



THERE CAN BE NO FORESTRY IN ICELAND WITHOUT EXOTICS

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Sustainability

- Environmental
 - Forests provide environmental services such as soil and water conservation
 - Forest utilisation should not permanently damage forest ecosystems or endanger species
- Social
 - Forests provide a wide range of services such as outdoor recreation
 - Forest utilisation should be done in a way that is acceptable to people
- Economic (the original sustainability)
 - Forests provide goods needed by people
 - Forest utilisation should provide those goods at a price that the market will bear... **continuously and forever.**



Wood markets

Product	Possible?	Market	Price	Native species?
Lumber	Yes	Large	Sufficient	No
Split firewood	Yes	Very small	Insufficient	Yes
Chips (fuel)	Yes	Small*	Insufficient	No
Chips (industry)	Yes	Very large*	Good	No
Handycrafts	Yes	Very small	Insufficient	Yes
Paper	Forget it			No

*Possible very large export market



Conclusion

- The slow growth, poor form and small stature of native species means that they can not fulfill the needs of society for forest products in an economically sustainable manner (although they can of course fulfill environmental and social sustainability functions).



Native woodlands were an important resource



Charcoal



Fuel and fodder



Rafters

But they could not fulfill many important needs

- For example
 - Ingimundur the Old imported the finest timber from Norway to build his *Hof* in Vatnshal shortly after the year 900.
 - The church at Skálholt was rebuilt with with „spruce“ specially imported from *Gulland* in 1646. It stood for 200 years.



And since we're talking about history

- 1700s – the Enlightenment came to Iceland
 - Several reports on the status of Iceland. Among the results:
 - Lack of fuel was a problem
 - Icelandic woodlands were sparse and badly managed
 - The realisation by some that perhaps trees could be PLANTED!



Voltaire planting trees by Jean Huber

But before we could plant trees:

Ignorance, poverty and prejudice needed to be overcome



Trials with exotic species

- Björn Halldórsson, a priest in Sauðlauksdal (1724-1794)
- Among the first to grow potatoes in Iceland in 1760



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Trials with exotic species

- Hans Baagøe, a Danish merchant in Húsavík from 1811 to 1836
 - Cultivated around 1200 trees, including pine, spruce, birch and rowan
 - Disappeared shortly after he left, probably cut and used for fodder.
- Georg Hans Schierbeck, Chief doctor in Reykjavík 1884-1893
 - Founded the Icelandic Horticultural Society
 - Planted several tree species in this garden. One still stands.



Swedish whitebeam (*Sorbus intermedia*)
The oldest tree in Reykjavík,
planted in 1884

1899-1907 – Ryder, Prytz and Flensburg

- Saw the need for fuel, lumber and to control blowing sand
 - Funded by grants from Denmark (development assistance)

Gathered information



Established trials

Established nurseries



Around 1900

- Sigurður Sigurðarson and the „North Iceland Cultivation Society“
- Established a tree nursery in Akureyri



Hillside just south of Akureyri shortly after 1900

The same hillside 100 years later



1899-1914

- Experiments with many species, most died but some survived:



Iceland Forest Service established in 1908

Agner F. Kofoed-Hansen, director to 1935

- Growing exotics seemed hopeless
 - Most of the exotics did not do well and it was difficult to get seeds
 - Responsibility for sand reclamation was moved from the Forest Service due to politics and lack of confidence in the Danish model
 - Planting was minimal
 - Emphasis on protecting birch woodland remnants
 - Emphasis on direct seeding of native birch

Haukagil í Vatnsdal



Mountain pine (*Pinus mugo*) survived best

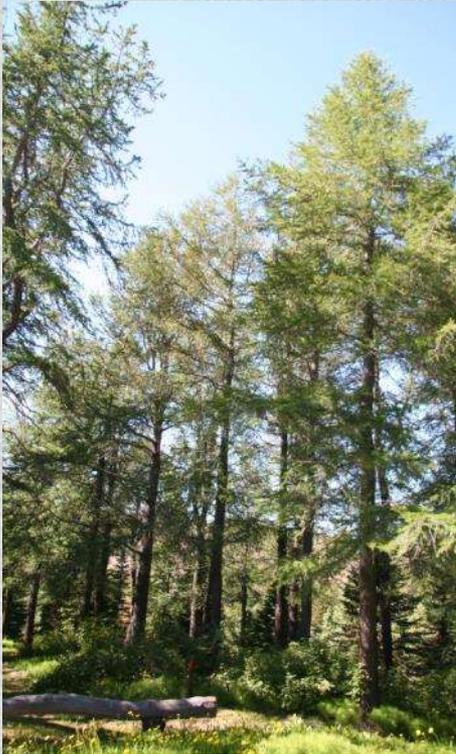
For over 50 years, it was seen as proof that forestry was impossible in Iceland



Changing emphasis 1935-1950

Hákon Bjarnason was the new director of the Iceland Forest Service

- A few species planted around 1900 were doing well



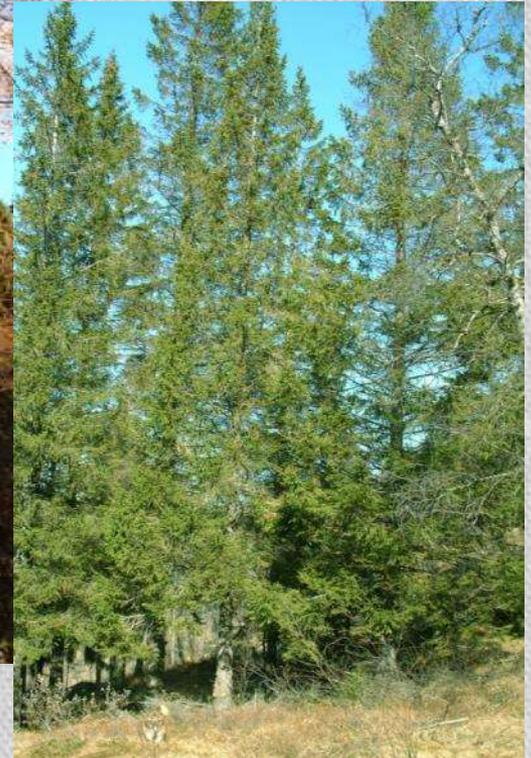
Larix sibirica



Pinus silvestris



Picea engelmannii



Picea abies

Changing emphasis 1935-1950

- Climate data was becoming available
 - Icelandic climate is similar to that of southern Alaska and northern Norway, where there are timber producing forests



Changing emphasis 1935-1950

- First trials with:



Picea sitchensis



Pinus contorta



Populus trichocarpa

Changing emphasis 1935-1950

- New forest nurseries were established



Changing emphasis 1935-1950

- Contacts with Norway and Alaska



Seward



Mo i Rana



Akureyri

Brute force and ignorance 1950-1963

- First period of planting



Brute force and ignorance 1950-1963

- Sitka spruce mostly died in the primitive nurseries and had a prolonged period of slow growth (20-30 years)



Brute force and ignorance 1950-1963

- Scots pine was mostly killed by the pine woodly aphid



Brute force and ignorance 1950-1963

- Norway spruce survived but did not grow



Brute force and ignorance 1950-1963

- Limited seed of good provenances of Russian larch and lodgepole pine



Pause for reflection 1963-1990

- Research and experience



Pause for reflection 1963-1990

- Research station at Mógilsá established in 1967



Pause for reflection 1963-1990

- Many provenance trials planted, seed source regions modified



Pause for reflection 1963-1990

- Nurseries modernised
- Container seedlings



Pause for reflection 1963-1990

- The first grants to farmers (very limited)



Increased afforestation 1990-2009

- The potential of several exotic species became obvious



Increased afforestation 1990-2009

- Afforestation on farms for timber production



Increased afforestation 1990-2009

- Afforestation for recreation, mostly near urban areas



Increased afforestation 1990-2009

- Afforestation for soil conservation



Increased afforestation 1990-2009

- This increased activity was not without its critics



Some people are uncomfortable with change.

Increased afforestation 1990-2009

- This increased activity was not without its critics



Some people are uncomfortable with change.

Ignorance, poverty, prejudice

- Ignorance has largely been overcome through research, education and experience.
- Poverty has been overcome through technical and social development.
- Prejudice is still around
 - Before: „Trees can not grow in Iceland“
 - Recently: „Trees can grow, but not for profit“
 - Now: „Exotic trees do not belong“
- These are the views of a minority but:
 - They can affect political decisions
- State support for forestry is still needed



Economic sustainability since 2008?

- Increase in thinning is largely paid for by selling the timber



The future

- Cultivated forests of exotic tree species will to an ever greater degree become the basis for job creation and thus become an important part of the rural economy.
- Eventually, forest products will become a significant part of the economy at large. (If a resource exists, it will be used.)
- People will come to accept forests of these exotic species as normal in the landscape just as they now accept man-made deserts as normal.



Thank you

