

THE USE OF FREE-RUNNING DOGS IN SPORT HUNTING OF WHITE-TAILED
DEER IN FLORIDA-- A REVIEW OF PERTINENT INFORMATION
AND DISCUSSION OF THE ISSUES

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AN ISSUE PAPER PREPARED BY STAFF
FLORIDA GAME AND FRESH WATER FISH COMMISSION
OCTOBER 1991

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EXECUTIVE SUMMARY

Florida's dramatic and rapid human population growth and resultant suburban sprawl have filled much of the state's heretofore undeveloped lands with people and diminished the extent of wildlife habitat. The resultant decline in the availability of undeveloped land suitable for wildlife oriented recreation has spawned conflict and competition among landowners, residents and recreational users for an increasingly limited land resource. This competition has taken many forms. Conflicts occur between hunters and landowners, among consumptive and non-consumptive recreational users, between hunters of different species, and among those who prefer different methods of hunting a given species.

Hunting deer with dogs (dog-hunting) is a tradition in the southeastern United States, and a popular hunting method within the State of Florida. In its most commonly employed form, free-running hounds and other chase dogs are used to locate and drive deer from cover to facilitate harvest by hunters.

Hunting in all its forms has become increasingly controversial. Dog-hunting has become especially controversial because it is a highly visible activity, is difficult to spatially control, and is believed by some to adversely affect wildlife populations and other wildlife oriented recreational opportunities.

The Florida Game and Fresh Water Fish Commission (Commission or GFC), because of its regulatory authority over wildlife and its recreational use, has been increasingly cast as a arbiter of these conflicts. This issue paper was prepared to present and analyze available information pertinent to the controversial use of free-running dogs to hunt white-tailed deer, and to propose more definitive management policies for consideration by the Commission. Because of the complexity of this issue, this discussion is restricted to the use of free-running dogs for the sport hunting of white-tailed deer. A number of related issues, including the use of free-running dogs for the hunting or pursuit of other wildlife species, are not addressed herein.

Four primary areas of concern were identified for investigation and analysis. These include:

- (1) the effects of dog-hunting on deer populations,
- (2) the effects of dog-hunting on turkey populations,
- (3) the effects of dog-hunting on turkey hunting success and hunter satisfaction, and
- (4) implications of dog-hunting in trespass problems.

The bulk of the evidence in the published literature suggests that dog-hunting of deer is more efficient than still hunting, although this fact is not well supported by evidence pertaining to buck harvest in Florida. There is some evidence that the dog-hunting can cause substantial non-harvest mortality of healthy white-tailed deer. However, there is no indication that stress or other factors associated with the harassment of deer by dogs adversely effect pregnancy rates or reproductive success. Neither do deer appear to permanently move out of an area in response to dog harassment.

Data from Florida Wildlife Management Areas (WMAs), as well as data from certain other areas elsewhere in the southeast, indicate with surprising consistency that deer herd density is lower on dog-hunt areas than on still-hunt areas. All Florida WMA dog-hunt areas studied had regulatory prohibitions on doe harvest in effect. Such prohibitions on doe harvest should allow deer populations to increase to carrying capacity. Such populations are expected to consist primarily of does. Available data suggest that this is not the case in Florida, and that doe mortality is much higher than expected under regulations which prohibit their harvest. It thus appears that concomitant illegal activity, by persons unknown, rather than the use of dogs to chase deer, is responsible for the decline of deer populations on dog-hunt areas.

Human disturbance, including but not limited to the kind of disturbance associated with dog hunting, has been suggested as an important factor adversely affecting wild turkey populations. However, while studies have demonstrated that turkeys will alter their distribution patterns in response to such disturbance, adverse effects on population levels have not been demonstrated. Dogs that are "on the track" can disturb turkeys. However, they do not typically prey upon them. Feral dogs have been shown to prey upon nesting hens, but deer hunting seasons in Florida do not typically overlap with periods of peak turkey nesting activity. During fall dog-hunting seasons, all age-classes of turkeys are able to avoid predation by deer dogs through flight.

Based upon our review, we conclude that dog-hunting seldom has a direct impact on turkey populations. Turkeys do, however respond to seasonal disturbances by moving to undisturbed areas or reducing their activity patterns. This fact can adversely effect turkey hunting success and turkey hunter satisfaction, and contribute to the perception that populations have declined.

The subject of deliberate and inadvertent trespass by dog-hunters and their dogs is prominent in the dog-hunting controversy. Because dog chases can extend for several miles and hounds cannot be easily controlled during the chase, dog-hunting is associated with a higher likelihood of trespass than many other forms of hunting.

Using the mean length of chase as determined from a number of studies, we calculated the area an average dog pack would need to complete a chase without trespassing onto adjacent lands. There is an inverse relationship between the size of the area hunted, and the likelihood of trespass (or overlap of chase radius among dog packs where more than one pack is involved) associated with any given chase. The average dog-hunt area on the state's WMAs (74,452 acres) can accommodate approximately 17 uniformly distributed dog packs simultaneously with an expectation that no more than 10% of the chases will result in trespass or overlap of packs. We believe that such areas commonly host between 26 and 52 packs per day during peak periods, emphasizing the high associated potential for trespass or overlap. This same approach suggest that roughly 33,000 acres are required to accommodate 10 dog-hunting parties with a 20% likelihood of trespass or overlap.

Overlap of chase radii among dog packs substantially reduces hunter satisfaction. However, trespass by hunting dogs and/or hunters onto prohibited areas is a more serious problem. The size and shape of hunting areas, and the adequacy of road systems are significant factors affecting the likelihood of

trespass associated with dog-hunting activities. It is also postulated that regulations limiting dog-hunters to the use of "small" dogs (typically beagles or beagle crosses) might be useful in limiting the likelihood of trespass, particularly on smaller hunting areas.

Archery, muzzleloading gun hunting, turkey hunting, and still-hunting of deer all require a measure of solitude. Most non-consumptive use of wildlife is seriously compromised by disturbance. Dog-hunting is substantially preemptive of these activities because of the high level of disturbance involved.

The preponderance of Florida's deer hunters (56%) prefer still-hunting. The number preferring dog-hunting (19%) is relatively small (25% indicate that they enjoy still-hunting and dog-hunting equally). Dog hunting is permitted on the preponderance of the WMAs in the state (65% of the total acreage), but this acreage has declined substantially in recent years.

A willingness on the part of dog-hunters to embrace the spirit and intent of laws and a standard of conduct which does not unreasonably compromise the opportunity for other interests groups to pursue their rights and privileges is believed to be crucial to the continuation of dog-hunting.

Policy recommendations are offered as a framework for continuing dog-hunting in the state. They include a statement of Commission intent to continue to permit dog-hunting so long as it can be conducted in manner which does not unreasonably compromise the rights, privileges and safety of citizens. It is proposed that dog-hunting is a highly preemptive form of recreation, with a high level of incompatibility with other activities. It is thus suggested that an opportunity to pursue other wildlife oriented recreational activities in isolation from dog-hunting (through temporal and spatial segregation) be maintained. Criteria for the future designation of dog-hunt areas on public lands are proposed.

Man has lived in close association with the dog for at least 10,000 years. Although no direct evidence exists to indicate the basis for the original human-dog relationship,¹ early man no doubt recognized the canids' proficiency in locating and pursuing its prey. It is reasonable to assume the utility of dogs in securing food was an important factor cementing the relationship between the dog and our hunter/gatherer ancestors.

The use of dogs for hunting is extensive. The American Kennel Club lists 24 breeds of "sporting dogs", 20 breeds of "hounds", and 23 breeds of terriers among the 125 breeds it recognizes.² Thus over 50% of the formally recognized dog breeds were developed for some form of hunting. The use of dogs for hunting takes many forms. The "sporting breeds" are typically used to find and flush birds for harvest, or to retrieve downed game. Terriers are used to go into the ground to ferret game (and pests) out of burrows for harvest. Hounds are used to trail and drive game,³ primarily game mammals. In Florida hunters use dogs to take and pursue a variety of wildlife under regulations promulgated by the Game and Fresh Water Fish Commission (GFC). Included on this list are ducks, gallinules, quail, woodcock, snipe, mourning doves, raccoons, foxes, bobcats, white-tailed deer and hogs.

Hunting deer with dogs (dog-hunting) is a tradition among many southeastern sportsmen. In Florida, dog-hunting occurs in at least three forms. "Slow trail" dogs are hunted on leash to trail and drive deer from heavy cover and to track wounded animals. In the Everglades, leashed dogs are sometimes carried on hunting vehicles to "wind" deer in the dense vegetation and alert hunters to the deer's presence. The most common method of deer dog-hunting in the state is the use of free-running hounds and other chase dogs to locate and drive deer from cover to facilitate harvest. Whether this activity is undertaken in north Florida swamps or on tree islands in the Everglades, it usually involves the transportation of dogs by vehicle to a selected drop-off point from which the dogs are cast. Often dogs are cast in the vicinity of a fresh deer track. Dogs typically search the area until they pick up a trail or "jump" a deer. A "chase" ensues, during which pre-positioned hunters, and/or hunters who reposition themselves during the chase attempt to "take" the fleeing deer. Although all three forms of dog-hunting described are affected by Commission rules which regulate the sport, this report focuses on the use of free-running dogs for deer hunting.

DEFINITION OF THE PROBLEM

Hunting in all its forms has become increasingly controversial. Human population growth and suburban sprawl have diminished the extent of wildlife habitat, and increased the frequency of human contact with many wildlife species and the hunters who have long pursued these species for sport and sustenance. An increased social awareness of wildlife, and an increased concern for the welfare and "rights" of animals has spawned greater public scrutiny of the treatment of animals. Much of this scrutiny is focused on hunting and hunting methods.

Conflicts and controversy also exist among hunters. With the declining availability of rural land available for hunting has come increased competition among hunters for periods and locales for pursuit of their respective hunting

preferences. This time/space crunch creates conflicts among hunters of different wildlife species, as well as among those who prefer different methods of hunting a given species.

Dog-hunting is highly visible activity. It requires extensive land areas, is difficult to spatially control, and is perceived by some to adversely effect wildlife populations. It is further perceived by some, including many hunters as well as non-hunters, to be incompatible or marginally compatible with other forms of consumptive and non-consumptive recreational use. It is thus a highly controversial activity.

Deer Hunter Preferences

Dog-hunters prefer to hunt with dogs for a variety of reasons:

- (1) they feel it increases their chance of killing a deer;
- (2) they feel it is more exciting than still-hunting;
- (3) they believe it is, to a much greater degree than any other form of deer hunting, a social activity with unique opportunities for comradeship and social bonding; and
- (4) they enjoy seeing and hearing their dogs work in the field.⁴

They further maintain that dog-hunting is a tradition in the southeast, and a "right" of hunters that should not be abridged.

According to a survey of individuals purchasing hunting licenses for the 1981-82 hunting season:

- (1) Eighty-four percent (84%) of the licensed hunters in the state hunted deer at some point during the previous 3 seasons.
- (2) Most of this group (95%), indicated that they had hunted deer during the just previously completed 1981-82 season.
- (3) Fifty-nine percent (59%) of those hunting deer during the previous 3 years indicated that they did not hunt deer with dogs under any circumstances.
- (4) Fifty-six percent (56%) of the active deer hunters responding indicated that still-hunting was their preferred method of deer hunting.
- (5) Nineteen percent (19%) indicated that dog-hunting was their preferred method.
- (6) Twenty-four percent (24%) indicated that they enjoyed dog-hunting and still-hunting equally.

Availability of Dog-Hunting Opportunities

The use of free-running dogs for deer hunting is permitted under regulations of the Game and Fresh Water Fish Commission (GFC):

- (1) on private lands;^a and
- (2) on certain Wildlife Management Areas (WMA) and Wildlife and Environmental Areas (WEA).^b

During the 1990-91 hunting season:

- (1) Seventy-four (74) units of the WMA/WEA system were opened for modern firearms hunting of white-tailed deer.
- (2) The use of free-running dogs for deer hunting was permitted on 42 (57%) of these areas.
- (3) A total of 3.6 million acres (65% of the WMA/WEA system) was opened to dog-hunting.
- (4) Dog-hunting was prohibited by GFC regulation on 1.6 million acres (35% of the WMA/WEA system).
- (5) Dog-hunting was similarly prohibited on 44,364 acres of the WMA/WEA system opened for primitive weapons hunting of white-tailed deer.

Still-hunting (the hunting of white-tailed deer without the use or aid of dogs) is not prohibited by GFC regulation on those WMAs/WEAs where dog-hunting is permitted. Some dog-hunters point to this fact in support of allegations of inequity in the regulatory process. They maintain that they should be afforded the opportunity to enjoy exclusive use of the areas where dog-hunting is permitted.

Although dog-hunting is permitted on all or portions of the majority of the state's WMAs and WEAs, the percentage of the WMA/WEA system opened to this activity has declined substantially in recent years. Historically, dog-hunting had been permitted primarily on large federally owned tracts, and on the extensive industrial forest lands included in the WMA system under lease agreements with private landowners. Since 1989, WMA/WEA lands leased from private owners have declined by more than 1/2 million acres. A substantial portion of these leased lands were dog hunt areas. Beginning with the 1990-91 hunting season, the U.S. National Park Service mandated a prohibition on dog-

^a For purposes of this report, unless otherwise specified, "private lands" refer to all lands not designated as WMAs and WEAs under rules of the GFC.

^b Note that the WMA/WEA system includes both privately owned lands made available for public recreational use through leases and other agreements, and lands in public ownership. For the purposes of this report, all lands in the WMA/WEA system are considered "public lands".

hunting on the 1/2 million acre Big Cypress WMA. This decline in the availability of public lands for dog-hunting has occurred concurrent with the evolution of a generally less tolerant attitude toward dog-hunting on the part of private landowners and the general public. The net effect has been a rapid and dramatic reduction in the availability of lands for dog-hunting during the past 5 years.

Dog-Hunter Response to the Dilemma

Dog-hunters are understandably concerned about the loss of public dog-hunting lands, as well as deteriorating public attitudes toward the practice of dog-hunting. They have responded to their dilemma by forming political action groups to intensify lobbying efforts directed at the Commission, various elected officials and other collegial bodies in pursuit of expanded dog-hunting opportunities⁵.

Some dog-hunters have proposed compromise approaches in the face of proposed tract-specific prohibitions on dog hunting. These include, but are not limited to:

- (1) regulations that would permit dog-hunting during portions of established hunting seasons (as contrasted with the traditional season long approach),
- (2) regulations limiting hunters to the use of muzzleloading guns during a portion of the season,
- (3) regulations limiting the numbers of dogs and/or hunters permitted on an area,
- (4) quotas on the number of deer to be taken, and
- (5) regulations that require the use of "small dogs" (beagles and other small breeds that are perceived to reduce the radius of chase, thus increasing compatibility with smaller tract size and reducing the potential for inadvertent trespass).

Other Suggested Approaches

Other interested parties have recommended various innovative regulatory approaches. These include:

- (1) walk-in (no vehicles allowed) dog-hunts,
- (2) permitting the use of slow trail dogs,
- (3) permitting traditional seasons that would prohibit or restrict the use of electronic communications and tracking equipment and vehicles to follow the chase,
- (4) regulation of dog-hunting on public and/or private lands through the issuance of a limited number of dog-hunting "party" permits.

with possible limits on the number of dogs each hunting party would be permitted to use,

- (5) limiting dog-hunt related vehicular activity to a subset of the roads opened to vehicular use on certain WMAs, and
- (6) implementation of an expanded quota hunt period (as opposed to the currently prevalent 9-day quota hunt period) for dog-hunting on selected WMAs.

Opposition to Dog-Hunting

Opposition to dog-hunting or to the expansion of dog hunting opportunities on public lands has come from a number of sources. Many animal animal welfare activist find dog-hunting to be among the most objectionable form of hunting. Several environmental organizations expressed opposition to a recent proposed expansion of areas where deer would be hunted with dogs, and the expansion of areas where fox, raccoon, and bobcat hunting (with dogs) would be permitted on the Osceola WMA. In their letters of opposition, these organizations variously cited their belief that dog-hunting and running were disruptive to wildlife, incompatible with threatened and endangered species conservation, incompatible with other uses, and potentially detrimental to the deer and bear populations. The U.S. Forest Service expressed opposition to the same proposal⁶, and the U.S. National Park Service mandated a prohibition on dog-hunting on the Big Cypress WMA ostensibly to protect other wildlife (notably the endangered Florida panther) from harassment. Recently some corporate landowners who participate in the WMA program have insisted upon conversion of WMA lands under their ownership from dog-hunting to still-hunting.⁷ Reasons given for the latter requests include expressed concerns about safety and adverse impacts of excessive vehicular use associated with dog hunting on road condition, trespass by dogs and hunters on adjacent private property, and damage to young pine plantations by vehicles.

Representatives of a still-hunting organization appeared before the Commission during its September 1991 meeting in Daytona Beach to protest a perceived inappropriately high allocation of lands in Ocala WMA to dog-hunting. At least one still-hunting organization expressed opposition to the recent proposed expansion of dog hunting opportunities on the Osceola WMA⁸, and still hunters frequently express concerns about the incompatibility between still-hunting and dog-hunting⁹. Many still-hunters complain about the intrusive and disruptive nature of dog-hunting. Prominent among such complaints are those relating to the overlap of deer-dog training and season and archery season in the GFC's Northwest Region.¹⁰

Some Commission personnel, including both wildlife biologists and administrative staff, are opposed, to varying degrees, to dog-hunting on public lands. This opposition is based upon perceptions that:

- (1) dog-hunting depresses deer populations and populations of certain other wildlife species,
- (2) disregard for regulations designed to protect wildlife is commonly associated with dog-hunting,

- (3) dog-hunting is more difficult to manage than still-hunting,
- (4) this activity requires substantial acreage with a hunter density much lower than still-hunting (less recreational opportunity per unit area),
- (5) proliferation of the reckless use of vehicles and the use of electronic communications equipment by dog-hunters is hazardous, results in excessive degradation of roads, and promotes a poor public image for hunters among the non-hunting public.
- (6) Dog-hunters are sometimes abusive and threatening to people who criticize their activity.

During recent years, a number of individuals and representatives of "landowner's rights" organizations have contacted Commission staff and/or appeared before the Commission complaining about dog-hunting from public roads. The complaints typically cite both willful and inadvertent trespass on private property by hunting dogs and/or hunters, and widespread disregard for private property rights by dog-hunters.¹¹ A representative of such an organization actively lobbied against a recent initiative by dog-hunters to secure expanded dog-hunting opportunities through a legislative initiative.¹²

Dog-hunting, and the more specific issues of dog-hunting on public lands, and perceived social conflicts associated with dog-hunting remain as highly controversial issues.

Objective

The purpose of this report is to analyze the issues in light of available information, and propose a more definitive management policy for consideration by the Game and Fresh Water Fish Commission.

PERTINENT INFORMATION

Existing Agency Policy: The Strategic Plan

The Commission's strategic plan¹³ contains a number of formally stated objectives, goals and policies which are pertinent to this issue. The first of these are the following three Commission management policy statements:

- (1) Management policy 7: "Temporal and spatial segregation of activities will be employed where feasible to resolve conflicts among user groups. Consideration will be given to traditional and minority users."¹⁴
- (2) Management policy 8: "A free and unencumbered use of the resource will be allowed, when biologically feasible. Regulations will be simplified, and utilized only to the extent necessary to protect the resource and to regulate users."¹⁵

- (3) Nongame Wildlife Management Program Policy 2: "In the partitioning of public use and opportunities for enjoyment of wildlife and wildlife lands, increased consideration will be given to those who enjoy wildlife-related recreation unrelated to hunting."¹⁶

Commission Goals and Objectives applicable to this issue include:

(1) Game Wildlife

Goals

- (a) "To maintain healthy game populations consistent with habitat carrying capacity", and
- (b) "To provide use of game species at a level compatible with the annual sustainable yield of a population."¹⁷

Objectives - White-tailed Deer

- (a) "To increase the ...average deer harvest per hunter day..."¹⁸
- (b) "To establish quantifiable hunter satisfaction objectives for deer hunters..."¹⁹

Objectives - Turkeys

- (a) "To maintain the current distribution of turkeys ..." ²⁰
- (b) "To establish quantifiable hunter satisfaction objectives for turkey hunters..."²¹

(2) Threatened and Endangered Wildlife

Goal

- (a) "To maintain, increase, and ensure the abundance and/or distribution of threatened and endangered wildlife to the point they are no longer endangered."²²

Technical Information

Effects of Dog Hunting on Deer Populations

Most information contained in this discussion is derived from the report "Biological effects of dog hunting on white-tailed deer in Florida with special emphasis on the Osceola WMA" by Robert E. Vanderhoof, the Commission's Deer Program Coordinator. For additional detail on the analyses presented herein, please see Mr. Vanderhoof's report.

The biological effects of running deer with dogs have been studied more extensively throughout the Southeastern U.S. than anywhere else in North America.^{23,24,25,26} Despite the attention given to the subject, many questions remain.

Issue

Does dog-hunting have a adverse affect on deer populations?

Facts Pertinent to the Issue

Literature Review--Definitive and unequivocal data on relative efficiency of dog- verses still-hunting have never been reported. However, some indicators of hunting efficiency have been reported (Table 1). Among the reports cited is a comprehensive study designed to determine the factors contributing to the decline of the deer herd on the Ocala WMA. That study determined that deer densities were lower on dog-hunt areas than on still-hunt areas, and that mean age of harvested deer was significantly lower for the dog-hunt area than for the still-hunt area. The study further determined that mean age of collected does on the dog-hunt areas was significantly younger than does collected on the still-hunt areas despite buck-only hunting on the dog-hunt areas.²⁷

Feral dogs can become significant predators of white-tailed deer in the Coastal Plain.^{28,29} Some evidence indicates that the use of dogs can cause substantial non-harvest mortality of healthy white-tailed deer³⁰, even though experimental chase data might suggest otherwise^{31,32,33,34} (Table 2). Does in late stages of pregnancy do not appear to be adversely affected by repeated harassment by dogs.³⁵ Studies addressing the effects of dog-running on neonatal fawns were not available.

Analysis of Data from Florida WMAs--Track-count, age-structure, and deer body measurement data were compiled from paired dog- and still-hunted public areas in Florida. Only areas with 3 or more years of data were used for analysis. All track-count data were statistically transformed as necessary using appropriate statistical techniques.³⁶ An appropriate statistical test was used to test both track-count and deer body measurement data for differences among years, method of hunting (dog-hunting or still-hunting), and interaction effects.³⁷ A different statistical test was used to compare mean age of harvested bucks between still- and dog-hunted areas.³⁸

Of the 10 areas analyzed, 8 exhibited a greater number of tracks/mi. on the still-hunted areas than on the dog-hunted areas (Figure 1). The differences reported herein refer to the detection of statistically significant differences.

Neither the average age of the buck harvest nor the average live weights of yearling bucks differed between dog- and still-hunted areas for any of the WMAs investigated. The average antler beam circumferences and lengths for harvested yearlings were larger on the dog-hunted than on the still-hunted area for 2 of 6 areas investigated (no differences in antler beam circumference and length were detected for the remaining 4 areas). Differences among years were also noted in weight and antler measurement comparisons.

A more detailed analysis of deer population data was conducted for the Osceola WMA pursuant to a specific proposal to expand dog-hunting opportunities on that tract. The Osceola WMA is divided into 3 areas: the west dog-hunt area (25,887 ac.), east dog-hunt area (26,866 ac.), and still-hunt area (104,254 ac.). The still-hunt area is located in the interior of the WMA and bordered on either side by the east and west dog-hunt areas. The east dog-hunt area is subjected to dog hunting of fox, raccoon, bobcat and bear.³⁹ The west dog-hunt area is subjected to dog hunting of deer and bear only.⁴⁰

Tracks/mi. differed between all 3 areas on the Osceola WMA (Figure 2). The still-hunt area exhibited more tracks/mi. than either the east or west dog-hunt areas. The west dog-hunt area also exhibited more tracks/mi than the east dog-hunt area. An analysis of LANDSAT satellite imagery suggests that the differences in deer density indicated by the track count data are not a result of habitat differences among the three areas.⁴¹

The average age of the buck harvest did not differ between the dog- and still-hunted areas on the Osceola WMA. The average weights of the yearling buck harvest also did not differ between dog- and still-hunt areas. Mean antler beam length and circumference of harvested yearlings on Osceola, however, were larger for the dog-hunted area than for the still-hunted areas.

Inferences and Conclusions

The data presented herein are the basis for a number of inferences regarding the biological effects of dog-hunting on deer populations. The bulk of the evidence in the published literature suggests that dog-hunting of deer is more efficient than still hunting (Table 1). Particularly compelling are the data from the Savanna River plant in South Carolina. However, the similarity in average age of the buck harvest between dog- and still-hunted areas does not support the notion that dog hunting in Florida exploits the buck population more efficiently than still hunting.

There is some evidence that the use of dogs can cause substantial non-harvest mortality of healthy white-tailed deer⁴². There is, however, no indication that harassment by dogs adversely effects the ability of does to successfully complete pregnancy. Although studies demonstrating the effects of dog-running on neonatal fawns were not available, hunting season in the state generally do not coincide with peak fawning periods, and dog-hunting is not expected to adversely effect neonatal fawn survival. Deer also apparently do not permanently move out of an area because of dog harassment (Table 2). Deer population density data, however, show that (for whatever reason) dog-hunting as presently practiced results in a smaller deer herd than does still-hunting (Figures 1 and 2, Table 1).

Harvest regulations prohibit the harvest of does during the general gun hunting season on the WMAs studied. In the absence of doe harvest, the efficiency of the hunting method is irrelevant unless bucks are so completely exploited that there are not enough to breed the available does. Data collected from a number of dog-hunt areas on WMAs provide no indication of depressed pregnancy rates.⁴³ and such an occurrence would be highly unlikely for a polygynous species like deer.

The data seem to indicate that deer density differences result from higher rate of doe mortality in dog-hunted areas^{44,45}. A bucks-only hunter population should increase to near carrying capacity and be composed primarily of does. The data, however, seem to show that the opposite is true for dog-hunted areas in Florida. The cause of higher doe mortality on dog-hunted areas can only be speculated upon. Dog-hunters might have a greater tendency to inadvertently shoot a doe because of the snap decisions that must be made as the chase rapidly unfolds.

Deer track surveys on the Osceola WMA are consistent with those discussed above in that deer density on dog-hunt areas is significantly below the still-hunt area. The track count and antler data on Osceola indicate that the dog-hunt areas support deer populations that are well below carrying capacity. Differences in deer density may be manifest as a density dependent response in antler development, although these data are viewed by some biologists as equivocal. Despite similar age structure of the buck harvest between dog- and still-hunted areas, higher doe mortality on the dog-hunted area would explain the observed difference in antler characteristics and simultaneous lack of difference in the age structure of males. Age data for the doe segment of the Osceola deer population which might help clarify the mechanism depressing the population are not available for this area.

The sole effect consistently associated with dog-hunting of deer populations on WMAs appears to be a reduction in density on dog-hunt areas over still-hunted areas. It appears that concomitant illegal activity, by persons unknown, rather than the use of dogs to chase deer, is responsible for the decline of deer populations on the dog-hunted areas. It is not clear whether such illegal activity occurs during deer hunting seasons or at some other time of year. If illegal activity is the cause of the population decline on these areas, rather than the act of dogs chasing deer per se, then the potential exists for dog-hunted and still-hunted areas to coexist without wide disparities in deer densities; indeed such is the case on many private holdings in the Florida Panhandle.⁴⁶

Effects of Dog Hunting on Turkey Populations

Much of the information contained in this discussion, and the discussion of the effects of dog-hunting on the quality of turkey hunting which follows is derived from the report "Biological effects of dog hunting on wild turkey populations" by David Cobb, Ph. D., and Neal Eichholz, Coordinator and Assistant Coordinator, respectively, of the Commission's Wild Turkey Management Program.

Issue

Does dog-hunting have an adverse effect on turkey populations?

Facts Pertinent to the Issue

Literature Review--Although there is a lack of clear-cut and demonstrable human disturbance is held to be an important factor affecting wild turkey populations.^{47,48,49} Human disturbance has also been cited as the critical factor

in determining the presence of turkeys in localized areas.⁵⁰ Flushing hens from nests during the nesting season can reportedly affect population recruitment⁵¹, even though hens that are disturbed early in the nesting cycle will sometimes renest.

Dogs that are "on the track" can disturb turkeys but do not typically prey upon them. When hunting hounds are not retrieved from the field after a hunt they often become feral. Such feral dogs sometimes prey on nesting hens and poults during the initial flightless period after hatching.⁵² However, during fall dog-hunting seasons, all age-classes of turkeys are able to avoid such disturbances through flight.

A number of studies have assessed disturbance effects on turkeys during the fall. In Alabama⁵³, turkeys briefly shifted to non-hunted areas during squirrel and dog-deer hunts on two WMAs. In Georgia⁵⁴, still-hunting for deer caused turkeys to reduce their range and avoid contact with humans. In Virginia, investigators found that hunters and dogs disrupted the home range fidelity of turkeys, keeping turkeys scattered during fall hunting seasons.⁵⁵ While these studies demonstrate an alteration in activity patterns in response to disturbance, they also show that various disturbance factors, including but not limited to dog-hunting, can produce this effect.

In a West Virginia study⁵⁶, turkey populations were reduced in areas where public-access road density, which served as an index to disturbance, exceeded 6 km/1000 ha. Investigators in two other studies^{57,58} suggested that disturbance negatively impacted turkey survival and habitat use patterns. Recreational activities, including deer hunting, also adversely affected turkey habitat use patterns on Land Between The Lakes, Kentucky⁵⁹. This fact prompted investigators to suggest that disturbance control is important in maintaining turkey population levels.

Only one study⁶⁰ has been designed to directly evaluate the effects of extended dog-hunting seasons on wild turkey population dynamics and habitat use. Hunting bear with dogs (mid-October through 31 December bear season with a three-week deer hunting split in November and December) caused turkeys to repeatedly exit and re-enter the hunt area in response to the presence of free-running dogs.⁶¹ However, dog-hunting was not found to impact population dynamics.⁶²

It is logical to assume that forced dispersals out of preferred habitats can have negative implications for turkey populations, although no data are available for testing this assumption. Range availability is reduced, and overall flock health could be reduced if birds are forced into suboptimal habitats. These reductions would lower the carrying capacity of an area for turkeys, therein reducing availability of the turkey resource to sportsmen.

The hunting of turkeys with the aid of dogs is prohibited by Florida law. The prohibition is based upon the premise that use of dogs by turkey hunters markedly increases harvest efficiency, rendering turkeys vulnerable to overharvest. We are not aware of studies specifically addressing this premise. Overharvest, including a component attributable to illegal hunting, has been shown to be detrimental to some Florida turkey populations.⁶³ Division of Law Enforcement records show that incidental, illegal harvest by persons engaged in

dog-deer hunting activities does occur.⁶⁴ However, no data are available from Florida or in the literature that quantify the level of illegal harvest which can be directly attributed to dog-hunting under specific management scenarios.

Inferences and Conclusions

Based on our review, there are two generalizations relative to the effect of dog hunting on wild turkey populations:

- (1) dog hunting seldom has a direct impact on turkey populations;
- (2) turkeys respond to seasonal disturbances by moving to undisturbed (i.e., unhunted) areas or simply reducing their activity patterns.

Effects of Dog-hunting on Turkey Hunting Success and Hunter Satisfaction

Issue

Does dog-hunting have an adverse effect on turkey hunting success and hunter satisfaction?

Facts Pertinent to the Issue

Literature Review--One of the objectives of the Commission's Strategic Plan⁶⁵ and of the Draft Conceptual Plan for Florida's Wild Turkey Management Program⁶⁶ is to identify components of and increase turkey hunter satisfaction. Results^{67,68} of a recent survey showed a negative correlation between disturbance and overall hunter satisfaction. Although not distinguished in the survey, this disturbance could take at least two forms: disturbance from other hunters, and disturbance from dog packs during concurrent fall turkey and dog-deer hunting seasons. The affect of these specific disturbance factors during dog-deer hunting seasons on turkey hunter satisfaction has not, however, been investigated.

Several studies cited in the discussion of the effects of dog-hunting on turkey populations depicted disruption of turkey home range patterns and or distribution in response to disturbance (including disturbance by free-running dogs).^{69,70,71} A North Carolina study suggested that dog-hunting caused turkeys to abandon the Coweeta Hydrological Lab study area, while other normal human activities occurring there did not.⁷²

Inferences and Conclusions

While disturbance of turkeys and resultant declines in turkey hunting success and hunter satisfaction can result from a variety of lawful activities, it appears that the potential for dog-hunting to effect this result is substantial. It is likely that the shift in distribution and alteration in activity patterns described in the literature review results in a decline in the quality of turkey hunting opportunities, and accounts for the widely held perception that turkey populations are adversely affected by the use of free-running dogs.

Implication of Dog-Hunting in Trespass Problems

Much information contained in this discussion is derived from the report "Biological effects of dog hunting on white-tailed deer in Florida with special emphasis on the Osceola WMA" by Robert E. Vanderhoof, the Commission's Deer Program Coordinator. For additional detail on the analyses presented herein, please see Mr. Vanderhoof's report.

Issue

How can the Commission effectively deal with the problems of deliberate and inadvertent trespass into prohibited areas by dog-hunters and their dogs?

Facts Pertinent to the Issue

Literature Review--The subject of trespass is of prominent importance in the dog-hunt controversy.⁷³ Because dog chases can extend for several miles, many contend that dog-hunting increases the likelihood of trespass.⁷⁴ The current literature contains no studies specifically designed to quantify the amount or type of trespass associated with dog-hunting of deer. Available literature does, however, contain data which allows the prediction of potential for trespass during the dog-hunting of deer in Florida (Table 3).

Calculated Area Required to Contain a Dog Chase--From the published literature, the mean length of an average dog-deer chase is 2.3 mi. and the mean maximum dispersal radius is 0.9 mi. (Table 3). We calculated, at various probability levels, the size of the area an average dog pack would need to complete a deer chase (using the more conservative dispersal radius data from the published literature) without trespass into surrounding areas (Table 4). Thus 6,514 acres of hunting area is required to accommodate a dog pack with a 95% likelihood that a given dog chase will be completely contained within the hunting area. Smaller hunting acreages are associated with progressively lower probabilities that any given chase can be contained entirely within the designated hunting area (only 408 acres are required per dog pack if it is judged acceptable for only 1 of every four chases to be completely contained within the designated area).

The average dog-hunt area on WMA/WEAs where dog-hunting is permitted in Florida contains 74,452 acres. On such an area, approximately 17 uniformly distributed dog packs can be accommodated at any one time with an expectation that no more than 10% of the chases will result in trespass or overlap chase areas (i.e. run the same area and potentially merge or interfere with each other). Obviously, the distance between the area where dogs are cast and the area boundary will also affect the likelihood of trespass. If all packs were brought to the center of a circular shaped 74,000 acre area and cast, the likelihood that any would leave the area (i.e. trespass on adjacent land) would be reduced. However, the likelihood that they would overlap would be increased.

Although no data are available to substantiate the fact, we believe that many of the dog-hunt areas in Florida commonly host 26-52 packs per day during peak periods⁷⁵, a dog-pack density associated with a roughly 20%-52% probability

that any given chase will result in trespass or overlap on an "average" dog-area. Table 5 presents the calculated number of dog packs that could be accommodated on the theoretical "average" WMA/WEA dog area at the indicated probability of trespass (overlap) levels.

This approach also suggests that roughly 33,000 acres are required to accommodate 10 dog-hunting parties per day, (with 20% of the chases resulting in trespass or overlap). The acreage required to accommodate 10 dog-hunting parties per day at various calculated levels of trespass/overlap probability is presented in Table 6.

Notwithstanding the data presented above, it is apparent that the likelihood of trespass does not have a direct linear relationship to the size of an area. The ratio of boundary length to total acreage also affects the likelihood of trespass. Thus the likelihood of trespass is substantially lower on a circular area (minimum boundary to area ratio) than it is on a long, narrow area (higher boundary to area ratio) of the same size.

Inferences and Conclusions

The information presented above suggests that the average WMA dog-hunt area (74,452 acres) cannot accommodate typical peak period hunting use (26-52 packs per day) without a high likelihood (20-52% probability) that dog packs will trespass onto adjacent tracts or overlap chase areas with other dog packs. Overlap of chase radii among dog packs substantially reduces hunter satisfaction.⁷⁶ However, trespass by hunting dogs and/or hunters onto prohibited areas and private property constitutes a more serious concern. Such trespass can constitute a serious violation of law, and contribute to an erosion of the public perception of hunters and the GFC as a responsible regulatory agency.

Recent trends in the size and nature of tracts in the WMA system have compounded the dilemma faced by the GFC in efforts to accommodate dog-hunting while meeting its responsibilities to minimize the likelihood of associated trespass. Large privately owned tracts are being removed from the WMA system, with much of this land going into private hunting leases. Governmental land acquisition programs, which have been the primary source of lands added to the WMA system during the same period, have tended to focus on smaller tracts (< 10,000 acres). The size and shape of an area are important determinants of the likelihood of trespass. The greater boundary to area ratio inherent in smaller tracts, as well as their relatively small size, tend to aggravate trespass concerns associated with dog-hunting.

There are a number of regulatory measures which may assist the GFC in dealing with this problem. Recently, dog-hunting advocates have suggested the required use of beagle and beagle cross hounds as a possible solution to concerns regarding trespass on unauthorized lands by free-running dogs. The so-called "small dog" concept is based upon the belief that smaller dogs will produce a smaller chase radius, reducing the likelihood of trespass. An Arkansas study indicated that such is indeed the case.⁷⁷ It follows that proportionately smaller areas could accommodate a given number of hunters satisfactorily. The Commission has adopted regulations requiring dog-hunters to use small dogs on the Jena Unit of the Big Bend WMA during the 1991-92 hunting season. If judged

successful, this approach may be useful in affording dog-hunting opportunities on some areas heretofore judged to be too small or otherwise unsuitable for dog-hunting.

Intuitively, it would seem that an adequate road system would be a significant factor affecting the likelihood of trespass. An extensive network of reasonably maintained roads facilitates the hunter's capacity to catch dogs before they can leave designated dog-hunt areas. An adequate road system also contributes substantially to dog-hunter satisfaction by facilitating control of the chase, thus minimizing the likelihood of loss or injury of dogs. Unfortunately, an adequate road system probably also encourages high-speed vehicular chases which endanger life and property, and contribute to a negative perception of hunting and hunters. Some of the measures mentioned in the section entitled "Definition of Problem" might be useful in alleviating this latter concern.

It may be feasible to use still-hunt areas to buffer the effects of trespass by dogs onto adjacent private property. If dog-hunt zones on public lands could be effectively surrounded by still-hunt areas of adequate width, inadvertent trespass of dogs onto still-hunt areas would be less socially offensive than trespass onto private property.

Other Considerations

The essence of still-hunting is solitude. The still-hunter relies upon his knowledge of the activities and habits of white-tailed deer, the unique habitat features of the property hunted, and an ability to position himself in a manner that will facilitate the "ambush" of deer during the deer's normal daily activity. (Although "solitude" is not the watchword, the dog-hunter relies on similar experience and knowledge, the primary differences being that the dog-hunter seeks to drive the deer out of its normal activity pattern and into an ambush, and frequently repositions himself during the chase to effect the ambush). Though methods vary, archery, muzzle-loading gun hunting, and classical turkey hunting similarly require solitude. The same is true, to a degree, for the recreational observation of wildlife in its natural habitat. Dog-hunting as practiced in the southeast, represents the antithesis of these activities. Compatibility between these activities and dog-hunting is low, necessitating a temporal or spatial segregation to avoid conflicts.

The preponderance of Florida's deer hunters prefer still hunting (56%). The number preferring dog-hunting is relatively small (19%), although a substantial additional group (25%) indicate that they enjoy dog-hunting and still-hunting equally. Dog-hunting is permitted on the preponderance (69%) of the public lands opened to deer hunting with modern firearms in the state. At least in theory, 100% of these public lands are opened to archery, muzzle-loading gun, still-hunting, and wildlife observation, although intensive dog-hunting is generally preemptive on those public lands during the time it is permitted. Even though the public lands acreage opened to dog-hunting has declined substantially, it remains the predominant activity on a substantial majority of the lands in the WMA/WEA system.

Each of the four "issues" addressed in the subsection entitled "Technical Information" dealt in some part with real, implied or perceived misconduct and/or degradation of the recreational experiences of others by dog-hunters (i.e. harvest of doe deer in areas where they are protected, incidental take of turkeys disturbed by dogs, degradation of the quality of turkey hunting because of disturbance by dogs, and trespass onto prohibited areas). Although dog-hunters perceive (with varying degrees of validity) threats to their sport from anti-hunters, turkey hunters, still-hunters, non-consumptive users, landowners, the general public, and the GFC itself, it is clear that a significant threat to the sport originates within the dog-hunting community. A willingness on the part of dog-hunters to embrace the spirit and intent of laws and a standard of conduct which does not unreasonably compromise the opportunity for other interests groups to pursue their rights and privileges is necessary if the sport is to survive.

MANAGEMENT POLICY RECOMMENDATIONS

Based upon the information analyzed and presented herein, Commission Staff recommends consideration of the following management policies regarding dog-hunting.

Deer Dog-hunting

1. The legal hunting of white-tailed deer with free-running dogs is consistent with the mission, goals, and objectives of the Game and Fresh Water Fish Commission.
2. As a traditional form of recreational hunting in the southeast, which can be regulated in a manner which does "... not adversely impact the long-term well-being of ... wildlife populations or their habitats..."⁷⁸, it is the intention of the Commission to continue, to the extent practicable and feasible consistent with other resource values, to permit dog-hunting of white-tailed deer in the state.

Deer Dog-hunting on Private Lands

1. It is the intent and policy of the Commission to permit the dog-hunting of white-tailed deer on private lands in the state for the full extent of the general gun hunting season, so long as such activity (1) does "...not adversely impact the long-term well-being of... wildlife populations or their habitats..."⁷⁹, (2) does not unreasonably deprive other citizens of their inalienable rights, including the right of the landowner to control access for dog-hunting purpose as he sees fit, and (3) does not jeopardize the safety of people utilizing the property, rights-of-way, or adjacent roads.
2. The Commission urges dog-hunters to remain acutely aware of the considerable potential social conflict inherent in their sport, and to take all measures necessary to reasonably ensure that they and their dogs do not trespass upon lands where they are unwelcome, and that their activities do not infringe upon

the rights and prerogatives of others.

Deer Dog-hunting on Public Lands

1. As a traditional form of recreational hunting in the southeast, which can be regulated in a manner which does "... not adversely impact the long-term well-being of ... wildlife populations or their habitats..."⁸⁰, the Commission intends to continue to permit the use of free-running dogs on the public lands under its control, constrained by (1) the capability of wildlife and land resources to sustain a reasonable level of such use without adverse impact, (2) the desires and land use needs of private landowners, and (3) the demonstrable compatibility of such activities with other resource uses and the inalienable rights of citizens.
2. Because dog-hunting is recognized as a preemptive form of wildlife oriented recreation, with a high level of incompatibility with still-hunting, archery hunting, muzzleloading gun hunting, turkey hunting, and recreational nature observation, it shall be the policy of the Commission to facilitate "...temporal and spatial segregation..."⁸¹ of these activities from dog-hunting.
3. Because still-hunting, archery hunting, muzzleloading gun hunting, turkey hunting, and recreational nature observation are not considered preemptive forms of wildlife oriented recreation, it shall be the policy of the Commission to also permit these activities on lands where dog-hunting is permitted.
4. The following criteria will be considered in determining whether and to what extent dog-hunting will be permitted on lands within the WMA system.
 - a. The level of local and regional interest in dog-hunting versus the level of local and regional interest in other forms of wildlife oriented recreation.
 - b. The local and regional availability of dog-hunting opportunities versus the level of local and regional availability of other forms of wildlife oriented recreation.
 - c. The size of the tract being evaluated. No tract smaller than 33,000 acres will be considered for unrestricted deer dog-hunting; no tract smaller than 15,000 acres will be considered for restricted (small dogs only) deer dog-hunting.
 - d. The shape of the area being evaluated. No area (1) averaging less than 2 miles in width will be designated

as a deer dog-hunt area. No area (1) averaging less than 3 miles in width shall be designated as an unrestricted deer dog-hunt area.

- e. The adequacy of the road system. Areas to be considered as dog-hunt areas should include a network of passable roads (or areas appropriately accessible by vehicle) sufficient to provide 4-wheeled drive vehicular access within 1.5 linear miles of any point on the area. A passable perimeter road is also highly desirable to facilitate control of dog packs.
- f. Desired deer and turkey population levels.
- g. Surrounding land use.

A complete listing of references cited is available upon request.

Table 1. Direct and indirect indicators of relative efficiency of dog verses still hunting reported in the literature.

State	Area	Finding
Texas ⁸²	Polk-Hardin County	Deer densities are 4X higher on still-hunt areas than on dog-hunt areas.
		Browse surveys showed that range conditions were not limiting deer numbers on dog-hunted lands.
		Hunter success on experimental dog hunts was 65%
Georgia ⁸³	Savannah River Ecology Lab	A significantly greater number of deer were harvested from the dog-hunt area than from the still-hunt area.
		Hunter success (deer/man-day) was significantly higher in the dog-hunt area than in the still-hunt area.
		With the initiation of dog hunting in a previously still-hunted area, harvest increased to a level approximating that of the dog-hunt area, and hunter success also increased.
Florida ⁸⁴	Ocala National Forest	Deer densities were lower on dog-hunt areas than on still-hunt areas.
		Mean age of harvested deer was significantly lower for the dog-hunt area than for the still-hunt area.
Arkansas ⁸⁵	Buffalo Wilderness Area	Harvest rate (deer harvested/hunter hours) did not differ significantly between dog- and still-hunted areas.
		Pellet group, track, and trail counts did not differ significantly between the still- and dog-hunt areas

Table 2. Reported results of studies directly or indirectly investigating non-harvest dog-induced mortality of white-tailed deer.

State	Area	Finding
Florida ⁸⁶ Alabama South Carolina	Eglin AFB Lee County Savannah River Plant	During a total of 65 separate chases deer never stood ground to "fight" the dogs. In 51 of 65 chases deer left their normal home range, but returned within 24 hrs. During the 65 separate chases no deer was ever caught by the dogs. All deer remained in good physical condition throughout the study despite being chased as many as 30 times.
North Carolina ⁸⁷	Mt. Mitchell WMA	Deer. left their home ranges in 70% of the chases, but all returned within 7 days, most within 24 hrs. Two of 15 animals were caught and killed by the dogs chasing them, 1 was killed by a bobcat after having been chased outside its home range by dogs.
Texas ⁸⁸	Polk and Hardin Counties	A crippling rate of 38% on controlled experimental hunts was reported. Buck:doe ratios on dog-hunt areas were significantly higher than still-hunt areas, indicating a higher doe mortality rate on the dog-hunt areas, even though harvesting does with dogs was not legal. No significant difference in deer reproductive potential or fawn survival was found between dog-hunted and still-hunted areas.
Florida ⁸⁹	Ocala National Forest	Mean age of collected does on the dog-hunt areas was significantly younger than does collected on the still-hunt areas despite buck-only hunting on the dog-hunt areas.
Virginia ⁹⁰	Radford Army Ammunition Plant	Pregnant does subject to intense (almost daily) dog chasing recruited fawns into the population at the same rate as non-dog-chased animals.

Table 2 Cont'd.

Arkansas ⁹¹	Ozark Mountains	In 26 chases of 7 individuals, no deer was caught by dogs nor did any deer stand ground to "fight" with dogs
		All deer were chased outside their home range and all returned within 72 hours.
	Coastal Plain	In 35 chases of 6 deer no individual was ever caught by dogs, nor did any deer stand ground and "fight" with dogs.

Table 3. Findings in the current literature pertaining to the potential for trespass while dog hunting white-tailed deer.

State	Area	Finding
Florida ⁹²	Eglin AFB	Chases (n=65) averaged 2.4 mi. in length and ranged from 0.2 to 13.4 mi.
Alabama	Lee County	
South	Savanna River	
Carolina	Plant	
Texas ⁹³	Polk and Hardin Counties	Maximum dog dispersal during 45 chases averaged 0.9 mi. and ranged from 0.1 to 4.6 mi.
Arkansas ⁹⁴	Madison County	Chases (n=12) averaged 2.1 mi. in length and ranged from 0.3 to 5.0 mi.
North Carolina ⁹⁵	Mt. Mitchell WMA	Chases (n=18) averaged 2.4 mi. in length and ranged from 0.3 to 6.8 mi.
Arkansas ⁹⁶	Coastal Plain	Chases (N=35) averaged 1.6 mi. in length and ranged from 0.3 to 5.1 mi.
	Ozark Mountains	Chases (N=26) averaged 1.9 mi. in length and ranged from 0.3 to 5.0 mi.

Table 4. Approximate minimum size of an area needed for 1 dog pack to hunt deer and the associated probabilities of trespass.

<u>Probability</u>	<u>Area Required</u>
0.05	6,514 ac
0.10	4,407 ac.
0.20	3,284 ac.
0.50	1,629 ac.
0.75	408 ac.

Assuming a mean maximum dispersal of 0.9 mi.⁹⁷ and 1.8 mi. as the 95 % upper limit of the range (normal distribution).

Table 5. Calculated number of dog packs which can be accommodated on an "average" (i.e. 74,000 acre) public dog-hunt area in Florida, with associated probabilities of trespass or overlap of dog packs (conflict).

<u>Probability of Conflict</u>	<u>Number of Dog Packs</u>
0.05	11
0.10	17
0.20	23
0.50	46
0.75	182

Assuming a mean maximum dispersal of 0.9 mi.⁹⁸ and 1.8 mi. as the 95% upper limit of the range (normal distribution)..

Table 6. Acreage required to accommodate 10 dog packs at various probabilities of trespass or overlap among dog packs (conflict).

<u>Probability of Conflict</u>	<u>Acreage</u>
0.05	65,140
0.10	44,070
0.20	32,840
0.50	16,290
0.75	4,080

Assuming a mean maximum dispersal of 0.9 mi.⁹⁹ and 1.8 mi. as the 95% upper limit of the range (normal distribution).

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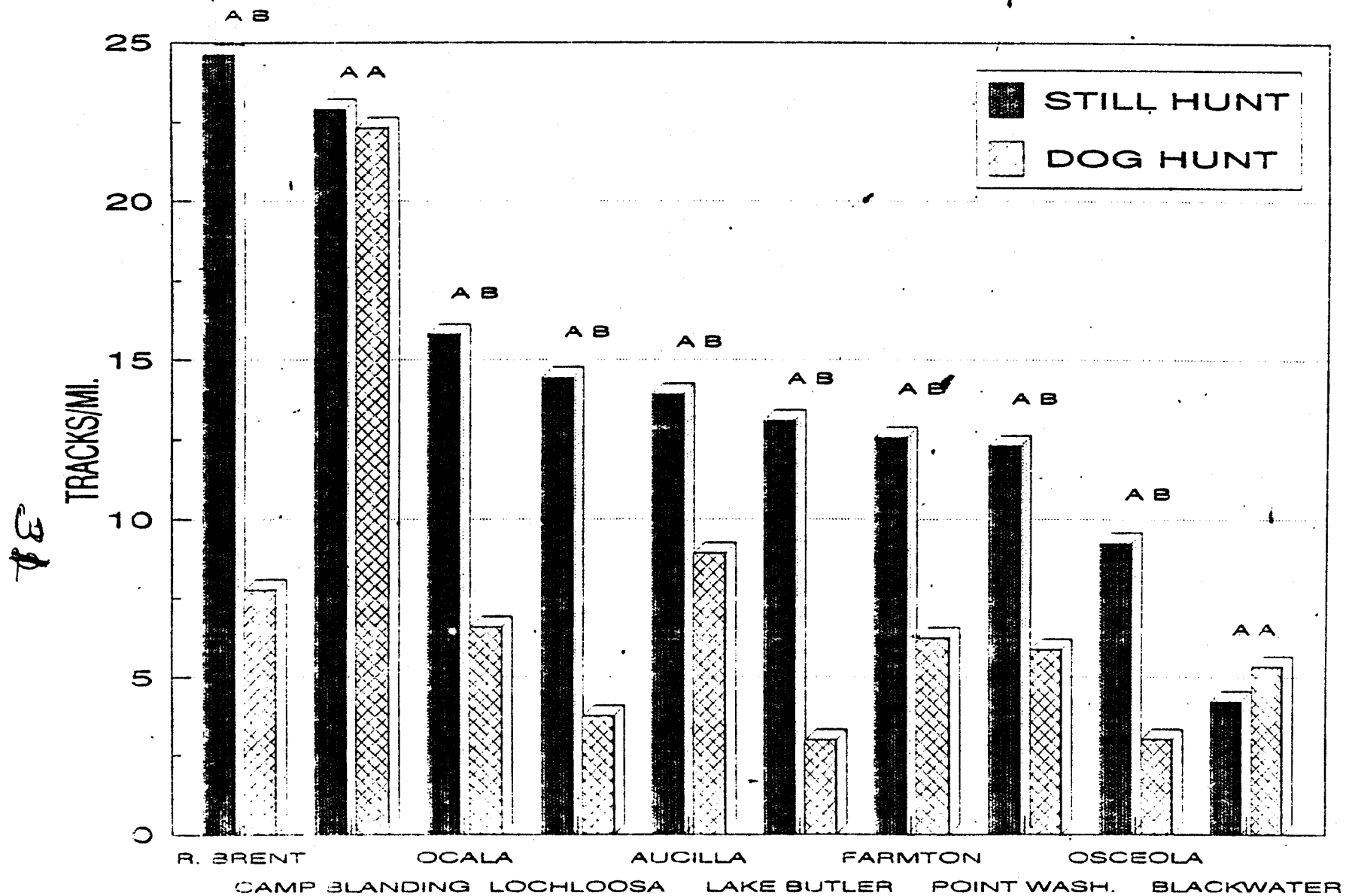


Figure 1: Track count comparisons for 10 wildlife management areas (WMAs) in Florida. Heterogenous letter pairs indicate statistical significance ($P < 0.05$) between dog and still-hunt areas within each WMA.

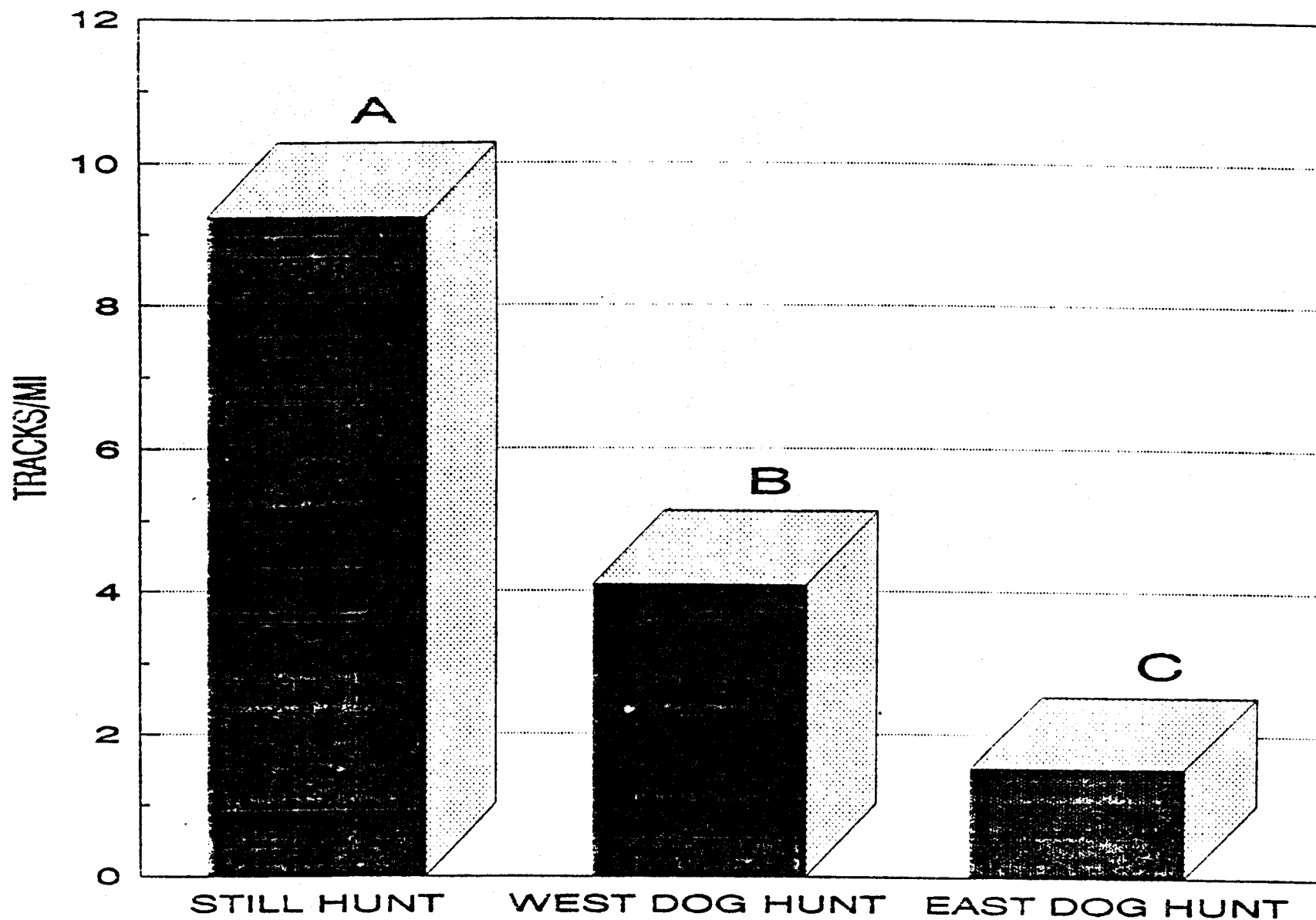


Figure 2: Track count comparisons for the 3 areas of the Osceola WMA in Northeastern Florida. Different letters indicate statistical significance ($P < 0.05$) between areas.