



## Big game hunter preferences for hunting club attributes: A choice experiment



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### ABSTRACT

Big game hunting on private leased forestland is popular in Georgia and other parts of the southern United States. Very often, the leasing arrangement takes the form of a club, wherein a specified number of members pay an annual fee to either a landowner or the club's manager to have a certain bundle of access rights in accordance with other club regulations or attributes. Currently, little is formally known about hunter preferences for club characteristics. The objective of this study was to identify hunter preferences for attributes related to big game hunting clubs and to derive measures of economic value for these attributes. This was accomplished by conducting a choice experiment (CE) via a mail survey in 2012 of licensed big game hunters in Georgia. The CE presented respondents with alternative hunting clubs representing different combinations of attributes including acreage, membership number, harvest regulations, recent forest management activity, and annual club dues. Responses were analyzed with conditional logit and multinomial probit regression models. Consistent with economic theory, hunters preferred more acreage and fewer members. The least preferred harvest regulation was a one buck limit without size restriction while recent clearcutting was the least preferred forest management activity. Results should provide a better understanding of big game hunters' preferences and trade-offs for club attributes and should help landowners and club managers make management decisions that enhance the value of their resources.

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### 1. Introduction

Nationwide, hunting is a popular recreational activity with significant economic impacts and benefits. In 2011, there were an estimated 13.7 million hunters in the United States, up from 12.5 million in 2006 (United States Department of the Interior, Fish and Wildlife Service and United States Department of Commerce, 2011). As population growth continues, the number of hunters is expected to increase despite a projected per capita participation rate decrease over the next 50 years (Bowker et al., 2012). Total expenditures related to hunting in the United States were estimated at \$33.7 billion in 2011, a \$8.2 billion increase from 2006 (United States Department of the Interior, Fish and Wildlife Service and United States Department of Commerce, 2011). In Georgia, there were approximately 392,000 resident and nonresident hunters in 2011 (ranking among the top 12 states) who generated 965 million dollars in total expenditures (United States Department of the Interior, Fish and Wildlife Service and United States Department of Commerce, 2011). Similar to surrounding southeastern states, nearly 90% of Georgia hunters hunted big game, and roughly 60% of all hunting expenditures

were related to big game hunting. Big game hunters typically have various access options such as public land, private leased land, and private non-leased land. For example, most Georgia hunters (76%) exclusively hunted on private land in 2011, while 22% hunted on both private and public land (United States Department of the Interior, Fish and Wildlife Service and United States Department of Commerce, 2011).

Purchasing a lease or joining a hunting club is a popular alternative for many hunters who lack their own hunting land or prefer an alternative to hunting on public land. In recent decades, the popularity of lease hunting has generally increased. For example, the percentage of forest industry firms in the southern United States that leased to hunting clubs or individuals was 64.5% in 1994 compared to 76% in 1999 (Marsinko et al., 1998; Morrison et al., 2001). In Georgia, the estimated farm gate value of hunting leases for white-tailed deer increased from approximately \$72 million in 2002 to \$96 million in 2012 (Boatwright and McKissick, 2013; Wolfe and Stubbs, 2013). The popularity of lease hunting demonstrates that hunters are willing to pay for a hunting experience on private land (Hussain et al., 2004). Similar to other purchasing decisions, hunters maximize utility by choosing leases that possess attributes important to them while considering money and time constraints. From the supply perspective, landowners provide fee access opportunities primarily to generate revenue. In addition, landowners

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benefit from greater access control and reduced property damage due to trespassing (Marsinko et al., 1992).

Primary and secondary hunting lease markets exist in the United States. With leasing, private corporate and non-corporate landowners sell hunting rights to an individual, a group of people, or to a hunting club (Mozumder et al., 2007). Typically, landowners providing lease opportunities sell access to an entire tract. However, a secondary lease market is present when hunting clubs sell membership opportunities to hunters who are not necessarily interested in, or financially capable of, becoming independent leaseholders. Membership in a club can be more dynamic since hunters often have the opportunity to choose which club(s) to join or leave each season. Hunting club membership dues are typically paid before the beginning of the fall hunting season and are not expressed in dollars per acre. In addition, hunting club members are subject to club rules and bylaws that guide the behavior of club members. Thus, hunting clubs can be considered composite goods that can be broken down into specific attributes. Attribute-based modeling of hunting club choice can be used to assess whether and how hunters value alternative club attributes. The objective of this study was to determine Georgia big game hunters' preferences for various club attributes and to estimate the relative value, or willingness to pay (WTP), associated with each attribute.

While each state possesses unique demographic characteristics and laws governing big game hunting, Georgia is similar to most Southern states in terms of species hunted, hunter access, demographics, and alternatives. In addition, the hunting club membership market in Georgia is generally not centralized or formal and is fairly representative of the market in nearby states.

### 1.1. Factors affecting lease choice and willingness to pay

Attribute based methods have been widely used to examine outdoor recreation preferences. Adamowicz et al. (1994) studied angler site preferences with a choice experiment (CE) and found that attributes such as water quality and fishing success significantly affected site choice. Mackenzie (1990) used a conjoint analysis and found that Delaware deer hunters' site preferences were affected by factors such as travel time, site congestion, and type of hunting companions. In Canada, Boxall et al. (1996) found that hunter access, site congestion, and moose populations significantly affected moose hunter site preferences. Similarly, Boxall and Macnab (2000) found that distance to residence, hunter access, site congestion, and evidence of forestry activity affected wildlife recreationist preferences in Canadian boreal forests. In the southern United States, Hussain et al. (2003) used a conjoint analysis and found that Alabama deer lease hunter preferences were affected primarily by factors such as harvest success and accessibility. Similarly, Hussain et al. (2010) examined preferences for hunting lease choice in Mississippi and found that hunters preferred leases with greater game diversity, closer distance to residence, longer lease durations, and sizes between 500 and 1000 acres.

In addition to attribute based approaches, studies have used methods such as hedonic modeling and contingent valuation to examine hunting lease preferences. A hedonic study of hunting lease revenue in primary market by Hussain et al. (2007) found no significant relationship between lease price per acre and lease size, while Shrestha and Alavalapati (2004) and Rhyne et al. (2009) found that lease price per acre decreased with increasing acreage. Examining hunting club membership dues, Livengood (1983) and Pope and Stoll (1985) found that club dues paid by deer hunters increased with greater lease acreage. Researchers have also found that crowded conditions were not preferred by waterfowl hunters (Gan and Luzar, 1993) and increased the likelihood of Mississippi hunters choosing to opt for private leases over public sites (Munn et al., 2011). Similarly, Hussain et al. (2003) found that Alabama deer hunters preferred lease sites with a smaller likelihood of crowding. Using contingent valuation, Stribling et al. (1992) found

that willingness to pay (WTP) for a lease in Alabama did not significantly increase with the opportunity to harvest more than two deer.

Purchasing a hunting lease and purchasing a hunting club membership is not the same decision. Though attribute based methods have been used to examine lease attributes (Hussain et al., 2010; Hussain et al., 2003), similar approaches are needed to analyze hunter preferences for club attributes specifically. Though previous studies identified significant lease site preferences related to factors such as site congestion and game diversity, the effect of different management approaches on lease or club choice has not been examined. It should be noted that the choice set (attributes and their levels) analyzed in our study are more relevant and realistic with the club or secondary lease market. For example, unlike 2 and 3 year durations considered by Hussain et al. (2010), lease duration is rarely over 1 year for most (if not all) of hunting lease markets in the region. Attributes in our choice experiment include more important factors in lease club joining decisions such as number of members, buck harvesting regulations, and forest management activities, none of which were considered in previous studies such as Hussain et al. (2010). The findings of this research should be useful for private landowners and timber companies interested in better understanding hunter preferences and adopting management approaches that can improve the marketability of their clubs or leases.

## 2. Methodology

### 2.1. Choice experiment background

A CE is an attribute based approach to valuation that treats an environmental amenity as a composite good with distinct attributes and attempts to estimate the marginal economic value associated with each attribute (Holmes and Adamowicz, 2003). An application of the characteristics theory of value (Lancaster, 1966), the CE approach assumes that consumer utility is derived from the attributes that a good or service possesses rather than from the good itself. This method can be especially useful in evaluating natural resource policy questions since the focus is often not the complete loss or preservation of an environmental good but rather the appropriate adjustment of relevant attributes that make up the good (Hussain et al., 2010).

There are a number of advantages associated with choosing a CE over other nonmarket approaches. For instance, welfare estimates obtained from contingent valuation approaches may be affected by respondents neglecting to take into account potential alternatives (Boxall et al., 1996). From an operational perspective, a CE can help to avoid the "explicit elicitation" of willingness to pay values and other issues typically associated with contingent valuation method like protest bids and strategic or social desirability bias (Hanley et al., 2001). A CE also provides advantages over revealed preference approaches such as hedonic modeling and the travel cost method. The revealed preference methods rely on examining observed market or consumer behavior, and therefore are relatively free from hypothetical market effects (Hanley et al., 2002). Nevertheless, a CE provides greater flexibility in framing the research question and controlling which attributes are included in the analysis (Ryan et al., 2007). In addition, attribute levels beyond the range of those currently observed in the marketplace can be examined using a CE (Hanley et al., 2002), making CE useful for ex ante policy analysis. However, it should be noted that potential concerns associated with conducting a CE include choice complexity, choice set length, and the potential for strictly dominated alternatives (Hanley et al., 2002).

### 2.2. Study area

This study was conducted in the state of Georgia, United States, where hunters have the opportunity to legally hunt three big game species: white-tailed deer (*Odocoileus virginianus*), eastern wild turkey (*Meleagris gallopavo*), and American black bear (*Ursus americanus*).

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