Methodology of Prescribed Burning
Demonstration Plot Description and Inventory for the Eurasian Fire in Nature Conservation Network and the Fire Paradox Russia and Mongolia Programme

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Introduction

- Lack of prescribed burning demonstration sites
- Effects of fire often not documented/investigated
- Uncertainty how and when to use prescribed burning techniques: early or late season?
Introduction

- Description of demonstration sites is developed within the Fire Paradox Programme WP 9.1

- Objectives:
  - determine and show differences of fire effects on fuel consumption, burn patterns, resulting heterogeneity
  - determine season for prescribed burnings

Documentation

- Purpose of treatment
- Desired burn conditions to reach objectives
- Site description
  - Soil conditions:
    - Altitude (m a.s.l.):
    - Aspect:
    - Slope (%):
    - Topography:
  - Fuel conditions:
    - Mean temperature during time of burn (°C):
    - Annual mean temperature (°C):
    - Mean precipitation during time of burn (mm):
    - Annual mean precipitation (mm/a):
    - Vegetation type (main species):
  - Site description:
    - Vegetation type (main species):
    - Annual mean precipitation (mm):
    - Mean precipitation during time of burn (mm):
    - Fuel load (target fuel): 0.5 kg
    - Annual mean temperature (°C):
    - Mean temperature during time of burn (°C):
    - Fuel description:
      - Tmax (°C):
Fuel sampling

Possible methods:
Line-Intersect-Sampling (LIS) for dead down woody debris,

Hemispherical photographs for canopy cover and gap fraction

Line-Intersect-Sampling

• Simple, nondestructive method to inventory downed woody material
• Can be applied to natural fallen debris and to slash

• Involves counting downed woody pieces that intersect vertical sampling planes
Line-Intersect-Sampling

- Provides the following information:
  - Weights and volumes per hectare of fine and coarse woody debris
  - Depth of fuel and forest floor duff
- Can be adapted to specific (present?) site conditions
- Problems may arise when species specific values are not provided, e.g. for specific gravity

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Hemispherical photographs

- Easy and rapid method to get an overview on stand and canopy characteristics
- Hemispherical photos provide
  - A detailed map of sky visibility and sky obstruction
Hemispherical photographs

- It is possible to calculate beneath canopy forests
  - solar radiation regimes
  - plant canopy characteristics:
    Leaf Area Index (LAI)
    Canopy openness
    Gap fraction

- LAI is used with estimates of specific leaf area and canopy depth to estimate Canopy Bulk Density

- A number of fire behavior and effects models require CBD to predict crown fire potential/behavior

- Allows to examine correlations between stand structure and surface fuel regimes, e.g. fuel moisture content
Outlook

Scorch height and percentage of burned surface fuel area will be determined as an indicator for fire severity.

This will provide first indicators on the effects of burning in different seasons on:

- emission reduction potential
- heterogeneity and patchiness
- fuel reduction potential
- risk reduction potential