

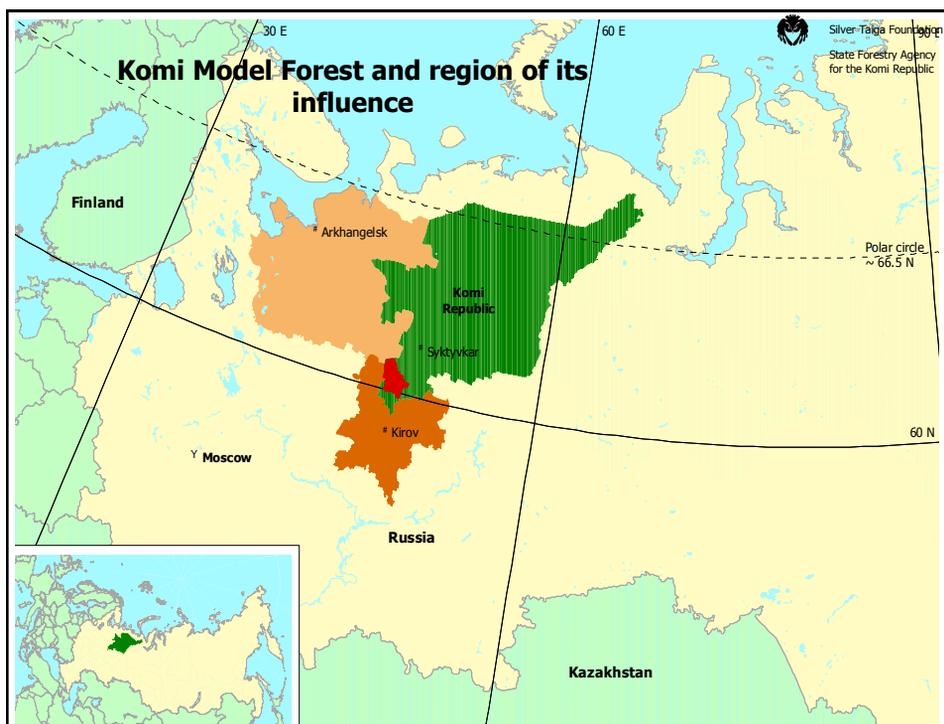
Issues of sustainable management of soil in northern forests - experience from Komi Model Forest, Russia.

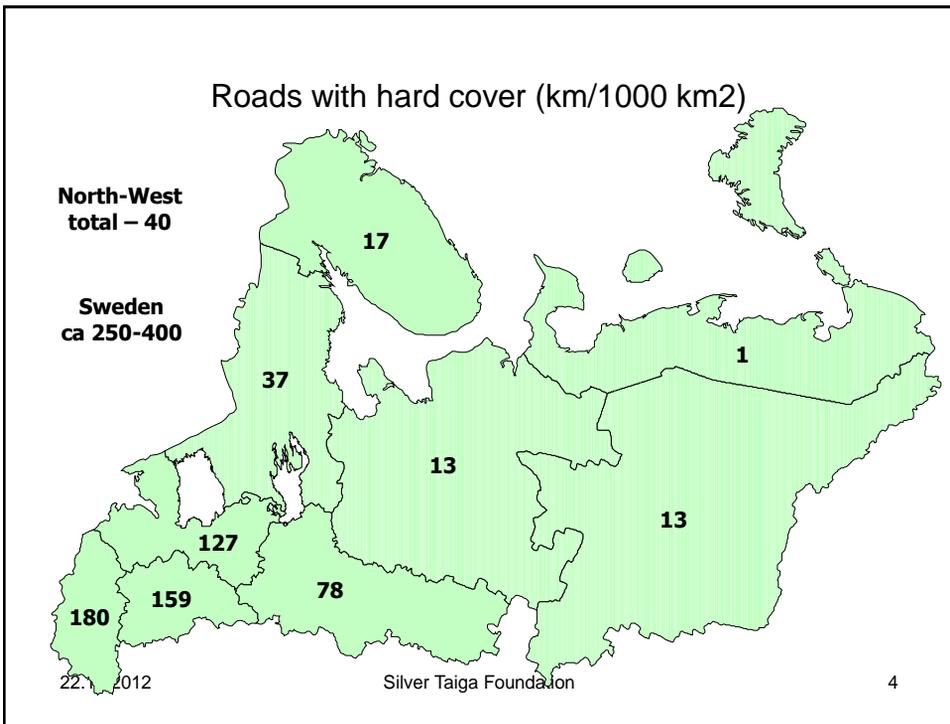
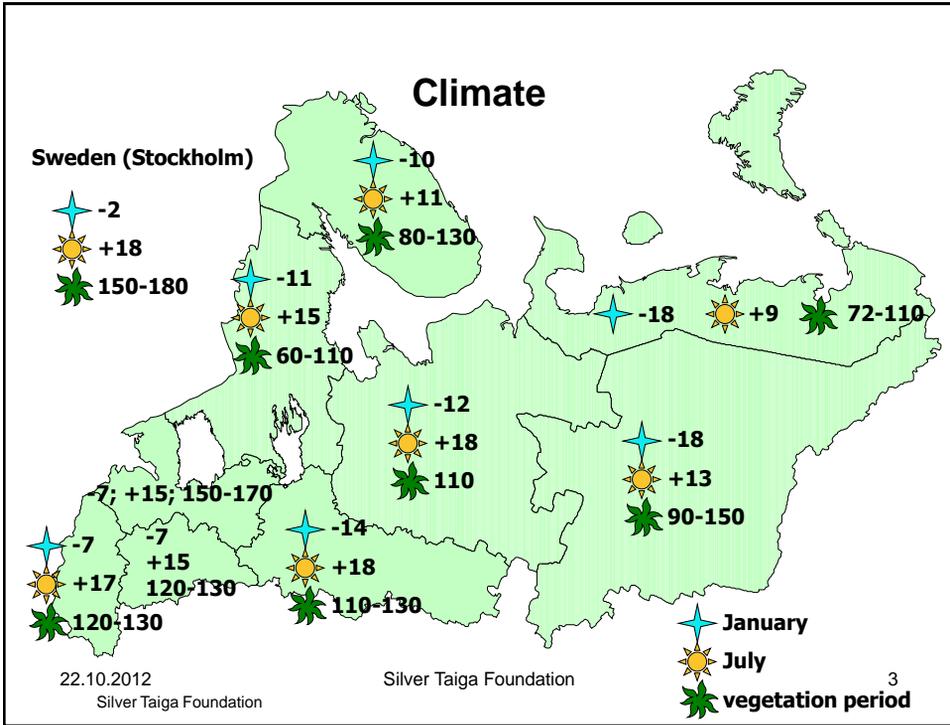
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Forests of the Komi Republic
Pine forest – frequent ground fire dynamics



Forests of the Komi Republic
Pine – spruce forest



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Forests of the Komi Republic Spruce



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Forests of the Komi Republic Birch forest as succession after fire in spruce forest



Forests of the Komi Republic
Spruce forest landscape after large fire



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Forests of the Komi Republic
Spruce forest with gap dynamic and long continuity
situated along river



Logging



Soil damage in 1990-ties
29% of logging area, productivity decrease 35%



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Large scale clear-cutting



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Soil damage along stream and on wet site



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Road across wet sites



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Soil damage by logging transport



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Photo Youri Pautov

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Erosion after logging



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Strengthening of logging track



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Why it is happening with soil?

- Staff of logging companies is not trained on how to avoid soil damage,
- Staff of logging companies is sometimes not aware of the damage,
- Fine for soil damage is treated as tax,
- Logging plan for winter and summer seasons is not based on map of soils sensitivity,
- Map of soil sensitivity can be established, but need cooperation of 4 agencies,
- Very low density of hard cover roads push for winter logging which is providing ca 70-80% of wood volume,
- Soil is frozen in winter ca 6 months, but last 4-5 years the winter season is shortened down to 4 months,
- Pine forest on sandy soils which could be alternative to winter logging has been logged many years ago as the most easy target,
- Logging is still dominated by pioneer approach,

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Soil proposals

- **Map with sensitive soils should be produced for all relevant forests and be available for interested parties,**
- **Consideration of soil sensitivity data should obligatory during planning process of logging, transport and road building,**
- **Relevant staff of logging companies should be trained on method of avoidance of soil damage,**
- **Gradual shift from pioneer logging toward forest management with investment in forest roads with hard cover,**
- **Fine should be progressive if damage is repeated (condition is that first three points are fulfilled),**
- **Logistic and long-term planning in logging companies should be considerably improved,**
- **Topographic map of high quality should be developed and accessible for planning departments of logging companies, state forest service and companies servicing with planning of logging and logistic,**

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