**Florida Fish and Wildlife Conservation Commission**
620 South Meridian Street, Tallahassee, FL 32399

POLICY☐; POSITION☒; GUIDELINE☐.

TITLE: **Position on Hardwood Control in Restoration of Fire-Adapted, Upland Natural Communities**

APPROVAL AUTHORITY: Division of Habitat and Species Conservation

DATE: 06/14/2010

## SUMMARY OF TEXT & PURPOSE FOR THE POSITION STATEMENT

It is the position of the Florida Fish and Wildlife Conservation Commission (FWC) that hardwood control in the fire-adapted natural communities of scrub, upland pine communities, and dry prairie often is necessary to restore and manage healthy populations of their characteristic plants and animals. Given concerns by some stakeholders, the FWC recognized the need to articulate these land management concepts and to describe how they play a crucial role in restoring and maintaining natural communities. In this document, hardwood control refers to the reduction in height or density of hardwoods that have encroached or become overgrown due to the exclusion of fire. The FWC retains hardwoods at varying densities in these communities depending on the goals for a property and the needs of wildlife, and the FWC does not typically control hardwoods in mature hardwood hammocks. Hardwood control conserves fire-adapted upland natural communities by facilitating the return of fire, and promotes suitable habitat conditions for many game and non-game wildlife characteristic of these natural communities. Hardwood control helps the FWC to create a mosaic of habitat conditions to maintain, to the greatest extent possible, the full complement of species characteristic of a given community.

*This position statement is intended to describe why the FWC sometimes conducts hardwood control; it is not intended to provide specific guidance on how an individual property should be managed. The management goals for natural communities on a property depend on the life history requirements of the wildlife for which the property is managed.*

## BACKGROUND

The mission of the FWC is to manage fish and wildlife resources for their long-term well-being and the benefit of the people. To accomplish this mission, the

FWC's management philosophy is to manage natural communities to support healthy populations of the plants and animals characteristic of each natural community. The natural communities of scrub, upland pine communities, and dry prairie are among the most imperiled in Florida. Much of the acreage of these natural communities has been converted to other land uses, and one of the primary threats to remaining acreage is the lack of fire. Restoration actions in fire-suppressed upland communities may include reducing the density or height of encroaching or overgrown trees and shrubs. Although restoration may involve management of a broad variety of plant species, this position statement specifically addresses hardwoods.

Hardwood control raises concerns from user groups. There are concerns about whether restored areas have sufficient mast for wildlife or whether hardwood reduction alters favorite hunting locations and changes movement patterns of game. The reduction of shade sometimes affects the enjoyment of specific activities. Other individuals are concerned that hardwood reduction negatively impacts wildlife populations or the aesthetic qualities of the property.

The FWC acknowledges that hardwood reduction may change how and where people recreate. While the initial appearance of hardwood control may not appeal to some people, these alterations provide long-term benefits by restoring more representative compositions of the plant and animal populations associated with these fire-adapted communities.

It is the position of the FWC that hardwood control in the fire-adapted natural communities of scrub, upland pine communities, and dry prairie often is necessary to restore and manage populations of their characteristic plants and animals. The FWC manages hardwoods to create a mosaic of habitat conditions, and the extent of hardwood control on a property depends on the existing habitat condition, the management objectives of the property, and the life history requirements of different wildlife species. Hardwood control conserves fire-adapted natural communities by allowing the reintroduction of fire and benefits many wildlife species characteristic of these communities.

## CONSERVATION OF NATURAL COMMUNITIES

Natural communities historically maintained by fire, such as scrub, upland pine communities, and dry prairie, are currently among the most imperiled in Florida, with fire exclusion an important contributing factor (FWC 2005). The amount of scrub has declined drastically since pre-European settlement due to land conversion for housing and agriculture. For example, estimates indicate a loss of 85% of scrub and sandhill on the Lake Wales Ridge in South Central Florida and over 95% of scrub in Palm Beach County (Fernald 1989, Turner et al. 2006). An

estimated 97% of upland longleaf pine communities have been lost within the Southeastern United States since European settlement, and less than 0.2% of the original extent is in good enough condition to support the full diversity of characteristic plants and animals (Frost 2006). Sandhill, for example, is a highly threatened type of upland pine community that occurs on well-drained sandy ridges. In Florida, only 8% of the original acreage of sandhill communities remains (Florida Natural Areas Inventory 2009). Dry prairie is unique to central peninsular Florida, having only historically occurred in the Okeechobee, Osceola and Desoto plains (Orzell and Bridges 1999). It is estimated that greater than 80% of dry prairie has been lost (Florida Natural Areas Inventory 2009).

Restoring the remaining areas of these natural communities requires the reintroduction of fire. Florida's natural communities have experienced a long history of lightning-caused fires, and many of the plants and animals characteristic of these communities evolved to depend on periodic fires to maintain suitable habitat conditions (Campbell and Christman 1982, Abrahamson 1984a, Abrahamson 1984b, Myers 1990, Menges 2007). In the absence of fire, shade-tolerant hardwoods will overtake many natural communities and ultimately turn them into hardwood forests through the process of plant succession (Peroni and Abrahamson 1986, Myers 1990, Menges and Hawkes 1998, Menges 2007).

Many of the lands in Florida are comprised of fire-suppressed natural communities that are in the later stages of plant succession. This is due to landscape alterations, such as roads, buildings and agriculture, which resulted in reduced fire frequency or the exclusion of fire (Peroni and Abrahamson 1986, Duncan and Schmalzer 2004, Whitney et al. 2004). Fires that historically swept across the landscape now are contained by these alterations or are suppressed to protect human property.

The absence of fire changes the characteristic structure of fire-adapted natural communities. Fire-maintained scrub typically has a shrubby, open structure that provides suitable habitat for scrub-adapted plants and animals (Campbell and Christman 1982, Woolfenden and Fitzpatrick 1984, Menges and Hawkes 1998). Scrub communities contain high concentrations of unique and imperiled species (Austin et al. 1987, Turner et al. 2006). For example, the Lake Wales Ridge harbors 29 species classified as federally Endangered or Threatened and more than 80 species of arthropods unique to scrub and sandhill (M. Deyrup, unpublished data, Turner et al. 2006). However, much of the scrub that remains today is dense and overgrown due to fire exclusion, providing poor habitat for many of these unique and imperiled species.

Sandhill and other upland pine communities depend on frequent fires to maintain the relatively open pine stands and diverse groundcover on which many

native species depend (Frost 2006, Means 2006). When fire is excluded from these communities, encroaching hardwoods eventually shade out the groundcover vegetation necessary to carry fire and create a closed-canopy forest unsuitable for many characteristic wildlife species (Myers 1990, Frost 2006, Means 2006). Over the long term, lack of fire ultimately prevents successful pine recruitment because hardwood competition can reduce the growth and survival of pine seedlings (Lohrey and Kossuth 1990). In addition, fire exposes a mineral soil bed, which promotes successful recruitment of longleaf pine seedlings (Brockway et al. 2006). Pines are the characteristic dominant trees in upland pine communities, provide habitat for characteristic wildlife, and supply flammable needles that help to carry the fires that maintain these communities.

Frequent fires historically maintained dry prairie's characteristic structure, including a relatively treeless landscape with a diverse herbaceous ground cover and low shrub height (Harper 1921, Orzell and Bridges 1999). Loss of fire on dry prairie results in oak and pine encroachment, excessive shrub growth and loss of ground cover (Orzell and Bridges 1999). These changes in vegetation structure impact characteristic wildlife such as ground-nesting birds (Fitzgerald and Tanner 1992).

Because encroaching hardwoods shade out understory vegetation, some fire-suppressed lands lack ground fuels or other conditions necessary to carry fire. Consequently, chemical or mechanical treatment may be necessary initially to control hardwoods and restore fuels on the ground. Hardwood control aids in preserving the fire-adapted natural communities found in Florida by allowing the reintroduction of fire.

## BENEFITS TO WILDLIFE

Wildlife can only exist where all of their life history requirements are met. Many of Florida's native upland terrestrial animals, including many game species, depend on periodic fires to maintain conditions that meet all or part of their life history requirements. In later stages of succession, hardwoods grow to a height and density that affect the ability of fire-adapted upland natural communities to support the abundance and diversity of wildlife characteristic of each community. Reducing the density or height of hardwoods can quickly increase habitat suitability for many characteristic plants and animals (Provencher et al. 2002, Means 2006, Slapcinsky et al. 2010).

Many imperiled species eventually disappear from fire-adapted communities when they become overgrown with hardwoods. Overgrown scrub is poor habitat for Florida scrub-jays, gopher tortoises, and Florida mice (Woolfenden and Fitzpatrick 1984, Layne 1992, FWC 2007). Fire-suppression in sandhills can create a dense

hardwood midstory, decreasing the habitat suitability for imperiled wildlife species including the gopher tortoise, eastern indigo snake, red-cockaded woodpecker, the Southeastern American kestrel, and Sherman's fox squirrel (United States Fish and Wildlife Service [USFWS] 1981, Kantola 1992, Stys 1993, Provencher et al. 2002, USFWS 2003, Whitney et al. 2004, Means 2006, FWC 2007). Overgrown dry prairie cannot support Florida grasshopper sparrows (Delany et al. 1985, Delany 1996, USFWS 1999b) and Audubon's crested caracara (USFWS 1989). Some species designated by the FWC as Species of Greatest Conservation Need also decline as the habitat becomes overgrown. Examples include red-headed woodpecker, Bachman's sparrow, and brown-headed nuthatch (Provencher et al. 2002).

Control of hardwoods returns sunlight to the ground and allows growth of forbs and grasses. Increases in the quantity of grasses and forbs provide seeds and cover for ground-dwelling birds, and the increase in the herbaceous understory provides suitable nesting, brood-rearing and summer foraging habitat for quail and turkey (Rosene 1969, Hurst and Stringer 1975, Williams 1991, Porter 1992, Yarrow and Yarrow 1999). The flush of fresh growth following a fire typically increases insect populations (Kerstyn and Stiling 1999, Campbell et al. 2007), which are a critical seasonal component of turkey poult and quail diets (Williams 1991, Yarrow and Yarrow 1999).

Reintroducing fire increases the quality and palatability of forage available for wildlife and reduces the height of shrubs and some trees, bringing this nutritious browse back within reach of deer (Lay 1957, Lay 1967, Lewis and Harshbarger 1976, Crawford 1984). Protein content in native plants increases in recently burned sites (Lay 1957, Thill et al. 1987), and deer may spend more time foraging in these areas (Lay 1967, Main and Richardson 2002). Protein is a critical dietary component for recruitment and antler development in deer (Verme and Ullrey 1984).

Hardwood control does not always reduce total mast production. The short, shrubby oaks characteristic of Florida's dry uplands resprout rapidly from root systems after fire and produce acorns as shrubs (Johnson and Landers 1978, DeGange et al. 1989, Abrahamson and Layne 2002a, Whitney et al. 2004). In scrub, total mast production (acorns plus palmetto berries) can be highest when the oaks are shrubby (Harlow et al. 1980, Brooks and Abbott 1985). Maintaining a mosaic of different shrub heights dominated by intermediate-sized oaks (approximately three to seven feet tall) may maximize acorn yields in scrub; further, some scrub oak species may actually produce fewer acorns per individual beyond 10 feet tall (Abrahamson and Layne 2002b). While acorns are a preferred deer food, they represent just one seasonal component of a deer's diet, and overgrown natural communities provide less year-round forage for deer (Harlow et al. 1980, Brooks and Abbott 1985, FWC 2008).

Although many characteristic wildlife species benefit from habitat maintained with frequent fire, some species require patches of different successional stages to meet some of their life history requirements. For example, wide-ranging species such as black bear and panther require a mosaic of different successional stages in some scrub and upland pine locations. Patches of taller, thicker vegetation provide den security and foraging opportunities for bears and panthers (Stratman and Pelton 2007, Benson et al. 2008), and it is desirable to have such patches scattered through the landscape in areas important for panther conservation and in areas with imperiled black bear populations.

## SCOPE OF HARDWOOD REDUCTION ON FWC LANDS

The FWC's approach to restoration and management of natural communities in Florida typically focuses on maintaining or enhancing habitat diversity. The FWC manages public lands consistent with its mission, the management plans established for each area, and the purposes of acquisition. The FWC also provides wildlife habitat management recommendations to other public land managing agencies and private landowners to promote the restoration of fire-adapted natural communities. The management concepts discussed in this document are embodied in the FWC's statewide management plans for species such as white-tailed deer, red-cockaded woodpecker, and gopher tortoise (FWC 2003, FWC 2007, FWC 2008) as well as federal recovery plans and management guidelines for threatened and endangered species such as Florida scrub-jays, red-cockaded woodpeckers, Florida grasshopper sparrows, and the Florida population of Audubon's crested caracara (USFWS 1989, USFWS 1999a, USFWS 1999b, USFWS 2003).

The FWC restores and maintains fire-adapted upland communities throughout Florida on lands that it manages. Often this requires reducing the height or density of some hardwoods using mechanical or chemical means. Although restoration may require control of hardwoods, the FWC recognizes that hardwoods increase plant diversity and provide cover and forage for wildlife. Depending on the goals for an individual area, the FWC may recommend retaining hardwoods in varying densities or may recommend planting hardwoods in areas lacking habitat diversity and mast production. By creating a mosaic of habitat conditions, the FWC strives to maintain, to the greatest extent possible, the full complement of species characteristic of a given community.

The FWC does not typically conduct hardwood control in mature hardwood communities. Mature hardwood forests are distinct natural communities that enhance habitat diversity for wildlife and provide aesthetic appeal to the landscape.

## CONCLUSION

Many of Florida's upland natural communities have evolved over time to depend upon fire. Restoring fire to these communities and providing habitat conditions suitable for characteristic wildlife may require reducing the density or height of hardwoods. The FWC supports the restoration and maintenance of these communities to a condition that perpetuates them and their characteristic species.

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