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# COMMITTEE ON FORESTRY

## TWENTY-SECOND SESSION

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### ENHANCING WORK ON BOREAL FORESTS

## I. BACKGROUND

1. The boreal climatic domain covers a large share of the northern hemisphere and contains altogether almost one third of the world's forest lands, and half of the world's remaining large tracts of primary forests. Although often not fully recognized, boreal forests play an important role in all three dimensions of sustainability: ecological, economic and social. They provide a wide range of ecosystem services. Boreal forests are home of unique biodiversity and wildlife, including some of the most endangered species and habitats and the largest caribou herds in the world. Trees, soils and peatlands of boreal forests constitute the largest terrestrial carbon pools with 559 Gt C (mostly stored in soils)<sup>1</sup>. They store a huge reservoir of a freshwater through their lakes and wetlands and play a key role in regulating climate. The economic importance of the world's boreal forests is significant. Around one fifth of the world's industrial roundwood production is estimated to come from the boreal areas.<sup>2</sup> Boreal forests are home to many indigenous peoples and a source of their livelihood, income, cultural and spiritual values and traditional knowledge. These peoples rely heavily on timber and non-wood forest products (e.g. berries, mushrooms, medicinal plants), traditional agriculture and hunting.

2. All three ecological zones in the boreal domain: boreal coniferous forests, boreal tundra woodlands, and boreal mountain systems<sup>3</sup> provide multiple goods and services and require significant attention and efforts to enhance their resilience, adaptation and sustainable management in the face of emerging challenges.

## II. MAIN THREATS TO BOREAL FORESTS

3. Although boreal forests' moderate expansion is relatively steady due to the slow shift of the northern treeline, the abandonment of agricultural land and afforestation, they are extremely susceptible to climate change, disturbances and natural hazards. Many areas of boreal forests worldwide are profoundly affected by warming climate that in turn influences large scale landscape

<sup>1</sup> IPCC Special Report. Land Use, Land Use Change, and Forestry. A Special Report of the Intergovernmental Panel on Climate Change. ISBN 92-9169-114-3. IPCC, 2000

<sup>2</sup> FAOSTAT, 2014. [http://faostat3.fao.org/faostat-gateway/go/to/download/F/\\*/\\*E](http://faostat3.fao.org/faostat-gateway/go/to/download/F/*/*E).

<sup>3</sup> FAO, 2012. Global ecological zones for FAO forest reporting: 2010 Update. FRA Working Paper 179. FAO, Rome. <http://www.fao.org/docrep/017/ap861e/ap861e00.pdf>

processes. Boreal forests are frequently affected by fires, wind throws, massive insects' outbreaks, or similar factors, and the frequency of such events are likely to increase as a result of warmer and drier conditions caused by a climate change.

4. With the continuing rise of global temperatures, localized melting of permafrost as well as the drying of the boreal micro-climates is likely to release CO<sub>2</sub> and methane to the atmosphere, turning current carbon sinks into sources of carbon. Results from some numerical models indicate that by the mid-21st century, near-surface permafrost area in the northern hemisphere may shrink by 15–30 percent, leading to complete melting of the frozen ground in the upper few meters, while elsewhere the depth of seasonal thawing may increase on average by 15–25 percent, and by 50 percent or more in the northernmost locations. Such changes would cause dramatic emission of greenhouse gases from the carbon-rich wetlands, e.g. of Siberia.<sup>4</sup>

5. Forest fires have been a dominant disturbance regime in boreal forests for millennia<sup>5</sup>, and recent data illustrate that, despite reasonably successful fire management strategies in many countries, forest fires still exert a significant threat. It is also observed that changing conditions, land or fire management practices may lead to increased fire hazards. They represent a great danger to the boreal carbon pool, biodiversity and affect greatly all ecosystem services. Increases in boreal fire frequency and size due to climate warming may ultimately make the boreal zone a net carbon source.

6. For example, there has been a general increasing trend in annual area burned in North America in the recent decades, including a doubling of both the annual area burned and the frequency of large fire years since 1960<sup>6</sup>. Studies of future North American boreal fire regimes suggest increasing annual area burned rates. Increasing fire severity is expected to challenge fire management with greater wildfire activity<sup>7</sup>. According to the Russian Federation forest fire statistics the frequency of forest fires has declined over the period 1973-2013, but the areas burned have, on the contrary, increased.<sup>8</sup>

7. Many areas of boreal forest have experienced productivity declines, related to warming temperatures, specifically the greater drying power of air, inducing photosynthetic down regulation of boreal tree species not adapted to the warmer conditions. Conversely, productivity has increased along the boreal-tundra ecotone where more mesic (moist) conditions may be generating the expected warming-induced positive growth response.<sup>9</sup>

8. Boreal forests' biodiversity is unique. For example, Russia's largest populations of brown bear, moose, wolf, red fox, reindeer, and wolverine can be found in the Eastern-Siberian Taiga, which contains the largest expanse of untouched boreal forest in the world. Canada's boreal zone provides habitat for half of the country's 300 bird species and a wide range of mammals, insects, fungi and micro-organisms and many relict-rare and range-restricted species of mosses, vascular plants and animals. Boreal forest ecoregions have been subject to some of the world's largest land conservation actions and commitments, e.g. the Canadian Boreal Initiative, or the large protected areas of Siberia and the Arctic in Russia. Land-use changes, infrastructure development and climate change are often mentioned as threats to the boreal biodiversity.

9. Unsustainable management practices affect some parts of boreal forests causing forest fragmentation and degradation, and impacting their biodiversity. These threats may significantly impact socio-economic benefits derived from boreal forests, including for people directly depending on boreal forests, for entire countries and for the global population. Proper land-use policies and forest

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<sup>4</sup> Anisimov, O. and Reneva, S. 2006. Permafrost and changing climate: the Russian perspective. *Ambio*, 35, 169-175.

<sup>5</sup> Stocks, at al. 1998: Climate change and forest fire potential in Russian and Canadian boreal forests. *Climate change* 38: 1-13.

<sup>6</sup> National Forestry Database of Canada 2014, Kasischke and Turetsky 2006

<sup>7</sup> Flannigan, M.D., Cantin, A.S., de Groot, W.J., Wotton, M., Newbery, A., Gowman, L.M. 2013. Global wildland fire severity in the 21st century. *For. Ecol. Manage.* 294: 54–61.

<sup>8</sup> Eritsov A. 2014. Aerial Forest Fire Center of Russia. Written communication.

<sup>9</sup> IPCC 2013, WGI Fifth Assessment Report

management practices are crucial for the sustainable use and conservation of boreal forests, including for managing terrestrial carbon pools associated with boreal forests and their water storage.

### III. FAO'S WORK ON BOREAL FORESTS

10. FAO currently does not have a specific work programme on boreal forests but FAO's normative work on e.g. forest fires, forest health, pests and diseases and climate change are highly relevant to boreal forests. Examples are the guidelines on forest fire, phytosanitary measures and climate change for policy makers. Through the Global Forest Resources Assessments (FRA) produced every five years, relevant data on boreal forests are collected, but large knowledge gaps still exist.

11. During recent years, FAO has been undertaking work in some countries of the region covering a vast portion of boreal forests. In 2008-2010, FAO, in collaboration with the Russian Federation, implemented a capacity building project for the implementation of forest policy reforms in Russia. In 2012 FAO published "*The Russian Federation Forest Sector Outlook Study to 2030*", prepared in collaboration with the Russian team of specialists. FAO and the European Bank for Reconstruction and Development (EBRD) collaborate on "*Forest Sector Study and Investment Roadmap in the Russian Far East*", and a Russian Federation-wide "*Liquid Biofuel Study on Forest Biomass and Residues*". FAO Forestry Department also cooperates with the World Bank in a project on "*Russian Federation and China: Responsible Trade and Investment Policies in the Forestry Sector*". The Russian Forest Agency has also requested FAO to jointly develop GEF projects on Russian Forests and is currently in the process of establishing its priorities.

12. In Mongolia, the FAO project "*Capacity Building and Institutional Development for Participatory Natural Resources Management and Conservation in Forest Areas of Mongolia*" supported the development of a successful approach for community-based forest management, including fire management, as well as the formulation of a supportive legislation and policy framework. The approach is now being implemented throughout the country with support of GEF funding.

### IV. CHALLENGES AND KNOWLEDGE GAPS

13. It was recently suggested at various fora that more emphasis should be given to the boreal climatic domain in FAO's work. At its 38<sup>th</sup> session, held in Rome on 15-22 June 2013, the FAO Conference stressed the need to consider boreal forests for their contribution to the provision of multiple goods and a wide range of ecosystem services. There are some substantial challenges and knowledge gaps related to boreal forests. These include, *inter alia*:

- lack of coordinated and integrated monitoring and assessment of boreal forests, including through remote sensing, to assess the status of their conditions;
- lack of assessment and information on socio-cultural values and traditional knowledge associated with boreal forests;
- need for:
  - global mapping and analysis of health and resilience of boreal forests, their adaptation to climatic change, and their potentials for scaling up;
  - global mapping of mitigation potential carried by boreal climatic domain;
  - economic valuation of the contributions from boreal forests to sustainable development;
- lack of identified management, policies and related measures needs to promote sustainable forest management in the boreal forests region;
- lack of information on investments needs in boreal forests to improve their status, management and restoration.

14. In a rapidly changing environment, boreal forests, similar to tropical or dryland forests need appropriate recognition and actions. In order to further the work, international cooperation and collaboration on boreal forests needs to be further enhanced, including in data collection, assessment and monitoring, exchanging experiences and capacity building.

## V. POINTS FOR CONSIDERATION

15. The Committee may wish to:
  - recognize the important role that boreal forests play in regulating global climate and in providing environmental, social and economic benefits, and encourage international cooperation in assessment and monitoring of boreal forests;
  - invite countries to assess the status and resilience of boreal forests and take these into account in forest-related policies and measures;
  - promote collaboration between countries to exchange data from national forest monitoring systems for detecting and preventing large-scale, cross-border forest disturbances;
16. To this end, the Committee may wish to consider the benefits of establishing a working group on boreal forests, pursuant to Rule VII of the Rules of Procedure of the Committee, that could:
  - facilitate dialogue among countries on boreal forests and identify key areas of work;
  - support and facilitate global engagement and commitment of countries and partner organizations in terms of technical and financial resources;
  - consider a programme of work for FAO's support to the working group and for its activities, consistent with FAO's Strategic Framework;
  - serve as a liaison platform on technical issues related to boreal forests for countries, FAO, other UN bodies and other organizations.
17. The Committee may request FAO to:
  - scale up its support to countries on boreal forests, in accordance with its new strategic objectives and subject to available resources;
  - undertake, within the framework of the FAO Global Forest Resources Assessment (FRA) and contingent upon the availability of extra-budgetary funding, a global assessment of the extent and status of boreal forests;
  - address the specificities of boreal forests in the normative and field work of FAO, especially those related to forest protection, forest fires, wildlife management and carbon monitoring;
  - bring forward the specific challenges of boreal forests to relevant international processes and public;
  - organize an ad-hoc preparatory meeting with interested countries to consider the draft terms of reference, modalities and other relevant arrangements for an open-ended working group on boreal forests;
  - based on the outcomes of the preparatory meeting present a proposal for the establishment of the working group on boreal forests for consideration and possible adoption by the Committee at its next session.