COMPARISON OF FOREST INVENTORY ANALYSIS AND FSVEG AREA ESTIMATES
SUITABLE AND ACCESSIBLE TIMBERLAND

Black Hills National Forest & Northern Research Station, Forest Inventory & Analysis
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Background

This summary is prepared to address concerns over acreage listed in FIA data and subsequent analysis. A comparison between the Forest Inventory Analysis (FIA) 2017–2019 inventory on the Black Hills National Forest (BKNF) land class area estimates and the 2015 forest Field Sampled Vegetation (FSVeg) Spatial layer was conducted to ensure consistency between inventories with an emphasis on suitable and accessible timberlands. It is important to understand that the acreage or acres of land classification of a national forest are not fixed. Many factors such as purchase, land sales, land exchanges, and changing site conditions all influence acres reported. While most adjustments are minor, large scale disturbance from insects, disease and wildland fire can result in significant changes in classification and acres reported.

Forest Inventory Analysis data are collected by professional field crews implementing national protocols and subject to quality assurance/quality control procedures. Details on field data collection are available online. The peer-reviewed statistical foundations of the FIA sample ensure that reliable, unbiased estimates are generated along with associated values of uncertainty.

FSVeg Spatial is a geodatabase platform that combines vegetation stand data with survey information from various sources including common stand exam surveys (CSE), photo interpretation, quick plot surveys, and post-harvest updates. CSE data is collected using rigorous national protocols. Data is used to develop site-specific resource estimates to assess vegetation and site attributes, determine stand treatment needs, and develop detailed silvicultural prescriptions. Since 2015 the BKNF has collected CSE data on 20,000 plots geographically dispersed across the forest. Details on CSE data collection are available online.

A comparison between these inventory datasets is imprecise due to the differences in how area is calculated, the timing of exams, sampling intensity, and classification protocols. CSE has been collected over a longer time period at higher plot densities when compared with the FIA inventory. These exams are designed to sample forest stands in comparison with the landscape scale sampling intensity of FIA inventories.

The 2015 FSVeg layer was selected for comparison since this layer was provided to FIA to determine the land class of plot locations during inventory design. The 2015 FSVeg layer was compared to the timber suitability calculations in Appendix G of the 2006 BKNF Land and Resource Management Plan Phase II Amendment to assess land class area changes during this time period.

We have concluded the following:
- The net suitable and accessible timberland total area estimates for each inventory are comparable (See Table 1). The FSVeg total (731,283 acres) falls within the 95% confidence interval for the FIA estimate (704,860 ± 30,808 acres).
- Differences in FIA and forest land classification are apparent regarding classification of currently non-forest areas or regenerating areas with low stocking. FIA data indicates that 44,000 acres is non-forest, presumably through a type conversion from forest to grasslands. The majority of these acres are still designated as part of the suitable and accessible timber base by the BKNF as non-stocked or marginally stocked areas (84,244 acres).
- Differences in classification of non-forest or regenerating areas with low stocking will not affect volume estimates.
- The BKNF suitable timber base decreased 2006-2015 by approximately 42,000 acres from 865,890 to 824,240 acres (See Table 2). Major changes to area estimates occurred for uneconomical areas and reserved areas such as wilderness, research natural areas, late successional reserves, and backcountry recreation areas.

Table 1. Comparison of FIA and FSVeg inventory estimates of suitable and accessible timberland.

Land class or condition	FIA Inventory 2017 - 2019	FSVeg Dec 2015 Suitable Base	Comments
	acres		
Total Acres - BKNF Suitable Base	**828,925**	**824,240**	For FIA data, plot locations were derived from the forest suitable base layer
Private and other ownership	-5,456	-4,194	Includes state lands for FSVeg
Reserved productive	-2,740	0	Wilderness, already filtered from FSVeg spatial layer
Net USFS Acres	**820,729**	**820,046**	
Other forestland	-10,995	-2,471	Non-commercial stands
Non-forest	-44,000	-1,904	Other land use or vegetation type conversion
Not classified	0	-144	
Net USFS suitable timberlands	**765,734**	**815,527**	
Non-stocked	-60,873	-84,244	Canopy closure < 10% on site that is capable of growing commercial timber.
Net stocked, suitable timberland	**704,861**	**731,283**	

Table 2. Net major changes to suitable and accessible timberlands by land class category, BKNF, 2006 - 2015.*

Description	Change (acres)
Increase in net NF acres	10,700
Increase in non-forest areas	-8,400
Increase in administratively withdrawn areas + Wilderness, + Research Natural Areas	-5,200
Increase in not technically feasible areas + Unstable soils, + Inaccessible, + Can't be restocked in 5 years	-19,000
Increase in non-commercial forests	-1,500
Decrease in areas removed to meet other multiple use objectives + Late Successional Reserves, - Riparian Reserves, + Developed Recreation Sites, - Backcountry Recreation areas, - Spearfish Canyon, - Southern Hills unsuitable	5,350
Increase in uneconomical areas + Steep slopes, + Road construction problems, + Isolated patches	-20,000
Forest type conversion	-3,500
Net Change to suitable and accessible timberland	-41,550

*Comparison between land class area in 2006 BKNF Land and Resource Management Plan Phase II Amendment and the February 5, 2015 FSVeg Spatial layer. This table does not include all land class changes.