International Wildland Fire Summit, 8 October 2003
Background Document

Conclusions and recommendations by the ECE/FAO/ILO Seminar on "Forest, Fire, and Global Change" 4-9 August 1996, Shushenskoe, Russian Federation

In 1996 the *ECE/FAO Seminar on Forest, Fire, and Global Change* was organized jointly by the Federal Forest Service of the Russian Federation and the ECE/FAO/ILO Team of Specialists on Forest Fire. During the seminar the following topics were addressed:

- Assessments on the extent of land areas affected by fire (forest and other land)
- Assessment of damages caused by wildfires
- Clarification of the role of forest fires in
  (a) land-use and land cover changes
  (b) ecosystems and in maintaining biodiversity
  (c) global carbon nutrient and water cycles
  (d) forests affected by industrial and radionuclide pollution
  (e) ecosystems affected by climate change
- Forest fire management, fire intelligence and equipment
- New spaceborne fire sensors

Based on these contributions the seminar formed working groups which prepared a general statement, conclusions, and recommendations which were included in a report and adopted by the seminar participants.

The recommendations of the seminar put main emphasis on the development of internationally agreeable standards and procedures for building a global database on wildland fires and an operational global vegetation fire monitoring system. Since the findings of the international group of wildland fire specialists have been followed up only partially it is proposed to re-evaluate the recommendations. The following general statement and those conclusions and recommendations are taken from the meeting report.[1]

1. General Statement: The Role of Fire in the Global Environment

I. Both anthropogenic and natural fires are an important phenomenon in all vegetation zones of the globe. Their impacts, however, are not uniform. Fires may lead to the temporary damage of forest ecosystems, to long-term site degradation and to alteration of hydrological regimes which may have detrimental impacts on economies, human health and safety.

II. As a consequence of global population growth and land-use changes, the cumulative effects of anthropogenic disturbances, and the over-use of vegetation resources, many forest types, which over evolutionary time periods became adapted to fire, are now becoming more vulnerable to fire.

[1] The full report of the meeting has been published in International Forest Fire News No.15, 40-47. See also: http://www.fire.uni-freiburg.de/iffn/org/ecefao/ece_3.htm

III. On the other hand, in many vegetation types, of the temperate, boreal and tropical ecosystems, fire plays a central role in maintaining the natural dynamics, biodiversity, carrying capacity and productivity of these ecosystems. In many parts of the world sustainable forestry and agricultural practices as well as pastoralism depend on the use of fire.

IV. Vegetation fires produce gaseous and particle emissions that have significant impacts on the composition and functioning of the global atmosphere. These emissions interact with those from fossil fuel burning and other technological sources which are the major cause for anthropogenic climate forcing.

V. Global climate change is expected to affect fire regimes and lead to an increase of occurrence and destructiveness of wildfires, particularly in the boreal regions of continental North America and Eurasia.

VI. Fire control has been the traditional fire policy in many parts of the world. An increasing number of countries have adopted fire management policies instead, in order to maintain the function of fire in removing the accumulation of fuel loads that would otherwise lead to damaging wildfires, and in order to arrest succession at stages that are more productive to humans than are forests and brushlands that would predominate in the absence of fire.

VII. In many countries, however, inappropriate choices are made - often because the responsible authorities and managers are not provided adequately with basic fire information, training, technologies and infrastructures. Large-scale wildfire disasters which occurred in the past years, especially in the less developed countries, may have been less severe and extended if national fire management capabilities had been developed and assistance through the international community provided.

VIII. Although the global fire science community has made considerable progress to investigate global impacts of fire, using available and developing new technologies, no international mechanisms exist for systematically collecting, evaluating and sharing global fire information. There are also no established mechanisms at the international level to provide fire disaster management, support and relief.

IX. Therefore the participants of the FAO/ECE/ILO Seminar on "Forest, Fire and Global Change" adopted the following conclusions and recommendations:

2. Conclusions

X. The economic and ecological impact of wildland fire at local to global levels has been demonstrated at this seminar. The possibility of major world disasters, such as the transfer of radioactive materials in wildland fire smoke, and the substantial loss of human life in recent fires, has been scientifically documented. The lack of, and need for, a global statistical fire database, by which the economic and ecological impact of fires could be spatially and temporally quantified, was identified. Such a reliable database is essential, under current global change conditions, to serve sustainable development and the urgent needs of fire management agencies, policy makers, international initiatives, and the global modelling community.

XI. Similarities in wildfire problems throughout the world are evident, particularly increasing fire incidence and impact coupled with declining financial resources for fire

management, underlying the urgent need to coordinate resources at the international/global level in order to deal effectively with impending major wildland fire disasters.

XII. As climate change is a virtual reality, with predicted significant impacts at northern latitudes, seminar participants recognize that boreal and temperate zone fire activity will increase significantly in the future, with resulting impacts on biodiversity, forest age-class distribution, forest migration, sustainability, and the terrestrial carbon budget. It is essential that future fire regimes in these regions be accurately predicted, so informed fire management decisions can be made.

3. Recommendations

XIII. The seminar participants draw the attention of the Joint Committee to this serious situation and to expeditiously consider the following recommendations:

A. Quantifiable information on the spatial and temporal distribution of global vegetation fires is urgently needed relative to both global change and disaster management issues. Considering the recent various initiatives of the UN system in favour of global environmental protection and sustainable development, the ECE/FAO/ILO Seminar on Forest, Fire and Global Change strongly urges the formation of a dedicated United Nations unit specifically designed to use the most modern means available to develop a global fire inventory, producing a first-order product in the very near future, and subsequently improving this product over the next decade. This fire inventory data will provide the basic inputs into the development of a Global Vegetation Fire Information System.

The FAO should take the initiative and coordinate a forum with other UN and non-UN organizations working in this field, e.g. various scientific activities of the International Geosphere-Biosphere Programme (IGBP), to ensure the realization of this recommendation.

The information given in the Appendices I to III (Draft Proposals for the Development of a Standardized Fire Inventory System) to these recommendations describe the information requirements (classes of information, information use), the establishment of mechanisms to collect and distribute fire inventory data on a global scale.

Appendix I (to Annex III)

Draft Proposals for the Development of a Standardized Fire Inventory System

I. Preamble

A Vegetation Fire Inventory System at both national and international levels serve a large number of practical needs:

1. Regional - national fire management

    a budget - resource requirements
    b daily to annual tracking of activity compared to normal
    c long-term trends
    d interagency - intergovernmental assistance
    e changes in long term trends

2. Regional - national non-fire

    a integrated assessments - monitoring of fire impacts on other resources
    b policies and regulations on
        i air quality
        ii global change
        iii biodiversity ?
        iv ?

3. International use of fire inventory

    a updated forest inventory; availability of timber;
      fire integrated in resource availability, salvage
    b market strategies
    c import- export policies - strategies
    d food and fibre availability rangelands
    e interagency - intergovernmental assistance agreements
    f national security
        i food and fibre assessment grass and fodder
        ii water supply and quality
    g research
        i global change
        ii integrated assessments monitoring
    h international treaties agreements
        i UNCED
          - climate convention
          - biodiversity
        ii CSD, IPF
        iii Montreal protocol on ozone
        iv IDNDR, others

4. Economic data utility national, but not international compatibility of assumptions

Appendix II (to Annex III)

Information Requirements

A. Classes of information

alpha type
- fire start and end dates
- fire location (lat, long; resolution?)
- fire size
- cause of fire

beta type
- fuels - biome classification
- fuel loading forest inventory, age class, size class

gamma type
- fire characterization (crown, surface, etc.)
- fuel consumption
- structural involvement (wildland urban interface)

delta type (current ECE/FAO)
- number of fires
- area burned (by forest type)
- cause of fires (number)

epsilon type
- gas and aerosol emission data

eta type
- total expenditure of fire programme
- total fire suppression costs
- total direct losses of merchantable timber, structural losses

B. Decision Space Table

Information use	Information type					**Frequency of information ***
	alpha	*beta*	*gamma*	*delta*	*eta*	
Regional/National (fire)						
1.Budget resource requirements	X	X			X	A
2.Daily to annual fire activity	X	X	**X**		X	DWMA
3.Long term trends	X	X	X		X	A
4.Interagency agreements	X				X	DWMA
5.Resource allocation	X	X	X		X	DWM
Regional/National (non fire)						
6.Assessment monitoring	X	X				A
7.Air qualitypolicy regulations	**X**	**X**		X		A
8.Global change policy regulations	X	X	X			A
9.Habitat change	X	X	**X**			A
International (fire)						
10. Intergovernmental assistance	X	X	X		X	DWMA
International (non-fire)						
11. Treaties and agreements	X	X	X	X		A
12. National security	X	**X**	**X**			DWM
13. Research		**X**	X	**X**	**X** X	A

14. Market import/export forecasting	X	X		X		A
*** D = daily; W = weekly; M = monthly; A = annual**						

C. Parsimonious Fire Inventory

Intergovernmental assistance at bilateral or regional level does not require a global data base. These agreements are regional and may differ in requirements from one region to another. If we exclude national security, we need only annual data for a global database. The gamma data type is assembled from the alpha data so there is no need to report this separately. The beta data on fuels can be obtained from other inventories, but must be standardized. The gamma data type will also require development of international standards before it can be considered. All vegetation fires must be included in this data base.

Appendix III (to Annex III)

Establishment of Mechanisms to Collect and Distribute Fire Inventory Data on a Global Scale

A. Current State of Fire Inventory

- Data consisting of individual fire reports are developed by many nations, but many regions of the world are not covered.
- Only ECE and EU nations have established mechanisms to share data.
- Current shared data consists of statistics aggregated from individual fire reports.
- Data from remote sensing is rapidly becoming available, but only for fires that can be defined by either heat signature or by fire scars on the landscape.

B. Issues

- A large number of uses of an international fire inventory have been identified in fire management, environmental policy and agreements, and in economic growth of nations.
- A parsimonious inventory has been identified which can be utilized by all nations (see statement on standardized fire inventory).
- There needs to be international agreement to provide fire inventory (similar to the FAO global forest inventory).

C. Implementation

- Fire inventory at the global scale should consist of individual fire data of date of fire start and end, location of fire, size of fire, and cause of fire. Fire location from individual fire reports normally report origin of fire. Remote sensed data are more likely to report centre of burned area. Should fire reports contain centre rather than origin, in addition to origin?
- Two additional forms of data will be needed in the future, biome classification and fire characterization. Standard for these additional information will need to be developed
- Rapid electronic communication is available for nearly all parts of the globe. Fire inventory data can be made available through World Wide Web. FAO is an appropriate centre to compile and distribute these data.
- Remote sensed data will need to be placed in the same format as individual fire reports and be made available on World Wide Web. Images can also be made available through WWW. Appropriate potential centres for compilation and distribution of these data are ISPRA (EU) or NASA's EOS-DIS.
- Those nations which cannot provide data in electronic format, should agree upon a hard copy format which can be scanned and readily placed in electronic format.