Use of Laser Data as a Tool when Calculating the Volume of Standing Forest in Property Tax Assessment of Agricultural Properties

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SUMMARY

Specific topic: Mass Appraisal Techniques

The subject to be presented focuses on the GIS that has been developed in conjunction with the preparatory work for the general taxation of agricultural properties in 2017, which Lantmäteriet (the Swedish mapping, cadastral and land registration authority) commissioned by the Swedish Tax Agency, has had a significant part in and a responsibility for. The size of the total standing volume on an agricultural property, which is a very essential value factor for a correct tax assessment, should be established for the part of the property that is forest land.

Lantmäteriet´s new national elevation model based on airborne laser scanning provides very accurate ground height values and as a side effect height data measurements of the forest. Swedish Forest Agency and SLU (Swedish University of Agricultural Sciences) have used the laser data in combination with existing sample plots from the National Forestry Inventory to improve the information on forest data, such as standing volume. The land cover data have also been used to determine what is forest land and what is arable land, grazing land, etc. The same information can also be given only for a specific forest property. The accuracy of the standing volume estimate is at least equal to that achieved at regular field estimations.

A weakness of the volume estimated by the laser is that this data in some cases has become too old and needs to be updated. An exciting technological development is ongoing, however, with a development that is expected to enable more frequent updates of the volumes. This will be of great importance, even for the Swedish Tax Agency that now intends to use this tool as an aid in the assessment in those cases when the growing forest volume is uncertain or missing. When this volume estimate will be updated at shorter intervals the information produced will evolve from

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being solely a support to an independent estimate of a property's growing volume without first having to ask this question to the property owner. This is especially advantageous because this is an issue that can be very difficult to estimate, particularly for those forest property owners who do not have a recent forest management plan or a similar skilled estimation of the growing forest.

A new land use class was created before the general taxation of agricultural properties in 2017, "Productive forest land by felling restrictions". This class contains formally established nature reserves and habitat protection areas. The area divided between nature reserves and habitat protection areas can be visualized in the form of polygons in the associated GIS. This is also an opportunity for the Swedish Tax Agency to pre-print the size of such areas on the tax forms sent out in connection with the property tax assessment, and has been judged to be of great value for the convenience of the forest property owners and also increase the quality of the tax assessment.