



The Comparison of The Natural Stands Quantitative Characteristics in Managed and Non-Managed Areas in Caspian Sea Coastal Forests

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ABSTRACT

In this consideration the natural forest stands in managed and non-managed areas in Iran's North forest were studied from the view point of quantitative characteristics. Inventory was done by random systematic method and with a net of 112×112 meters dimensions with sample pieces of 500 square meters. In each sample piece the quantitative characteristics of breast height sections Basal Area (B.A) and the number of trees in a hectare were considered. ANOVA was used for testing the significant difference among parameters of quantitative means in the two areas the results of this study showed that from the view point of quantitative characteristics among Basal Area in hectare and the number in hectare in the two managed and non-managed areas a significant difference exists.

Keywords: Quantitative characteristics, Coastal, Natural forest.

INTRODUCTION

From the view point of precedence Caspian Sea coastal forests, Iran's North, are exception in the world and in fact they are the natural heritage of world. These days factors such as inaccurate planning and incorrect execution along with other factors caused the destruction of the forests (Namiranian, 1999). Therefore the executions of the protection plans for these forests in order to prevent more destructions and to restore these forests is necessary and essential. According to this it should become clear that how has the forest evolutionary process been in non-protected stands and in protected stands that weren't managed how has the forest reached its climax and how it is stability guaranteed. The betterment of the quantitative forest situation after a execution of a management period. In a study a part of forest stands in protected and non-protected areas in Iran's Arasbaran forests were compared from the viewpoint of quantitative characteristics and it was known that the number in hectare and section surface in hectare in protected stands are significantly more than non-protected areas

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(Alijanpour et al., 2003). In another study the consideration of forest quantitative situation in protected and non-protected areas in Iran's west forests showed that generally the quantitative and qualitative situations in protected areas is better than non-protected areas (Pourreza, 2004). Also the study of wooden species diversity in protected and non-protected areas of Iran's Arasbaran forests showed that there is a significant difference between the Richness index and Evenness index in the natural protected stands in comparison with non-protected forest stands (Alijanpour et al., 2009). The managed and natural stands biodiversity and regeneration structure of *Shorea robusta* species also Terai area in Nepal was also studied. The results showed that regeneration and plant diversity in the managed forest of the above species regeneration during natural forests management has had a comparatively good increase (Webb and Sah., 2003). Also other researchers have admitted in their studies that the combination of prevailing tree species in exploited stand in comparison with natural and protected stands have had some changes so that most of unwanted species have replaced the area's original and prevailing species. So before interfering in a stand the ecologic and habitation should be considered (Angers et al., 2005; Pat, 2007).

MATERIALS AND METHODS

The Under Study Area

The execution location of this study was Tonekabons forest in North of Iran. This areas forests are located in 36° 47' 40" longitude and 50° 41' 45" latitude and its least altitude from sealevel is 230 m and its most altitude form sea level is 2350 m (Figure.1). Pedologically the soil type is forest brown and its mean annual shower is 1250 mm and the under study area's mean annual heat degree is 12.5°C and it has humid weather. The main species that exist in the under study sites are *Fagus orientalis* along with *Carpinus betulus*, *Alnus subcordata*, *Acer velutinum*, *Quercus castaneifolia*, *Ulmus glabra* and *Diospyrus lotus*, and shrubs such as *Mespilus germanica*, *Ilex hyrcana* and *Crataegus* sp. are observed in the trial sites.

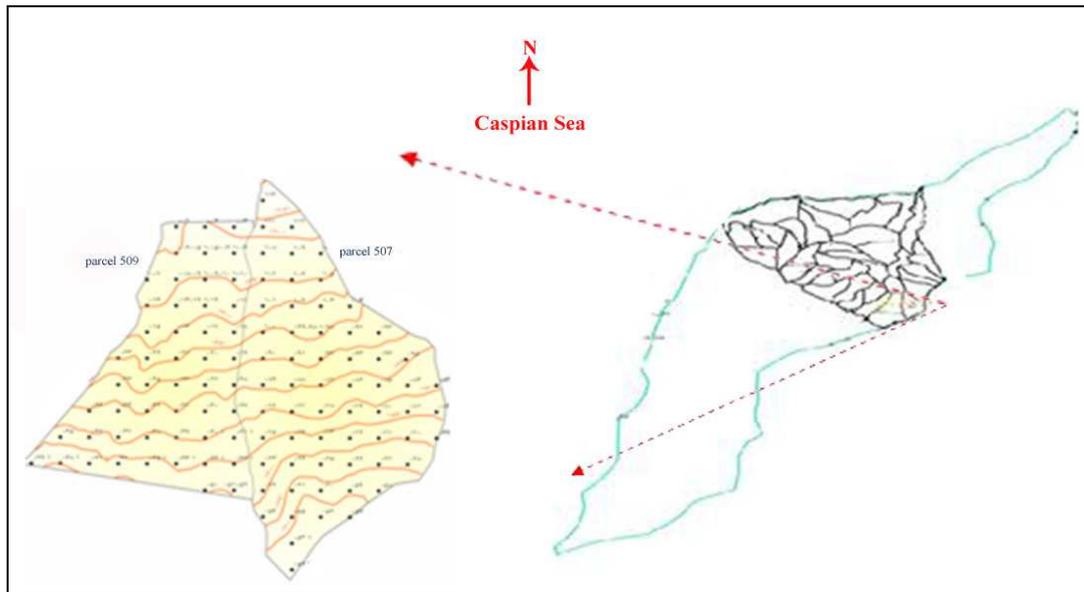


Figure 1. The research area.

Study Method

In order to do this study two parcels with numbers of 509 (non-managed) with a measurement of 65 hectares and 507 (managed) with a measurement of 81 hectares were selected. In this area because the under study forest stands are congenial the inventory was done by a random-systematic method and with a net of 112×112 meters dimensions with 500 square meters circle shape sample pieces. In the non-managed parcel 51 sample plots and in the managed parcel 63 sample pieces were selected and in each sample piece quantitative characteristics such as diameter and the number of trees were measured.

RESULTS

The results of the obtained means in the two managed and non-managed stands according ANOVA are shown in the following Table1.

Table1. The comparison of the quantitative characteristics of managed and non-managed parcels.

Characteristic	Non-managed Area	Managed Area	F Value
Mean of the number in hectare	149.6	182.35	14.2***
Mean of Basal Area in hectare(m ²)	26.94	43.54	12.29***

*** Significante in 0.001 level

According to the obtained results the quantity of number in hectare and also basal area in hectare in the managed and non-managed stands have had considerable difference (Figure 2 and 3) and this difference is significant at 1% level.

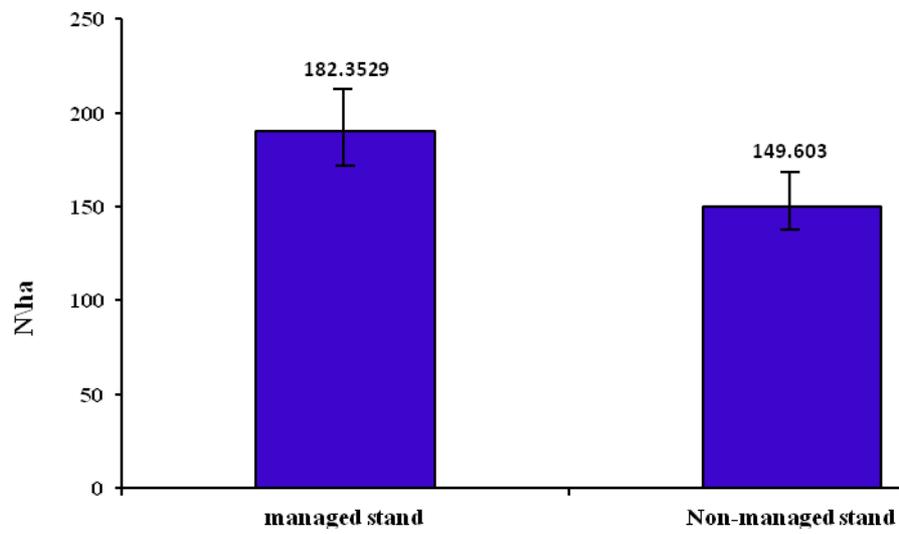


Figure 2. The statistical comparison of the number in hectare in managed and non-managed stands.

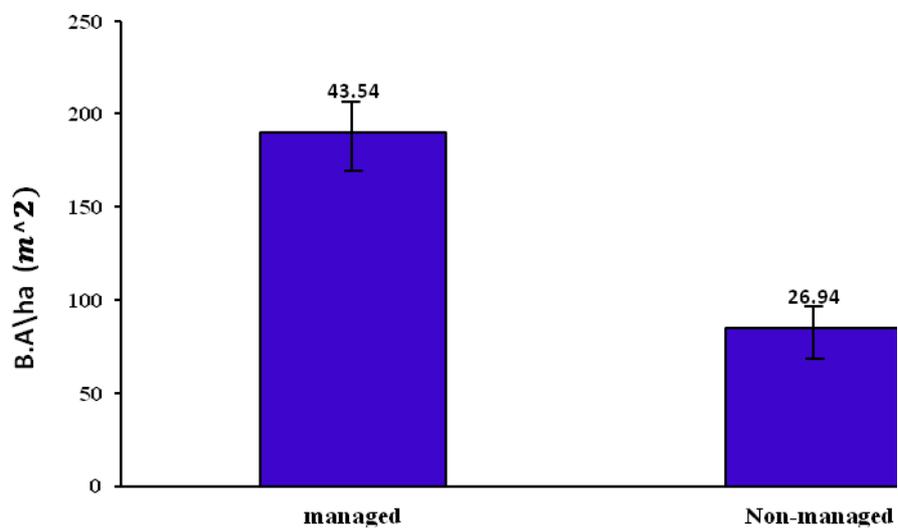


Figure 3. The statistical comparison of the Basal Area hectare in managed and non-managed stands

The consideration of the number of distribution in different diameter classes in managed stands shows the most gathering of trees in young and middle aged stages with low diameter classes (Figure.4). The same situation is observed in non-managed stands the shows the considerable decrease in number in hectare in middle aged trees with high diameter classes (Figure 5).

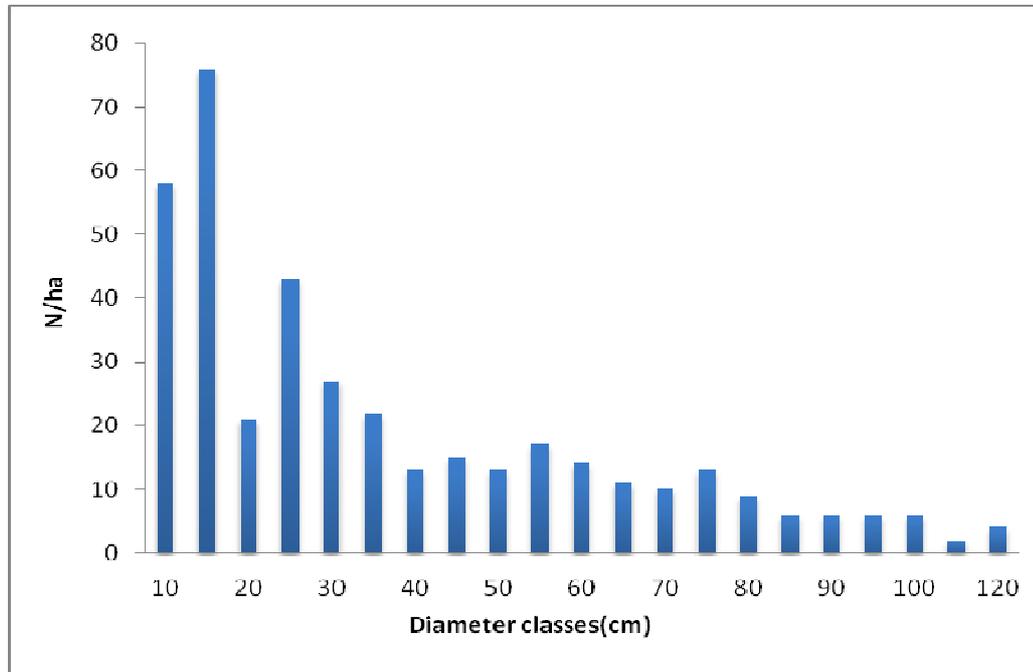


Figure 4. The distribution of numbers in different diameter classes in managed stand.

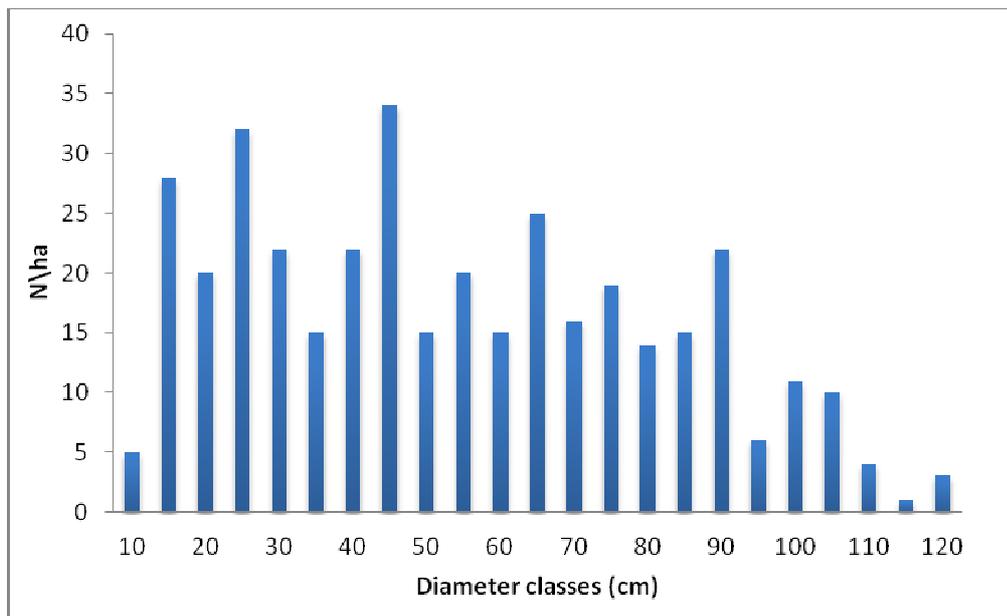


Figure 5. The distribution of numbers in different diameter classes in non-managed stand.

The survey of correlation curve between diameter breast height and the trees height in managed stand shows that there relationship is almost as a linear model (Figure 6). The correlation intensity (r) between these two parameters equals 83.8% which ANOVA insists on its significance at one percent level (Table 2).

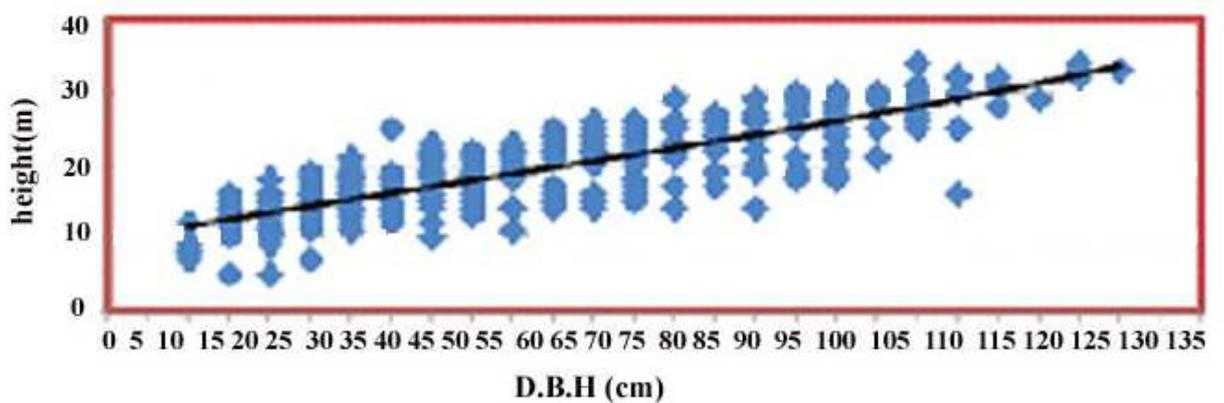


Figure 6. The diameter and height in managed stand

Table 2. Height and diameter correlation equation in managed stand.

Model	B	Std. Deviation	F Value
Constant	9.825	0.371	26.455
D	0.838	0.006	29.693**

** Significant in 0.01 level

Correlation curve between the trees diameter and height in non-managed stands shows a non-linear model (Figure 7). The correlation intensity (r) between these two parameters in non-managed stands equals 79.4% (Table 3).

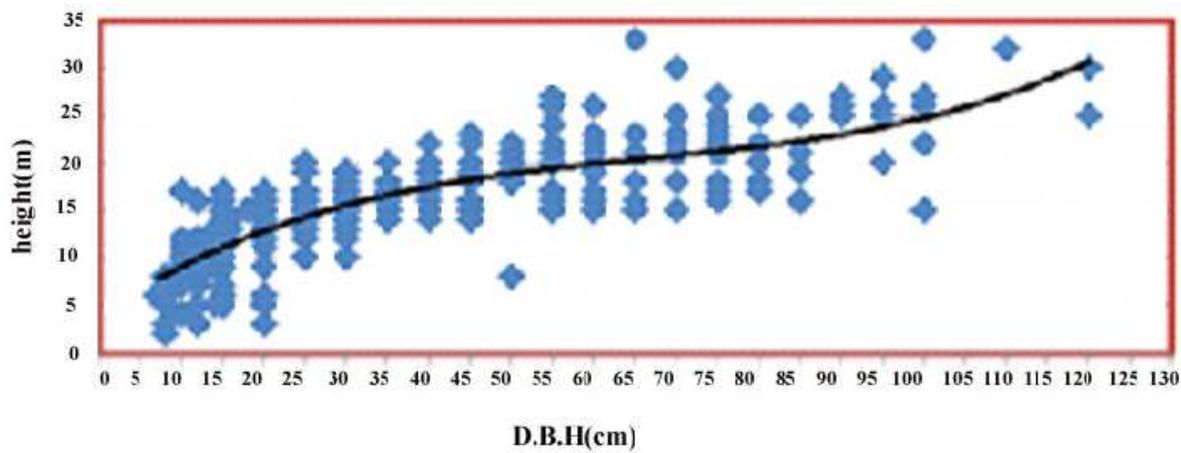


Figure 7. Diameter and height curve in non-managed stand.

Table 3. Diameter and height correlation equation in non-managed stand

Model	Std. Deviation	B	F Value
Constant	0.306	-	29.098
D	0.007	0.794	25.151**

** Significant in 0.01 level.

Discussion and Conclusion

The results of this study showed that in the managed stand the stand quantitative parameters such as number in hectare and Basal Area in hectare have more desirable situation in comparison with non-managed protected stand. This result shows that essential management of forest stands in many cases has caused positive changes in forest stands in this area. The considerations show that the most quantitative characteristics in managed stand have a better situation in comparison with non-managed stands (Pourreza, 2004; Alijanpour, 2003). The distribution of the trees number in hectare in different diameter classes in managed stands have a more congenial and regular state in comparison with non-managed stand. In other words because of structure diversity the managed stand has a more stable situation. The distribution of the trees number in hectare in non-managed stand is mostly related to less and young diameter classes. The inaccurate and essential silviculture management can have intense destructive effects in the forest and the main goals of afforestation plans that are making various and stable forest structure can be questioned. Because in many mentioned studies essential an accurate forest management can end to the increasing of biologic diversity (Halpern and Spies, 1995; Larsen, 1995; Attiwill, 1994). Therefore applying stable and essential management is not only non detrimental for forest stands but also in many cases in can cause structure improvement and biodiversity that ends to forest stand survival.

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