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# CITY OF SUNSET VALLEY WILDLIFE MANAGEMENT PLAN



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35 **EXECUTIVE SUMMARY**

36 The City of Sunset Valley has a long history of environmental stewardship. This Wildlife  
37 Management Plan continues those efforts by providing a framework for managing human-  
38 wildlife interactions. The goals of this plan are to:

- 39 • Protect and enhance wildlife habitat
- 40 • Promote environmental education
- 41 • Promote volunteer involvement in wildlife and habitat protection and enhancement  
42 projects
- 43 • Promote internal education and consistency in Department actions

44 In addition species specific management plans have been developed for several vertebrate and  
45 invertebrate species. This includes:

- 46 • White-tailed deer
- 47 • Golden-cheeked Warblers
- 48 • Red Imported Fire Ants
- 49 • Feral Hogs, Dogs, and Cats
- 50 • Mosquitoes
- 51 • Coyotes

52 Each of these species specific management plans includes biological information and  
53 management actions to be carried out by City staff and volunteers. In particular fire ant,  
54 mosquito and coyote coexistence will require a community approach to management.

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64 **PURPOSE**

65 The purpose of this Wildlife Management Plan (WMP) is to provide the guidelines and policies  
66 for managing wildlife within the City of Sunset Valley. The overall goal of this plan is to  
67 integrate the management of the natural and human systems within Sunset Valley to benefit  
68 both the residents of the City and the wildlife that depend on the land. This WMP establishes a  
69 framework for making wildlife management decisions, provides direction on regulatory and  
70 program changes, and outlines a set of actions for long-term management of human-wildlife  
71 conflicts.

72 This plan is written with the understanding that very few of Sunset Valley’s greenspace and  
73 conservation areas are fenced and wildlife moves freely between public and private land. Any  
74 wildlife management activities will need to include aspects of public education.

75 **BACKGROUND**

76 The City of Sunset Valley has a long history of environmental stewardship. Incorporated in  
77 1954, the City has been able to balance economic development with conservation and water  
78 quality protection. More than 25% of the City is dedicated as greenspace and conservation  
79 areas which are located over the Edwards Aquifer. A diverse wildlife population and protection  
80 of the natural habitat is important to the residents of Sunset Valley.

81 **GREENSPACES AND CONSERVATION AREAS**

82 The City of Sunset Valley has five dedicated greenspace and conservation areas and a trail  
83 system that are maintained in accordance with the City’s Open Space Management Plan and  
84 Trails Master Plan. Residential areas abut all of these areas..

85 **SOUTH HILLS CONSERVATION AREA**

86 The South Hills Conservation Area is located at the southern edge of the City, along the western  
87 edge of the Cherry Creek neighborhood. The tract is 42.83 acres. The South Hills Conservation  
88 Area has a peak elevation of approximately 740 feet above sea level and the lowest elevation is  
89 670 feet. Soils within the area include Ferris-Heiden along slopes and flats. The extant plant  
90 community of the South Hills Conservation Area is Ashe Juniper –Oak woodland. The Kincheon  
91 branch of Williamson Creek is also found within this area.

92 **GAINES GREENBELT**

93 The Gaines Greenbelt is located at the northern edge of the City of Sunset Valley, and connects  
94 with the City of Austin’s Barton Creek Greenbelt. The area is bisected several times by Gaines  
95 Creek. Gaines Creek is ephemeral and is a tributary for Barton Creek. The tract is 22.08 acres in

96 extent. The Gaines Greenbelt has an elevation varying from 570 to 660 feet along the plateau.  
97 The soil of the Gaines Greenbelt is mostly Tarrant soils and rock outcrops. This is a soil that is  
98 commonly found on steep slopes along rivers. The plant community of the Gaines Greenbelt is  
99 that of an Oak – Juniper woodland.

#### 100 **INDIAN GRASS PRAIRIE PRESERVE**

101 The Indian Grass Prairie Preserve is located along Williamson Creek between Country White  
102 Lane, Home Depot Boulevard, Brodie Lane, and the apartment complex. Part of the western  
103 boundary is adjacent to watershed protection lands of the City of Austin. Contained within the  
104 preserve area are a radio tower, an associated small building, and a gravel road. A wastewater  
105 line is also located north of Williamson Creek. The area comprises 21.43 acres in extent.  
106 Located approximately 700 feet above sea level, the Indian Grass Prairie Preserve has several  
107 interesting physical features. The substrate of the Indian Grass Prairie Preserve is Edwards  
108 Limestone and a cave occurs along the northern edge of the area. This cave commonly called  
109 Sunset Valley Cave (Goat’s Head Cave) and Rattlesnake Sink is a recharge feature for the  
110 Edwards Aquifer. The cave is composed of two main chambers and is home to a variety of  
111 invertebrate species. The Indian Grass Prairie Preserve is located within the Edwards Aquifer  
112 recharge zone.

113 The site is bisected by Williamson Creek, which is composed of Mixed Alluvial Land. Mixed  
114 Alluvial Land is comprised of beds of exposed limestone and gravelly alluvium (USDA, 1974).  
115 The majority of the site is composed of Tarrant and Speck soils. Tarrant soils are well-drained  
116 clay soils found atop limestone. Speck soils are reddish brown and also overlay a limestone  
117 substrate. The plant community of the Indian Grass Prairie Preserve is that of a Plateau Live Oak  
118 – Midgrass vegetative community (*Quercus spp.*).

#### 119 **COUGAR CREEK GREENBELT**

120 The Cougar Creek Greenbelt is located along the Sunset Valley Branch (commonly called Cougar  
121 Creek) of Williamson Creek. The tract extends from Brodie Lane, across Ernest Robles Way, and  
122 south of Jones Road. The tract is 23.37 acres in extent.

123 The Cougar Creek Greenbelt has an elevation ranging from 680 to 700 feet above sea level. Soil  
124 types include Crawford clay, Speck stony clay loam, and Tarrant soils. The construction of berms  
125 along the tributary along with a nearby re-irrigation system has caused the formation of an  
126 ephemeral wetland on a southwestern portion of the property. The berms were constructed to  
127 constrain the flow of the creek, a concrete dam was also constructed at the terminus of the  
128 berm. The plant community of the Cougar Creek Greenbelt is that of a Plateau Live Oak  
129 (*Quercus spp.*) – Midgrass series.

130 **SUNSET VALLEY NATURE AREA**

131 The Sunset Valley Nature Area is located between Lovegrass Lane and Oakdale Drive. The tract  
132 surrounds a portion of the main branch of Williamson Creek and connects with the South Hills  
133 Conservation Area. Brodie Lane separates the Sunset Valley Nature Area from the Indian Prairie  
134 Grass Preserve. The flow of Williamson Creek is ephemeral and no permanent body of water is  
135 located on the tract. The tract is 64.59 acres in extent. The elevation of the Sunset Valley  
136 Nature Area extends from approximately 670 to 700 feet. A third of the tract has an Edward's  
137 Limestone substrate and the remainder of the site is Buda Limestone. The tract is bisected by  
138 Williamson Creek, which is composed of Mixed Alluvial Land (Md). The majority of this tract is  
139 composed of Tarrant and Speck soils. The Sunset Valley Nature Area is considered to be a  
140 Plateau Live Oak (*Quercus fusiformis*) - Midgrass plant community.

141 **WILDLIFE DESCRIPTIONS**

142 Sunset Valley is home to a variety of plant and animal species. Wildlife observed within the City  
143 of Sunset Valley includes White-tailed Deer (*Odocoileus virginianus*), Coyote (*Canis latrans*),  
144 Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Virginia Opossum (*Didelphis*  
145 *virginiana*), Eastern Cottontail Rabbit (*Sylvilagus floridanus*), Bobcat (*Lynx rufus*), Common Gray  
146 Fox (*Urocyon cinereoargenteus*), Nine-banded Armadillos (*Dasybus novemcinctus*), Squirrels  
147 (*Spermophilus sp.*) and other various rodent species. Texas Rat Snake (*Elaphe obsoleta*  
148 *lindheimeri*), Prairie Kingsnake (*Lampropeltis calligaster calligaster*), Western Diamondback  
149 Rattlesnake (*Crotalus atrox*), Rough Earth Snake (*Virginia striatula*), Red-eared Slider  
150 (*Trachemys scripta elegans*), Texas River Cooter (*Pseudemys texana*), Green Anole (*Anolis*  
151 *carolinensis*), Reticulated Gecko (*Coleonyx reticulatus*), and and Gulf Coast toad (*Incilius*  
152 *valliceps*) are the reptile and amphibian species identified to date. Central Texas is along a  
153 migratory bird path and has a rich diversity of bird species. Texas is centrally located along a  
154 migratory bird route. As such over 100 bird species have been identified in Sunset Valley as  
155 seen in Appendix A.

156 **Endangered Wildlife Description:** The Gaines Greenbelt is unique in that it provides habitat for  
157 the endangered Golden-cheeked Warbler (*Dendroica chrysoparia*). Golden-cheeked Warblers  
158 nest in the Ashe-Juniper and Oak woodlands surrounding canyons and ravines. These small  
159 songbirds (~4.5 inches) were listed as endangered in 1990, their decline is related to habitat  
160 loss and fragmentation. Migratory in nature, these birds spend the winter in Mexico and  
161 Central America, and Central Texas is the only place where these birds nest and raise their  
162 young.

163 **GENERAL WILDLIFE MANAGEMENT GOALS**

164 Recognizing that effective wildlife management takes a comprehensive approach that  
165 integrates city resources and resident actions, the following goals have been developed:

- 166 • Protect and enhance wildlife habitat
- 167 • Promote environmental education
- 168 • Promote volunteer involvement in wildlife and habitat protection and enhancement  
169 projects
- 170 • Promote internal education and consistency in Department actions

171 **PROTECT AND ENHANCE WILDLIFE HABITAT**

172 **Objective 1:** Protect existing habitat from degradation

173 Wildlife habitat within the City’s green spaces and conservation areas should be protected from  
174 degradation at all times. Conservation Areas in particular should be designated primarily as  
175 wildlife habitat. These areas should have limited development and humans should stay in  
176 designated areas, such as trails. The green spaces and conservation areas should be monitored  
177 on a regular basis for degradation and deterioration. When habitat deterioration is found,  
178 plans to restore the site should be developed.

179 A list of potential habitat protection and enhancement plans should be developed. The plan for  
180 each specific area should include:

- 181 • A site description and nature of the problem
- 182 • Detailed actions to be taken
- 183 • A project schedule
- 184 • Materials and equipment needed
- 185 • Maintenance and monitoring program
- 186 • Potential corrective actions if project is not successful

187 Actions to protect wildlife habitat include:

- 188 • Monitoring and removal of invasive, exotic species
- 189 • Planting native vegetation
- 190 • Creek restoration
- 191 • Trail maintenance
- 192 • Closing informal, social trails
- 193 • Enforcing applicable laws and regulations

194

195 **Objective 2:** Allow human use of natural areas while protecting wildlife and habitat

196 A balance must be achieved between people accessing the green spaces and conservation areas  
197 and habitat protection. Trails and viewing areas should be designed and maintained in  
198 accordance with the approved Trails Master Plan. People entering into green spaces and  
199 conservation areas should have control of their pets at all times. Domesticated cats and dogs  
200 have been documented to have negative effects on wildlife.

201 Increased support of trail maintenance is needed to prevent erosion. Methods should be used  
202 to help keep people on the trails. Additional signage will also be needed to keep people on the  
203 trails and to provide educational opportunities.

204 **Objective 3:** Maintain habitat and species diversity

205 Efforts should be made to maintain or increase species diversity within the green spaces and  
206 conservation areas. This can be achieved through restoration projects and insuring habitat  
207 does not get further fragmented by trails and development.

208 **Objective 4:** Protect critical and sensitive habitats

209 Critical and sensitive habitat should be protected from development and degradation. The  
210 Gaines Greenbelt is critical habitat for an endangered species. Karst features are also sensitive  
211 habitats, including the majority of Williamson Creek within Sunset Valley. These areas require  
212 monitoring and management to protect not only wildlife habitat but water quality.

213 **Objective 5:** Promote native plant communities and enhance wildlife habitats

214 Native plant communities should be protected and enhanced. This can be achieved by  
215 removing exotic species and replanting with native species. Areas that lack vegetation should  
216 be restored using a native seed mix. Structure diversity within plant communities is an  
217 important factor. Site specific plans should be developed for each restoration project.

218 **Objective 6:** Control exotic plants

219 Methods to control exotic, invasives should be researched and developed as the need arises.  
220 Plans to remove known invasives such as Chinaberry, Chinese Tallow, Japanese Ligustrum, and  
221 Nandina should be site specific. Minimal applications of herbicide can be used on those  
222 invasive, exotics that can re-grow from root stock.

223 **Objective 7:** Monitor for invasive species

224 Staff will monitor for potential invasive species within the City. For example, the Tawny Crazy  
225 Ant (*Nylanderia spp. near pubens*) has been found within Travis County. If invasive species are



226 found within Sunset Valley appropriate actions will be taken to notify residents and begin  
227 control measures.

228 **Objective 7:** Enforce Existing Regulations to protect wildlife

229 Chapter 96 of the Code of Ordinances is related to public parks. This ordinance has provisions  
230 for protecting wildlife. It is unlawful for a person to:

231 (N) Hunt or molest, harm, frighten, kill, trap, pursue, tease, shoot or throw missiles at any  
232 animal, wildlife, reptile or bird in a public park. Hazing of coyotes is not considered a prohibited  
233 act.

234 More rigorous enforcement of this law is necessary as well as increased education on the  
235 ecological reasons behind these ordinances.

236 **Objective 8:** Educate residents and visitors on the ecological reasons for regulations.

237 Increased effort to educate residents and visitors to the City on the ecological reasons for  
238 regulations is necessary. This should hopefully lead to better compliance; thus habitat and  
239 wildlife will be better protected.

240 **Objective 9:** Develop and maintain a wildlife resource inventory.

241 Maintaining an inventory of wildlife resources including vegetation maps and wildlife species  
242 will aid in making management decisions. In addition vegetative mapping can help determine  
243 areas of degradation and where improvement projects should be focused.

244 **PROMOTE ENVIRONMENTAL EDUCATION**

245 **OBJECTIVE 1:** Provide wildlife biology and ecology education to residents and visitors.

246 Informed users in the green spaces and conservation areas are a valuable asset to the City.  
247 Active education such as training classes and seminars, along with passive education such as  
248 interpretive signage should be utilized. The City's Conservation Rangers program should be  
249 expanded to allow participation from people living outside of Sunset Valley. Many of the trail  
250 users are from the City of Austin. Empowering them with the knowledge necessary to protect  
251 the green spaces and conservation areas is beneficial to the City. Periodic newsletter articles  
252 would be a simple way to disseminate ecological information.

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256 **Objective 2:** Educate residents and visitors on the ecological reasons for regulations.

257 Increase efforts to educate residents and visitors to the City on the ecological reasons for  
258 regulations. This will lead to better compliance, thus habitat and wildlife will be better  
259 protected.

260 **Objective 3:** Use green spaces and conservation areas for school trips and educational  
261 programs

262 Efforts should be continued to take schools and community groups into the green spaces and  
263 conservation areas on guided hikes. These programs should be expanded to include additional  
264 ecological and wildlife information. Outdoor fieldwork experience could also be offered to  
265 interested individuals or groups, such as mapping vegetation communities.

266 **Objective 4:** Promote use of the City’s environmental resource library.

267 The City maintains an environmental resource library at city hall. Residents should be informed  
268 of this resource and a check out system developed. The list of available books should be kept  
269 online.

270 **Objective 5:** Promote biological research within the green spaces and conservation areas

271 Researchers should be encouraged to use green spaces and conservation areas for biological  
272 and ecological research. The City should receive reports and data from all research conducted.  
273 The data from these research projects can aid the city in management of the green spaces. The  
274 Public Works and Environmental Services Department should pursue partnering with local  
275 universities for research opportunities.

276 **PROMOTE VOLUNTEER INVOLVEMENT IN WILDLIFE HABITAT PROTECTION AND**  
277 **MANAGEMENT**

278 **Objective 1:** Promote Conservation Ranger Program

279 One of the greatest assets the City has is its volunteers. Their efforts can make a huge impact  
280 on management of the green spaces and conservation areas. The City’s Conservation Ranger  
281 program should be revitalized to enhance volunteer involvement in the City’s open spaces.  
282 Projects that can be conducted by volunteers include:

- 283 • Baseline habitat and wildlife surveys (e.g. Hahn surveys)
- 284 • Trail rehabilitation and stream restoration
- 285 • Removal of invasive, exotic species
- 286 • Selective removal of Ashe Juniper

- 287 • Surveying trail users attitudes and knowledge of green spaces
- 288 • Monitoring habitat quality

289 For any project involving volunteers, planning meetings will need to be held to ensure projects  
290 meet their goals. City staff should have a list of potential habitat projects and work with  
291 interested volunteers.

292 **OBJECTIVE 2:** Integrate environmental education with volunteer projects

293 All projects should contain educational opportunities. This includes explaining the reasons  
294 behind a project. Volunteers can also develop and teach seminars. The volunteers become  
295 local stewards of the green spaces. Conservation Rangers should receive training in various  
296 aspects of site specific wildlife biology and ecology and will identify specific problems or  
297 opportunities that need to be addressed.

298 **PROMOTE INTERNAL EDUCATION AND CONSISTENCY IN DEPARTMENT ACTIONS**

299 **Objective 1:** Provide wildlife biology and ecology education for City staff

300 Educational opportunities for City staff should be promoted. This is especially important for  
301 staff involved in vegetation and landscaping management and those who respond to wildlife  
302 calls on a routine basis. The focus of the courses should be on ecology and ecological  
303 principles, and should emphasize the ecological communities of Sunset Valley. Ecological  
304 processes, including energy flow, nutrient cycling, and water movement should be included in  
305 the training. Education courses will be designed to provide applicable tools to everyday  
306 management decisions made by staff.

307 **Objective 2:** Develop policies for how wildlife-related incidents are handled

308 Inter-departmental policies and response plans on how to handle wildlife-related incidents  
309 should be developed. This will create consistency in how staff responds to wildlife issues.

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## **SPECIES SPECIFIC MANAGEMENT PLANS**

Due to various factors, some animals require specific plans to manage populations and mitigate potential human-wildlife conflicts. The following sections include information on specific species and how they shall be managed within the City of Sunset Valley.

### **WHITE-TAILED DEER (WTD)MANAGEMENT PLAN**

Texas is home to one of the largest White-tailed deer (*Odocoileus virginianus*) populations in North America. The Edwards Plateau in particular produces more White-tailed deer than any other region of the state. A large population of free-ranging, browsing ungulates can have a significant effect on open space habitat as well as residential areas. Deer cause localized damage to landscaping and can be responsible for car accidents. If over-populated, WTD can also cause damage to open spaces by decreasing species diversity.

#### **SPECIES DESCRIPTION**

White-tailed deer refers to the underside of the tail that is raised when the animal is alarmed. WTD are relatively small deer weighing between 100 to 300 pounds and maximum heights of approximately 3 ½ feet shoulder height (Curtis and Sullivan,2001). Does are smaller and lighter than bucks and lack antlers. In the summer, WTD have a red-brown coat that becomes gray-brown in the fall and winter. WTD breeding occurs mid-September through late February. The peak of the breeding season, also called rut, is in November. There is a 200 day gestation period with fawns being born in early summer. Fawns are red-brown with white spots, weighing between 4 to 8 pounds at birth. Twins are common in years where food is abundant. Bucks begin to develop antlers in April and these grow through August. Antler size depends on age and nutrition. Older bucks will have larger antlers. Antlers are covered with skin called velvet. This skin contains blood vessels that provide nutrients to the growing antlers. When the antlers stop growing, the velvet dries and is rubbed off. Bucks damage small trees and shrubs as they remove the velvet. Each winter bucks lose their antlers and will grow a new set in the spring.

#### **HABITAT INFORMATION**

In Sunset Valley, WTD are found throughout all of the green spaces and conservation areas. WTD are also commonly spotted in residential areas. WTD are considered an edge adapted species. This means that they thrive in areas with a diversity of habitat and a high proportion of habitat edges. Habitat edges refer to the area where two differing habitats meet. In urban areas this can be the areas where green spaces meet the urbanized residential and commercial areas. This urban-wildland interface plays an important role in species diversity and richness. Habitat in Sunset Valley consists of Oak-Juniper woodlands and Oak-Midgrass plant

350 communities. Deer feed primarily on grasses, forbs, leaves, twigs, and buds. Deer will also eat  
351 acorns, as well as the buds and twigs of leafy plants, in the winter.

## 352 **WILDLIFE DAMAGE**

353 Damage caused by WTD ranges from eating landscaping to injuring young trees. It is estimated  
354 that deer are responsible for nearly \$250 million dollars in damage each year to household  
355 landscaping nationwide (Curtis and Sullivan, 2001). Deer also affect vegetative diversity as they  
356 over-browse tree seedlings. As deer forage and eat the seedlings of oaks, other less desirable  
357 species such as Japanese Ligustrum (*Ligustrum japonica*) or Chinaberry (*Melia azaderach*) may  
358 reach maturity. This leads to a loss of mature, native trees in natural areas and changes  
359 vegetation composition (Bishop et al., 2007). Deer may also reduce understory coverage which  
360 can affect the nesting and foraging areas of many songbirds. This can in turn affect the species  
361 diversity and abundance of these songbirds. Deer also cause over 1 billion dollars in auto  
362 damage each year in the United States (Curtis and Sullivan, 2001). Deer may also be host to the  
363 Lone Star Tick (*Amblyomma americanum*) that can induce allergy to red meat and the Black-  
364 legged Tick (*Ixodes pacificus*) that is a vector for Lyme disease.

## 365 **MANAGEMENT PROGRAM**

366 With a lack of natural predators and little to no hunting pressure in urban areas there are very  
367 few factors that limit white-tailed deer population sizes. Management will be focused on the  
368 following areas:

- 369 • Monitoring deer populations
- 370 • Enforcement of local ordinances
- 371 • Public education and residential damage prevention
- 372 • Chronic Wasting Disease monitoring and education program
- 373 • Population reduction

## 374 **MONITORING DEER POPULATIONS**

375 Monitoring should be the first step of any wildlife management activity. Texas Parks and  
376 Wildlife (TPWD) has several census and survey techniques for the Hill Country. Technical  
377 assistance for deer surveys is also available from TPWD. Sunset Valley uses a combination of  
378 techniques to monitor deer populations: modified Hahn Line and camera surveys. The Hahn  
379 line survey consists of several trails and roads. Visibility estimates, recorded perpendicular to  
380 the route, are used to estimate acreage sampled. The camera survey utilizes a static location  
381 with a feed station. The Hahn line gives a good population estimate, however it has been found  
382 to underreport bucks. The camera survey allows staff to estimate the number of bucks in the  
383 population, as well as provide a population estimate. A minimum of five Hahn line surveys

384 should be conducted on non-consecutive days, at either dawn or dusk. This is the minimum  
385 number of visits required to generate a population density estimate. These surveys should be  
386 conducted in the late summer to give an accurate account of bucks, does and fawns. Camera  
387 surveys can be conducted at different times of the year to check population estimates.  
388 Population estimates will play a factor in determining whether any population control measures  
389 will be conducted.

## 390 **LOCAL ORDINANCE ENFORCEMENT**

391 In most cases feeding wildlife is not recommended and can lead to several problems. Food  
392 manufactured for people is not nutritionally adequate for wild animals and can lead to health  
393 problems. When wildlife become accustomed to eating near humans, they often lose their fear  
394 of humans and this can lead to nuisance behavior. When wildlife discovers a constant food  
395 source at a single location, this may cause animals to congregate in larger groups and can lead  
396 to the spread of disease or fighting among the animals. Chapter 94 of Sunset Valleys Code of  
397 Ordinances contains provisions preventing the feeding of wildlife.

### 398 **§ 94.03 FEEDING OF DEER AND OTHER WILDLIFE**

399 (A) No person shall purposely feed wild deer, cause wild deer to be fed or provide food or  
400 edible matter to wild deer through a ground-feeding station, salt lick or other means to  
401 feed wild deer in the city on any public or private land.  
402

403 (B) No person shall purposely feed raccoons, coyotes, opossum, skunks, ringtail cats, and  
404 foxes except as allowed by wildlife rehabilitators holding appropriate state and/or  
405 federal permits. Except as allowed to wildlife rehabilitators holding state and/or federal  
406 permits.  
407

408 (C) A person shall be deemed to have purposely fed or caused the wildlife listed in (A) and  
409 (B) above to be fed if:  
410

411 (1) A person places edible matter on the ground or any place less than six feet off  
412 the ground that is not intended for domestic livestock.  
413

414 (2) The distribution of edible matter is through a commercially sold automatic  
415 feeder.  
416

417 (3) The edible matter is in an area that is neither in an enclosed building nor in an  
418 area that is not fully enclosed by a fence or other enclosure sufficient to keep out  
419 wild animals and without a closed receptacle reasonably sufficient to keep wild  
420 animals from eating the edible matter.  
421

422 (B) The presence of edible matter on the ground or any place less than six feet off the  
423 ground that is not intended for domestic livestock is hereby declared to be a nuisance if  
424 the edible matter is;

- 425  
426 (1) Outside an enclosed building, fence or other enclosure sufficient to keep out  
427 wild deer; and/or;  
428 (2) Not enclosed in a receptacle reasonably sufficient to keep wild deer from eating  
429 the edible matter.

430  
431 (E) No person shall permit, allow or suffer the presence of edible matter that constitutes a  
432 nuisance on land owned, leased, occupied or controlled by the person.

433  
434 (F) The prohibition of this section shall not apply to any peace officer or other agent of the  
435 city acting in conformance with an animal control program.

436  
437 No person shall purposely feed wild deer, cause wild deer to be fed or provide food or edible  
438 matter to wild deer through a ground feeding station, salt lick or other means to feed wild deer  
439 in the City on any public or private land.

440 The term edible matter is defined as any wheat, pelleted livestock food, corn in any form, fruit  
441 vegetables, hay alfalfa human food scraps, any form of commercially sold wildlife feed,  
442 birdseed or livestock feed, or any other edible matter.

443 This ordinance shall be enforced to prevent the feeding of deer and other wildlife. The City  
444 endeavors to attract the deer to areas deeper in the green spaces and conservation areas to  
445 avoid human-wildlife conflicts.

#### 446 **PUBLIC EDUCATION AND DAMAGE PREVENTION**

447 Public education is key to all aspects of wildlife management. Educating residents on the  
448 dangers of feeding wildlife, especially corn, should be the first part of any deer education  
449 program. Next, educating residents on deer resistant plants for landscaping will help lower the  
450 likelihood of this type of damage. A variety of repellents and scare devices are available to  
451 deter deer from entering into areas. Repellents work best in small areas such as gardens or  
452 landscape plantings. Repellents come in two categories: those that repel by taste and those  
453 that repel by odor. Repellents should be applied at the first sign of damage. The effectiveness  
454 of repellents depend on the number of deer, feeding habits and environmental conditions.

455 Scare devices such as lights, whistles, and air horns have been effective at keeping deer from  
456 certain areas. However, in suburban and urban areas their use may be violations of noise

457 ordinances and disturb nearby neighbors. Deer also habituate to scare devices in a short  
458 amount of time.

459 Sunset Valley has installed wildlife reflectors along Brodie Lane and Ernest Robles Way to deter  
460 wildlife from entering traffic when cars are present. At night when a car comes near these  
461 reflectors, light is reflected into the open spaces. When deer see this light they are startled and  
462 stop before entering the roadway. These have reduced the number of deer killed along the  
463 roadways. If another area in town begin to have an increased number of automobile related  
464 deer mortalities, these streets should be considered for installation of wildlife reflectors.

#### 465 **POPULATION MANAGEMENT**

466 Habitat carrying capacity and climatic stress may reduce deer populations. However with  
467 limited hunting ability in urban areas it may become necessary for the City to reduce deer  
468 populations to sustainable levels. There are a variety of ideas of how to accomplish this goal.  
469 Trap, transport, and release techniques have been used in some parts of Texas and are popular  
470 with the public. There are several problems with this method. Given the widespread  
471 population of WTD there are few places with excess carrying capacity to take deer. Although  
472 trap and release is publicly popular the reality is that the survivability of translocated deer is  
473 often very low (DeNicola et al., 2000). Muscle tissue degeneration, muscle stiffness, lack of  
474 coordination, paralysis and death due to the stress of capture and handling may occur up to 26  
475 days after capture (Beringer et al., 1996). Mortality in translocated deer, also known as capture  
476 myopathy, is very high. Translocated deer have a mortality rate upwards of 49% (Beringer et  
477 al., 2004, Beringer et al., 2002; Beringer et al., 1996; Bishop et al., 1999; Cromwell et al., 1999;  
478 Hawkins and Montgomery, 1969).

479 Trap and euthanize has been the method used by the City in the past. This method uses baited  
480 traps and drop nets to capture WTD, which are then euthanized with a firearm. Trap and kill  
481 methods are considered to be less humane than recreational hunting or sharpshooting. This is  
482 due to the stress the deer is under prior to euthanization. However, given the urbanized nature  
483 of Sunset Valley, hunting and to some degree sharpshooting may not be as desirable.

484 Population estimates for the deer of Sunset Valley have estimated between 40 to 60 deer in the  
485 area in the last few years. In comparison in 2000, it was estimated that there were nearly 165  
486 deer in the area. Limited trapping was completed in the early 2000's to reduce the number of  
487 deer in the area. Increased urbanization of the southwest Austin area may have contributed to  
488 the population reduction. Also, Sunset Valley has a healthy coyote population. Although  
489 coyotes generally do not take down adult deer, they can kill fawns. It is possible that this has  
490 reduced recruitment of new members to the population.



491 If the deer population increases above the carrying capacity, evidenced by browse lines in the  
492 nature areas and increased population estimates, population reduction measures may become  
493 necessary. If this becomes necessary the information will be presented to the public at a City  
494 Council meeting. At that time staff will receive proper permitting from the TPWD. It is highly  
495 encouraged that the City works with local meat processors and organizations such as Hunters  
496 for the Hungry, Caritas of Austin, and the Capital Area Food Bank to distribute venison resulting  
497 from any population reduction management activity.

498 **CHRONIC WASTING DISEASE**

499 Chronic Wasting Disease (CWD) is a fatal, transmittable neurological disease effecting members  
500 of the deer family. This disease was first recognized in a captive deer population in Colorado in  
501 1967. Since then it has been documented in 21 states in free ranging deer.

502 Chronic Wasting Disease is transmissible spongiform encephalopathy or prion disease. Various  
503 prion diseases exist including Creutzfeldt-Jakob disease in humans. Prions are misfolded  
504 proteins that attack the nervous system. Symptoms include emaciation, excessive salivation,  
505 thirst, and urination. Many of these symptoms can be caused by other diseases or conditions.  
506 Definitive diagnosis is only made through post-mortem laboratory testing.

507 Chronic Wasting Disease causes significant decline in deer populations. Eradication of  
508 established CWD in a population is nearly impossible. The best approach is disease prevention.  
509 Managing for CWD will consist of monitoring the deer population on an annual basis to  
510 determine population health. Residents will be encouraged to report animals that appear  
511 unhealthy for additional surveillance efforts. Public education will also be included as part of  
512 this plan. Public education includes providing information on CWD including what symptoms to  
513 look for and to not eat meat from suspect animals. In addition the public will be apprised of  
514 deer population health and if the disease is found within Travis County.

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## **GOLDEN CHEEKED WARBLER MANAGEMENT**

523 Sunset Valley is home to the endangered Golden Cheeked Warbler (GCWA). In 1990 the GCWA  
524 was listed a federally endangered species due to habitat loss (USFWS, 1992). In 2014, Sunset  
525 Valley joined the City of Austin, Travis County, and the Lower Colorado River Authority in a  
526 Managing Partner Agreement to join the Balcones Canyonlands Conservation Plan in the  
527 regional protection of the GCWA. All management activities in regards to the GCWA must  
528 conform to the approved Land Management Plan (LMP) for the Gaines Greenbelt.

### **SPECIES DESCRIPTION**

530 Adult Golden-cheeked warblers reach a length of 4.5 inches. GCWA's are small songbirds with  
531 a yellow face, a white belly, and a black throat. The warbler was named for the distinctive  
532 radiant yellow cheeks. Females look similar to males although their plumage is duller. GCWA  
533 only nest in the central Texas area within Ashe Juniper-Oak woodlands. Warblers eat spiders  
534 and insects found among the hardwoods.

535 Male GCWA arrive in Texas in early March, a few days before young males and females. Males  
536 mark territories and begin vocalizing in preparation of the females arrival. The female builds a  
537 small compact nest made of Ashe Juniper bark bound together with grass and spider webs.  
538 Females generally place their nests in the upper two-thirds portion of the trees. Females lay 3-  
539 4 eggs and incubate them for twelve days. Hatchlings are fed by both the male and female.  
540 Fledging occurs after about nine days. The fledglings remain with their parents for about four  
541 weeks. By mid-July the young are ready for the journey south.

### **HABITAT DESCRIPTION**

543 GCWA occur on upland plateaus, gently sloping hills, and steep canyon slopes. GCWA occupy a  
544 variety of topographical niches. GCWA habitat is found on the shallow limestone soils of the  
545 Edwards Plateau. The vegetation structure of GCWA habitat is a mix of mature Ashe Juniper  
546 (*Juniperus asheii*) and broad-leaved hardwoods (Campbell, 2003). Tree canopy must be  
547 generally greater than 50%. However, some areas with 35-50% are used at times by GCWAs.  
548 The vegetative structure must contain both low (less than 5m) and high (above 5m) foraging  
549 substrates. In general, GCWAs forage and display in Plateau Love Oaks (*Quercus fusiformis*),  
550 Shin Oak (*Quercus sinuata*), and Cedar Elms (*Ulmus crassifolia*) more frequently. In Sunset  
551 Valley, GCWA habitat exists only in the Gaines Greenbelt. This is the City's only open space  
552 north of Highway 290.

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555 **THREATS**

556 The main threats to GCWAs are habitat loss and habitat fragmentation. Habitat fragmentation  
557 results in an increase in edge to area ratio, which in turn can lead to increased rates of  
558 predation, cowbird parasitism, noise and light pollution and a decrease in prey abundance  
559 (USFWS 1992; Campbell, 1995; USFWS 1996). Red imported fire ants (*Solenopsis invicta*) which  
560 are more common in disturbed areas, are known to prey on GCWA nestlings (Reidy et al.,  
561 2008). Increased populations of blue jays (*Cyanocitta cristata*) and brown-headed cowbirds  
562 (*Molothrus ater*) which are common in urban and agricultural areas, may also cause increased  
563 mortality, parasitism, and stress, compared to areas less impacted by humans (Stake et al.,  
564 2004). Brood parasitism occurs when one species lays eggs in another species nest and the  
565 host species raises the young. Over-browsing by deer has impacted recruitment of hardwood  
566 seedlings. The loss of hardwoods has led to habitat degradation. Oak species are also  
567 susceptible to oak wilt. Human disturbance has also been shown to have effects on the  
568 foraging and nesting behavior of GCWAs, especially through increased habitat fragmentation  
569 and increased edge effects (Davis et al., 2010; Reidy et al., 2004)

570 **MANAGEMENT PROGRAM**

571 The Gaines Greenbelt is a small portion of a much larger preserve system. The goals of Sunset  
572 Valley's management program is to preserve the habitat within the Gaines Greenbelt.  
573 Management goals reflect compliance with the BCCP Permit and associated documents,  
574 including the Land Management Plan standards of practice. Primarily, the Gaines Greenbelt will  
575 be managed to:

- 576 • benefit GCWA occupation and productivity during the breeding season,
- 577 • preserve and recover native diverse oak-juniper woodland,
- 578 • promote and contribute to a sustainable and diverse native ecosystem, and

579 **Natural Resource Surveys and Monitoring**

580 Surveys and monitoring are intended to provide better information for conservation and  
581 management decisions.

582 **Golden Cheeked Warbler**

583 To track any change(s) to the baseline condition of GCWA territories partially or wholly  
584 occupying the tract, a federally permitted biologist will conduct territory-level mapping every  
585 two years using the same protocols that other BCP land managers are using. Other local  
586 organizations may be involved in the survey and monitoring effort, as long as they are or are  
587 with a federally permitted biologist.

588 Vegetation

589 Permanent photo points will be established and documented for annual use to monitor visitor  
590 impacts, changes in plant communities, help map invasive species issues, determine effects of  
591 management and restoration, and revise management approach as needed to meet goals. No  
592 specified number of points is required. Points should be positioned to be repeated annually and  
593 sufficient to represent trail management and restoration needs (e.g. places where trails impact  
594 habitat quality and/or highest erosion potential over time), rare species' habitat condition, and  
595 boundary issues. Each point will be documented in the following framework and the collection  
596 will be reported as baseline and updates in the Annual Report:

597 Oak Wilt

598 Sunset Valley will coordinate with the City of Austin for oak wilt surveys (City of Austin flies  
599 every two years for monitoring oak wilt centers). Oak wilt areas will be mapped. If detected,  
600 treatment and/or containment options will be discussed with BCCP land managing partners.  
601 Treatment plans which include mechanical removal or trimming will also include debris removal  
602 from the preserve as a wildfire prevention measure.

603 **INVASIVE SPECIES CONTROL**

604 Non-native vegetation focal areas will be mapped within the first two years of this LMP. A  
605 treatment plan will be developed and included in this document, based on highest priority,  
606 highest risk, standards of practice that protect/not adversely impact the surrounding  
607 environment; means and methods will be included in the treatment plan (e.g. mechanical or  
608 chemical means, depending on the site type within the parcel). Treatment plans which include  
609 mechanical removal or trimming will also include debris removal from the preserve as a wildfire  
610 prevention measure.

611 Red imported fire ants will be controlled using BCCP accepted practices for preserve areas with  
612 karst potential as needed, using the BCP Tier II Karst Management Plan as a guide. No chemical  
613 means will be used within surface drainage zones of karst features.

614 Patrol and outreach events will make an effort to document colonies of Tawny Crazy Ant  
615 (*Nylanderia fulva*) and Sunset Valley will coordinate with BCP Land Managers to determine if a  
616 course of action is needed and how best to address the issue.

617 Brush Control

618 The land management practice in Texas to reduce juniper cover and enhance savannah and  
619 mosaic (grassland - oak motte) vegetation communities (colloquially, "brush control") is not an  
620 acceptable practice on sites suitable for, occupied by, and managed for GCWA. No largescale  
621 vegetation management will be practiced on this site unless a restoration plan is submitted to

622 and approved by the BCP Land Managers. Restoration plans which include mechanical removal  
623 or trimming will also include debris removal from the preserve as a wildfire prevention  
624 measure.

625 **Wildlife Management in Regards to GCWA**

626 The Gaines Greenbelt should provide habitat for a diverse variety of wildlife. Browsing  
627 ungulates (e.g. white-tailed deer, non-natives like axis or blackbuck), if not managed at or  
628 below carrying capacity, can cause a significant amount of habitat damage by feeding on tender  
629 new hardwood shoots. Hardwoods are a significant component of GCWA habitat and  
630 regeneration is a concern in this area.

631 Surveys will be conducted in conjunction with TPWD biologists' recommendations to establish  
632 whether deer control is needed and feasible to implement.

633 If needed, targeted outreach to Preserve-adjacent neighbors and general outreach during  
634 regular programs will be implemented to reduce and deter deer feeding. Outreach programs  
635 will be companion efforts to the existing Sunset Valley "no feeding" ordinance.

636 Feral hogs decrease native vegetation abundance, diversity, and resiliency; create pathways for  
637 non-native invasive species (e.g. vegetation, fire ants); and severely degrade water resources  
638 (creekways and springs). Hog control is paramount when hogs are detected. BCP Land  
639 Managers can provide recommendation for feral hog trapping and control methods if feral hog  
640 damage is detected.

641 **Outreach and Education**

642 Sunset Valley has an active Conservation Rangers program and regular community outreach  
643 related to natural resources conservation and management. BCCP and BCP information  
644 provided by existing Travis County and City of Austin preserve outreach programs can be  
645 incorporated into Sunset Valley programs, providing additional opportunities and new habitats  
646 for constituents and volunteers to engage.

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## RED IMPORTED FIRE ANT MANAGEMENT

### 654 **BACKGROUND**

655 Indigenous to the floodplain of northern Argentina, southern Brazil and Paraguay, the Red  
656 Imported Fire Ant (*Solenopsis invicta*) is a damaging pest in the United States. The Red  
657 Imported Fire Ant (RIFA) is a highly invasive species that was introduced in the 1930's near  
658 Mobile, Alabama (Davis et al., 1994). The spread of RIFA can be contributed to the movement  
659 of infested sod and nursery stock from around the country. In 1958, The U.S. Department of  
660 Agriculture enacted Federal Quarantine 301.81 that regulated the movement of items  
661 containing soil and hay into uninfected areas (USDA, 2013). The RIFA was first recorded in  
662 Texas in 1956. It is estimated that RIFA will inhabit nearly one quarter of the United States  
663 wherever the average minimum temperatures are greater than 10 degrees Fahrenheit (Allen et  
664 al, 1995). These small insects pose a threat to people, small animals and endangered species  
665 within Sunset Valley.

666 RIFA presents several problems. They can eliminate native ant species with data indicating  
667 that overall ant diversity has decreased in areas where RIFA are present (Porter et al., 1988).  
668 RIFA are omnivorous and feed on both plant and animal material. RIFA feed on other  
669 arthropods and have been recorded attacking lizards, turtles, snakes, young mammals such as  
670 fawns, and eggs and young of birds (Allen et al, 2004; Morisawa 2000; Morris and Steigman,  
671 1993; Porter and Savignano, 1990). RIFA may also invade caves and can impact cave fauna  
672 including predation of endangered cave fauna.

### 673 **SPECIES DESCRIPTION**

674 The RIFA is a small reddish brown ant, with workers of many sizes (polymorphic) between 2.4-  
675 6mm. Worker ants are wingless, sterile females. These ants protect the nest, feed and defend  
676 the queen. They also forage and care for the developing brood. The winged, reproductive ants  
677 live in the mounds until their mating flights usually in the spring and fall. Males die soon after  
678 mating, while the queen finds a suitable nesting site. The queen will lay approximately a dozen  
679 eggs which hatch within ten days. As the workers begin to feed the queen, she can lay up to  
680 800 eggs per day. Larvae develop and then pupate within ten days. Adults will emerge within  
681 fifteen days. The average RIFA colony contains between 100,000-500,000 worker ants.

682 There are two types of RIFA colonies: single queen (monogyne) and multiple queens (polygyne).  
683 In single queen colonies worker ants are very territorial. Multiple queen colonies have worker  
684 ants that travel between mounds. The travel between colonies increases the numbers of  
685 mounds found within any given area. For example, areas infested with single queen colonies  
686 have 40-150 mounds per acre. In comparison, multiple queen colonies can have more than 200  
687 mounds per acre (Texas Imported Fire Ant Research and Management Project, 2014). Fifty

688 percent of RIFA colonies in Texas are of the polygyne type (Allen et al., 1994). RIFA are highly  
689 aggressive and inject necrotizing venom when they sting. Workers live about five weeks, while  
690 queens can live more than seven years.

691  
692 **COLONY ESTABLISHMENT AND BEHAVIOR**

693 RIFA spread by one of the following methods:

- 694 1. Transport of colonies or mated queens in items that contain soil such as nursery stock  
695 and sod and soil used for construction purposes.
- 696 2. Mating flights of queens that are blown by strong winds into new areas.
- 697 3. Queens are transported to new areas in trucks, cars, and trains.
- 698 4. Floodwaters move ants to new locations.

699 Once mated, queens will find a suitable site and dig a small burrow. Queens are most  
700 vulnerable at this time. It is estimated that 90-99% of mated queens are killed during their  
701 mating flight or the early colony establishment. The queens will lay their eggs within a day and  
702 within six months colonies of several thousand ants will be found at the surface.

703 RIFA construct mounds that have conical domes with rain resistant crusts. Mounds are  
704 approximately 16 inches in diameter and 10 inches high. In heavy soils mounds may be larger.  
705 Mounds are more active at the surface in cooler, rainy weather. Below the mound is a hive of  
706 activity and intricate tunnel system. Chambers and tunnels below the mound may extend to  
707 depths of five feet. The tunnels branch and open at the surface to allow workers to forage.

708 RIFA are territorial and will defend their mounds from intruders. Disturbances to the mounds  
709 results in the workers rushing out and attacking anything that moves. Worker ants are sensitive  
710 to vibrations and release pheromones that signal other workers to attack. During the  
711 disturbance worker ants will move the queen to deeper parts of the colony. As long as the  
712 queen and a few workers survive the colony will survive and rebuild.

713 RIFA cannot regulate mound temperature and humidity. As the day heats up larvae and queens  
714 move deeper into the mounds. During periods of drought and high heat RIFA may remain deep  
715 underground. If water invades a mound workers will create a raft to safely move the queen,  
716 larvae and eggs to a new location.

717 **MONITORING**

718 Monitoring of RIFA can be done using baited sampling stations. These stations can provide data  
719 on species abundance and diversity in a relatively short time. This data will help determine  
720 management options and protect native ant populations.

721 **MANAGEMENT**

722 There are many methods of control available. Since half of the RIFA colonies in the area are  
723 polygynic there are additional management challenges to consider. In colonies with multiple  
724 queens, all the queens must be killed to eliminate the colony. The following methods have  
725 proven successful in managing RIFA.

726 **CHEMICAL CONTROL**

727 Baits are generally formulated using slow-acting poisons that control mounds within weeks  
728 (abamectin, spinosad, amindinohydrazone, etc). The baits may also use chemicals that impede  
729 worker ants and cause the colony to starve within months (fenoxycarb, pyriproxyfen,  
730 methoprene, etc). Sunset Valley has used Ascend (abamectin), Award (fenoxycarb), and various  
731 spinosad formulations in the past. Sunset Valley also encourages residents to treat RIFA as a  
732 community on their annual Fire Ant Control Day.

733 Baits are typically used for individual mound treatments or broadcasted over a larger area.  
734 There are some drawbacks to broadcast applications in that some colonies don't receive bait,  
735 the bait photochemically degrades, or the bait is not specific to RIFA. Hormone based  
736 formulations of bait are most effective using a fall application. In lightly infected areas it is best  
737 to use ant bait as a mound treatment. In areas with high infestations a mound treatment and  
738 broadcast treatment can be used.

739 Pesticide impacts on non target species should be considered. Native ants slow the invasion of  
740 RIFA and can kill new queens. Harvester ants can be protected from pesticide applications by  
741 applying ice to the mounds to keep them inactive 24 hours after bait application. Efforts must  
742 be made to reduce and contain the use of pesticides. Within 75 feet of known karst features,  
743 once it is determined that RIFA are present the following guidelines shall be followed:

- 744 1. Baits shall be placed in the morning.
- 745 2. Baits will be at least 15m from the cave or sinkhole entrance
- 746 3. Granular pesticides will be placed in small plastic containers with mesh covers. This  
747 allows RIFA to enter but not larger invertebrates.
- 748 4. Locations will be marked with wire flags such as used for irrigation markings.
- 749 5. Each evening the bait stations will be removed as well as dirt around the container that  
750 noticeably has fire ant bait.
- 751 6. These steps will allow the removal of all bait before cave crickets or other invertebrates  
752 emerge from the cave or sinkhole area.

753 The following areas will be regularly treated with fire ant bait:



- 754 • Valley Creek Park
- 755 • City Hall Complex at 3205 Jones Road
- 756 • 1 Sunset Trail
- 757 • 10 Sunset Trail
- 758 • 5012 Westgate Blvd.
- 759 • Villas Greenspaces
- 760 • 37 Lone Oak
- 761 • Crystal Mountain seating area.
- 762 • Homestead Hill
- 763 • Along all trails and within 2 meters either side of the trails. This includes all granite
- 764 gravel trails, as well as, nature and conservation area trails.

765 **BOILING WATER METHOD**

766 Boiling water has proven to be an effective form of fire ant control for individual mounds. It is  
767 especially useful near karst features, as it should have no negative impacts on other cave  
768 invertebrates. This method utilizes a portable high-intensity propane stove that will heat the  
769 water applied to individual mounds. For ant colonies within 15 m of known karst features this  
770 is the preferred method of control.

771 The following areas will be treated with boiling water methods to control RIFA:

- 772 1. Within 15m of all known karst features owned by the City of Sunset Valley.

773 Further, residents with known karst features may request assistance from the City to initiate  
774 this method of treatment in these areas on their property.

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## **FERAL ANIMAL MANAGEMENT**

### **785 FERAL DOGS AND CATS**

786 Feral domesticated animals, in particular dogs and cats, can have a negative impact on the  
787 environment. Feral cats have been shown to significantly impact native populations of reptiles,  
788 small mammals, and birds (Winter and Wallace, 2006; Dickman, 2009). With the exception of  
789 habitat loss, cats have been involved in the extinction of more bird species than any other  
790 cause (Coleman, et al., 1997). Feral dogs may form packs and pose a safety threat to wildlife as  
791 well as people. Feral dogs may also carry diseases that are transmittable to wildlife such as  
792 distemper, rabies, and parvovirus (Sime, 1999).

### **793 MONITORING AND MANAGEMENT**

794 City staff will monitor green spaces and conservation areas for feral cats and dogs. Staff will  
795 use live traps to capture these animals. Efforts will be made to locate owners using the Sunset  
796 Valley pet registration list. If no owner can be determined, the animals will be taken to the  
797 appropriate humane care facility. If cats are found with a tip of their ear missing, residents  
798 who participate in trap, neuter, and return (TNR) will be notified to determine if the animal in  
799 question is under their care.

### **800 EDUCATION AND OUTREACH**

801 Public education will be provided to residents to encourage responsible pet care. In regards to  
802 domesticated pets outreach efforts will be done in conjunction with assistance from the Austin-  
803 Humane Society, and the Austin Animal Center. Public education and outreach information will  
804 include:

- 805 • Dangers to wildlife from feral dogs and cats.
- 806 • Dangers to pets that are dumped and left in wild environments.
- 807 • Dangers to free-roaming cats from coyotes.

### **808 FERAL HOGS**

809 Feral hogs (*Sus scrofa*) include European wild hog (Russian boar), escaped domestic hogs and  
810 European-domestic crossbreeds. Feral hogs have been found throughout the southeastern  
811 United States in 19 states include Texas. It is estimated that there are two million feral hogs in  
812 Texas alone (Mapston, 2004). Feral hogs create ecological problems and significant financial  
813 damage. Although not currently found in Sunset Valley they have been located in nearby areas.

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815 **SPECIES INFORMATION**

816 Feral hogs are members of the Suidae family and native to Europe and Asia. Domesticated over  
817 9000 years ago, early Texas explorers brought hogs to Texas as livestock. Over time, escaped  
818 hogs became feral. In the 1950's European wild hogs were released for sport hunting. These  
819 hogs began to interbreed with feral animals. Today, domestic and wild traits can be observed  
820 in feral hog populations.

821 Feral hogs have a shoulder height of approximately 36 inches and weigh between 100 to more  
822 than 400 pounds once mature. Males are larger than females. Feral hogs have poor eyesight  
823 but a good sense of smell and hearing. Feral hogs may breed before they are a year old.  
824 Gestation lasts 115 days with a litter of four to six. There are usually two litters a year. With this  
825 many hogs born each year, populations can expand rapidly. Hogs travel in family groups of two  
826 sows and their young. Boars are more solitary and only join the herd in order to mate  
827 (Mapston, 2004)

828 Home ranges for feral hogs range between 320 to 12,160 acres (Mapston, 2004; Taylor 2003).  
829 Mortality is greatest among the young with life expectancy between four to five years. Disease,  
830 parasite, tooth deterioration and hunting are main causes of mortality. Predation by coyotes  
831 and bobcats does not significantly affect feral hog populations (Mapston, 2004). Hogs are  
832 omnivorous and feed on small mammals, invertebrates, birds, amphibians, reptiles, vegetation  
833 and even carrion (Adkins and Harveson, 2006; Taylor, 1997).

834 **FERAL HOG DAMAGE**

835 Feral hogs can destroy fences, tearing down wiring and fence posts. Hogs compete with native  
836 wildlife for food, water, and space. Feral hogs can prey on newborn livestock and destroy  
837 gardens. Feral hogs are also known to carry diseases and parasites transmittable to livestock  
838 and humans (Simmons et al., 2011). Feral hogs prefer riparian areas where they increase soil  
839 erosion and create shifts in plant succession (Mapston, 2004). Hogs also destroy crops and  
840 greatly affect the agricultural industry (Texas Cooperative Extension, 2002)

841 **MONITORING**

842 Although not currently found in Sunset Valley it is important to monitor for potential  
843 introduction of feral hogs to the area. Feral hogs have been found in nearby communities and  
844 it is prudent to plan for the possibility they may reach Sunset Valley. Feral hogs are nocturnal  
845 and their presence is generally detected by the damage they leave. Signs such as wallows,  
846 rooting, and rubs along trees and fences. Hog tracks are more rounded and have a greater  
847 width to length ratio than WTD. Scat looks different than deer or predator droppings, most  
848 similar to a young cow (Mapston, 2004).

849 **MANAGEMENT**

850 Feral hogs are classified as non-game animals and are unprotected by the TPWD. This means  
851 that they can be taken by legal means at any time, with no size or bag limits. According to Parks  
852 and Wildlife Code, a resident landowner, or the owner’s agent, or lessee may take feral hogs  
853 causing depredation on the resident’s landowners land without a hunting license. The Texas  
854 Animal Health Commission controls the transport of feral hogs in order to reduce the spread of  
855 infectious diseases. Cage traps and pens can be used to capture feral hogs. Baits include fruit,  
856 vegetables, carrion, fermented corn or grain, livestock pellets. Hogs can quickly become “trap  
857 shy” so traps must be moved to different locations.

858 Feral hogs can be a very damaging species within an area. If feral hogs are found to be within  
859 Sunset Valley the following guidelines will be followed:

- 860 1. Public notice will be provided through mailings to all residents providing education  
861 information.
- 862 2. City Council will be briefed on feral hog activity.
- 863 3. With Council approval, staff will acquire a contractor to trap and kill feral hogs.
- 864 4. Green spaces and conservation areas used for trapping will be closed to public access.
- 865 5. Captured feral hogs will be euthanized in the most humane way possible. The feral hogs  
866 will then be sent for processing at the discretion of the contractor.

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## MOSQUITO MANAGEMENT

879 Mosquito control activities are important to protect public health. Mosquitoes are vectors for  
880 various arboviruses. Arbovirus is an acronym for Arthropod-borne viruses. Mosquitoes are  
881 vectors of dengue and yellow fever, chikungunya, various types of encephalitis including  
882 eastern and western encephalitis, St. Louis encephalitis, and California encephalitis. West Nile  
883 Virus is also carried by mosquitoes. Mosquitoes also transmit heartworms.

### 884 **SPECIES DESCRIPTION**

885 There are more than 2500 species of mosquitoes around the world, and over 165 species are  
886 found in the United States. In Texas at least 84 species of mosquito are found with 8-12  
887 implicated in disease transmission (Steil and Marshall, Little Elm). In general mosquitoes need  
888 still, stagnant water away from predators such as fish to complete metamorphosis. Larval  
889 habitats can range from wetlands to human-made structures such as gutters and discarded  
890 tires. Not all mosquitoes feed on humans, some feed mostly on birds, reptiles and amphibians.

### 891 **BREEDING CYCLES**

892 There are four stages to a mosquito's life cycle: egg, larva, pupa and adult. Mosquitoes require  
893 water to breed and spend their larval and pupal stages in water. Flood-water mosquitoes such  
894 as *Psorophora*, *Ochlerotatus*, and *Aedes* lay in eggs in places where water collects. These eggs  
895 can remain in dry conditions for several months. When heavy rains come and water levels rise,  
896 the eggs can hatch in a few days. This produces swarms of aggressive, hungry mosquitoes.  
897 Another wave of mosquitoes hatch within 10 to 14 days after the rain stops. Other mosquitoes  
898 such as those in the *Culex* genus, lay eggs in the standing water left by heavy rains. The time it  
899 takes a mosquito to complete its life cycle depends on the species, however in general eggs  
900 hatch within 48 hours.

### 901 **MANAGEMENT**

902 The mosquito management program for the City of Sunset Valley has several objectives. The  
903 objectives of the plan are as follows:

- 904 1. Surveillance of Mosquito Populations for Arbovirus
- 905 2. Public Education and Outreach
  - 906 a. Stress source reduction on residential and municipal properties.
  - 907 b. Promote the use of personal mosquito protection.
  - 908 c. Provide information on West Nile virus.
- 909 3. Using larvicide where practical, feasible, and likely to be effective.

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913 Surveillance of Mosquito Populations

914 Using gravid and other types of mosquito traps the City will capture mosquitos and have them  
915 sent to the Texas Department of State Health Services for testing. The laboratory tests for the  
916 presence of arboviruses. This will be done twice a month between May and November. If  
917 arbovirus is detected the City will increase public education efforts and look for pockets of  
918 standing water to treat with larvicide. The City will work with the Health Service Region and  
919 Zoonosis Control Team with the Department of State Health Services to determine if additional  
920 action is needed.

921 Public Education and Outreach

922 Public education is a key component for successful mosquito management. Helping residents  
923 understand that they should eliminate anything that can hold water for more than 2-3 days will  
924 reduce mosquito breeding locations. Removing buckets, tires, cleaning gutters, and dumping  
925 water from pet bowls can remove locations mosquitoes may be attracted to. The Southern  
926 House Mosquito, *Culex quinquefasciatus*, is a carrier of West Nile Virus. This species prefers to  
927 breed in artificial water sources such as buckets and tires, over wetland and marsh areas Banks,  
928 2014). Helping citizens understand mosquitoes' role in spreading diseases such as West Nile  
929 Virus, will make them aware of the dangers of these illnesses. This will also help them  
930 understand their role in protecting themselves against mosquitoes. This information will be  
931 sent in the monthly newsletter and a fact sheet that can be placed online and in print at City  
932 Hall.

933 Residential site assessments to determine locations for potential mosquito breeding grounds  
934 will be offered to residents upon requests. This program will help residents find sources for  
935 mosquito breeding and properly mitigate for any larvae present.

936 Larvicide

937 Larvicides are an effective way to provide mosquito control. Certain types of *Bacillus* bacteria  
938 have been used to develop mosquito larvicides. *Bacillus thuringiensis* (BTi) is a naturally  
939 occurring soil bacteria that is capable of killing mosquito larvae. BTi is commercially available in  
940 various forms to put into water sources to control mosquitoes. Once mosquito larvae ingest  
941 the pesticide, the stomach cells begin to burst and the mosquitoes are unable to eat and soon  
942 die.

943 The application of mosquito larvae control will be done during the time period when average  
944 evening temperatures are above 60 degrees F. The City will use larvicides, when practical in  
945 areas where there is standing water with confirmed mosquito larvae. Water quality ponds are  
946 designed to redistribute water within 72 hours. The water quality ponds will be monitored to

947 determine proper functioning. If ponds are not emptying within their allotted period  
948 appropriate action will be taken to remove the water source.

949 Since the mosquitoes that are carriers for West Nile Virus prefer artificial water sources it is  
950 most important that these sources are removed. A plan for surveillance and public education  
951 combined with use of larvicide in infested areas should help provide protection for the general  
952 public.

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## **COYOTE COEXISTENCE MANAGEMENT PROGRAM**

974 Although the City of Sunset Valley has a long history of environmental stewardship, some  
975 wildlife has  
976 the potential for conflict with humans. Coyotes (*Canis latrans*) and to some extent raccoons  
977 can be considered nuisances and have a higher potential for human-wildlife conflict.

### **COYOTE BIOLOGY**

979 Coyotes (*Canis latrans*) are one of the most adaptable animals in North America. As a member  
980 of the Dog (Canidae) family, they are close relatives of wolves, foxes, and domestic dogs.  
981 Coyotes are considered to be medium sized dogs ranging between 20 to 45 pounds. Coyotes  
982 are distinguished by their grayish brown coat with tinges of red and bushy tails. Unlike most  
983 dogs who have brown eyes coyotes have yellow eyes. In the dog family coyotes are one of its  
984 fastest members running up to 65km per hour (Vaught et al, 2000)

985 One of the reasons coyotes are so adaptable is that they are opportunistic omnivores. From  
986 fruits and insects, to rodents and rabbits coyotes will eat what is readily available (MacCracken,  
987 1982; Morey et al., 2007). In urban environments coyotes will adapt to things that are  
988 associated with humans, such as dog food, domesticated cats, and even garbage.

### **WHERE ARE COYOTES FOUND**

990 Unlike most carnivores whose range has decreased over time, coyotes have spread across  
991 North and Central America since European settlement (Berkoff, 2001). From the desert  
992 southwest to Canada, coyotes are found in almost every habitat. This adaptability has allowed  
993 coyotes to enter into the urban landscape successfully. Coyotes have been seen around Sunset  
994 Valley for years. Coyotes are commonly found in the City's green spaces and conservation  
995 areas.

### **RURAL vs. URBAN/SUBURBAN COYOTES**

997 Entering into the urban and suburban arena has created opportunities for interactions between  
998 humans and coyotes. Although coyotes generally avoid humans and human activity, they can  
999 successfully survive in a human dominated landscape. In these areas coyotes generally have  
1000 smaller home ranges, meaning the area in which an animal lives and travels (Grinder and  
1001 Krausman, 2001). Suburban and Urban areas generally have adequate food sources requiring  
1002 less movement. In more wild settings, coyotes are considered to exhibit peak activity is dusk  
1003 and dawn (Andelt and Mahan, 1980; Grinder and Krausman, 2001). In an effort to avoid  
1004 humans, coyotes in urban and suburban areas have become more nocturnal, more active  
1005 during the middle of the night.



1006 **COYOTES IN THE URBAN ECOSYSTEM**

1007 In urban and suburban areas coyotes are apex predators. There are no natural predators of  
1008 coyotes in these environments. As such coyotes may be considered a keystone species, an  
1009 animal that has a crucial role in the function of the ecosystem.

1010 **ARE COYOTES OVERPOPULATED?**

1011 The question of whether coyotes are overpopulated is often asked. There is not a good method  
1012 to estimate coyote populations. Camera survey techniques work well on wildlife that has  
1013 distinctive patterns or individual animals. For example, deer populations can be surveyed  
1014 because bucks look distinctive. Populations can be estimated from the number of individual  
1015 bucks in the area. Coyotes generally look similar making it difficult to tell one animal from  
1016 another. Tracking stations can also give presence absence data, but not population numbers.  
1017 Coyotes are capable of moving long distances and are good at avoiding people. Coyotes  
1018 generally have high mortality rates. Large numbers of coyotes die before they are a year old  
1019 due to a variety of factors. The number of coyotes is not necessarily the problem. The problem  
1020 occurs when coyotes lose their fear of people.

1021 **COYOTE BEHAVIOR**

1022 Coyotes are generally territorial animals; these animals are considered to be residential  
1023 coyotes. However, there are transient coyotes that cover large areas and do not defend  
1024 particular territories. Coyotes have been known to change from being residential to transient  
1025 and vice versa. Coyotes usually avoid people and many of their habits demonstrate this. In  
1026 several studies, coyotes showed preferences for natural areas in urban environments (Gehrt et  
1027 al, 2009). The change to being nocturnal is also an effort to avoid human interaction. Although  
1028 coyotes rarely interact with humans, there are times when coyotes begin to lose their wariness  
1029 of people. By and large this happens when people have created environments that encourage  
1030 coyotes to come into human dominated landscapes. By allowing coyotes to get close and  
1031 having food sources on properties, coyotes may begin to habituate to the presence of people.

1032 **COYOTE BEHAVIORAL SCORES**

1033 When coyotes begin to habituate to human behavior, researchers have developed a score that  
1034 demonstrates increased levels of aggression. The pattern of coyote behavior may show an  
1035 increased likelihood of aggression against people (Timm et al., 2004). This scale ranges from 0-  
1036 7, with zero representing a coyote calling at night and seven being aggression against an adult.  
1037 If behavioral reports go up the scale, this is an indicator that coyotes have begun to lose their  
1038 fear of humans and encounters are more likely to occur. When coyote behavior begins to go  
1039 above a four, hazing may no longer be as effective a tool. Hazing coyotes includes throwing

1040 items, making loud noises, and trying to scare the coyote away.

1041 **LIKELIHOOD OF INJURY OR DEATH FROM A COYOTE**

1042 Although coyotes are predators and wildlife can seem unpredictable, the likelihood of being  
1043 injured or killed by a coyote is extremely small (White and Gehrt et al., 2009). There have only  
1044 been two confirmed deaths due to coyotes nationwide and only one unprovoked attack in  
1045 Travis County. For perspective, 38 people were killed in 2012 alone by domesticated dogs and  
1046 4.5 million people are bit each year by domesticated dogs. Nearly 200 people die each year in  
1047 deer-related automobile accidents. Although the threat coyotes pose to people may be low,  
1048 dogs and cats are more likely to be killed as coyotes hunt for food and defend territories.

1049 **MANAGEMENT OPTIONS**

1050 The question of what to do when coyotes begin to lose their fear of humans is not easily  
1051 answered. There are a variety of options to manage coyotes but no single panacea. There are  
1052 two extremes to management: eradication and leaving wild areas strictly to wildlife. Neither of  
1053 these options will likely work for a variety of reasons.

1054 **COYOTE ERADICATION**

1055 Eradication is incredibly difficult and not cost-effective (Henke, 1995). Coyote populations  
1056 generally remain stable unless large numbers are removed. Historically, this was attempted for  
1057 a brief period of time in Central Texas. However, coyotes remain in these areas today. When  
1058 populations of coyotes are threatened, females may enter estrus at a younger age adding a  
1059 new generation of coyotes to the population. Eradication options also come with detrimental  
1060 side effects. As an apex predator, coyotes prey on a variety of smaller predators  
1061 (mesopredators) including raccoons, skunks, and rodents. When coyotes are removed these  
1062 mesopredators are no longer under threat of predation and can change the balance of the  
1063 ecosystem (Prugh et al, 2009). Prey populations could also be affected. Although coyotes will  
1064 generally not attack adult healthy deer, they will kill fawns. Coyotes also feed heavily on  
1065 rodents who may be disease vectors. Coyotes help keep these populations in balance  
1066 (Whitaker and Lindsey, 1999; Henke, 1995).

1067 **LEAVE WILD AREAS FOR WILDLIFE**

1068 Greenspaces are set aside as habitat for wildlife. However, coyotes are capable of covering  
1069 large distances. They will not strictly stay in open areas. Restricting human or domesticated  
1070 dog access to these areas will not necessarily change the behavior of coyotes that have  
1071 habituated to human presence.

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1073 **OTHER MANAGEMENT OPTIONS**

1074 There are several methods that have been demonstrated to work in managing coyotes. First is  
1075 aversive conditioning or hazing. This can be done in a variety of ways. When people encounter  
1076 coyotes they can throw things, yell, and scream. This can also be done on a larger scale with  
1077 groups of people going out to haze coyotes in a concerted effort to install a wariness of  
1078 humans. Some researchers believe that once coyotes have begun to habituate to human  
1079 behavior, hazing may only have a short term effect. If coyotes are just beginning to lose their  
1080 wariness, hazing is a very effective tool.

1081 In Southern California research demonstrates that the removal of a small number of coyotes  
1082 can effectively change the behavior of a population. In several locations, trapping and  
1083 euthanizing as few as two coyotes has stopped aggressive coyote behavior. These results are  
1084 regardless of whether a particular aggressive coyote was captured (R. Baker 2007; Timm et al,  
1085 2004, Timm and Baker, 1998). This small scale lethal control has been used in Travis County in  
1086 areas where coyotes appear to become more aggressive toward people.

1087 Finally, public education is the most important part of any management plan. Educating the  
1088 public on how to haze coyotes, to keep pets and their food indoors, and cleaning up yards to  
1089 remove areas coyotes can hide are all important tools to coexisting with coyotes.

1090 **COYOTE COEXISTENCE MANAGEMENT PLAN**

1091 Coyotes are an important part of the ecosystem; however they do have the potential for  
1092 conflicts with humans in specific situations. Since it is impossible and undesirable to completely  
1093 remove coyotes from the environment, the best practice to manage wildlife through a coyote  
1094 coexistence program. This program is a multi-faceted approach to balance respect and  
1095 protection of wildlife and their habitats with concerns regarding public safety. The program will  
1096 include the following:

- 1097 • Public Education and Outreach
- 1098     ○ Human Behavior Modification
- 1099 • Hazing Program
- 1100     ○ Coyote Behavior Modification
- 1101 • Response Plan for Wildlife Incidents

1102 **PUBLIC EDUCATION AND OUTREACH**

1103 Public Education and Outreach are key to helping residents and visitors within the City's  
1104 greenspaces to make responsible decisions near wildlife. Public education will focus on  
1105 providing residents with accurate information regarding wildlife and what they can do to

1106 reduce opportunities for conflicts. This will include decreasing wildlife attractants, safeguarding  
 1107 children and pets, and creating reasonable expectations of normal wildlife behavior. Table 1  
 1108 has a list of normal and inappropriate coyote behavior.

1109 Table : 1 Normal and Inappropriate Coyote Behavior

Normal Coyote Behavior	Inappropriate Coyote Behavior
Coyotes heard howling, yipping, or barking.	Coyote actively approaching a person, with no attractants as incentive.
Coyotes seen at a distance, resting or moving at dawn, dusk or at night.	Coyote stalking a person or pet under direct control of its owner.
Coyotes preying on small mammals such as rats, mice and domestic cats.	Coyote being aggressive toward a person, showing teeth, lunging or nipping.
Coyote entering a yard that is open, unfenced near, greenspaces, and/or has attractants such as pet food.	Coyote enters an area where humans and are pets are present and does not leave when hazed.
Coyotes crossing streets and sidewalks.	Coyote biting a person or pet on a leash.

1110

1111 Human behavior modification can have a major influence on wildlife behavior. Providing  
 1112 information to residents that allows them to make responsible choices to stop attracting  
 1113 coyotes into the human landscape will reduce human-wildlife conflicts.

1114 Public education and outreach will primarily include dissemination of information through the  
 1115 following:

- 1116 • Interpretive signs in parks, green spaces, and conservation areas.
- 1117 • Periodic newsletter articles.
- 1118 • Information bulletins at City Hall and on the website.
- 1119 • Mailings and/or door hangers when human-wildlife conflicts occur.
- 1120 • Public presentations as necessary.
- 1121 • Hazing training to volunteers.

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1123 **HAZING PROGRAM-COYOTE BEHAVIOR MODIFICATION**

1124 When urban wildlife becomes habituated to human presence, it may be necessary to modify  
 1125 the behavior of the animals. Hazing is a process that employs a use of deterrents to move an  
 1126 animal out of an area or to discourage inappropriate or undesirable behavior. Deterrents  
 1127 include noise-making tools such as whistles and horns, items such as spray bottles and bright  
 1128 lights, or simply yelling and throwing objects. Hazing helps to maintain animals’ fear of

1129 humans and discourages them from entering into more residential areas. Hazing should never  
1130 cause harm or injure an animal. If an animal is injured by hazing it may become more  
1131 aggressive and unpredictable. Hazing should not be used if an animal is trying to avoid humans  
1132 or is concealed at a distance in its natural habitat.

1133 It is not possible to remove coyotes from the urban ecosystem. Studies have shown that large  
1134 scale removal of coyotes from an area may invite transient coyotes to remain or increase  
1135 breeding within the existing population. Hazing is an essential part of the plan to create a safe  
1136 environment of coexistence and reduce conflicts between humans and coyotes.

### 1137 **GOALS OF THE HAZING TRAINING PROGRAM**

- 1138 1. To change coyote behavior in order to avoid human conflicts. Human behavior has a  
1139 strong influence on animal behavior. People living in areas where coyotes are present  
1140 can remove items that attract coyotes to their yards, identify dangerous situations, and  
1141 respond appropriately to wildlife interactions.
- 1142 2. To provide residents with educational material and tools to actively participate in  
1143 reshaping coyote behavior. This will help residents feel safe in their yards, as well as the  
1144 greenspace and conservation areas.
- 1145 3. To model hazing behavior and share information about coyotes and their behavior.
- 1146 4. To develop a long-term community-based hazing program to shape coyote behavior.

### 1147 **HAZING PROGRAM GUIDELINES**

- 1148 1. Levels of hazing need to target coyote activity appropriately.
  - 1149 a. Coyotes live within the green spaces and conservation areas. If coyotes are  
1150 demonstrating avoidance behavior, hazing is not necessary.
  - 1151 b. If coyotes are seen at night or near dusk or dawn, hazing may not be necessary.
  - 1152 c. Coyotes that do not demonstrate appropriate avoidance behavior in all  
1153 circumstances should be hazed.
- 1154 2. Hazing must be exaggerated, aggressive and consistent when first beginning a program.  
1155 As coyotes learn appropriate responses, it will take less to make them avoid humans.  
1156 Early in the process, it is common for coyotes not to respond to hazing techniques.  
1157 Without a history of hostility, they do not have the context to create the desired  
1158 outcome.
- 1159 3. Techniques and tools can be used in the same manner for one or multiple animals.  
1160 Usually there is a dominant animal in the group who will respond and the others will  
1161 follow. DO NOT ignore, turn away, or avoid hazing because there are multiple animals.
- 1162 4. The more often a coyote is hazed by a variety of tools, techniques, and people, the more  
1163 effective the hazing will be in changing the animal's behavior.

- 1164 5. Hazing must be associated with the person doing the actions. The coyote must be  
1165 aware of where the potential threat is coming from.
- 1166 6. Coyotes can and do recognize individual people and animals in their territory. They can  
1167 learn to avoid or harass specific individuals.
- 1168 7. Coyotes are creatures of habit. Identifying the habits can help target which behaviors to  
1169 change. For example if a coyote is reported in the same area at the same time several  
1170 days in a row, hazers can target their efforts to change the animal's future behavior.
- 1171 8. Regular hazing can insure that future generations of coyotes learn acceptable behavior.
- 1172 9. Once hazing begins it must continue until the animal leaves, otherwise the coyote will  
1173 wait until the person gives up and the coyote will be more resistant to additional hazing.
- 1174 10. Hazing uses a variety of tools for deterrent. This is critical as coyotes get used to  
1175 individual items and sounds.
- 1176 a. Noisemakers such as voice, whistles, air horns, shaker cans, pots, and pans.  
1177 b. Projectiles such as sticks, small rocks, tennis balls, rubber balls.  
1178 c. Other deterrents include hoses, spray bottles with vinegar, pepper spray, bear  
1179 repellant, walking sticks, pop up umbrellas.
- 1180 11. Human behavior must change to support hazing.
- 1181 12. Education about exclusion techniques, removing attractants, and personal  
1182 responsibility regarding pet safety are critical parts of a coyote hazing plan.
- 1183 13. Coyotes are skittish by nature. Habituated behavior is learned and reinforced by human  
1184 behavior. Coyotes as a rule DO NOT act aggressively toward aggressive people. The one  
1185 exception is if the coyote is sick or injured. In this case the animal's behavior may be  
1186 unpredictable. If a sick or injured animal is suspected the City should be contacted  
1187 immediately.
- 1188 14. Individuals involved in hazing need to be trained to explain hazing to residents who  
1189 witness the process. They also need to explain the difference between hazing and  
1190 harassment of wildlife and goals of appropriate behavior for coexistence.

1191 **HAZING TRAINING PROGRAM**

1192 Coexisting with wildlife requires a community approach. Hazing activities will need to be  
1193 conducted by City staff and trained volunteers. Without community support, the program will  
1194 not succeed and the likelihood of human-wildlife conflict will increase. The Hazing Training  
1195 Program will include information on coyote ecology, current research, and an overview of  
1196 hazing techniques. Volunteers will learn about the Coyote Coexistence Management Program,  
1197 normal and abnormal coyote behavior, and how to respond to questions in the community  
1198 regarding coyote management. Resident volunteers are the best equipped to respond  
1199 consistently and at the opportune times in their own neighborhoods, parks, and open spaces.

1200 The Hazing Training Program will empower residents to aid in changing coyote behavior in a  
1201 safe and consistent manner.

1202 Topics included in the Hazing Training Program will include:

- 1203 1. Coyote behavior and ecology.
- 1204 2. Why coyotes are in urban areas, specifically Sunset Valley.
- 1205 3. Normal and abnormal coyote behavior.
- 1206 4. Seasonal behavior changes, breeding, pup rearing, and denning behavior.
- 1207 5. Reality of danger toward people vs. pets
- 1208 6. Children and coyotes.
- 1209 7. How human behavior influences coyote behavior.
- 1210 8. Attractants.
- 1211 9. Tips on deterring animals from entering private property.
- 1212 10. Appropriate response when encountering a coyote.
- 1213 11. What is hazing, including goals, and how to engage.
- 1214 12. Appropriate hazing techniques
- 1215 13. Pet safety tips.
- 1216 14. Lethal control options.

1217 Volunteers shall send detailed accounts to City staff to help track hazing activities. This will  
1218 help the City determine what has been successful, techniques used and tools needed. The  
1219 accounts will include the following,

- 1220 1. Date, time, location, and number of animals hazed.
- 1221 2. Initial coyote behavior, hazing technique, and coyote response.

1222 Volunteers will also be notified of coyote hot spots and asked to haze in those areas. The  
1223 Hazing Training Program is essential to coyote co-existence.

1224 **RESPONSE PLAN FOR HUMAN-COYOTE CONFLICT**

1225 The following charts detail the response plan for various types of human-coyote conflicts.  
1226 These are the guidelines the City will follow in responding to conflicts. The Hazing Training  
1227 Program will be offered throughout the year regardless of the conflicts that occur.

1228 **SIGHTING/OBSERVATION**

Coyotes demonstrating normal coyote behavior.
1. The City will assess the situation and provide necessary training to the residents concerning interaction with wildlife.
2. The City will provide hazing training as requested.

1229

**ENCOUNTER**

Interaction between wild animals and people that negatively impacts people or their resources or pets, or wild animals and their habitat.
1. The City will assess the situation and provide necessary training to the residents concerning interaction with wildlife.
2. The City will provide hazing training as requested.

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**INCIDENT**

A conflict between a human and a coyote where the animal approaches a human and growls, bares, teeth, or lunges; or injures or kills pets under direct control (leash) of a pet, but no human injury occurs.
1. The Sunset Valley Police Department in cooperation with the Public Works and Environmental Services Department will investigate all aspects of the incident, determine possible causes, and enforce all applicable city regulations.
2. All residents within 500' of the incident will be notified.
3. Information will be placed on the Sunset Valley website and in the monthly newsletter.
4. The City will offer hazing training to all residents within 500' of the incident.
5. If there are more than two documented incidents within a six week period the City may consider lethal control to remove aggressive coyotes.

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**ATTACK**

An aggressive action by a coyote that results in physical contact and injury to a human.
1. The Sunset Valley Police Department in cooperation with the Public Works and Environmental Services Department will investigate all aspects of the attack, determine possible causes, and enforce all applicable city regulations.
2. Texas Parks and Wildlife Department and the Texas Department of State Health Services will be notified of the attack.
3. The City will mail all residents information regarding the attack and will provide educational material regarding wildlife.
4. If the attack occurred within the greenspaces and conservation areas, they may be closed until the investigation has been completed.
5. Depending on the circumstances of the attack, lethal control may be considered to remove aggressive coyotes. Any coyote euthanized will be tested for rabies.
6. The City will offer hazing training to all interested residents and neighboring residential areas.

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**COYOTE BEHAVIOR and RESPONSE CLASSIFICATION**

Coyote Behavior	Classification
Coyote heard howling, yipping, and/or barking.	Observation
Coyote seen moving in green spaces, conservation areas, and crossing streets at dawn, dusk, or at night.	Sighting
Coyote seen resting in green spaces or conservation areas.	Sighting
Coyote following or approaching a person and pet.	Sighting/Encounter
Coyote entering a yard without pets.	Sighting/Encounter
Coyote seen in residential or commercial areas during the middle of the day.	Encounter
Coyote entering a yard with pets.	Encounter
Coyote entering a yard and injuring or killing a pet (witnessed).	Encounter
Coyote entering a yard with people and pets, no injuries occurring.	Encounter
Coyote biting or injuring a pet in the green spaces and conservation areas while pet is not on leash.	Encounter/Incident
Coyote entering a yard and injuring or killing a pet with people present.	Incident
Coyote biting or injuring a pet on leash.	Incident
Coyote approaching a person without a pet.	Incident
Coyote demonstrating aggressive behavior such as baring teeth, lunging, or nipping and no injuries occur.	Incident
Coyote biting or injuring a person.	Attack

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These are samples of the types of conflicts that occur and their response classification.

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Depending on the circumstances of a human-wildlife conflict the City may change conflict

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classifications to fit the situation. The goal of the Coyote Coexistence Management Program is

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to reduce human-wildlife conflict to sighting, observations, and minimal encounters. However,

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if coyote behavior escalates to a point where there are an increasing number of incidents or an

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attack, the City may take appropriate action. The City has the responsibility to protect public

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safety. Neighboring cities, such as Westlake Hills, (pers. comm., R. Wood 2013) have had

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success in curbing aggressive behavior in coyote populations by small-scale lethal removal.

1247 Before this occurs, the City will make efforts to modify human and coyote behavior. The Hazing  
1248 Training Program is an essential part of the plan to create a safe environment and reduce  
1249 conflicts between humans and coyotes.

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