Special analysis of stocks of living biomass in non-productive forests (CC13) on terrestrial NFI plots

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Introduction

The UNFCCC expert review team asked in its review-report (UNFCCC 2014) to extend the information on carbon stock changes in unproductive forests (CC13) in Switzerland's Greenhouse Gas Inventory. This Inventory has to be submitted under the United Nations Framework Convention on Climate Change (UNFCCC) and under the Kyoto Protocol.

The Swiss national forest inventory (NFI) does not cover unproductive forests in its regular inventory scheme. However, a few measurements are made in unproductive forests. In this report, the available data on diameters of the terrestrial inventory NFI3 (2004-2006; Brändli 2010) and NFI4a+ (2009-2012; Thürig 2014; See FOEN 2014 Table 7-11) of brush forests are analyzed. From these diameters, the basal area can be calculated. In this report, basal area is used as a proxy for the stock of living biomass, since an increase in basal area is positively correlated with an increase in living biomass (e.g. Nowak and Crane 2002).

This analysis only covers brush forests since terrestrial data for "inaccessible stands" and "unproductive forest not covered by the NFI", both classified as CC13 in Switzerland's Greenhouse Gas Inventory, are not available (for a detailed description see FOEN 2014 Chapter 7.3.4.9).

Results

The diameter classes of all trees in 2006 (NFI3) and 2012 (NFI4a+) at 39 sample plots with shrubs and trees on unproductive forest areas has been compared. Since no allometric functions are available for these stands, it is not possible to calculate carbon stocks from these data.

Figure 1 shows the histogram of the diameter classes of plots which were brush forests during the NFI 3 (2006) and NFI4a+ (2012). The results are listed in Table 1.

Figure 1 and Table 1 show that the number of trees has increased over this 6 years period. From these data the basal area has been calculated. Table 1 shows an increase in the mean basal area from 4.59 m^2 ha^{-1} in 2006 to 5.47 m^2 ha^{-1} in 2012.

From the dynamics in basal area, it can be concluded that carbon stock of living biomass in unproductive forests is increasing for the observed period. Reporting no changes for this pool is thus a conservative estimate (IPCC Tier 1 approach).

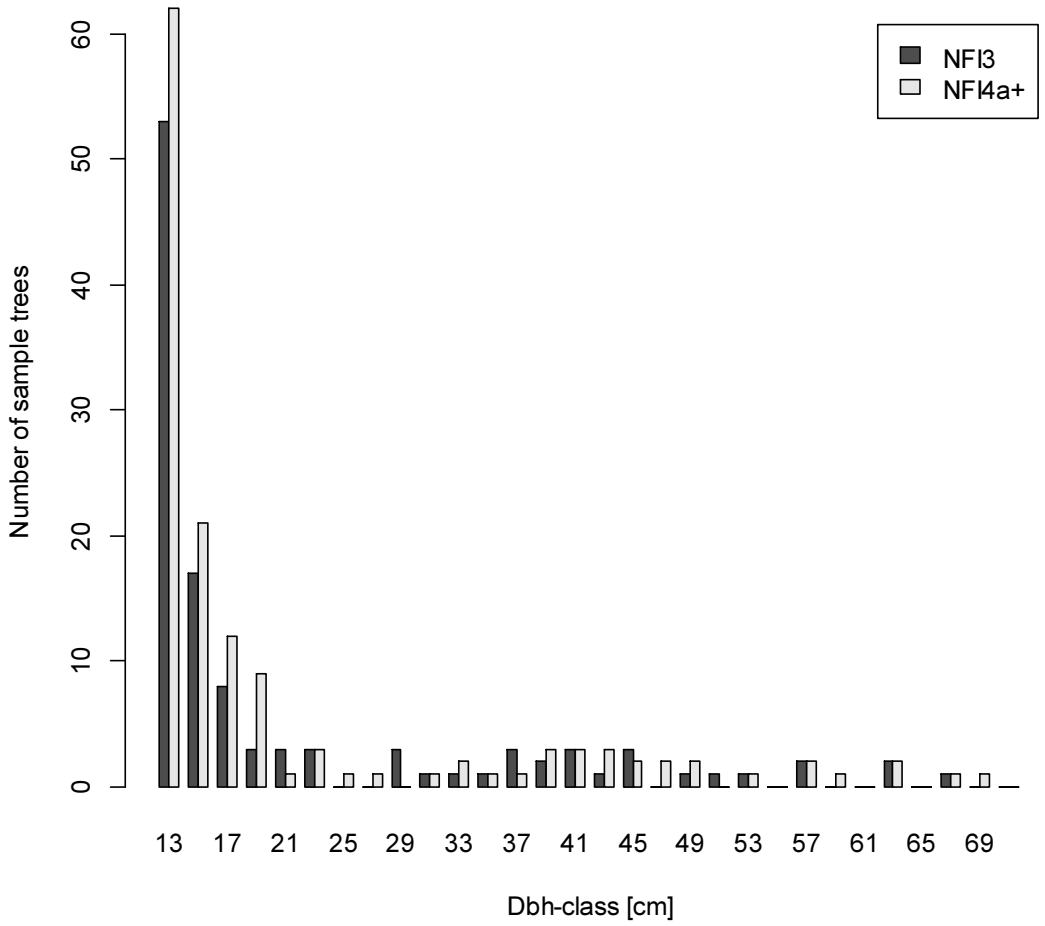

Fig 1. Histogram of DBH classes of plots covered with brush forests during NFI 3 (2004-2006) and NFI4a+ (2009-2012).

Table 1: Number (N) of plots and trees and the average basal area of all sample plots in persistent brush forest over NFI3 and NFI4a+.

	N plots	N trees	average basal area (m^2 ha^{-1})
NFI3 2004-2006	39	113	4.59
NFI4a+ 2009-2012	39	138	5.47

References

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