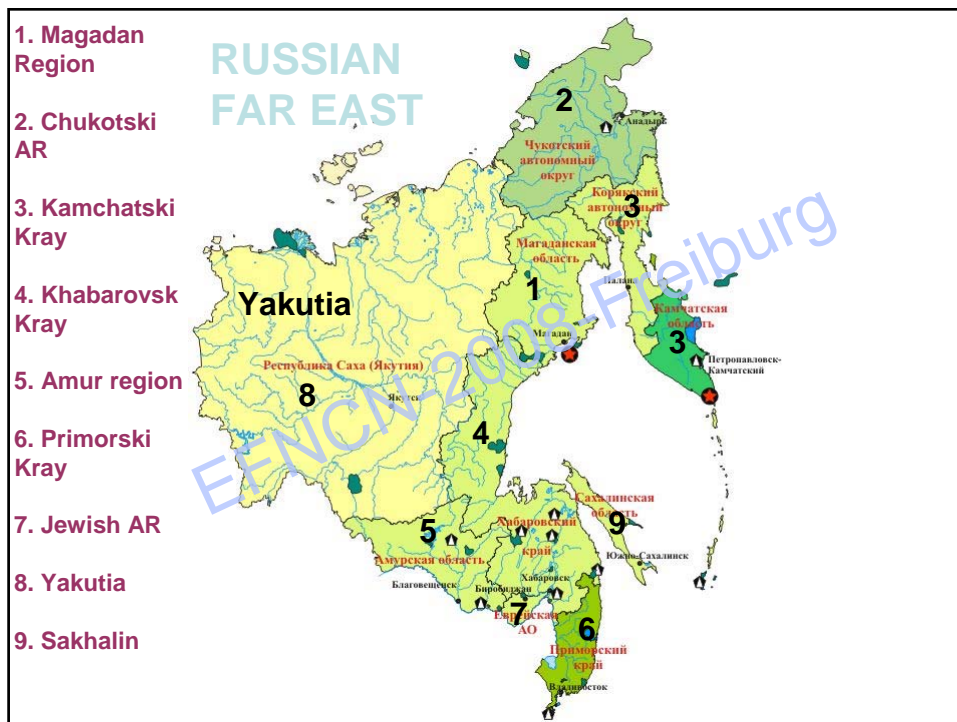
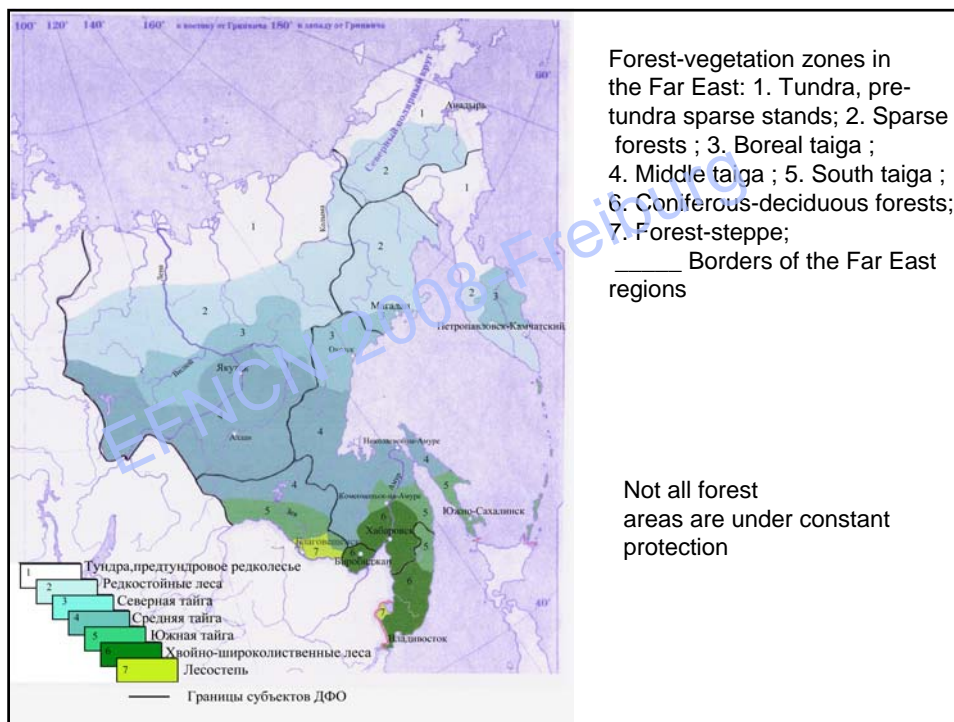


Symposium on Fire Management in Cultural and Natural Landscapes, Nature Conservation and Forestry in Temperate-Boreal Eurasia
Freiburg, Germany, 25-27 January 2008

PRESCRIBED BURNING IN THE RUSSIAN FAR EAST

Dr. Leonid Kondrashov, Pacific Forest Forum (PFF), Russia

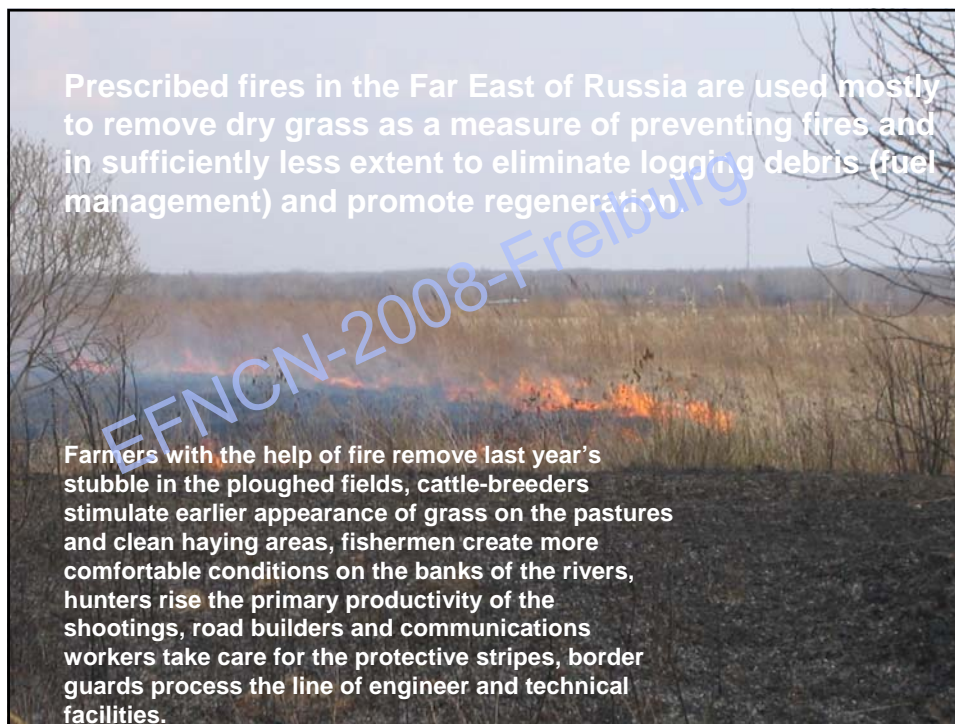




Far East Forest Fires in 2007 (by October 9)

Far East regions	Fire incidents from the beginning of fire season			
	Total number	Lands covered by fires, hectares		
		Total	Including crown fires	Unforested lands
Sakhalin region	67	1914.1	0	4224
Khabarovsk Krai	532	143494	0	29567
Primorski Krai	102	2894	0	48
Amur region	234	81634	0	12970
Jewish AR	50	1491		7313
Kamchatka Krai	20	4840.1	1828	1247.3
Magadan region	64	3466.9	0	3820
Chukotka AR	79	9438.8	0	55881.8
Yakutia	61	5358.3	2000	717.4
Total	1229	254531.2	3828	185788.5
Reserves' forests				
Total	18	4243	0	6896
Forests of other agencies				
Amur region	30	2691	0	2246
Khabarovsk Krai	9	596	0	62
Primorski Krai	1	5	0	0
Kamchatka Krai	3	40.1	0	40.1
Total	43	3332.1	0	2348.1
Total number of fire in Far East	1290	262106.3	3828	195032.6

Source: Rosprirodnadzor on Far East Federal District

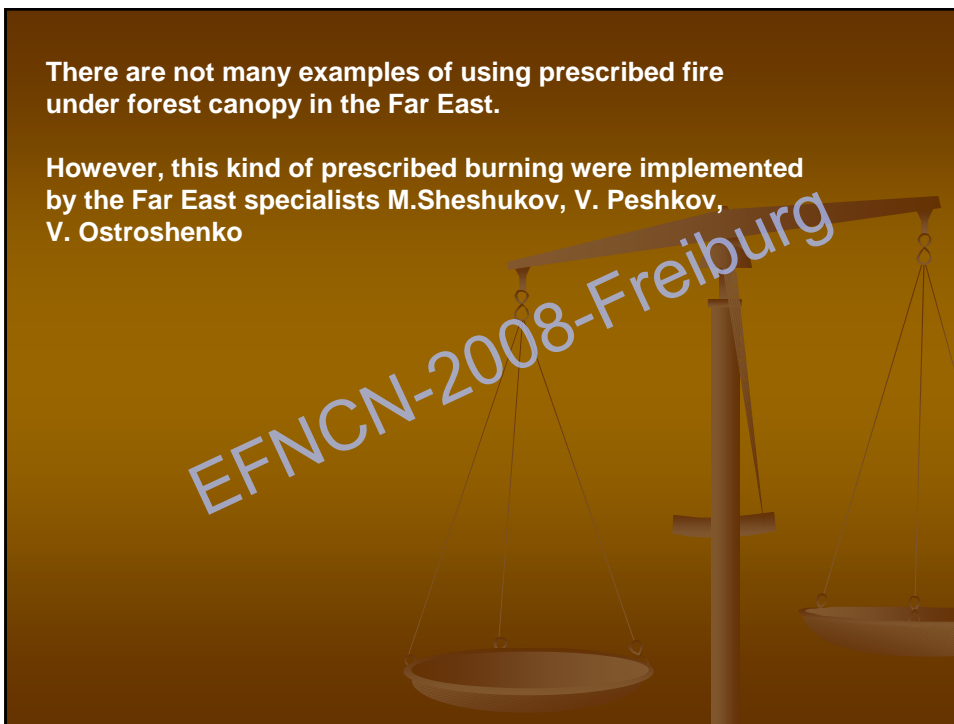


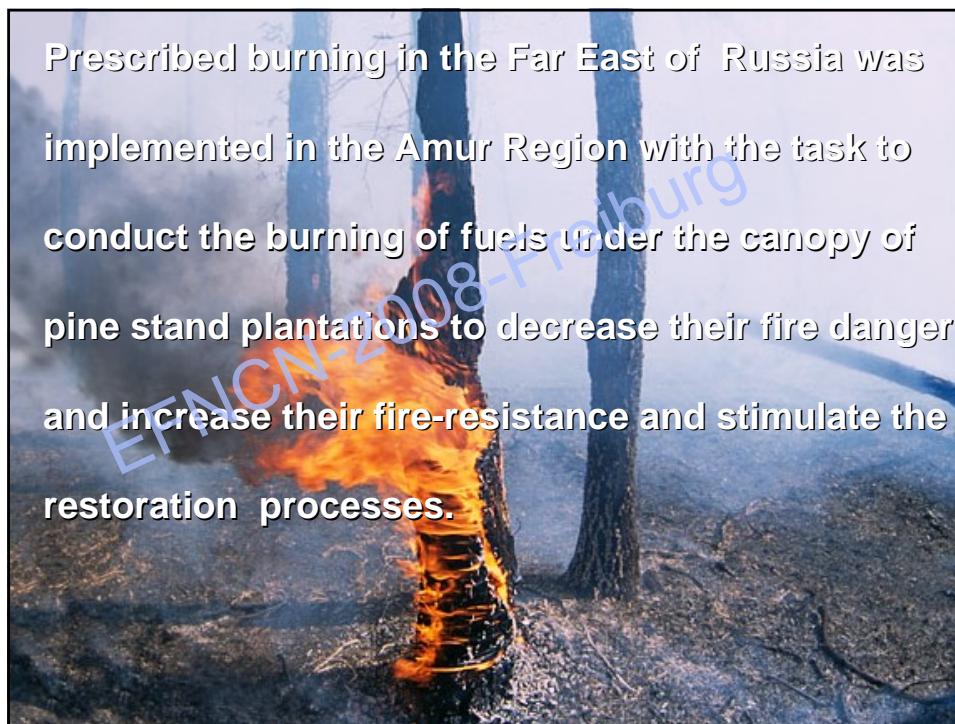
Jewish Autonomous region - 2004



There are not many examples of using prescribed fire under forest canopy in the Far East.

However, this kind of prescribed burning were implemented by the Far East specialists M. Sheshukov, V. Peshkov, V. Ostroshenko





Why pine plantation?

1. Pine stands are valuable forest resources and have a big fire danger.
2. Pine trees in the plantation have homogeneous composition and layers (tree wastes and litter of needles):
make easier to regulate parameters of the fire edge;
decrease the possibility to lose control over the fire.
4. Plantations are more accessible
and have a dense network of fire lines and fire roads.

Description of the experimental site:

Composition: *Pinus sylvestris*

Age – 20 years

Average height – 10.5 m

Diameter – 11.5 cm;

Volume stock – 149 m³/ha.

The crown begins at 4.5 m.

Undergrowth and grass cover is weakly developed.

Location is flat.

The sites were divided by the mineralized stripes into areas 0.5 and 0.8 ha

The experiments were done in July: 1st site – 1982 and 2nd site -1983

Relative humidity:

1st site - 58% and 2nd site - 66%

Wind speed:

1st site -2-3 and 2nd site - 3-4 m/sec.

Burning intensity:

1st site - weak and 2nd site - middle

The average height of soot deposit:

1st site: 0.75 m and 2nd site – 1.0 m.

The biggest flame height (1.3 m) was observed in the thickened rows (2-3 trees per 1 meter) on the 2nd site.

The fire bypassed the areas where the needle stock was less than 0.3 kg/m² and also with thick grass vegetation.

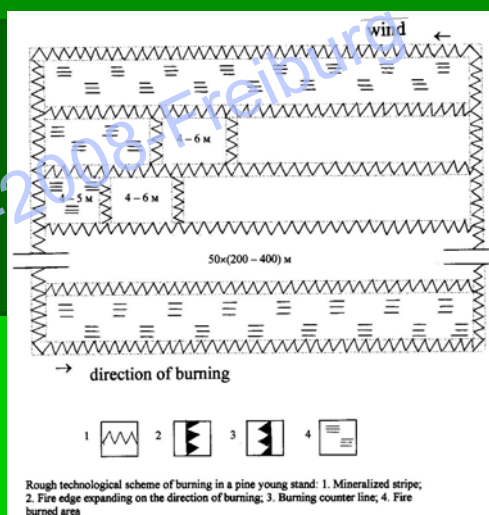
**Distribution of needle fuel under the canopy of pine plantations
(kg/m², oven-dry weight)**

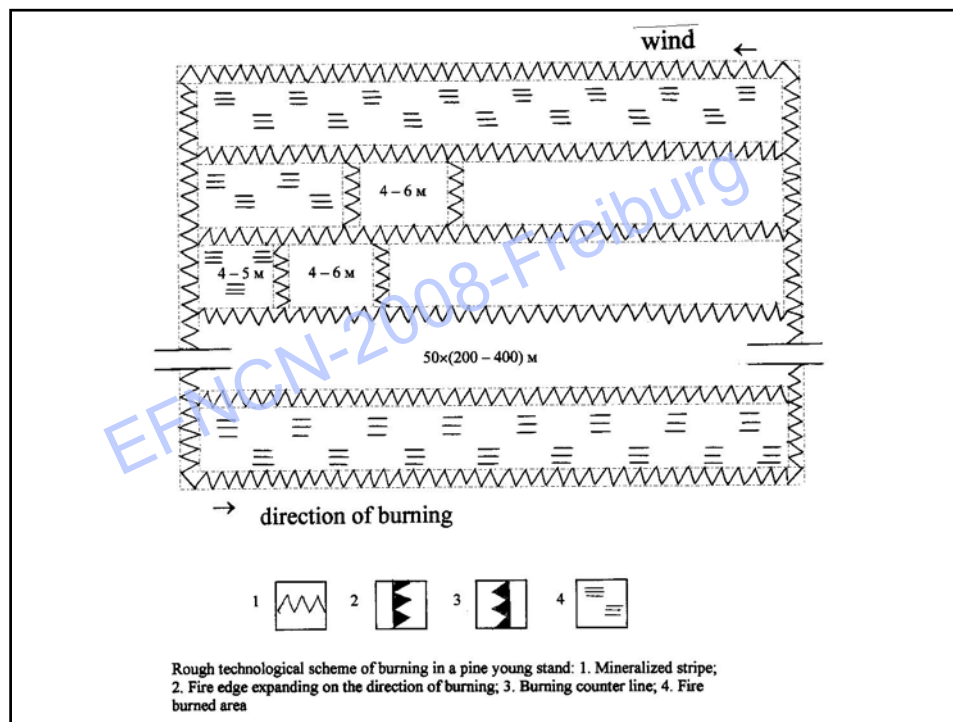
Distribution of fuels	Number of experimental sites	Fuel mass		Underburning %
		Before burning	After burning	
Under the canopy at a distance from stems (m)				
0.3	1	3.4	1.3	38
	2	4.0	1.2	31
0.7	1	2.2	1.3	58
	2	2.2	0.9	42
In the centers of row-spacing				
	1	1.7	1.1	63
	2	1.1	0.6	54

The burning was implemented by a team of 6-8 people with fire equipment (bulldozer or tractor with a tank) as well as personal protective equipment.

The sites used for prescribed burning were divided by the fire lines into isolated drawn sites with the size 50X (200-400) m.

Firing was made against the wind from the fire line or other barriers.





The completeness of burning was uneven:

Significantly higher it is in the rows under crowns of the trees.

Underburning :

On the 1st site in the rows near the stems -38%
in the centers of row-spacing – 63%,
on the 2nd site correspondingly – 31 and 54%.

On both sites the needle layer was completely consumed,
and the upper sub-horizon of litter layer was burned partly.

Around the majority of stems at a distance 0.3-0.5 m the litter
burned out to mineral layer.

The damage of cambium at root collar and root
system was not detected.

The share of dying-off trees: 1st site - 10%, 2nd site - 13%
of all trees.



The greatest mortality was observed at the range 6 cm:

1st site – 97%

2nd site - 76%

of the total number of dead trees.

The rest mortality is attributed to the range 8 and 10 cm.

The total number of undamaged trees is more than injured and dead taken together.

Thus,

mortality corresponded to the sanitary cuttings of the weak and middle intensity.

Conclusion:

1) The PB decreases the fire danger and rises the fire resistance of the trees: growth rates are increasing (due to mortality of young trees, rapid mineralization of needle wastes, improving of light and hydrothermal regime);

2) PB is reasonable to conduct in the closed pine stands from the age of 20 years in plantations;

3) It is rational to conduct PB from 15 June to 15 September: grass cover on the adjoining sites is in the green condition and may fulfill the role of natural barriers.

The best time for PB:

Relative humidity - 45-65%

Windless period or wind speed not more than 3 m/sec;

4) Optimal parameters of the fire edge are the speed of frontal edge spread is 0.5-0.9 m/min, height of the flame – 0.4-0.7 m.

Today the new regulations on prescribed burning of surface cover are elaborated in Russia as well as a new concept of forest fire protection.

The methodology of prescribed burning taking into account the Far East regional peculiarities is also developed.

