representative	Identify hunting camps throughout the watershed as opportunities present themselves and inspect sewage disposal methods	2015–2025	Included in ID costs from Management Recommendation 3
Designated representative	As needed, work with volunteering landowners to establish appropriate sewage disposal methods for each inspected hunting camp	2015–2025	\$5,000 ea.

Feral Hog Control

Attoyac Bayou

Goal: To manage the feral hog population through available means in efforts to reduce the total number of hogs in the watershed by 10% (1,015 hogs) and maintain that level of reduction annually.

Description: Voluntarily implement efforts to reduce feral hog populations throughout the watershed by reducing food supplies, removing hogs as practical and educating landowners on BMPs for hog removal.

Implementation Strategies

Participation	Recommended Strategies	Period	Capital Costs
Landowners, land managers, lessees	Voluntarily construct fencing around deer feeders to prevent feral hog utilization	2015–2018	\$200 per feeder exclusion
	Voluntarily identify travel corridors and employ trapping and hunting in these areas to reduce hog numbers	2015–2025	N/A
	Voluntarily shoot all hogs on site; ensure that lessees shoot all hogs on site	2015–2025	N/A
AgriLife Extension	Deliver Feral Hog Education workshop	2015, 2018, 2025	\$7,500 ea.
County/AgriLife Extension	Promote use of Extension's online tracking tool to report hog harvest data	2015–2025	\$10,000

Estimated Load Reduction

Reducing the feral hog population will reduce bacteria loading to the landscape and direct deposition to the creek. This effort will primarily reduce direct deposition as these animals spend the majority of their time in the riparian corridor. As estimated and used in the SELECT model, each feral hog can contribute as much as $1.16 \text{ E}+09$ cfu of *E. coli* to the watershed daily. Using this number plus a reasonable attenuation factor that assumes 25% of the fecal bacteria deposited by feral hogs reaches the water body, reducing the population by 10% yields a maximum annual load reduction of $1.07 \text{ E}+14$ cfu of *E. coli*. See Appendix D for calculations.

Feral Hog Control Leon River

Goal: Decrease feral hog population in and around Leon River watershed and quantify benefits.

Description: County government officials collaborating with select state agencies would implement a variety of existing and new programs aimed at culling and trapping feral hogs to reduce the population. Since 2012, significant advancements have been made to improve the techniques, technology, education, and spatial targeting used to reduce feral hog populations. The implementation of these advancements will expand and improve the approaches outlined below and provided further assurances that feral hog management can be a successful BMP.

Implementation Strategies

Participation	Recommendations	Period	Capital Costs
Comanche, Erath, Hamilton, Coryell Counties, Texas AgriLife Extension Service	Hire 1 additional county trapper to assist all four counties	2011-2020	\$832,000
	Purchase additional hog control equipment	2011	\$31,227
	Investigate feasibility of establishing a trial bounty program (\$3,000 per year per county)	2011-2017	\$84,0000
	Coordinate with TWS to conduct aerial hunting of hogs once per year in each county	2011-2015	NA
	Formulate and implement use of online tracking tools to improve data management and demonstrate progress at reducing feral hog population	2012	\$40,000
Texas Wildlife Services	Reduce feral hog population through hunting and trapping	2011-2020	\$70,000
Landowners	Construct fencing around deer feeding stations to deny hog access at \$187 per deer feeder (number of deer feeders in watershed unknown)	2011-2015	NA

Load Reduction

Reductions in feral hog populations will reduce bacteria loading to the landscape (rangeland, forestland, cropland) and direct deposition to waterbodies. This program will be most effective in addressing direct deposition as these animals spend the majority of their time in the riparian corridor. This program is expected to bring a reduction as high as $5,293 \times 10^6$ orgs/day in one watershed with an average over 2000×10^6 orgs/day for all watersheds. The program is the second highest contributor to source reduction with a range of 18% to 38% contribution to total load reduction. The strategy has less an effect for wash off as the reductions are expected to be less than 100×10^6 orgs/day with no more than 1% for load reduction contribution for any given subwatershed



Feral Hog Control Upper Llano

Goal: Decrease feral hog population by 66% (26,000) over 10-year period

Description: LRFS and County government officials collaborating with select state agencies to implement a variety of existing and new programs aimed at culling feral hogs to reduce population throughout the watershed by reducing food supplies, removing hogs as practical and educating landowners on BMPs for hog removal.

Implementation Strategies

Participation	Recommended Strategies	Period	Capital Costs
Landowners, land managers, lessees	Voluntarily report feral hog activity to determine travel corridors using AgriLife feral hog reporting website	2016–2025	N/A
	Voluntarily construct fencing around deer feeders to prevent feral hog utilization (\$200/feeder enclosure)	2016–2025	N/A
	Voluntarily participate in Task Force to coordinate hunting/trapping, sharing of equipment, donation of meat (via professional trapper)	2016-2025	N/A
AgriLife Extension and TSSWCB	Deliver Feral Hog Education workshop and help coordinate formation of Hog Task Force and Feral Hog reporting website	2016, 2019, 2025	N/A
Kimble, Sutton, Edwards, Real, Menard, Kerr Counties Agencies	Coordinate implementation and participation in the formation of Hog Task Force to serve the watershed.	2016-2018	N/A
Upper Llano Hog Task Force and Texas Department of Agriculture	Feral Hog Bounties (\$5/hog)	2016-2025	\$130,000
	Purchase hog trapping equipment (3/county) for cooperative sharing (\$3,000 / 30 ft' trap)	2016-2025	\$27,000
	Aerial hunting (\$700/hour)	2016-2025	\$56,000

Estimated Load Reduction

Reducing the feral hog population will reduce bacteria and nutrient loading to watershed rivers and streams and their impacts on riparian zones and streambanks. It is estimated that each feral hog contributes 2.53E+12 cfu of *E. coli* to the watershed annually.

Illegal Dumping / Dead Animal Disposal Leon River

Goal: Improve alternatives and convenience for disposal of dead animals and discourage people from disposing of dead animals in creeks and rivers.

Description: The reconnaissance survey and anecdotal evidence indicate that carcasses of small livestock, deer, dogs, and a wide variety of wildlife are commonly found in creeks. Often they are thrown into creeks from bridges. County government officials would investigate the feasibility of programs to provide alternatives for individuals to dispose of dead animals in a way that would encourage people not to dispose of carcasses in creeks. A low cost recommendation to consider would be the purchase a poultry incinerator that would be operated by each County. This option would require obtaining a permit from TCEQ and acquisition of a land parcel to locate dumpster(s) and operate the incinerator. A strategy could include purchase of equipment for burial, access to a regional disposal facility (landfill), and public education and outreach. County officials could also post signs on roads crossing creeks notifying public that fines can be issued for disposal of carcasses or litter in creeks. Municipalities might also investigate how they can contribute to this effort by providing dumpsters or locations where citizens can dispose of dead animals.

Implementation Strategies

Participation	Recommendations	Period	Capital Costs
Comanche, Hamilton, Coryell Counties	Investigate feasibility of constructing dead animal disposal facility (incinerator and dumpsters) and conduct an outreach program (\$17,000 per county)	2016-2020	\$68,000
	Provide county-owned equipment (backhoe, trailer, truck) to help landowners dispose of animal carcasses on private property (\$92,5000 per county)	2016-2020	\$370,000
Comanche, Hamilton, Coryell Counties	Consider posting signs at bridges warning of fines for disposal of carcasses in creeks (\$12,000 per county)	2011-2015	\$48,000
Comanche, Hamilton, Coryell Counties	Provide additional resources to County animal control officers for travel time and outreach to work with citizens to dispose of dead animals (\$1,347 per county)	2011-2015	\$5,389
Cities of Dublin, Hamilton, Gatesville	Operate dead animal disposal facility for small animals (incinerator and dumpsters) and conduct an outreach program (\$8,000 per municipality)	2011-2020	\$24,000

Load Reduction

While reductions in bacteria associated with this management strategy is minimal (less than 1 percent contribution to load reduction for any given subwatershed), stakeholders are willing to pursue these management strategies because they address known pollutant sources and aesthetic nuisances along creeks.

Urban Wildlife

Management Measure	Responsible Party	Unit Cost	Number Implemented			Total Cost
			Year			
			1-3	4-6	7-10	
<i>Urban Stormwater Management Measures</i>						
Pet Waste Collection Stations	City of Kyle	\$620/station installation \$85 annual/station	10	4	4	\$22,040 ¹
Pet Waste Collection Stations	City of Lockhart	\$620/station installation \$85 annual/station	10	4	4	\$22,040
Pet Waste Collection Stations	City of Luling	\$620/station installation \$85 annual/station	6	2	2	\$12,475
Pet Waste Collection Stations	City of Buda	\$620/station installation \$85 annual/station	10	4	4	\$22,040
Comprehensive Urban Stormwater Assessment	City of Kyle	\$30,000/survey	1	---	---	\$30,000 ¹
Retrofit Stormwater Detention Basins	City of Kyle	\$35,000 engineering \$50,000/basin	2	---	---	\$135,000 ¹
Initiate Street Sweeping Program	City of Kyle	\$110,000/sweeper	---	---	---	\$110,000 ²
Comprehensive Urban Stormwater Assessment	City of Lockhart	\$25,000/survey	1	---	---	\$25,000
Manage Urban Waterfowl Populations	City of Lockhart	---	---	---	---	N/A
Comprehensive Urban Stormwater Assessment	City of Luling	\$20,000/survey	1	---	---	\$20,000
Rehabilitate Stormwater Retention Pond	City of Luling	\$500,000/pond	1		---	\$500,000
Initiate Street Sweeping Program	City of Buda	\$150,000/sweeper	1	---	---	\$150,000 ²

Urban Wildlife Management

Guadalupe River and Canyon TMDL

- ⊙ Reduce bird feces at Louise Hays Park & Kerrville-Schreiner Park
- ⊙ Install bird exclusion, deterrent devices on bridges over the waterway
- ⊙ Manage waterfowl population at Louise Hays Park and Kerrville-Schreiner Park.



Ag & Urban NPS Management Measures

- ⦿ Urban stormwater management :
 - ⦿ Stormwater BMP implementation
 - ⦿ Dry ponds reduce bacteria 88-99%
 - ⦿ Wet ponds reduce bacteria 47-68%
- ⦿ Ag management:
 - ⦿ Develop and implement WQMPs & Conservation Plans
 - ⦿ Filter strips reduce *E. coli* 58-99%
 - ⦿ Prescribed grazing reduces *E. coli* 66-72%

Wildlife Related Management Measures *Summary*

- ⦿ Wildlife Management
- ⦿ Hunting Camp OSSFs
- ⦿ Feral Hog Management
- ⦿ Illegal Dumping/Dead Animal Disposal
- ⦿ Urban Wildlife Management
- ⦿ Urban Stormwater Management Practices
- ⦿ Agricultural Best Management Practices