

## Abstract template for the conference “A century of national forest inventories – informing past, present and future decisions”

Dear author. This is a two-page template that in the first page will ask for information on presenter name, topic, and preferred presentation form.

On page two, you are asked to fill in your abstract in the format and font size indicated. Please remember to include authors affiliation information in the footer section of page two. The length of the abstract may not be more than one page including references.

<b>Abstract title:</b>		Regional Harvest, Stocking, and Sustainability in a Complex Forest: What Can We Learn from NFI Data?
<b>Take-home message:</b>		<i>Forests in the northeastern United States are diverse and productive, but recent trends and patterns in harvest and stocking suggest challenges for future resource sustainability. Field data from the Forest Inventory and Analysis program are critical for diagnosing, understanding, and resolving these challenges.</i>
<b>Presenter name:</b>		Mark J. Ducey
<b>Presenter contact info:</b>		Department of Natural Resources and the Environment, University of New Hampshire, Durham, NH 03824 USA; mark.ducey@unh.edu
<b>General topic, see website:</b>  (please double click on the check box and activate the relevant one)	<input type="checkbox"/>	Improving future NFIs by learning from the past
	<input checked="" type="checkbox"/>	NFIs today and in the future
	<input type="checkbox"/>	Cutting edge and futuristic inventory techniques and technologies
<b>Preferred presentation form:</b>	<input type="checkbox"/>	Oral presentation
	<input checked="" type="checkbox"/>	Poster <b>(but could easily adapt to oral presentation)</b>
<i>Abstracts will be reviewed by members of our scientific committee and you will be given information on decisions in due time after the submission deadline has passed.</i>		

# Regional Harvest, Stocking, and Sustainability in a Complex Forest: What Can We Learn from NFI Data?

Mark J. Ducey<sup>1</sup>, John S. Gunn<sup>1</sup>, and Ethan P. Belair<sup>2</sup>

**Introduction:** Forest degradation is a concern that encompasses temperate as well as tropical forests, and one that national forest inventories are well-poised to address. We have used data from the Forest Inventory and Analysis (FIA) program in the northeastern United States to try to understand regional patterns of forest harvesting and their impacts on stocking, composition, and the future sustainability of wood supply.

**Materials and methods:** We used data from the U.S. Forest Inventory and Analysis (FIA) program for the northeastern United States to examine harvesting behavior and stocking levels in regional forests. We developed a quantitative decision tree to classify harvest events based on the trees removed and retained, and quantitative criteria for forest degradation. Degradation criteria combined a functional trait-based stocking measure (Ducey and Knapp 2010), classification of tree species by relative desirability, and field assessment of individual tree quality by FIA field crews. Here, we synthesize results from two existing papers (Belair and Ducey 2018, Gunn et al. 2018) along with new analysis of trends in harvested areas and volumes.

**Results:** In addition to widespread practices that conform to generally accepted silvicultural guidelines for the region, we identified a substantial number of harvest events (35% of plots with detected removals) in which harvesting disproportionately removed desirable stems and species, either in the form of high-grading or of apparently exploitative heavy cuts that left behind a predominantly undesirable residual stand. Because removals in this latter case are heavy, they account for a disproportionate share of current regional wood supply. Stocking of desirable stems and species indicates that nearly 40% of forested land in northern New England is in a degraded condition. Although there is a regional increase in average total stocking, nearly all of this increase comes from unacceptable stems of relatively shade-tolerant hardwoods, or from balsam fir that is expected to see heavy mortality in an impending spruce budworm outbreak.

**Conclusion:** Although aspects of the FIA design create unavoidable limitations, these data are invaluable for drawing inferences about regional forest conditions and identifying improvements in forest practices that will require positive policy support.

**References:** Belair, E.P. and M.J. Ducey, 2018, *J. For.* 116, 273-282.

Ducey, M.J. and R.A. Knapp, 2010, *For. Ecol. Manage.* 260, 1613-1622.

Gunn, J.S., M.J. Ducey, and E.P. Belair, 2018, *For. Ecol. Manage.* (accepted, in press).

1. Department of Natural Resources and the Environment, University of New Hampshire, Durham, NH 03824, USA

2. University of New Hampshire Cooperative Extension, Goffstown, NH 03045, USA

Corresponding author: mark.ducey@unh.edu

1. Department of Natural Resources and the Environment, University of New Hampshire, Durham, NH 03824, USA

2. University of New Hampshire Cooperative Extension, Goffstown, NH 03045, USA

*Corresponding author: mark.ducey@unh.edu*