

to provide basic information on forest resources for formulating national forest policy. Under the periodic system, forest inventories were conducted on a province-by-province cycle, which caused difficulties in compiling forestry statistics for the whole country because of multi-year inventory data. Furthermore, there has been increasing demand for reliable and timely information on forest resources and ecosystem from international processes and conventions since the late 1990s. From the 5<sup>th</sup> NFI (2006–2010), the inventory program has been improved, moving from a periodic to an annual inventory system. The new NFI design focuses on assessing and monitoring the extent and state of forest resources in Korea in an accurate and timely manner. The transition has required conceptual and technical changes in the inventory program, and is featured by the following core elements: annual inventory at 5-year intervals, new systematic layout of 4,000 permanent sample plots, new ground plot design, addition of new variables related to forest carbon estimation and biodiversity, collaborative implementing framework, etc.

**Forest information and sustainability indicators for serving society's needs.** Parviainen, J. (*Finnish Forest Research Institute, Finland; jari.parviainen@metla.fi*).

The present worldwide set of criteria and indicators on sustainable forest management (SFM) has been compiled mainly for the purposes of the forest sector. The demand for forest-related information by various sectors of society has, on the other hand, increased considerably. In particular, the energy sector (with increasing use of wood-based bioenergy), the health sector (using forests as medicinal compounds and therapeutic means), and the construction sector (using wood as an environmentally sound material) require up-to-date forest information for their purposes. In addition there is also increasing need to serve society with forest information in thematic areas such as: climate change, biodiversity conservation, human health, various forest ecosystem services, environmental characteristics, and the manufacturing chain of wooden products. The present SFM indicator sets are not flexible enough to provide the required data. This presentation provides a proposal for how the criteria and indicators could be updated to better serve society's needs. The proposal covers following items: updating quantitative and qualitative indicators in accordance with new demands, overall policies and special policy areas, threshold values, verification issues, and applications on how the criteria and indicators can serve other sectors and thematic areas.

**Status and progress in large-scale assessment of biological diversity in the United States.** Shifley, S.R., Flather, C.H., Smith, W.B., Riitters, K.H., Sieg, C.H. (*U.S. Forest Service, USA; sshifley@fs.fed.us; cflather@fs.fed.us; bsmith12@fs.fed.us; kriitters@fs.fed.us; csieg@fs.fed.us*).

Conservation of biological diversity is one of seven criteria used to evaluate forest sustainability in the United States. The status of biological diversity is characterized by nine indicators that report area, protected status, and fragmentation of forest habitats; number and conservation status of forest-associated species; range and abundance of forest species to describe genetic diversity; and institutional commitments to conserve biodiversity. A long-term, nationwide forest inventory system documents the stability of total forest area with notable shifts in age distributions, species composition, ownership, and management emphasis. Recent mapping of protected forest areas revealed that 14% of forests are protected and function as focal points for biodiversity conservation. Notable advances in the analysis of forest fragmentation have developed internationally consistent methods to quantify land cover and forest fragmentation at multiple spatial scales and indicate that nearly 75% of all forest habitats are within 300 m of an edge. Continued development of species information databases now permit national summaries of occurrence and conservation status of forest-associated vascular plants and most vertebrates—29% of which are presumed extinct or at-risk of extinction. As these databases continue to mature, information on less well-studied species (e.g., forest invertebrates) will be incorporated.

**Status and progress in large-scale assessments of the productive capacity of forest ecosystems in the United States.** Smith, W.B., Oswalt, S.N. (*U.S. Forest Service, USA; bsmith12@fs.fed.us; soswalt@fs.fed.us*).

Maintenance of the productive capacity of forest ecosystems is one of seven criteria used to evaluate forest sustainability in the United States and other countries that use the Montreal Process Criteria and Indicator framework. Productive capacity is quantified by five indicators: area of forest available for timber production and nonwood forest products, growing stock volume and increment, area and volume in planted forests, timber harvest, and harvest of nonwood forest products. For more than 50 years, the United States has used a nationwide forest inventory system to document the status of and temporal trends in regional forest distribution, volume, composition, ownership, and management or use. In the past, these measures were monitored using periodically implemented state-level inventories. Recently, the United States changed its approach from periodic assessment to an annual assessment to provide current and consistent data at the national and sub-national levels. In this paper, we compare historical inventory and reporting processes with current inventory and reporting processes, discuss the advantages and disadvantages of annual reporting systems, showcase highlights from the most recent report on sustainable forests, and present gaps in our current knowledge.

**Assessing the carbon stocks and fluxes for United States forest ecosystems and products.** Woodall, C.W., Skog, K.E., Heath, L.S., Perry, C.H. (*U.S. Forest Service, USA; cwoodall@fs.fed.us; kskog@fs.fed.us; lsheath@fs.fed.us; chperry@fs.fed.us*).

National-scale estimates of forest ecosystem carbon pools and fluxes are crucial to comprehensive carbon cycle accounting. In the United States, forest ecosystem and product carbon (C) fluxes provide one of the largest offsets of annual greenhouse gas emissions. Current estimates of forest ecosystem and product pools and fluxes for the U.S. were developed by the U.S. Department of Agriculture, Forest Service, under the framework of the Montreal Process Working Group on Criteria and Indicators, to evaluate the sustainability of forest ecosystem processes that mitigate greenhouse gas emissions. Results of this national assessment indicate that forest ecosystem C pools still provide one of the largest offsets of greenhouse gas emissions. However, in the context of national-scale forest health issues such as fire, land-use change, and invasive species, the direction of C fluxes in the future is in question. Given the diversity of forest ecosystems across the nation, the allocation of C to various forest components is highly variable, thus increasing the complexity of C sequestration activities. In light of possible climate change effects, trends in national-scale forest ecosystem C pools and fluxes may contain even greater uncertainty into the future.