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Basics of Fire Management in Eurasia

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Wildland fires represent an important natural factor affecting the global environment due to the influence on the distribution of carbon throughout the geosphere and the atmosphere. Forest fire evokes strong emotions because it is often associated with great destructive power. However, it is clear fire has long been a natural component of the forest and is in fact responsible for shaping many of the forests that we are enjoying and utilizing today.

In many cases wildfires define the occurrence of flora and forest ecosystem dynamics. Each forest formation has its own fire regime characterized by a definite type of fire, intensity, size, fire frequency and post-fire reforestation dynamics.

Historically fire regimes in forest landscape ecosystems have been defined by natural conditions. Two fire regimes can be allocated in Siberian forests. Rare fire returns define fire regimes of bogged dark coniferous forests of Western Siberia. In contrary big burned areas and high fire frequency are characteristic for lowland light coniferous forests of Eastern Siberia.

Burned areas of Siberia are defined by big fires having 95% annual damage. Their arising in Siberia is defined by high frequency of droughts and prevailing light coniferous forests.

In Eastern Siberia and Far East there catastrophic big fire outbreaks are repeated 2-3 years in one region after 3-4 years. In some cases wildfires have positive effects on forestry. They consume fuel load decreasing fire hazard in forest, destroy insects habitat and stimulate natural restoration in light coniferous forests. At the same time wildfires having long drought on the background often are destructive especially in dark coniferous forests. Fire kills all stands and forest restoration moves through stand replacement and is delayed for long time. Up to 60% fires have place in southern taiga forests around the Trans-Siberian Railway. These forests highly are subjected by man's impact. Long years coniferous forests cuttings, wildfires, insects like Siberian Moth outbreaks decreased coniferous forested areas and they were replaced by non valuable deciduous stands.

In a huge territories of Siberia it is impossible to fight fires in all forest-plant zones. Economy of the country will not stand to such kind of expenses. Moreover, full exclusion of wildfires in boreal forests leads to extra fuel loads. Catastrophic fires arising in extreme fire seasons spread on huge areas destroying dark coniferous and damaging light coniferous forests.

Many countries of Northern Hemisphere changed their fire control policy to fire management in 1980s. Fire management in forests is a balance between the practical considerations of fire protection and the need to allow fire to play its natural role.

Fire management system is less expensive and more effective due to the varied approach to the fire control providing from full suppression and their control in definite boundaries, where they will not have ecological and economical damages. And in some cases wildfires are allowed to burn within the specific landscapes.

Fire management programs also include planned prescribed burning to solve forest restoration problems and preserve forests.

For achievement of forest fire protection effectiveness, forest resources saving and biodiversity the resolving of following organizing and scientific measures are necessary:

- Not use the Policy of all fires suppression and admit that some forest fires have positive effects on boreal forest ecosystems.
- Inventory post-fire state of forests and evaluate post-fire ecosystem succession in case, when forest fires are not suppressed. These will allow revealing conditions, under which forest fire plays positive role.
- The forest fire management area districting has to be based on ecological-economical evaluation of fire effects accounting post-fire forest succession.
- Legal on Federal level the prescribed burnings on forest areas to decrease high intensity fire hazard near settlements, valuable forests and so on.
- Design and apply the system of forest fire management passports of forest areas. The main goal is fire management development providing forest resources saving and shifting of forest succession direction.
- Organize the forest fire protection system on four levels:
    - High level protection. It should be applied on areas with valuable economical objects of civil and defence structures, and where high losses are possible.
    - Continuous protection. It should be applied on areas with intensive forest management and history valuable areas (reservations, parks etc.).
    - Limited protection. It is appropriate for reserve forest fund with regions of high fire protection of valuable natural resources (oil or gas rigs etc.).
    - Episodic protection. It should be applied during extreme fire seasons.

All of above mentioned levels have to be different in level of financing, technical facilities, amount and qualification of stuff and other features. The system allows to minimize the forest fire protection expenses and to maintain the natural role of fires in biological resources formation. In the scientific sphere the following tasks should be done:

- Investigate wildfires effects on large ecosystems;
- Determine border conditions of fire effects on forest ecosystems and biodiversity.
- Develop scientific database for long term forecasting of fire effects on forest recourses and basics for economic evaluation of positive and negative effects on large ecosystems and whole biosphere.

All these allow to quantify and estimate time-space economical and ecological fire effects on forest ecosystems. The same database will be highly valuable for forest fire administration and fire protection services as well as for international programs and organizations concerning global forest fire effects modelling.

Forest fires are the problem in our country as well as in other countries of Northern Hemisphere. And the solving of this is the main key point in protection and saving of natural resources, the ecology state and surviving under global natural and technogenic catastrophes.