Methodologies and results of mapping of primary and old-growth forests in Northern Finland

Jan Saijets / Natural forests of Sápmi working group

(In Finnish: Luonnonmetsät Sápmi –työryhmä)

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Natural forests of Sápmi working group

Jan Saijets

- Senior research scientist (radio technology), Dr. of Technology
- From a reindeer herding family in Inari
- Represents Sámi parliament in a few biodiversity strategy and forest related processes
- Member of livelihoods and rights board of Sámi parliament
- Responsibility in working group:
  - Background mapping work of potential natural forests
  - Collecting of forest inventory data into maps

Jarmo Pyykkö

- Experienced forest inventor since 1990's (e.g. in Russia)
- Consult for many reindeer herding co-operatives
- Responsibility in working group:
  - Co-ordination of field work of tens of voluntary inventors
  - Field work
  - Producing background maps
  - Digitizing field work

Olli Manninen

- Experienced forest inventor (e.g. Finland, Sweden, Russia)
- Has done field work in Sámi home region since 2003
- A comprehensive knowledge of forest species
- Responsibility in working group:
  - Field work
  - Digitizing field work

Juha Länsman

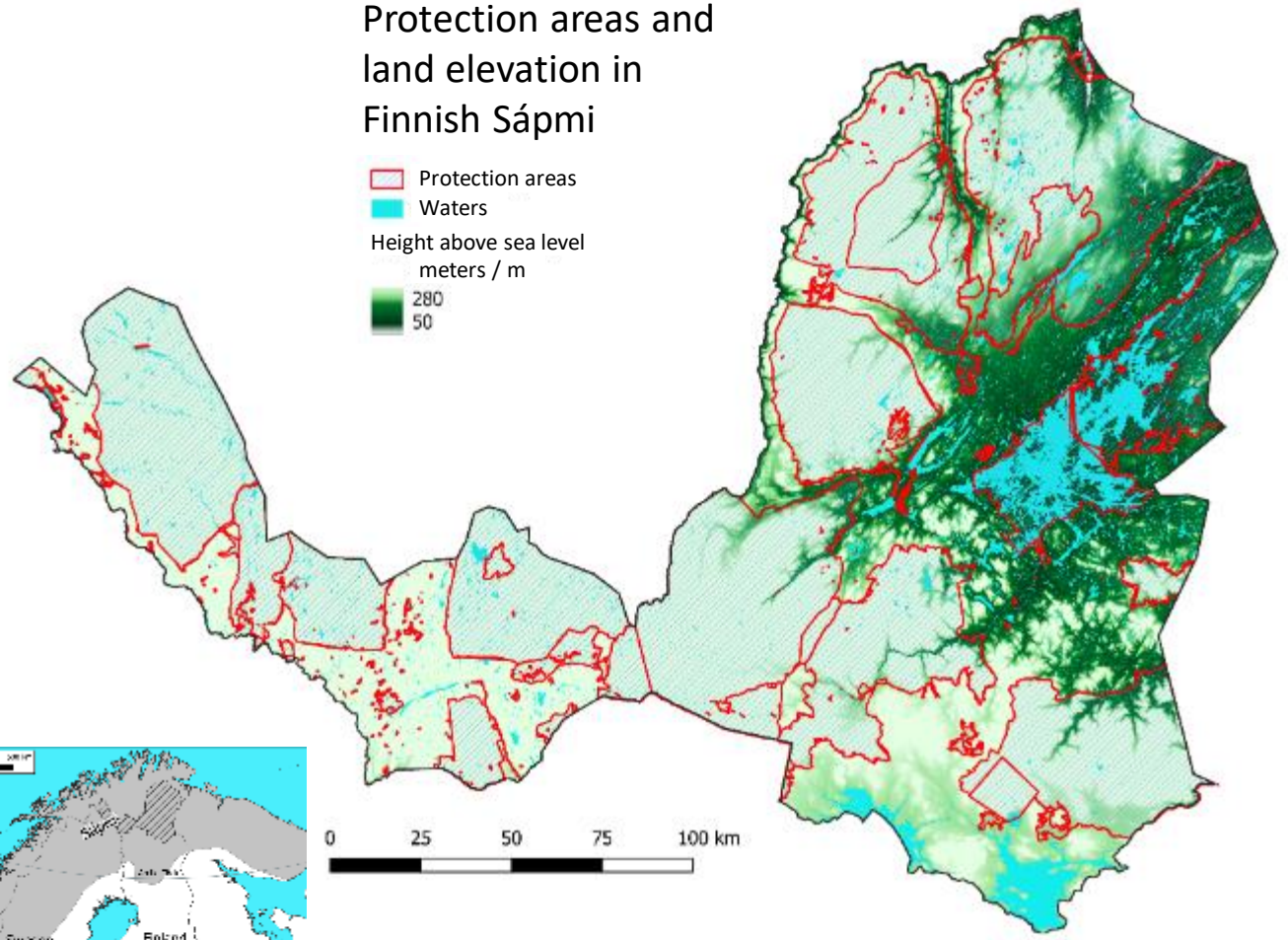
- Forest inventor from Inari/Lapland in different projects since 2018
- Consulted Sámi parliament on land use impact assessments (e.g. gold digging)
- Have been 300 days in inventory work since 2018.
- Responsibility in working group:
  - Field work
  - Digitizing field work

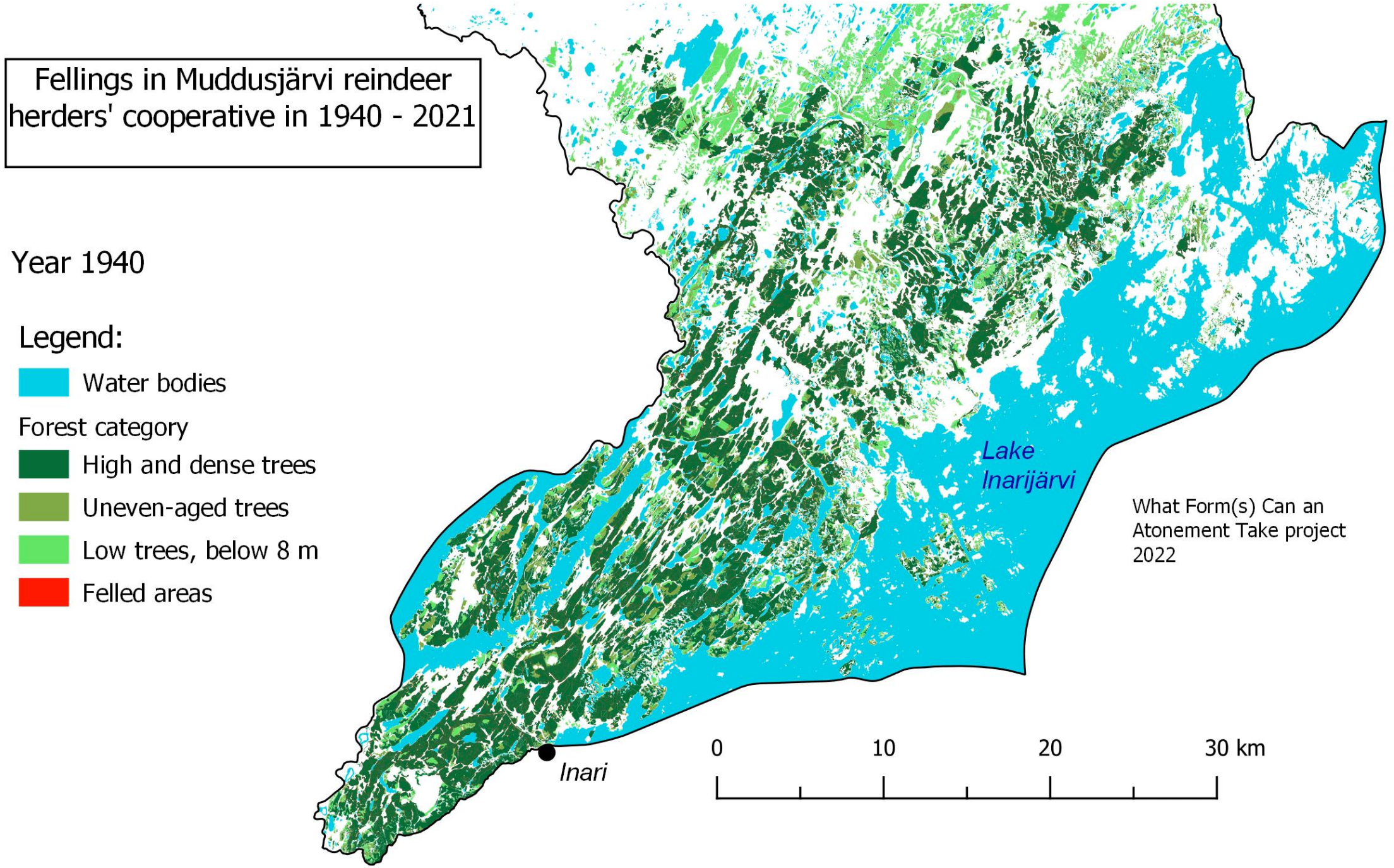
Background of working group

- Worked on projects funded by Koneen foundation
  - What form does an atonement take, 2018 - 2021
  - Mapping of natural forests, 2021 - 2023
- Work funded by Greenpeace
- Voluntary workers
  - Tens of voluntary forest inventors, 2021 – 2022
  - Collecting of previous inventory works by working group members
- Motive for mapping work
  - There is no systematic survey of primary or old-growth forests in Sápmi although it is generally know that the forests are unique and they are very important for Sámi reindeer herding

Sámi rights and status of land protection

- Sámi home region in Finland is located in the municiplaties of Enontekiö, Inari and Utsjoki and Northern part of Sodankylä. 90% of the lands are controlled by the State.
- A lot of forests have been protected but the winter grazing areas still need to be preserved
  - Forestry is concentrated on low lands
  - Many of the protected areas are loosely or temporarily protected
- General opinion of the Sámis is against loggings
  - In 2018 election
    - 69 % of Sámis voted for candidates opposing loggings
    - 22 % of Sámis voted for candidates who considered loggings to be on fair level
- Reindeer herding is one of the corner stones of Sámi culture along with other traditional livelihoods.
- International indigenous peoples rights and domestic law forbid causing significant harm to Sámi reindeer herding. This significant level of harm may have been met already.



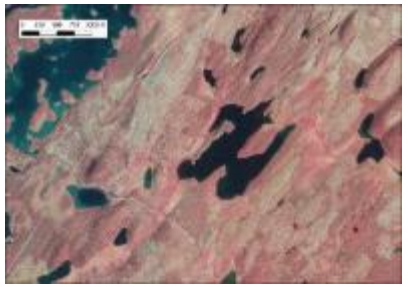

Fellings in Muddusjärvi reindeer herders' cooperative in 1940 - 2021
Year 1940
Legend:
Water bodies
Forest category
High and dense trees
Uneven-aged trees
Low trees, below 8 m
Felled areas
Lake Inarijärvi
Inari
0
10
20
30 km
What Form(s) Can an Atonement Take project 2022

Methodology to find potential natural forests

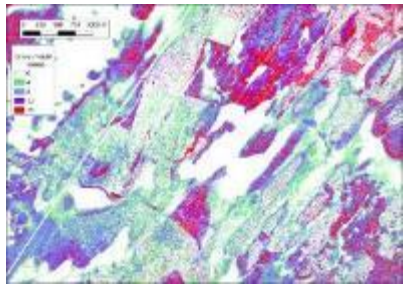
- Areas without logging history were searched using maps and remote sensed data.

Topographic map by NLSF

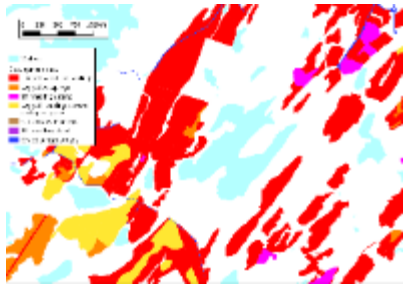
Aerial false color imagery



Canopy models/Lidar data

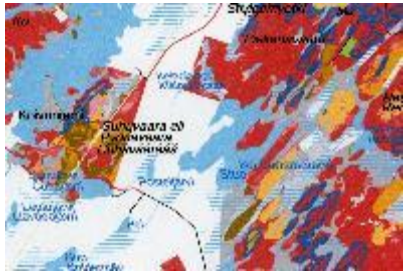


Digitized logging areas

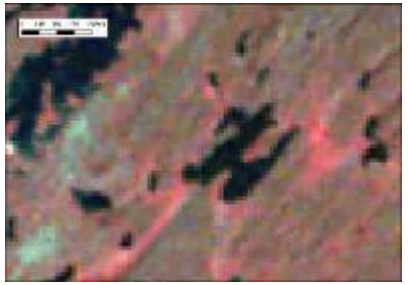


Land areas – (logging areas + treeless areas)

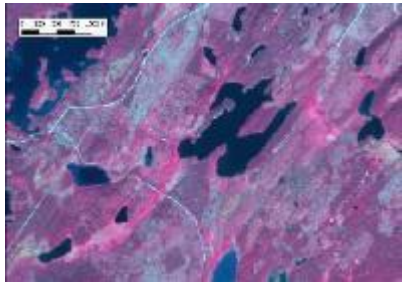
State forest maps by Metsähallitus



Landsat imagery (here 1971)



Sentinel 2 imagery (here 2018)

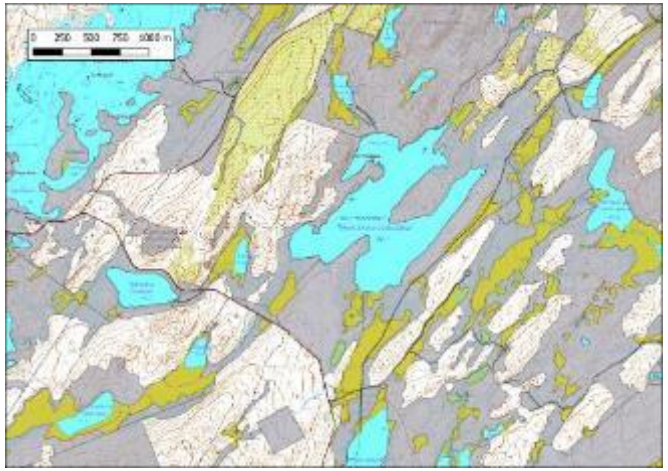


Historical aerial imagery (here 1966)

Other important data:

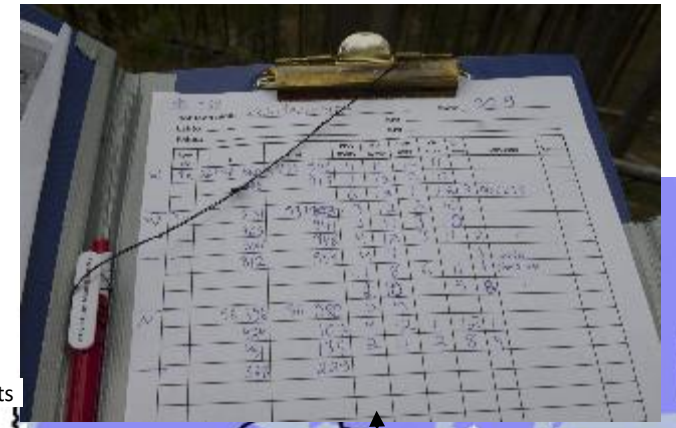
- BPAN-data
- Syke Tarkka –web service
- Interviews of reindeer herders and a retired forest worker

”Continuity forests” or forests without a known logging history

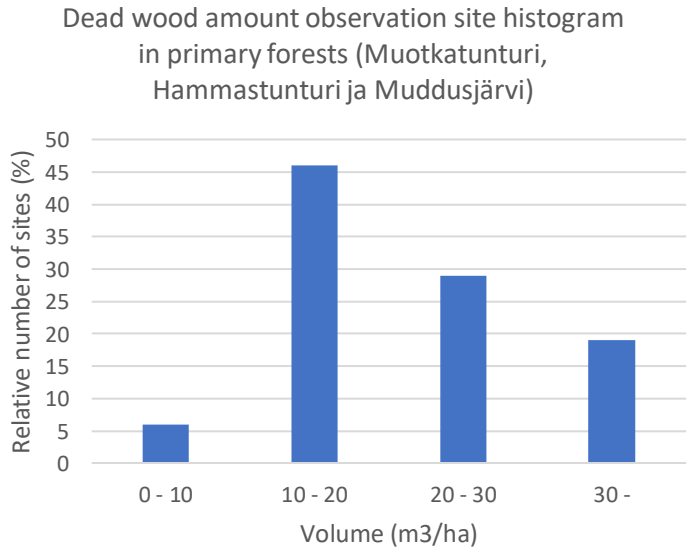


Field work

- In addition to the working group tens of voluntary forest inventors were in field work
  - Observations of forest structure, number of stumps, estimation of dead wood amount
  - These observation sites were used as a rough reference around Inari
    - At the least 550 sites documented
    - Lisäksi arviolta 150 – 200 linjaa puuttuu Inarin kirkonkylän ympäristöstä
- Field work in Inari between 2018 - 2023
- Field work in Enontekiö and Sodankylä in 2010 - 2023
- Inventory work has concentrated on economic forests controlled by Metsähallitus Metsätalous Oy.



Koutavaara, 9 observation sites 4 km North of Inari village

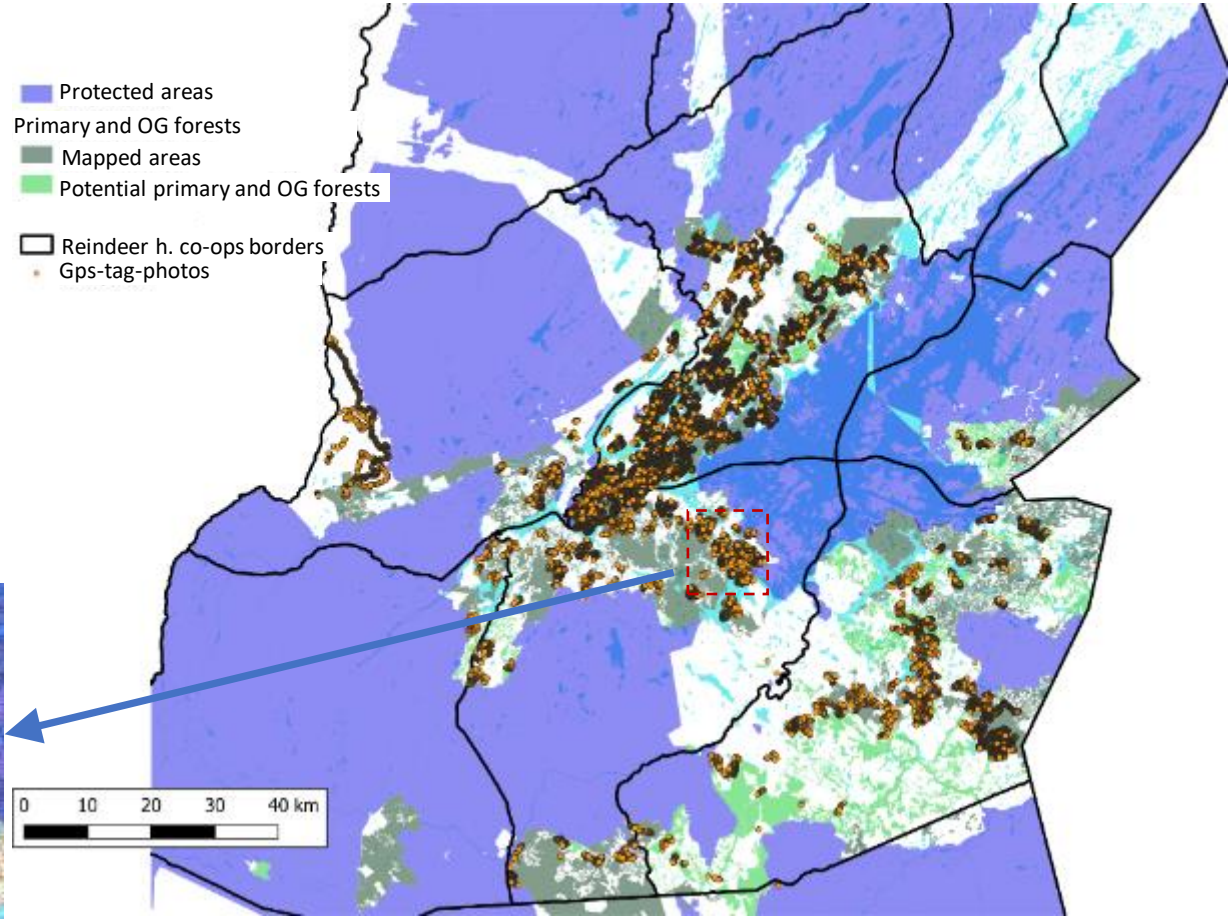


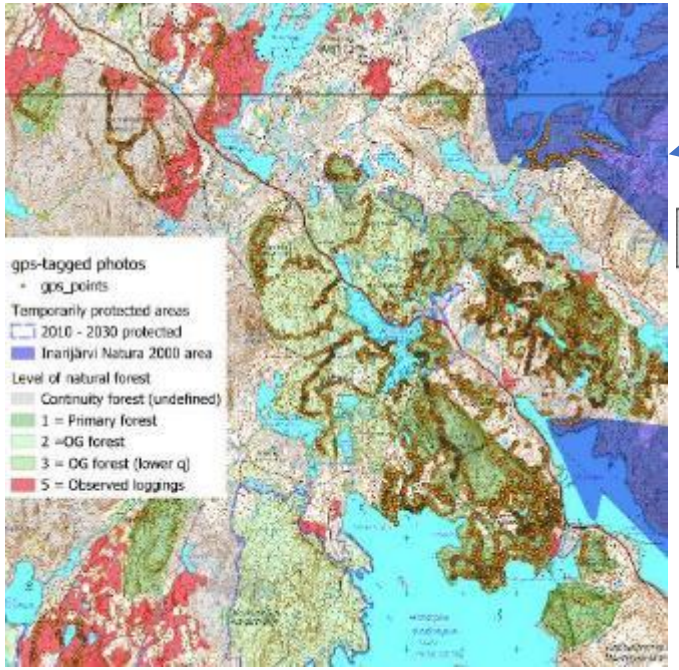
Dead wood amount average is 21.5 m^3/ha at primary forest observation sites.

Delineating valueable forest areas

Areas mapped are huge

- Generalization of field data has had to be made based on:
  - Field work observations
  - Remote sensed GIS-data (canopy, aerial images)
  - Local and traditional knowledge of reindeer herders
- Some areas examined quite accurately





Here are approx.
10 000 photo points

Database of gps-tagged field photos

- 120 000 photos
  - 36 000 photos not yet added to the database

Criteria for natural forests used in mapping

- Primary forests (PF)
  - No observations of industrial forestry. A few individual stumps may exist.
- Old-growth forests (OGF)
  - Forest structure resemble that of primary forests. Last selective logging is more than 50 years ago. There are a lot of old trees and dead wood. Stumps are scarce or non-existent.
- Less valuable old-growth forest (OGF-)
  - Forest structure resemble natural forest structure although loggings have been made quite recently. There are significant amounts of old trees and dead wood while the forest is a continuity forest.
- Continuity forest (CF)
  - The forest has never been clear cut or intensively logged.

- From reindeer herding point of view, the OGF- category can be almost as good winter grazing area as PF and OGF-areas. They are important.
- Both productive and low-productive areas have been taken into account and areas estimated with canopy models.

A lot of unprotected valuable forests exist

Pietarin Tupavaara – primary forests 4000 ha

Part of 20-year long temporary protection area ending in 2030. Such areas 50 000 ha altogether.

Vaadinselkä – Ukonjärvi –ympäristö – primary forest 1300 ha + 900 ha old-growth forests

”Normal” economy forest without protection

Mapped and defined valuable forest areas

Total area: 730 000 ha

- Productive forest land 177 000 ha
- Low productive forest land 324 000 ha
- Swamps and lakes 230 000 ha
- CF areas not included but mapped, OGF- practically not included

State economy forests:

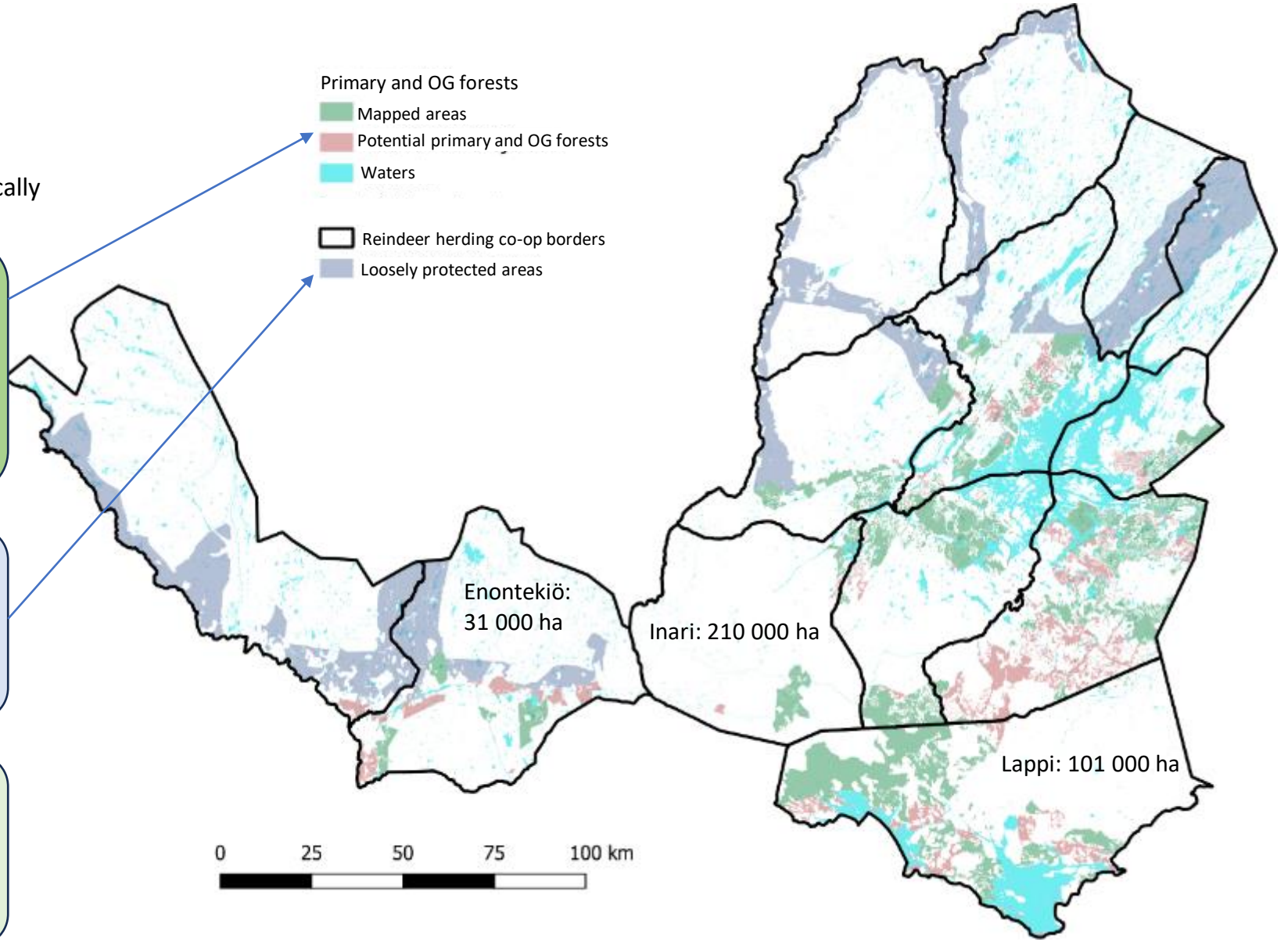
- 350 000 ha
  - Forest land 132 000 ha
  - Low productive forest 138 000 ha

Loosely protected areas:

- 355 000 ha
  - Forest land 27 000 ha
  - Low productive forest 177 000 ha

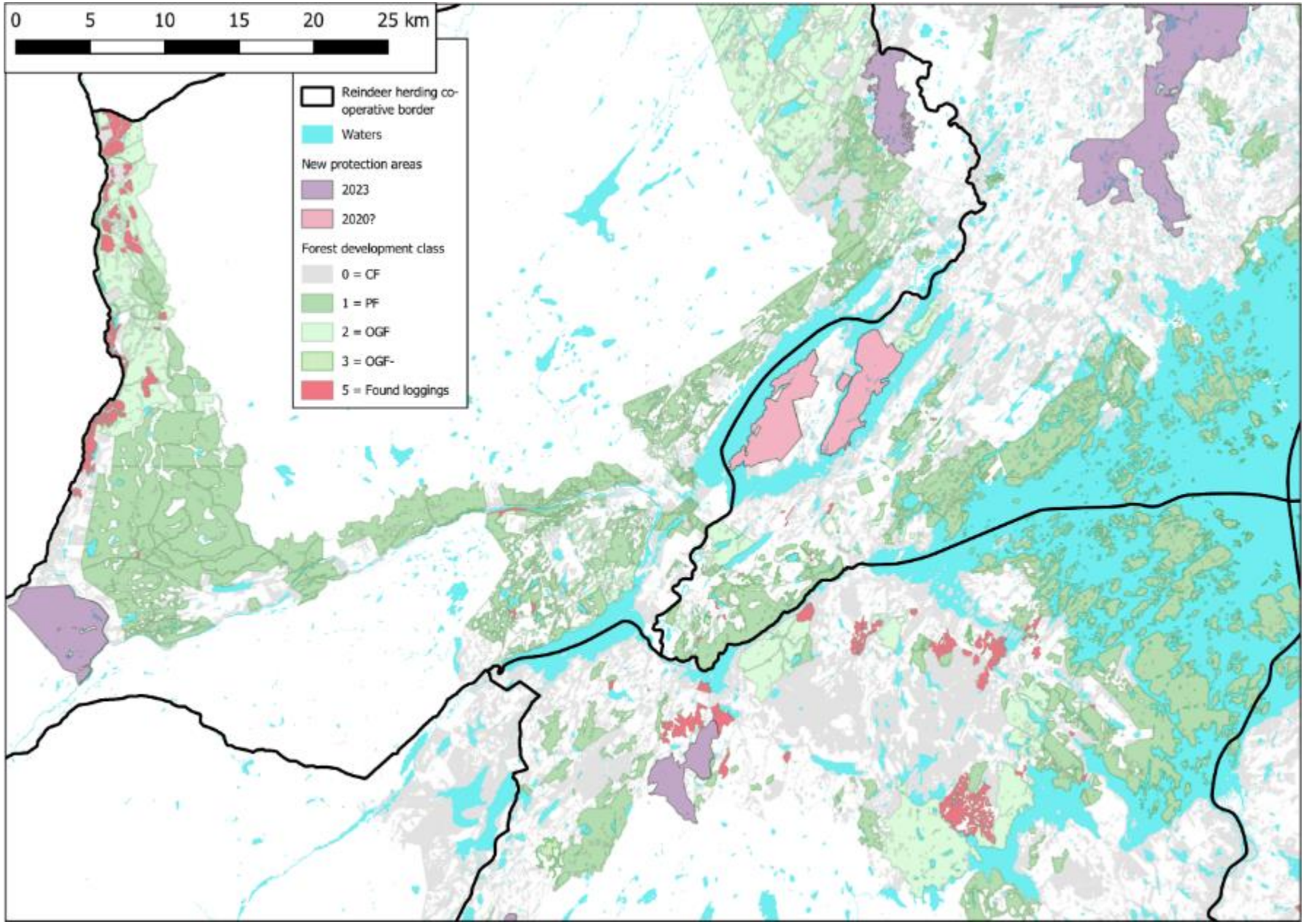
Inarijärvi Lake Natura area (not drawn on the map)

- Forest land 18 000 ha
- Low productive forest 8 500 ha



More accurate classification

- The more accurate classification is the bottom level of the data
  - PF
  - OGF
  - OGF-
  - CF
  - Undefined CF
  - Found loggings
- Some of the grey areas have not been visited and remain as undefined and at the least CF



Conclusions 1/2

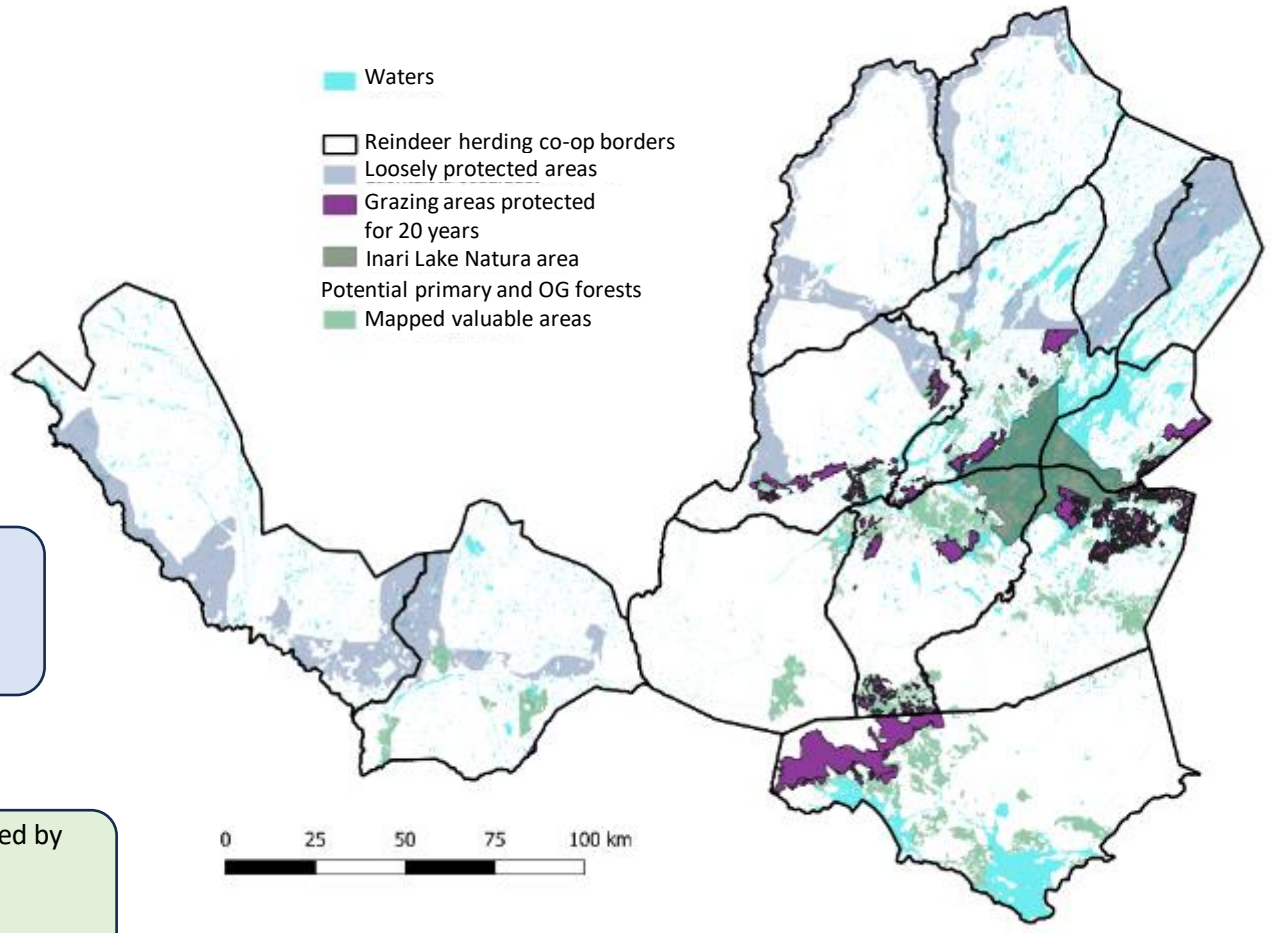
- A lot of certain natural forests that are valuable for protection
  - Forest land 136 000 ha
  - Low productive forest land 315 000 ha
- These should be protected instantly
  - This is also the will of four reindeer herding co-operatives.
- Metsähallitus/State has already area data of most of these
  - Forest land 83 000 ha
  - Low productive forest land 104 000 ha

Inari Lake Natura area
- Forest land 18 000 ha
- Low productive forest land 8 500 ha

Loosely protected areas (luontaistalousalue) in Inari:
- Forest land 20 000 ha
- Low productive forest land 66 000 ha

Grazing areas protected for 20 years
- Forest land 39 000 ha
- Low productive forest land 26 000 ha

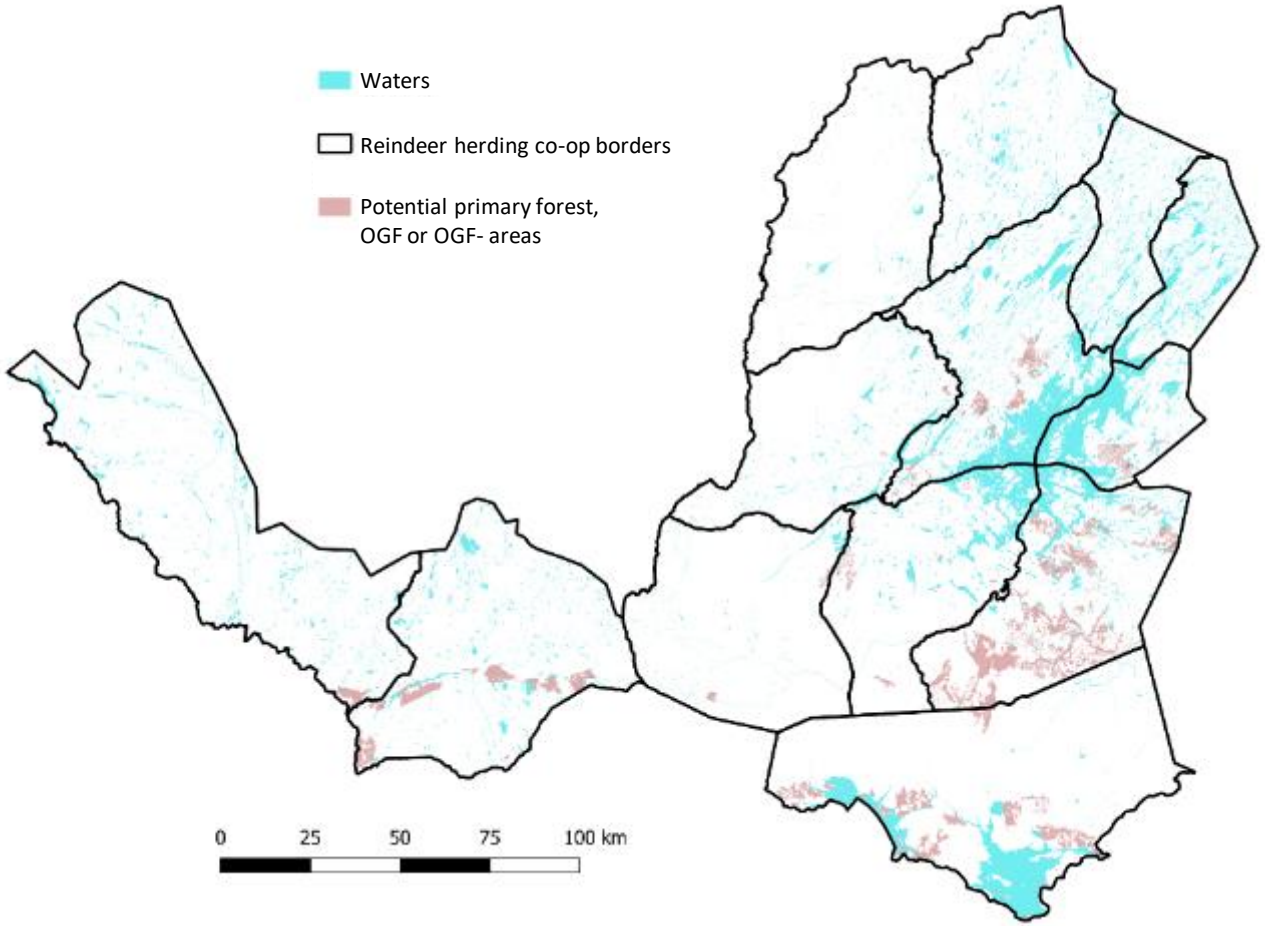
Protection areas by Metsähallitus (not defined by law)
- Forest land 5 600 ha
- Low productive forest land 5 800 ha



Conclusions 2/2

- Yet unmapped and potential natural forests should be put on moratorium:
  - Forest land 31 000 ha
  - Low productive forest land 46 000 ha
- To be mapped in 2024?
- Reindeer herders want more forests to be strictly protected than just “pure” natural forests.
  - FPIC-process needed
- Remaining natural forests are one of the basis of Sámi culture

Potential State controlled economy natural forests requiring field work




= ”Thank you” in Northern
Sámi language