Abstract:

The pastures with extent nearly half the area of the country of Iran are one of the most important natural are as and productive resources. Proper management of pasture, is requires a precise estimate of the range of pastures. One of the parameters that can be used in determines the damage to pastures, invasive plant survey; determine the status, trends and production of pastures is plant density. Density can be estimated by different methods that one of the fastest and most cost are distance methods. Therefore, in this study, seven of distance methods of estimation of density was studied and their performance was compared, including the closest individual, nearest neighbor, random pairs, point centered quarter, Diggle's distance point, angle order and new method of quartered neighbor. Vegetation type was studied with the dominance of *Astragalus* (*Astragalus squarrosus*) in Manzelab pastures in Zahedan. To do this study, first, in the key area mentioned type, three areas of 5000 square meters (100 × 50) selected and in each area was attempted to count all of the base of the plant to be used as a control method and these methods was compared with those. In each of these areas, five transects 100 m was based on the distance of 10 m from each other. During each transect, 10 points to a distance of 10 meters were identified and marked as the Distance Methods. Distribution of the species examined in each area was calculated using the two indices Hopkins and Eberhart. For data analysis, mean comparisons using a protected t-test and Bonferroni test was performed at 5% level. In this research, to compare the estimated density of the distance methods with the true density, Protected T-test used. And also the accuracy of the obtained density, by calculating the relative difference in density estimation method with the control group (Estimated density error per method).The results showed that if a measure of accuracy is desired, of random pairs and , point centered quarter are more appropriate compared to other methods studied. If the measure of precision is desired, the angle order and nearest neighbor methods is recommended. If the time scale desired, closest individual and nearest neighbor methods are the best methods. When all three criteria are equally important, the nearest neighbor method and then the Diggle's distance point are presented as the most effective method in the study area. However, due to differences in the results of the study in each of the areas, cannot be recommended a particular method for the other regions with certainty.

Keywords:

plant density, distance method, plotless, Manzelab pastures, Zahedan

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