

Status of Fox and Coyote Hunting Enclosures in the Southeastern United States

Osborne E. Baker, South Carolina Department of Natural Resources, P.O. Box 167, Columbia, SC 29202

Abstract: As a result of declining hunting opportunities, many fox (*Urocyon cinereogargenteus* and *Vulpes vulpes*) and coyote (*Canis latrans*) hunters in the Southeast now practice their sport inside fenced enclosures of tracts of land commonly referred to as "fox pens." A mail survey in 1997 of each southeastern state's furbearer project was used to determine the status of fox and coyote hunting enclosures in the southeastern United States. Thirty-three questions were asked, 6 of which pertained to enclosure status, 14 to regulations, 3 to operations, 3 to health concerns, and 7 to state agency attitudes. The survey revealed that a minimum of 466 fox and coyote hunting enclosures were in operation in the Southeast. Only Maryland reported no enclosures. Respondents ranked concerns over public health implications and native wildlife health implications of enclosures highest. While numerous concerns were listed, each respondent recognized benefits of fox and coyote hunting enclosures. No respondents believed that the complete closure of these facilities was necessary.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 52:367-376

Fox hunting with hounds is a long-standing tradition in the southeastern United States. In colonial times, it was the preferred sport of the aristocracy, and fox and coyote hunting remains a traditional form of recreation in the Southeast today. However, opportunities to practice this sport have declined. Increasing human populations have resulted in the loss of quality fox habitat in blocks large enough to support the sport. The increase in the number of roads associated with increasing human populations also threatens the safety of hounds. The expansion and growth of white-tailed deer (*Odocoileus virginianus*) populations in the Southeast has made fox hunting even more difficult.

As a result of declining hunting opportunities, many fox and coyote hunters in the Southeast have resorted to practicing their sport inside fenced enclosures of tracts of land common referred to as "fox pens." Nearly all enclosures periodically stock foxes in their pens. In addition to both gray foxes and red foxes, coyotes are also released in enclosures. These fox- and hound-proof enclosures allow fox hunting in an environment that provides hound safety, abundance of desired game, absence of

undesirable game—primarily white-tailed deer—and reduced conflicts with other user groups and landowners. A good description of the construction and operation of a typical southeastern fox hunting enclosure was provided by Cantrell and Wooding (1990).

The first enclosures were constructed about 1980. The concept of fox pens developed rapidly in the Southeast and without regulation in most cases. By 1988, Southeastern Fur Resources Committee members reported approximately 150 fox pens in the Southeast, with enclosures operating in at least 13 of the 16 states (Clark 1988).

Although fox pens had obvious benefits for some sportsmen, state wildlife management agencies quickly became concerned over the potential for problems associated with this unregulated sporting practice. In 1989, the Southeastern Cooperative Wildlife Disease Study documented significant disease risks associated with the interstate movement of foxes and coyotes for the purpose of stocking hunting enclosures (Davidson et al. 1992). In 1990, the Southeastern Association of Fish and Wildlife Agencies adopted a resolution urging the adoption of state-by-state regulations prohibiting the importation or interstate movement of foxes or coyotes for the purpose of stocking enclosures. Subsequently, similar resolutions were adopted by the Southeastern Section of The Wildlife Society and by the International Association of Fish and Wildlife Agencies. Questions also arose over the issue of fair chase. In 1990, objections began to be raised by animal rights organizations.

To assist wildlife management agencies in managing fox pens, the Southeastern Association of Fish and Wildlife Agencies endorsed a model for state regulation of fox hunting enclosures in 1990, a product of the Association's Fur Resources Committee. The Fur Resources Committee also produced a set of "best management practices" for fox-pen operations. Best management practices were designed to be used by states that wanted to pursue a non-regulatory approach to managing these enclosures. To further direct fox-pen management the southeastern state wildlife agencies partnered with the Southeastern Cooperative Wildlife Disease Study to conduct a workshop and develop numerous forms of technical literature for guiding fox-pen owners in matters of enclosure management and health maintenance.

To evaluate the current status of fox pens and the level of success in regulating and managing these enclosures, the state directors of the Southeastern Association of Fish and Wildlife Agencies requested a survey to develop a state-by-state account of enclosure status, regulations, and attitudes toward fox pens.

Methods

Information on fox and coyote hunting enclosure status and management was obtained in 1997 through a 4-page mail survey of each southeastern state wildlife agency furbearer project leader. Each respondent was asked 33 questions; 6 related to fox and coyote enclosure status, 14 related to regulations, 3 related to enclosure operations, 3 related to health concerns, and 7 related to furbearer biologists' or state wildlife agencies' attitudes toward various aspects of fox and coyote hunting enclosure management. Questions asked through the survey were generated by

South Carolina Department of Natural Resources staff, then edited by select members of the Fur Resources Committee of the Southeastern Association of Fish and Wildlife Agencies. A copy of each state's regulations and statutes pertaining to fox and coyote hunting enclosures was obtained. Follow-up telephone interviews were conducted to obtain supplemental information and clarification on survey opinions concerning problem areas and future management needs.

The more elementary responses to parts of the questionnaire permitted mean, frequency, or percentage expressions to be tabulated. Where biologists were asked to rate a level of response regarding fox hunting enclosure issues, considerations were scored using the Likert scale (Babbie 1973), with 0 being no response and 10 being the highest level of response. Where biologists were asked to rank a list of 7 pre-determined concerns, scores were assigned with 0 being the lowest level of concern, and 7 being the highest level. All concerns not given a rank by the respondent were assigned a score of zero. Means were calculated for each factor to identify the most important considerations. Standard deviations were calculated to determine if a consensus existed among survey respondents. Each state's regulations and statutes pertaining to fox and coyote hunting enclosures were reviewed to evaluate other regulatory aspects not revealed in the questionnaire.

Results and Discussion

Status of Enclosures

All 16 member states of the Southeastern Association of Fish and Wildlife Agencies responded to the survey. Only Maryland reported no enclosures, stating that the activity was prohibited by Maryland state law (Table 1). Maryland was therefore omitted from the statistical analysis. The mean number of fox and coyote hunting enclosures operating per state was 31.1. Mississippi accounted for the greatest number of enclosures with 67. Oklahoma reported it did not have an estimate of enclosure number, but assumed the number was low compared with other southeastern states. The survey revealed a minimum of 466 fox and coyote hunting enclosures were in operation in the Southeast.

The first known reported fox hunting enclosure was constructed in Georgia in 1980. By 1989, fox or coyote enclosures were in operation in all southeastern states except Maryland. When asked how the number of enclosures had changed over the past 5 years, 8 of 13 states reported the number had increased, 2 reported a decrease, and 3 stated the number remained stable. Trends over the past 2 years, however, revealed a stabilization in enclosure numbers. Only 3 of 14 states reported the number of enclosures increased over the past 2 years, while 2 states reported declining numbers, and 9 reported the number remained stable.

Respondents were also asked if hunting enclosures were operated specifically for running furbearers other than foxes or coyotes. Six of 16 states (Ky., N.C., Okla., S.C., Tenn., W.Va.) reported that enclosures were being operated specifically for hunting raccoons. One state (Tenn.) reported 11 identified raccoon enclosures.

Table 1. The status of fox and coyote hunting enclosures in the Southeastern United States.

State	N enclosures	Date of first enclosure	5 yr. change	2 yr. change	x size (ha)	Smallest enclosure (ha)	Largest enclosure (ha)	Other furbearer enclosures
Alabama	24	~1985	increased	stable	129	3	445	
Arkansas	≥51		increased	increased	122	2	972	
Florida	2	1987	decreased	decreased	122	40	200	
Georgia	63	<1981	stable	stable	92	4	750	
Kentucky	~30			stable		3		raccoon
Louisiana	≥43	1984	increased	stable	102	2	400	
Maryland	0	NA	NA	NA	NA	NA	NA	
Mississippi	≥67	~1984	increased	stable	61	3	284	
Missouri	≥36	~1987	increased	stable	90	9	207	
North Carolina	≥60	<1990	increased	stable	77	3	506	raccoon
Oklahoma								raccoon
South Carolina	43	1985	stable	stable	115	8	417	raccoon
Tennessee	≥7	~1985	increased	increased	20	8	160	raccoon
Texas	≥7	1985			90	14	160	
Virginia	27	<1990	increased	increased	114	42	365	
West Virginia	6	1989	increased	increased	142	41	284	raccoon

Regulation of Enclosures

In response to questions about how states managed fox and coyote hunting enclosures, 6 states (Fla., Ky., La., Miss., Mo., Va.) indicated enclosures were governed by department regulations, 3 states (Ga., Md., S.C.) by state statutes, 3 states (N.C., Tenn., W.Va.) by both regulations and statutes, and 4 states (Ala., Ark., Okla., Texas) responded that enclosures were unregulated. While 75% of the southeastern states responded that fox and coyote hunting enclosures were regulated, the degree of regulation was variable. Some states had extensive, multi-faceted regulations, while others only governed the importation of game for stocking. Those states with more holistic regulations or statutes tended to be similar and mirrored the "model for state regulation of fox hunting enclosures" prepared by the Fur Resources Committee. A need for regulations was indicated by 2 of 4 states which do not currently regulate fox and coyote hunting enclosures. Four out of 10 states which currently have regulations or statutes believe further regulation is needed.

Licenses or permits were required to operate enclosures in 10 of 15 states. Enclosure permit fees ranged from \$10 to \$250 and averaged \$63. In 2 states (Ky., Miss.), permit fees were set differently for commercial and non-commercial enclosures. In 1 state (S.C.), permits were only required of enclosure operators who desired to purchase foxes for stocking enclosures.

The regulations of 2 states (Mo., N.C.) specifically stated that a hunting license was required of all residents and non-resident hunters participating in hound sports inside enclosures. Previous conversations with state furbearer project coordinators indicated that licenses were required in most other southeastern states, although it was not specifically stated in the enclosure regulations. In addition to a hunting license, 3 states (Ga., Mo., N.C.) also required an enclosure user's permit. Two states (Ky., Tenn.) provided a hunting license exemption for users of fox and coyote enclosures.

Operation of Enclosures

The proportion of enclosures that operate commercially varied between states and ranged from 5% to 100% with a mean of 73.8%. Commercial operations were defined as any which allow non-owners to use the facility for a fee. Charges for running hounds in enclosures was fairly consistent throughout the Southeast. All respondents who supplied information on enclosure charges ($N = 8$) reported a fee of either \$5 per dog or \$5–\$10 per dog.

Enclosure sizes across the Southeast ranged from 2 (La., Ark.) to 972 ha (Ark.). The average enclosure sizes reported by states ranged from 20 to 142 ha with a mean of 97 ha. Six states set minimum acreage for enclosures, ranging from 8 to 81 ha and averaging 42 ha. Only 1 state (Tenn.) set a maximum size for enclosures that was 260 ha. Six states (Ala., Ark., Ga., La., N.C., S.C.) reported at least 1 enclosure larger than 400 ha.

Respondents reported that fox and coyote hunting enclosure operators preferred red foxes (10 of 15 states) over coyotes (5 states) or gray foxes (0 states). While gray foxes were not the highest preference of enclosure operators in any state, they were preferred over coyotes in 2 states.

Many enclosure owners restricted the number of hounds which could be run in their pens at any one time. Only 3 of 12 states reported regulations or statues which governed this aspect of enclosure operations. One state (W.Va.) restricted activity to 1 hound per 5.6 ha. One state (Ga.) restricted hound numbers to 1 per 2 ha but only in enclosures <40 ha in size, and 1 state (Fla.) based the hound restriction on the ground cover density with the allowable numbers ranging from 1 to 3 hounds per 6 ha. All states allowed competition field trials in enclosures. In the absence of restrictions on hound numbers, the field of hounds in the larger, nationally recognized field trials commonly ranged from 200 to 400 dogs and reportedly exceeded 700 in one event.

Some states required protection of game within enclosures: 5 states had requirements in place for dog-proof escape cover and 1 state required a dog-proof acclimation pen for foxes. Health-care regulations of the various states included vaccinations and deworming of game, submission of diseased game to a state diagnostic lab, and feeding and watering requirements. Seven states established minimum fencing requirements to ensure the containment of hounds and game. Only 1 state (Ga.) required the posting of enclosure boundaries.

Stocking of Enclosures

All states except Texas legally allowed gray foxes and red foxes to be stocked in enclosures. In Texas, movement of all live furbearers was prohibited due to a state-wide rabies quarantine. Ten of 15 states allowed coyotes to be stocked in enclosures. States that did not allow the stocking of coyotes (N.C., S.C., Texas, Va., W.Va.) were generally where coyote populations were sparse and the densities were low. Several of these states cited that the prohibition against stocking coyotes was in place to reduce the impetus for enclosure operators to go out of state to procure coyotes because

of concerns over coyotes escaping enclosures into areas which currently are free of coyotes. Game cannot be expected to be contained in enclosures due to pen damages resulting from wind storms, vandalism, and logging operations. The South Carolina Wildlife and Marine Resources Department documented the establishment of several populations of coyotes as a result of the destruction of enclosure fences resulting from Hurricane Hugo in 1989 (Baker 1994).

When asked about legal sources of game for stocking enclosures, 7 of 15 states reported that gray foxes and red foxes could be imported from out-of-state, representing a change in several states' regulations or statutes since the adoption of the 1990 import ban resolutions. At that time, 11 of 15 states allowed foxes to be imported for stocking enclosures (S.C. Dep. Nat. Resour., unpub. data). Two states (Fla., Tenn.) required that foxes be imported from out-of-state sources due to restrictions on trapping foxes within the states. Only 5 of 15 states allowed the importation of coyotes for stocking enclosures. Other regulations or statutes concerning stocking included a provision for game to be acquired within a specified distance of the enclosure (Va., W.Va.), ear tagging of stocked game (Miss., Mo., W.Va.), licensing of commercial fox breeders (Ga., La., Mo.), and a limitation on the period of time foxes could be held before release into enclosures (Va.).

Only 2 states (La., Mo.) required a specific period of non-hunting in enclosures following the stocking of game. Three states (Ga., Va., W.Va.) regulated the stocking densities at 1 fox per 4 ha. Stocking seasons for foxes were established in 4 states (Ga., La., Mo., Va.) and generally were associated with trapping season. Only 1 state (Va.) established a season for stocking coyotes.

Health Concerns

Of the 8 states that allowed the importation of foxes or coyotes for stocking enclosures, 7 required a health certificate to accompany the animals. In a 1990 survey, 11 states allowed the importation of foxes and coyotes, and 4 of those required health certificates (S.C. Dep. Nat. Resour., unpub. data). Five of 7 biologists who responded in the survey that their states required health certificates for importation of game felt the certificate did not adequately address the states' health concerns. The ineffectiveness of health certificates to prevent importation of rabid animals has been demonstrated in several instances (Nettles et al. 1979, O. James, unpubl. data). Based on the descriptions of state health certificates, most would be more accurately entitled a "certificate of veterinary inspection." The Southeastern Cooperative Wildlife Disease Study (SCWDS), through its quarterly newsletter, informed states that "certificates of veterinary inspection do not serve as a guarantee of disease or parasite-free animals." The value of the certificate, according to the SCWDS, is "primarily through the establishment of a legal paper trail that allows monitoring of shipments and a more rapid tracing if something goes wrong . . . It cannot be used as a substitute for more restrictive importation policies" (V. F. Nettles, pers. commun.).

Three states that allowed importation of foxes or coyotes for stocking enclosures (Fla., Okla., W.Va.) restricted the source of the animals to states where certain wildlife diseases are not endemic. This was the regulation most often advised against

by survey respondents who cited the unenforceability of the regulation because of the difficulty in verifying the state of origin. Covert law enforcement operations conducted by the South Carolina Wildlife and Marine Resources Department revealed that an Ohio broker of foxes and coyotes selling to southeastern enclosures was actually procuring the alleged "Ohio game" from an area encompassing 11 northern, midwestern, and western states and 1 Canadian province (Baker 1990).

The survey revealed that public health agencies in two-thirds of the southeastern states have indicated concern over the potential for public health problems associated with fox and coyote hunting enclosures. Since 1990, resolutions urging states to prohibit importation of foxes and coyotes have been adopted by the National Association of State Public Health Veterinarians, the United States Animal Health Association, the Council of State Territorial Epidemiologist, and the American Veterinary Medical Association. In one-third of the states, activities in enclosures resulted in temporary quarantines or temporary closures by either the state public health agency or the state wildlife management agency.

Five states identified the presence of non-indigenous diseases or parasites in game or hounds in enclosures or in game en route to enclosures. Three states (N.C., Okla., S.C.) documented the presence of the non-indigenous tape worm *Echinococcus multilocularis* in confiscated shipments of foxes and coyotes destined for enclosures. Two states (Ala., Fla.) confirmed the transmission of the urban dog/coyote strain of rabies to hounds known to have been hunted in enclosures in those states. The dog/coyote strain of rabies was previously found only in the extreme southern portion of Texas and adjacent Mexico (Clark 1994). According to the Alabama Department of Health, the Alabama enclosure had been stocked with coyotes imported from Texas (W. B. Johnston, pers. commun.).

The potential for the translocation of wildlife diseases appears immense. Records from a single midwestern broker of live foxes and coyotes revealed transactions of purchases and sales involving 409 individuals in 24 states (Baker 1994). Further evidence of the potential for the translocation of wildlife diseases was demonstrated by the Southeastern Cooperative Wildlife Disease Study, which detected the presence of 33 different species of pathogens in a single shipment of foxes and coyotes en route to hunting enclosures in the Southeast (Davidson et al. 1992). The pathogens included 21 helminths, 2 protozoans, 3 arthropods, and 3 viruses.

Law Enforcement

One-half of all southeastern states that have fox and coyote hunting enclosures reported law enforcement problems associated with them. The most common type of violation reported was the illegal importation of game. Each of the 7 states which reported law enforcement problems associated with fox and coyote enclosures encountered problems with illegal importation of game (Ala., Fla., Miss., N.C., S.C., Tenn., Va.). Information collected during covert law enforcement investigations in South Carolina revealed that at least 1 midwestern dealer of live foxes and coyotes sold game to enclosure operators in each southeastern state (Baker 1994), indicating that the extent of the problem may be greater than reported in this survey. Other types of

violations reported included illegal acquisition of in-state game (Fla.), breach of enclosure quarantine (N.C.), illegal trapping to supply enclosures with game (S.C.), hunting of non-canid game such as turkey and deer out of season (Tenn.), and violation of the distance limit established for acquiring stocked game (Va.).

Although states were not surveyed to determine the level of law enforcement activity associated with fox and coyote enclosures, side notes to the survey revealed that Lacey Act convictions had been made on at least 18 individuals in 3 states. To better monitor activities in enclosures, 3 states maintained the authority for inspection at any time by representatives of the state wildlife management agency. Seven states had specific record-keeping requirements.

Sociological and Wildlife Management Concerns

The benefits of fox hunting enclosures to sportsmen as identified by southeastern furbearer biologists included (in no particular order of priority) providing for safety of hounds, elimination of hound containment and control concerns, a dependable source of game, convenience in retrieving hounds, additional recreational opportunities, a hound-running environment free of "off game" (e.g., deer), and controlled puppy-training opportunities. The benefits of fox hunting enclosures to the community were identified as reducing trespassing problems, reducing free-ranging hound problems, adding to the local economy, reducing the illegal kill of wildlife, reducing conflicts with other users of public roadways, allowing the training of hounds without impacting wildlife populations outside of enclosures, allowing the running of hounds without conflicting with other hunting activities, providing an additional market for trappers during a period of low fur value, and reducing attempts by fox hunters to eliminate trapping. Three states, however, responded that they were unaware of any benefits of foxhunting enclosures to the community.

Although each state recognized at least some benefits of fox hunting enclosures, they all expressed concerns as well. Respondents were asked to rate their agency's overall level of concern regarding fox and coyote hunting enclosures on a scale of 0 to 10, with 0 representing no concern and 10 representing extreme concern. The mean rating of concern was 6.0 (SD 5 1.1) with a range of 4 to 10. Respondents ranked specific concerns over public health implications and native wildlife health implications above all others (Table 2). These concerns were followed in order of priority by concerns over impacts on the image of hunting, animal welfare, the potential for game law violation, impact on local fox populations, political sensitivity of the issue, concept of put-and-take wildlife management, and cost of enforcement. Although several national animal rights organizations have raised questions about the humaneness of fox hunting enclosures, the issue has not appeared to be a priority with them thus far. One notable exception was a legislative attempt in North Dakota to prohibit the exportation of foxes and coyotes for the purpose of stocking southern hunting enclosures.

Four biologists who responded to the survey held the opinion that the benefits of fox and coyote hunting enclosures outweighed the problems associated with them, 3 believed that they did not, and 8 believed the benefits and problems associated with

Table 2. Ranking of southeastern state wildlife agencies' ($N = 16$) concerns regarding fox and coyote hunting enclosures.

Issue	Average rank ^a	Standard deviation	<i>N</i> states concerned
Public health implications	6.3	0.79	16
Native wildlife health implications	6.1	0.70	16
Fair chase concerns and its impact on the overall image of hunters	3.9	1.14	14
Animal welfare concerns	3.3	1.25	13
Encourages violation of game laws	2.3	1.25	10
Capture of wild foxes for stocking could deplete local fox resources	1.4	1.25	8
Other	0.7	1.10	3
Politically sensitive			
Promotes dependency on put-and-take wildlife management			
Cost of enforcement of enclosure activities			

a. Issues ranked from 1 to 7, with 7 representing the issue of greatest concern. Issues not ranked were assigned a score of 0.

these enclosures to be about equal. None of the respondents believed that the complete closure of fox and coyote hunting enclosures was necessary.

Tools deemed necessary for better managing and controlling fox and coyote hunting enclosures (14 states responding) were better data on enclosure use and practices (12 respondents), more education of enclosure operators and users (10), greater law enforcement effort (8), more or better regulations (6), and more research (4). The level of contact between state wildlife agencies and enclosure operators (rated on a level of 0 to 10, with 10 being the highest level of contact), ranged from 4 to 10 with a mean of 5.8 (SD 5 2.0).

I believe that the collaborative approach to managing and regulating fox hunting enclosures in the Southeast has been beneficial to all of the states involved. Based on comments from southeastern state furbearer project leaders at our annual workshops, I believe that there is unanimity of opinion on the value of this type of united approach to dealing with a region-wide issue. While the survey does point out some clear successes in the management and regulation of fox pens in the Southeast, it also reveals that there is still a need for further improvement. While most of the needed improvements revealed by the survey are state-specific, I believe that there are 2 basic regional issues which need to be addressed in the Southeast. First, we need to seek the closure of the remaining state borders to the importation of canids for stocking enclosures. Second, we need to continue to seek regulations which will promote animal welfare and achieve the strictest definition of fair chase within enclosures.

Literature Cited

- Babbie, E. R. 1973. Survey research methods. Wadsworth Publ. Co., Inc., Belmont, Calif. 384 pp.
- Baker, O. E. 1990. Covert investigations related to South Carolina fox pens. Proc. Annu. Southeast. Furbearer workshop. 4:23-24.
- . 1994. Problems associated with the importation of canids for hound coursing pens. Proc. Annu. Midwest. Furbearer workshop. 12:1-7.

- Cantrell, M. A. and J. B. Wooding. 1990. Characteristics of fox enclosures in Florida. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 44:133–141.
- Clark, J. D. 1998. A questionnaire survey of southeastern fur resources managers regarding fox hunting enclosures. Ark. Game and Fish Comm., Wildl. Manage. Div. Rep., Little Rock. 8pp.
- Clark, K. A. 1994. Epizootic canine rabies transmitted by coyotes in south Texas. J. Am. Vet. Med. Assoc. 204:536–540.
- Davidson, W. R., M. J. Appel, G. L. Doster, O. E. Baker, and J. F. Brown. 1992. Diseases and parasites of red foxes, and coyotes from commercial sources selling to fox-chasing enclosures. J. Wildl. Diseases 28:581–589.
- Nettles, V. F., J. H. Shaddock, R. K. Sikes, and C. R. Reyes. 1979. Rabies in translocated raccoons. Am. J. Public Health. 79:601–602.