

What is the point of caring about birds and reindeer? Now we know more about how they are affected!

Bergstén, M. & Lindberg Alseryd, N.

enetjärn
natur ab



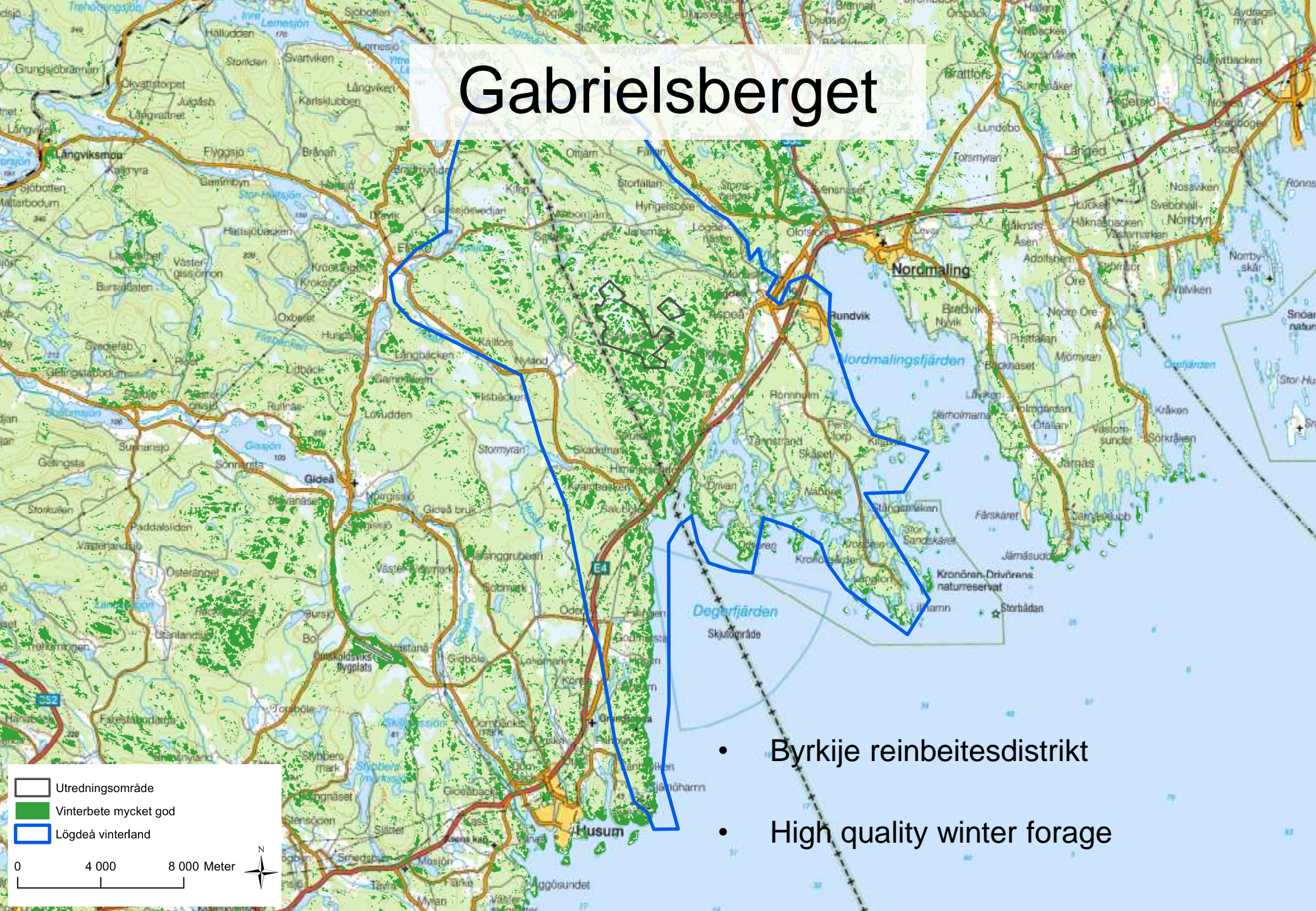
Conclusions from control programmes for reindeer husbandry

Contents

1. Conclusions from Gabrielsberget wind farm
2. Conclusions from Uljabuouda and Stor-Rotliden wind farms
3. Control program in Markbygden project



Gabrielsberget

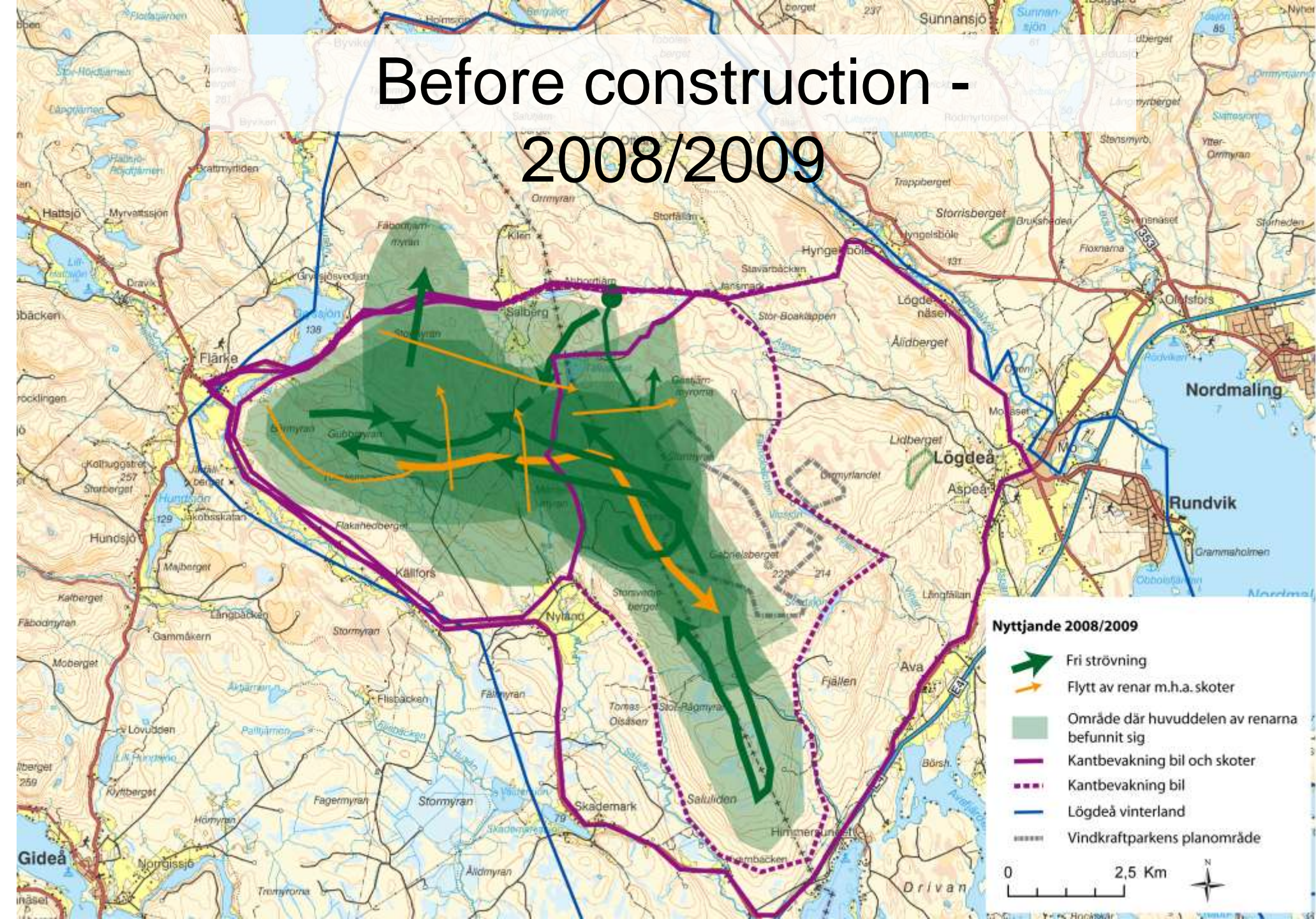


- Byrkije reinbeitesdistrikt
- High quality winter forage

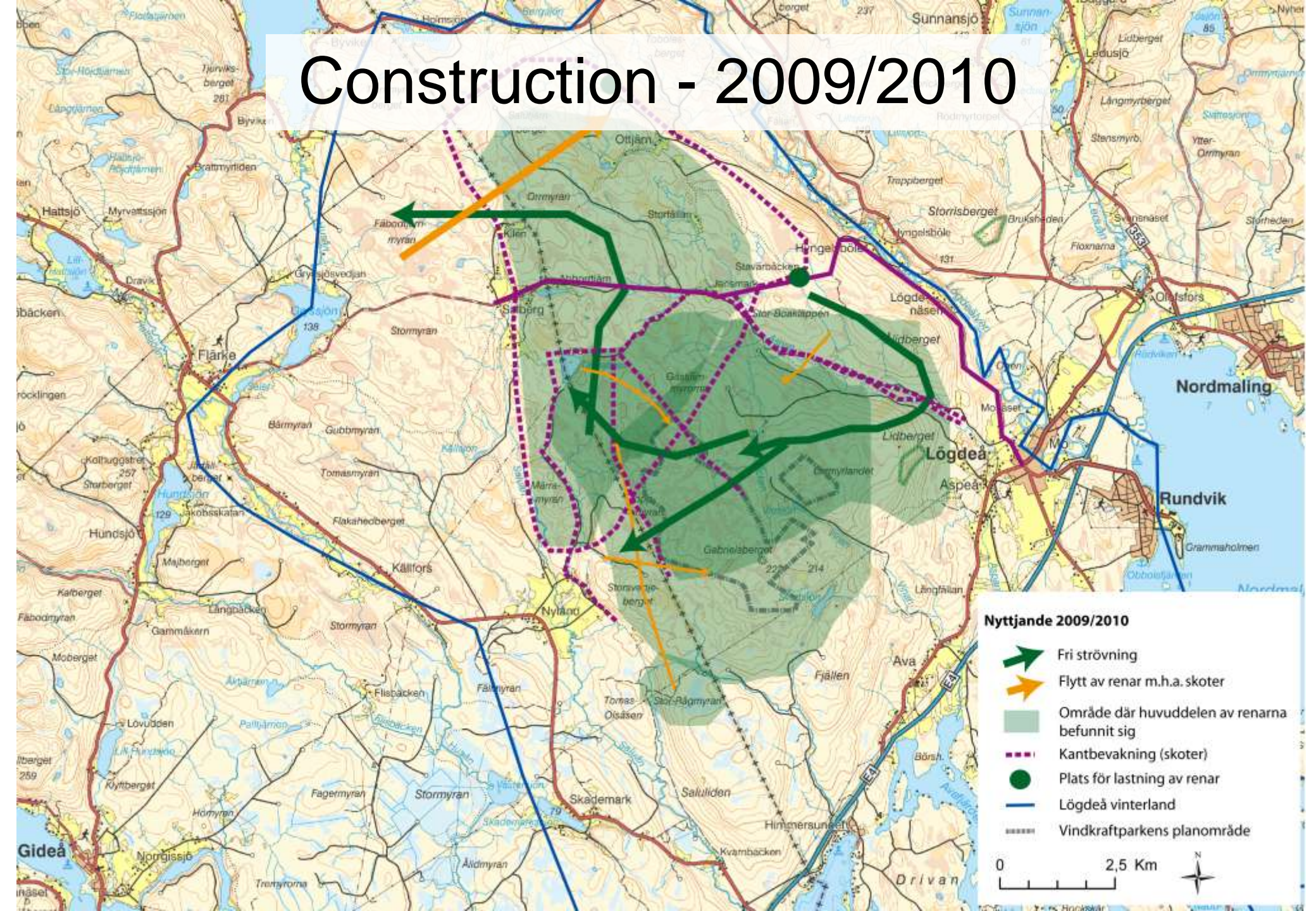


Method: interviews with the reindeer herders

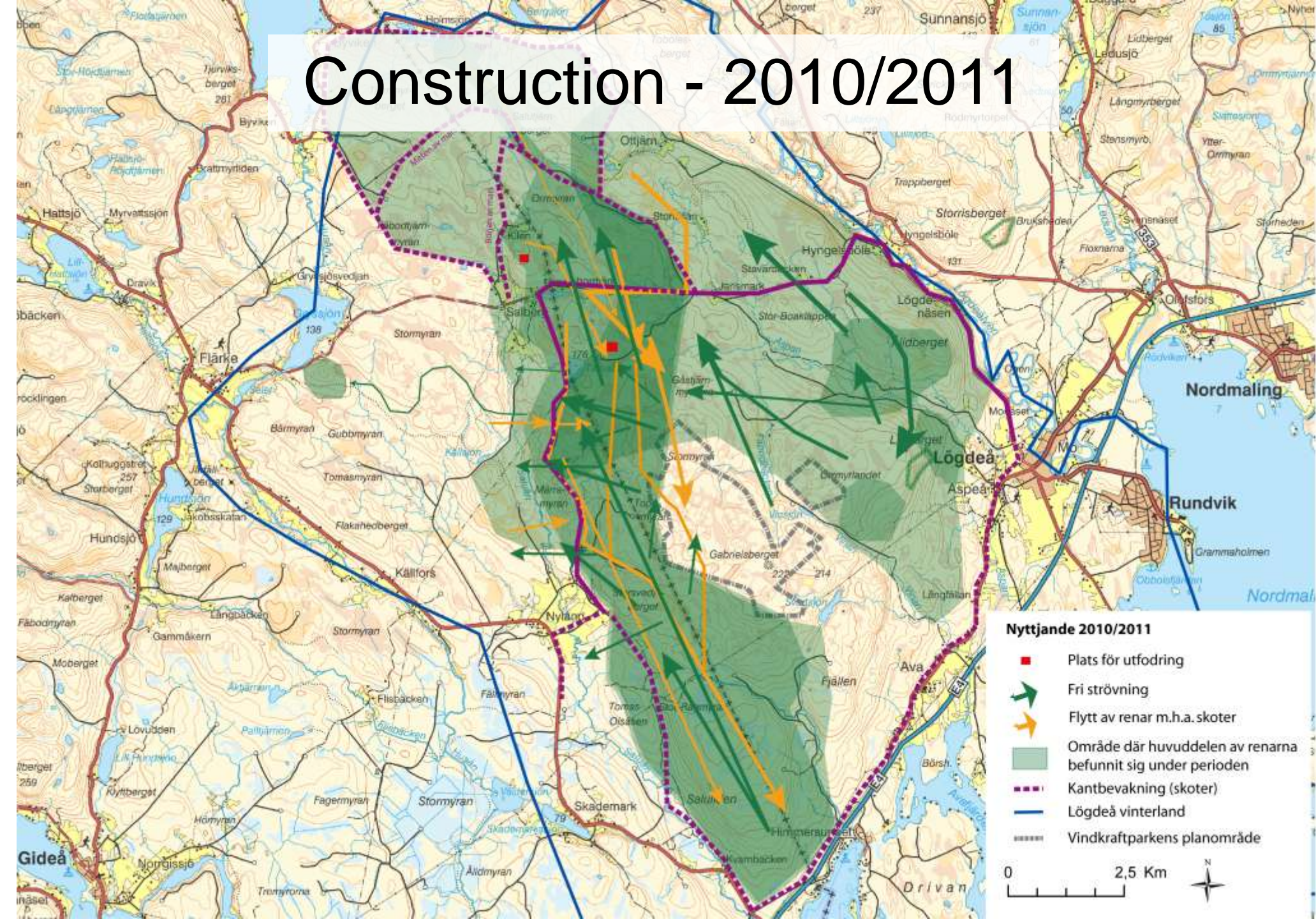
Before construction - 2008/2009



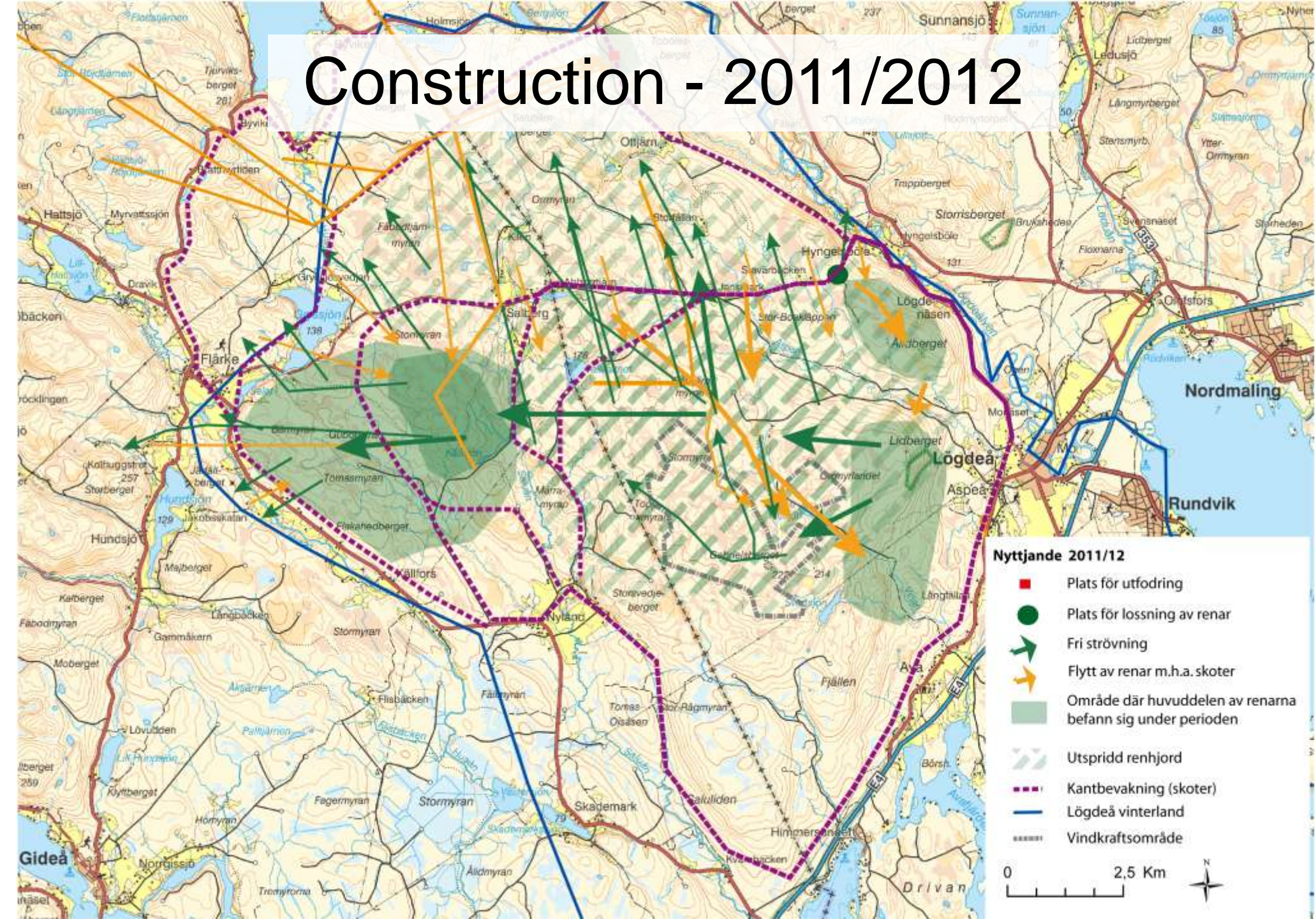
Construction - 2009/2010



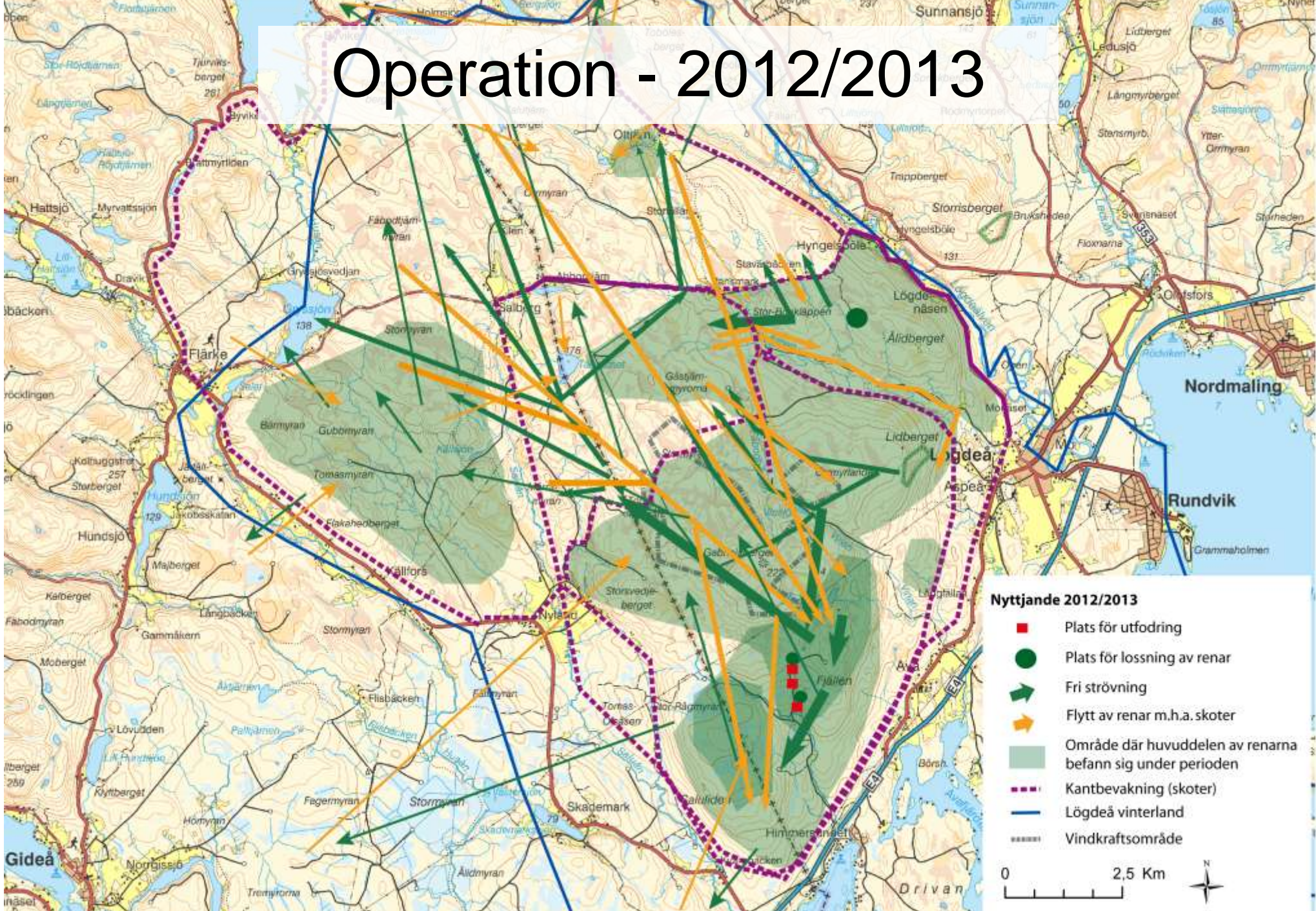
Construction - 2010/2011



Construction - 2011/2012



Operation - 2012/2013



Nyttjande 2012/2013

- Plats för utfodring
- Plats för lossning av renar
- ➔ Fri strövning
- ➔ Flytt av renar m.h.a. skoter
- Område där huvuddelen av renarna befann sig under perioden
- ⋯ Kantbevakning (skoter)
- Lögdeå vinterland
- ⋯ Vindkraftsområde

0 2,5 Km

Reindeer - Conclusion I

The reindeer use of the wind farm area and its near surroundings has decreased by 50 %

Method: interview data

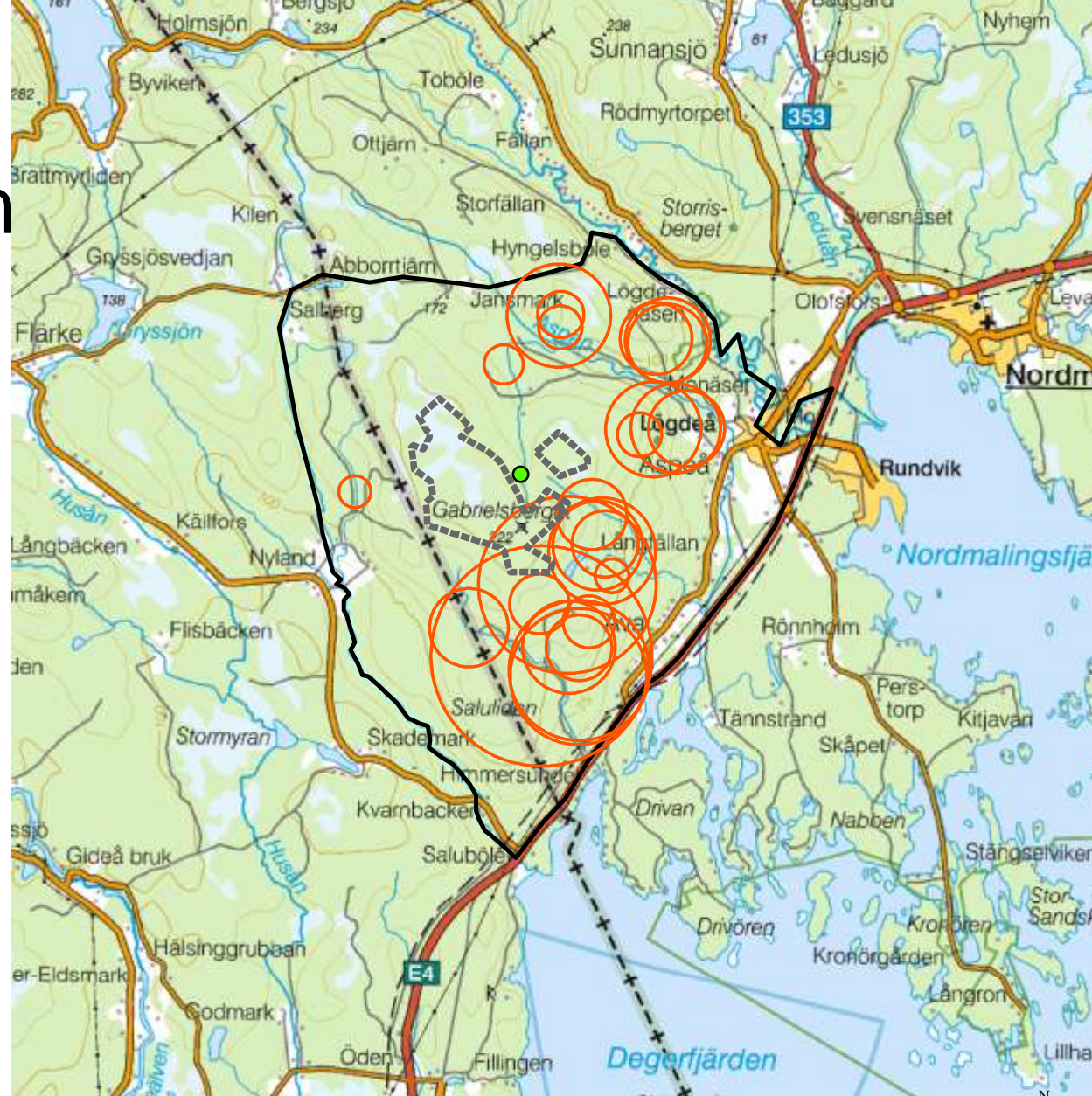






Reindeer - Conclusion

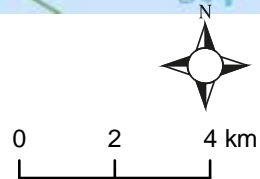
No undisturbed grazing behaviour within a 2 km radius from the center of the wind farm

Undisturbed grazing behaviour at distances of 2 km or more from the center of the wind farm

Method: GPS data



-  Vindkraftsområde
-  Område där en GPS-ren haft betesro
-  Avgränsat område
-  Centrumpunkt vindkraftområde



Grazing land - Conclusion I

Land use: 34 ha, whereof 24
ha high quality

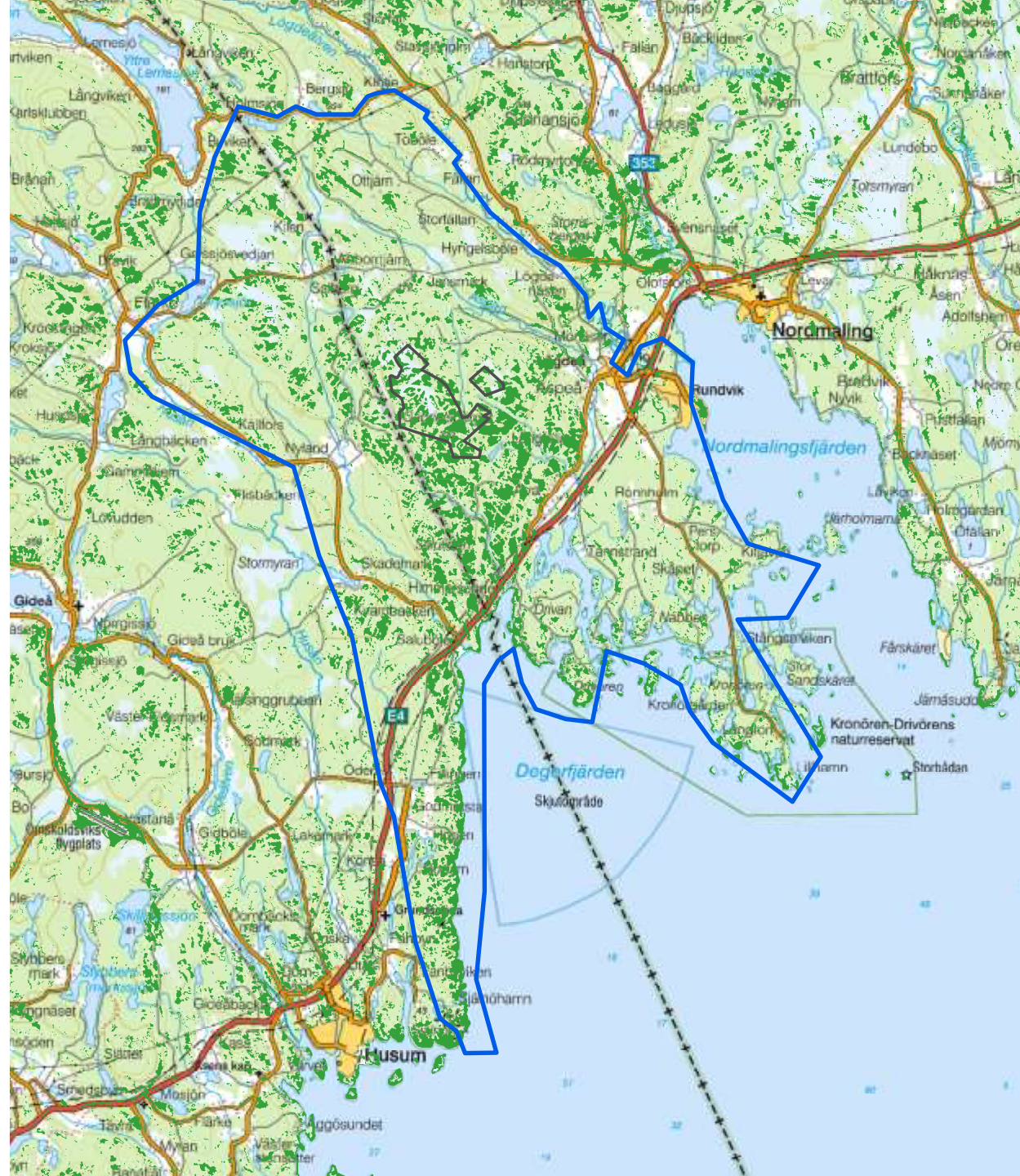
Method: GPS data



Grazing land - Conclusion II

The reindeer actively choose
areas with high quality forage

Method: GPS data



Reindeer husbandry - conclusions

	Before	Construction			Operation
Grazing condition	Good	Very good	Very good	Bad	Very good
Number of reindeer	c. 1200	c. 1400	c. 1400	c. 850	c. 1500
Reindeer herders	c. 1,4	c. 1,7	c. 2,0	c. 2,4	c. 2,2
Reindeer passing the border	Few times, c. 1,5 days a week	Few times	Almost every day	Every day	c. 6,2 days av week
Number of reindeer left in Sweden	0-5	0-5	2	36	50
Feeding with pellet and hay	No	No	Yes, 39 % of the period	Yes, 44 % of the period (inside fence)	Yes, 38 % of the period (partially inside fence)
Helicopter	No	No	Yes, one day	No	No
Lynx	No regen.	One regen.	One regen.	No regen.	No regen.

Reindeer husbandry - Conclusion I

More reindeer crossed the monitoring border, from 1,5-6,2 times a week

More work monitoring the borders

More frequently that reindeer were taken from areas outside the borders, from 0 to 10 occasions

More reindeer left behind in Sweden



Reindeer husbandry - Conclusion II

More reindeer herders needed,
from 1,4 to 2,2 persons on average
over the season

More work per day

More snowmobiling (3 times)

More driving (cars)



Reindeer husbandry - Conclusion III

Feeding:

- pellets and hay
- twelve reindeer died (did not want to eat)

Increased pressure on the grazing
land in other areas



Reindeer husbandry - Conclusion IV

Reindeer condition

Increasing concern for the
reindeer, own security and
economy

Reindeer came closer to the
villages and railway Botniabanan

Increased risk for conflicts with
landowners and residents

Possible compensation for
damaged forest



Uljabuouda



2006 – 2012

Reference group

Maskaure sami village

Method: inventory of
droppings and interviews

Low utilization

The area has not actively
been used by the Sami village
during the control period

Stor-Rotliden

2009 – 2013

Vilhelmina norra
sami village

Method: interviews and
inventory of droppings

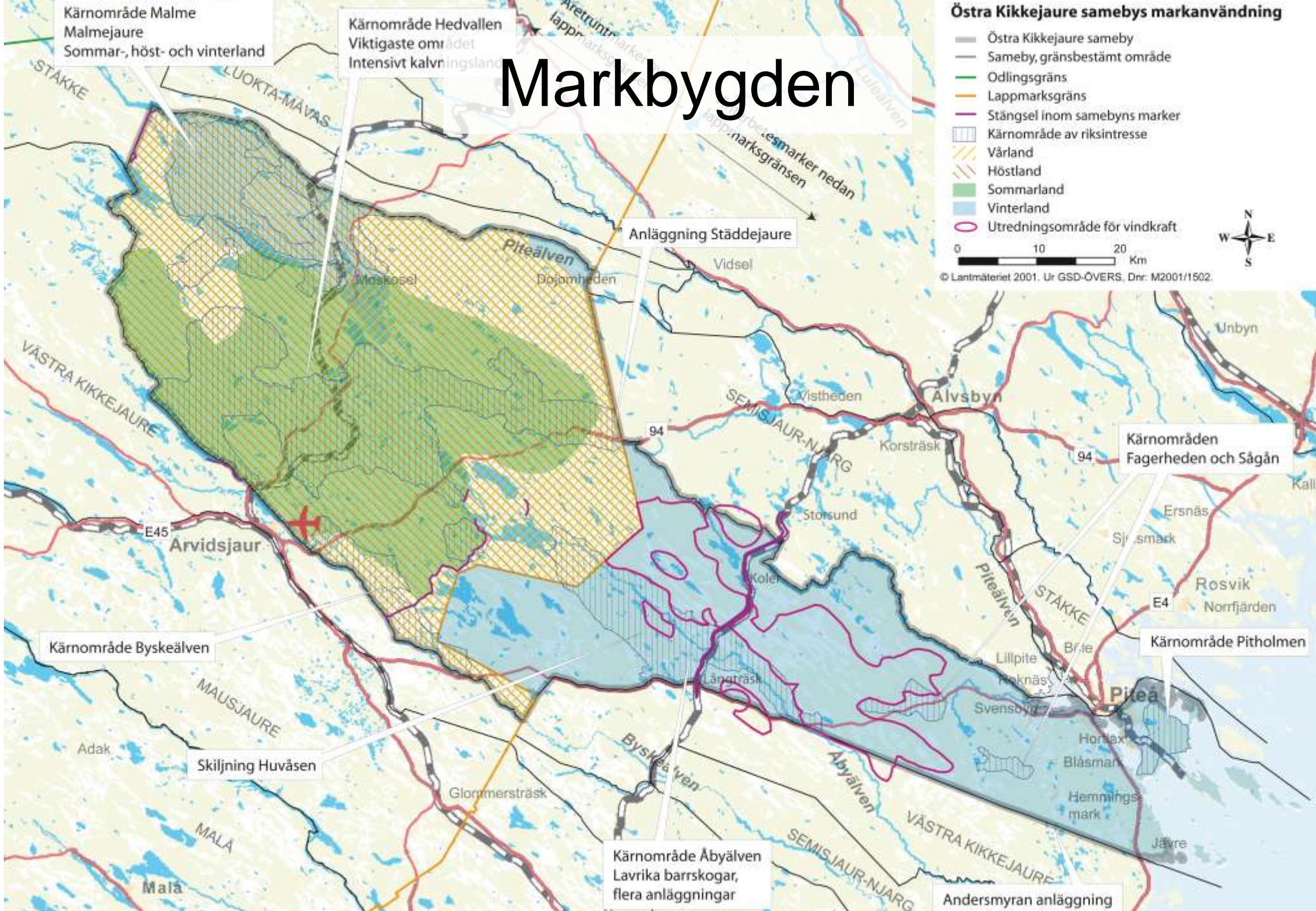
It is not possible for the first three years of the monitoring program to verify if it is the wind farm that created the problems for reindeer husbandry or if it is due to some other factor

Markbygden

Östra Kikkejaure samebys markanvändning

- Östra Kikkejaure sameby
- Sameby, gränsbestämt område
- Odlingigräns
- Lappmarksgräns
- Stängsel inom samebyns marker
- Kärnområde av riksintresse
- Vårland
- Höstland
- Sommarland
- Vinterland
- Utredningsområde för vindkraft

0 10 20 Km
© Lantmäteriet 2001. Ur GSD-ÖVERS, Dnr: M2001/1502.



Kärnområde Malme Malmejaure
Sommar-, höst- och vinterland

Kärnområde Hedvallen
Viktigaste området
Intensivt kalvningsland

Anläggning Städejaure

Kärnområden
Fagerheden och Sägån

Kärnområde Pitholmen

Kärnområde Byskeälven

Kärnområde Åbyälven
Lavrika barrskogar,
flera anläggningar

Andersmyran anläggning

Skiljning Huvåsen

Niklas Lindberg Alseryd



Why environmental monitoring at N Scandinavian wind power farms?

- Still: lack of knowledge on effects on Northern ecosystems, communities and species
- Swedish conditions differ from many previous studies (W Europe and U.S.), even more so in N Sweden!
- Creates insecurity in decision-makers
- Part of the permits (condition) for many wind power localisations





Bird control programmes (evaluating, planning, implementing) – our experiences:

- Golden Eagle
- Wetland birds
- Owls
- Other breeding birds
- Migrating birds (landbirds, waders etc.)





Bird monitoring: 3 sites



Case 1: Uljabuoda (10 wind turbines)

- Alpine and boreal forest habitat (Norrbotten)
- Focus on breeding birds, 46 species recorded 2006-2011
- Species: large raptors, grouse, waders, passerines
- Survey 2 years before construction, 3 years during construction, 1 year after construction
- Line-counts, territory mapping, monitoring of raptors in surrounding landscape
- Control: before-after, reference area, national monitoring





Case 1: Uljabuoda (cont.)

- Low bird densities = few data for most species
- No lasting negative effects in 3 common species (Golden plover, Meadow pipit, Wheatear)
- Decrease in number of nesting Golden plovers (*Pluvialis apricaria*) during construction phase
- Recovery of Golden plovers according to post-construction survey
- Study finished
- Long-term effects on birds not possible to analyse



Case 2: Gabrielsberget (40 turbines)

- Boreal forest habitat, hill plateau (Västerbotten)
- Main focus on breeding birds, c. 50 species recorded (2007-2008, 2013)
- Species: waders, grouse, Red-throated Diver, passerines
- Survey 2 years before construction, 1 year after construction
- Point and line counts, territory mapping
- Registration of collision fatalities
- Control: before-after, reference area, national monitoring





Case 2: Gabrielsberget (cont.)

- No significant effects on bird fauna after 1 year
- Line/point counts: No significant declines in numbers (considerable between-year variation)
- Signs of minor changes (decreases/increases) in a few species
- Territory mapping: Few effects on number of territories (mainly passerines), increase in 2 species
- Data limited for many scarce species



Case 2: Gabrielsberget (cont.)

- Capercaillie (*Tetrao urogallus*) still found within the area
- Breeding pair of Red-throated Diver (*Gavia stellata*) still present within the area
- Study continues one more year
- Long-term effects not possible to analyse



Case 3: Hörnefors (11 turbines)

- Forested peninsula along coastline (Västerbotten)
- Focus on migrating birds – important flyway
- Counts and mapping of daytime bird migration
- Species: raptors, cranes, swans, geese, waders, pigeons, passerines
- Survey 2 years before construction, 1 year during construction, 2 year after construction
- Search for collision fatalities (trained dog)
- Control: before-after





Case 3: Hörnefors (cont.)

- Significant changes of migration corridors after 2 years
- Barrier effect (avoidance) for all bird groups. Particularly for swans, waders, pigeons, passerines
- Avoidance behaviour increased over time
- Weakest avoidance for Rough-legged Buzzard (*Buteo lagopus*) and gulls (*Larus* spp.)
- No collision fatalities detected
- Study finished



Conclusions

- **Breeding birds, alpine and boreal habitats:**
- Small or no negative effects on a short time-scale
- Indications of small decreases (few species) in line with previous research
- Scarce species difficult to analyse at single sites
- Long-term effects not studied!



Conclusions (cont.)

- **Migrating birds:**
- Barrier effect caused avoidance behaviour
- Avoidance behaviour differs between species, in line with previous research
- Strong avoidance: swans, waders etc.
- Weaker avoidance: buzzards, gulls
- Collision rates were low (not detectable)



What's new then?

- Few previous studies in alpine and boreal habitats
- Studied species differ
- Patterns in line with those at more southern sites (previous research)
- Valuable new information!



Lessons learned - Common pitfalls

- Questions behind conditions in the permit must be well-founded
- Good scientific arguments necessary!
- Avoid “wish-lists”, influenced by local opinions etc.
- Aim of the study governs species, time-scale and methods in focus.



cont. Common pitfalls

- Bad design/inadequate budget makes the programme useless (but still costly!):

Species in focus, methods, spatial scale, etc.

- Time scale and control/reference data very important to consider!
- Continuous evaluation: Be prepared to make changes in the programme





enetjärn
natur ab

