



Additional Plan for Wind Power

MUNICIPALITIES OF STORUMAN AND SORSELE
AMENDMENT TO MUNICIPAL STRUCTURAL PLAN

APPROVED BY

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Amendment to Municipal Structural Plan

Contents

Wind power in the municipalities of Storuman and Sorsele	6
Government planning targets	6
How to read Additional Plan for Wind Power	7
Additional reading about wind power	7
» Part 1. Background	9
Sustainable community development	10
National and regional environmental objectives	10
Municipal climate strategy and environmental objectives	10
Wind power and the environment	10
» Sustainable development	10
Wind power potential in Västerbotten	11
Intermediate goals and objectives for wind power development in Västerbotten	11
» Requirements for wind power production in Storuman and Sorsele	12
Wind conditions	13
Landscape factors	13
Shape of the landscape	13
Populations and settlements	13
» Technical information	14
Building foundations and surrounding area	14
Noise levels	14
Shadows	14
Electricity networks	15
Infrastructure	16
Risk of accidents	17
Environmental Code	18
Legislation governing national interest classification	18
» Legislation governing the establishment of wind power	18
The planning and building legislation (PBL)	19
Heritage conservation legislation	19
Reindeer Husbandry Act	19
Reindeer Husbandry Ordinance	19
Sami Parliament Act	19
» Protected areas within the municipalities of Storuman and Sorsele	20
Rivers of national interest	20
Natura 2000 sites	22
Nature reserves	23
National interests	25
Reindeer husbandry	26
Tourism and outdoor recreational activities	28
Cultural heritage	29
Unbroken areas of mountain terrain	30
Nature conservation	30
Communications	30
Substances and materials	30
Energy - wind power	31
» Other public interests	32
Outdoor recreation	32
Reindeer husbandry	32
Agriculture and forestry	32
Cultural landscapes	32
Communication links	32
» Local and regional interests	33
Wetlands	33
Agricultural landscape	33
Forests	33
» Registration and licences	34
Registration with the municipality	34
Licence	35
Smaller stations	35
Municipal structural plans	36
Local Plan	36
Area provisions	36
» Planning process	36
Structural planning process	37
Municipal organisation	37
Public meetings, local reference groups and other contacts	37
» Organisation	37
» Part 2. Proposals	39
Criteria for definition and evaluation	40
Guidelines for the establishment of wind power	41
Guidelines for smaller stations	41
Municipal policy	42
Assessment model	42
Summary of suitable areas	43
General map	44-45
Environmental assessment	46
Consultation process	47
Project on display	48
» Part 3. Assessed areas for wind power	49
Areas in Sorsele Municipality	49-73
Areas in Storuman Municipality	75-99



Introduction

The wind's energy has long been harnessed by man. The first windmills are known to date from 4,000 years ago in China and Japan. Wind power came to Europe about 1,000 years ago and, by the 1300s, it had reached Sweden. Windmills are rare in Västerbotten and there are no records of any being built in the municipalities of Storuman and Sorsele. Those that did exist were in use at the end of the 1800s and located along the coast.

The utilisation of renewable energy sources plays a major role in meeting Sweden's environmental quality objectives. Wind power is renewable and, from an environmental point of view, one of the best alternative energy sources. Excellent conditions for producing wind power exist in Sweden, particularly the Inland region of Västerbotten.

Wind power in the municipalities of Storuman and Sorsele

There are several developers planning to establish wind power stations in Storuman and Sorsele. When deciding on a suitable location, it is necessary to balance the varying interests with the fact that there could be wildlife species in the area that are sensitive to change. Storuman and Sorsele are similar in many respects and it is, therefore, logical to treat the establishment of wind power across the region in a similar way. The two communities already share one area in particular, which is currently being assessed for its wind power potential. Creating a joint plan for wind power will make the process of handling new wind power projects more efficient, as well as identifying which areas are suitable for development. Several public meetings have already been held in Storuman and Sorsele in order to canvass opinion.

Studies have been carried out in more than 50 locations to ascertain wind conditions, the potential for wind power development and to consider any other affected interests. The research findings are presented in the chapter on Proposals.

The main purpose of the additional plan, is to facilitate current and future wind power projects in Storuman and Sorsele by establishing joint assessment criteria and a joint approach to the development of wind power.

By becoming an amendment to the structural plans of both municipalities, the additional plan can remain active for a longer period. In accordance with planning and building legislation, chapter 4, the process of developing both plans is identical. For more information read the chapter, Planning process. In both municipalities, areas that are identified as being suitable for wind power are not in conflict with previous decisions governing the use of land and water.

Government planning targets

In 2002, the government announced targets that required the amount of wind power-generated electricity to increase from one terawatt hours (TWh) to ten TWh by 2015. In addition, the electricity has to be reliably available and competitively priced when compared with imported electricity. The process of achieving these targets will also create the conditions for an effective and sustainable use of energy and result in a transference to renewable energy.

The Swedish Energy Agency has since been instructed by the government to produce new planning targets for wind power. These suggest further increases in production, from 10 TWh to 30 THw by 2020.

In order to achieve this, Parliament has granted funding to help municipalities draw up the relevant plans. Wind power turbines are tall and affect several interests and the environment. Municipal planning, developing additional plans and public consultation are all important in the process of establishing wind power stations. The National Board of Housing, Planning and Building (Boverket) is responsible for administering financial support and providing guidance to communities.

How to read

Additional Plan for Wind Power

The plan contains a background section and a proposals section. The background section contains information about the region's conditions and the potential for wind power in Sweden. In the proposals section, those areas that have already been researched are marked on a map and information is provided about wind conditions, the potential for wind power development, other affected interests (i.e. of national interest, interest to the general public and of local interest) and a current assessment. The maps should not be interpreted as providing detailed and accurate information about wind conditions. They are based on theoretical calculations of wind energy 103 metres above the lowest level of free flowing air (i.e. along the tops of trees). More information about using this level known as the chart datum displacement (nollplansförskjutning) has been published by Uppsala University 2009. Maps for wind areas that are deemed suitable have a 500 m horizontal resolution whilst those that are not suitable have a 1000 m horizontal resolution. The current project does not have the financial resources to produce a more accurate wind map covering both municipalities.

Additional reading about wind power

Information about wind power is available on the Internet. We recommend the Swedish Energy Agency, www.energimyndigheten.se and the National Board of Housing, Planning and Building www.boverket.se.

If you want know more about nature reserves and areas of national interest within the municipalities try the website of the County Administrative Board, www.ac.lst.se.

» **Part 1. Background**

This section has information on wind power and conditions affecting its establishment in the municipalities. There are details about sustainable development, environmental objectives, legislation and the basic facts concerning wind power development.

» Sustainable development

Sustainable community development

The municipalities are important partners in the efforts to achieve sustainable energy use within the community. Any development has to have a low impact on climate and the environment. It is important that these efforts are incorporated into planning regulations covering property renovation or new housing. Municipalities will be able to save money and reduce the environmental impact by investing in green alternatives. Positive co-operation between a municipality and private enterprise creates more job opportunities, increased levels of skills and experience, improved public health and greater mutual responsibility for the development of the community.

Private enterprise also plays a key role in a community's long-term sustainable development. Rising electricity prices have made energy a major factor in strategic future planning which, in turn, presents a municipality with an opportunity to assist businesses in retaining their competitiveness.

When developing wind power, the aspect of sustainability is particularly important to local businesses. Sustainable energy has a strategic role to play in the future development of key sectors such as reindeer herding, forestry and mining.

Establishing wind power stations is one way of reducing carbon dioxide emissions and also creates jobs.

National and regional environmental objectives

Parliament has produced environmental quality objectives for 16 different areas. In 2005, the latest objective to be added to the list was "A Rich Diversity of Plant and Animal Life".

The overall goal of the Government's environmental policy is to hand on to the next generation a society in which the major environmental problems facing Sweden have been solved. This entails reducing pressures on the environment by 2020 (for climate objectives, by 2050) to levels that are sustainable in the long run. Nature, however, needs time to heal and in some cases we will not be able to achieve the targeted

environmental objectives, despite the major efforts that have been made.

The purpose of the environmental quality objectives is to:

- Promote public health
- Protect the bio-diversity and natural environment
- Care for the cultural environment and cultural heritage
- Preserve the eco-system's ability to reproduce in the long term
- Safeguard the good use of natural resources

Implementation of these objectives has been divided up into a series of targets on a national and regional level. These targets provide direction and a timescale for measures that are needed to achieve the main environmental objectives. Västerbotten has been allocated a series of targets that are tailored to suit its environment.

Storuman and Sorsele have adopted the regional environmental targets.

Renewable energy sources such as wind power will play a part in reaching certain objectives, including: Reduced Climate Impact, Clean Air, Natural Acidification Only and Zero Eutrophication.

Wind power in Storuman and Sorsele will help to reduce carbon dioxide emissions on a national and global level as it will generate environmentally-friendly electricity which will be made available to the Nordic electricity markets. However, it may have a negative impact on the following government objectives: Magnificent Mountain Landscape, A Rich Diversity of Plant and Animal Life and A Healthy Forest. Storuman and Sorsele have adopted the regional environmental targets (all 16 objectives).

Municipal climate strategy and environmental objectives

Eco-municipality

Since 1990, Sorsele has worked towards creating a sustainable community by focusing efforts on becoming an eco-municipality.

This entails leading the development of an ecological and economical sustainable community which also boasts a high quality of life. Sorsele's objective is to become a centre of expertise on environmental and ecological issues. Its unique natural and cultural heritage is to be carefully preserved and developed. Planning and change will not be rushed through but considered carefully and comprehensively, in full consultation with other partners.

Climate strategy

Since 2002, Storuman's climate strategy has been central to efforts to reduce the municipality's greenhouse gas emissions. The objective is, by 2010, to reduce carbon dioxide emissions by eight per cent from their 1990 levels and to keep the whole community/region informed on how it is achieving this.

The climate strategy can be divided into five sections:

- Negotiating favourable contracts on more environmentally-friendly municipal transport.
- Reduced electricity and oil consumption and increased use of better heating alternatives.
- Encouraging greener waste disposal methods.
- Working with, informing and advising members of the public and businesses.
- Plan using environmental objectives.

Wind power and the environment

The development of wind power has, in general, a positive effect on biological diversity as it plays a part in reducing acidification, eutrophication and greenhouse gases. According to current research, it appears that wind power only has a very limited effect on wildlife.

The site of a wind power station will, of course, affect the local environment, which is why it is important to choose sites and design wind parks or individual turbines with great care. The development of wind power will change the landscape. Certain locations are sensitive to this while other landscapes can benefit from it.

Wind power promotes sustainable development by exploiting the wind as a renewable energy source. It is also environmentally friendly as emissions are very small when the wind power station is active.

The amount of energy used to build a wind power turbine can be replaced by that same turbine within six to eight months, depending on the wind conditions. The total amount of energy needed to build a wind power turbine (with a lifespan of 20 years), is only three per cent of the total electricity produced.

When the lifespan of the wind power turbine has expired, it can be dismantled without causing permanent harm to the environment and most of the parts can be recycled.

Wind power is sustainable and helps to reduce global pressure on the environment as our dependency on coal, oil and gas gradually lessens.

In Västerbotten, hydro-power is the main source of energy, so wind power will not replace any production that does not cause carbon dioxide emissions.

As Sweden's electricity market is linked to international markets, the environmentally friendly energy produced in Västerbotten is available throughout the rest of the country and abroad.

Wind power potential in Västerbotten

The Inland region of Västerbotten has favourable wind conditions, particularly in the mountains but also in the forested areas. The mountain region appears to accommodate larger wind power farms, but there are other interests that need to be addressed, such as the natural and cultural heritage sites, tourism (very important for those who live in the mountains) and reindeer herding.

Forested regions contain many hills and areas of high ground that have favourable wind conditions. There are also in many areas along the coast and further out to sea that could harness wind power.

In the mountains, the annual average wind speed is more than 7 metres/second (m/s). In forested areas, there are several locations where the average wind speed exceeds 7 m/s and along the coast, at a height of 103 m, the average speed exceeds 8 m/s.

Västerbotten has traditionally used water as a source of electricity and is responsible for producing a significant proportion of Sweden's hydro-power. Wind power is generated along the coast and at a couple of locations in the Inland region, at Skarvsjöby, for example.

Combining energy from the wind and water could be a good alternative for renewable power and help achieve the national energy objectives.

In the regional development plan (RUP), the production of renewable energy in Västerbotten is a priority objective. According to RUP, Västerbotten has the potential to contribute to a safe, cost effective and sustainable use of energy - based on renewables such as wind, water and biomass.

Västerbotten has the potential to produce a large amount of renewable energy, both nationally and internationally.

Intermediate goals and objectives for wind power development in Västerbotten

The planning target for Västerbotten is 303 GWh by 2015. The county does not, currently, have a wind power policy.

Dog in windy weather



» Requirements for wind power production in Storuman and Sorsele

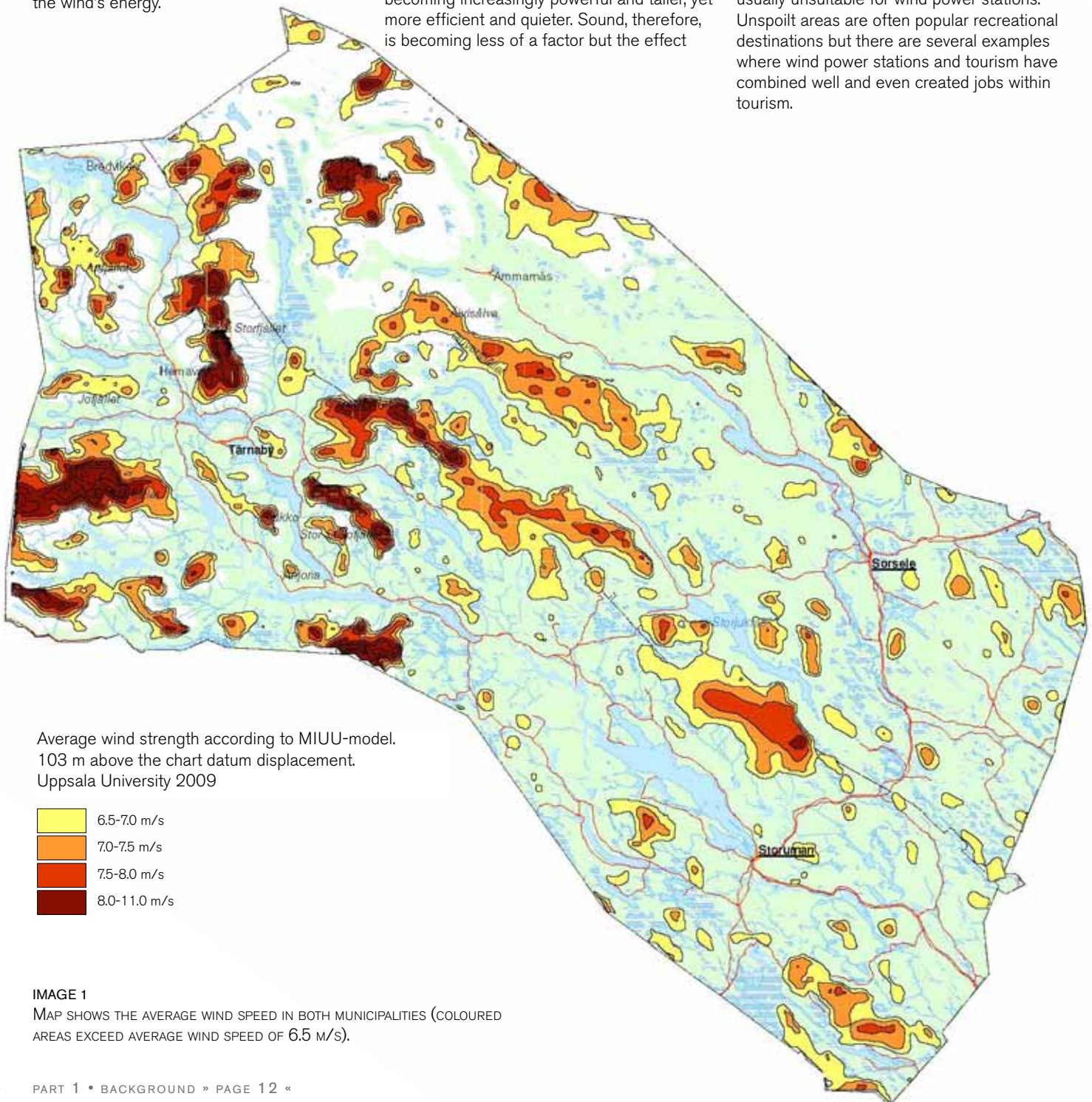
Exposure to the wind is the single most important factor in deciding the location of wind power stations. The differences between locations with good or poor profitability are considerable. Proximity to the existing electricity network and the network's size are also important factors when considering location. Wind power stations take up large areas of land because of the distance needed between each turbine to fully exploit the wind's energy.

A single large station generates more energy in a restricted area than many small ones because larger stations have taller turbines that can reach stronger winds.

Sound, shadow, and changes to the landscape are all factors that are taken into consideration when assessing the suitable distance between wind power stations and buildings or settlements. Turbines are becoming increasingly powerful and taller, yet more efficient and quieter. Sound, therefore, is becoming less of a factor but the effect

of shadows cast by the turbines is growing in significance. How sound is perceived is related to how the turbine visibly affects the landscape.

Careful consideration is required when assessing the effects of location on outdoor activities, reindeer herding and tourism. Pristine and quiet areas, which are identified in the municipalities' structural plans, are usually unsuitable for wind power stations. Unspoiled areas are often popular recreational destinations but there are several examples where wind power stations and tourism have combined well and even created jobs within tourism.



Wind conditions

The municipalities enjoy favourable wind conditions. According to the wind map, there are several locations in the mountains and forested areas which are particularly suitable. To be classified as having favourable wind conditions, the annual wind speed should exceed 7 m/s between 103-118 metres above sea level. The wind strength map (map 1) displays the wind conditions found in both municipalities.

Wind strength or speed is measured in metres per second (m/s). The annual access to wind at a single location is either classified as an average wind strength in m/s or as a measurement of wind energy in kWh/m² at a given height. This can vary greatly depending on location and height above the ground. Wind turbines can generate energy from wind speeds between 3-25 m/s.

Landscape factors

Building wind power stations is going to change the landscape. It is imperative that these changes take into consideration the current and future value of each landscape. Certain locations are sensitive to wind power while others can benefit from the new development.

Both individual turbines and larger wind power farms require meticulous planning. Everyone has an interest in the natural environment, whether they live and work in it or use it for leisure activities. Developing wind power, therefore, has to be a democratic process. This is not only necessary for good management of landscape resources and value, but also to achieve broad public support.

Shape of the landscape

The regions of Storuman and Sorsele are characterised by expanses of mountainous landscapes in the west and large swathes of forest to the east. The forest is intersected by areas of treeless high ground and individual hills. Tärnafjällen is a beautiful and unique mountain community with an active Sami culture. Ammarnäsfjällen has magnificent natural and cultural environments and is part of the Vindelfjällen nature reserve. Both municipalities, which are two of Sweden's largest, are in Lapland and belong to the county of Västerbotten.

The Vindelfjällen nature reserve spreads over both municipalities and, with its 550,000 hectares, is northern Europe's largest reserve. It is centred on the upper reaches of the river Vindelälven and incorporates lake Tärnasjön, the peak Artfjället, with its rich floral diversity,

Lake Tärnasjön »

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and the mountain range of Norra Storfjället and Ammarfjället.

Pine forests cover eastern parts of the reserve, which is not only home to rare animals such as the peregrine falcon and polar fox, but a popular destination for trekkers, skiers and snowmobile users.

The municipalities boast two large rivers, the Umeälven and the Vindelälven. The source for the Vindelälven is in the upper reaches of Sorsele Municipality. In 1970 the river was awarded national status and protected from any plans to build hydro-power stations along its course. It is, therefore, one of only a handful of rivers that have not been controlled in some way. One of the main reasons why the 430 km river was spared was because it flows through many areas deemed as having a particular ecological value.

The Umeälven, which runs through the municipality of Storuman, is made up of large lakes that are linked by short stretches of flowing river. It has eight hydro-power stations along it.

Sorsele and Storuman are sparsely populated rural communities. Each covers about 7,500 km². Municipalities found to the east, north and south are Lycksele, Arvidsjaur, Arjeplog, Malå and Vilhelmina. To the west is Norway and the communities of Hattfjelldal, Hemnas and Rana.

Populations and settlements

In total, there are about 9,000 residents with 2,700 in Sorsele and 6,200 in Storuman. There are three major centres: Sorsele, Storuman and Tärnaby/Hemavan. Almost 60% of Sorsele's population lives in the surrounding villages, the largest being Ammarnäs, Blattnicksele and Gargnäs, with about 200 residents in each. The average number of inhabitants equates to less than one per km², so there are substantial areas which are unpopulated.



» Technical information

A wind turbine is activated by the wind moving rotor blades which are linked to an electricity generator. The turbines are active when wind speed is between three and 25 m/s, the maximum effect being achieved when wind speed is approximately 12 to 14 m/s. It is calculated, therefore, that a wind turbine can produce electricity up to 6,000 hours per year out of a possible total of 8,760.

Building foundations and surrounding area

The impact on the environment when building the foundations of a wind power station, is minimal compared to what is required to construct the roads to get there and the power cables which take the electricity to the grid. The basic foundation needed for a 90 m high turbine is approximately 20 m in diameter. In addition, a transformer station is required, which is built adjacent to the tower or incorporated into the turbine itself. The area housing the aggregate will also need space for parking and the road. It is calculated that the area needed for a wind power farm is between 0,1-0,2 km² per megawatt, depending on the terrain. When the station is to be decommissioned, the land has to be reverted back to its original condition and funds must be made available in order to do this.

Noise levels

There are two types of sound that emanate from a wind turbine; mechanical and aerodynamic. Due to technical improvements, there are seldom problems with mechanical noises. The aerodynamic noise from the rotor blades is perceived as a swishing sound, which is most noticeable between 63,000-64,000 Hz. The noise is similar to that heard when wind blows through various types of vegetation.

Noise levels decrease as distance from the turbine increases. This is due to sound being dispersed over a larger area. How sound is dispersed depends on wind conditions, air temperature and the various dampening effects of terrain. A suitable benchmark level is 40 dB(A), although turbines that give off a purer sound are normally 5 dB(A) lower. In areas where outdoor activities are popular, the acceptable noise level is reduced to 35 dB(A). In certain cases, natural background noises can drown out the noise made by the turbine.

Reindeer can not only be disturbed by noise emanating from the power station, it appears that they can also be frightened by the physical rotation of the blades.

Shadows

Wind power turbines create quickly rotating shadows that humans can find irritating. Exposure to moving shadows for a long period of time has been found to cause stress-related symptoms. Shadows that are known to disturb are linked to a number of factors: height, solstice, distance, weather, visibility, wind direction and topography.

The risk of creating shadow disturbance is greatest when the turbine is placed to the south-west or south-east of built-up areas.

A shadow weakens as the distance from the turbine increases, becoming less sharp and, finally dissipating altogether. Shadow length on a clear winter's day could be considerably longer than on a clear summer's day. Shadows are visible at greater distances on a vertical surface than when compared to horizontal shadows. The easiest way to create shadows which do not cause a disturbance is to locate the station further away and at the correct points of the compass.



Wind turbine »

Reflections coming off the blades in strong sunlight can be very disturbing over long distances. This can be rectified however and need not occur with new installations.

Electricity networks

The amount of energy that can be generated from a wind power turbine can vary with the wind, which means that the network voltage will also vary when the turbine is connected. Changes in voltage are easier to manage in a high voltage grid, the optimal being cables with 130 kilovolts (kV). Connecting to the network is only possible if there is available capacity.

Storuman and Sorsele each have a local network with about 10-20 kV and a regional network with 40-130 kV. The regional

network has its centre at the dam in Stensele and spreads down to the coast. The local network distributes electricity to consumers throughout the sparsely populated areas. It is owned and maintained by Vattenfall Eldistribution.

In Storuman there is also a national grid with either 220 or 400 kV. Switchgear, based in Grundfors, transfers electricity to Norway and to the county of Norrbotten via an area in the south-eastern region of Sorsele. The national grid is owned by Svenska Kraftnät.

When connecting a larger number of turbines that produce about 15-20 MW, the network will need upgrading to a 20-30 kV level, which can then be connected to the regional 40-130 kV network. Power lines need to be installed, either underground or via a network of pylons in tree-cleared corridors.

Transformer stations will also have to be

built. Larger wind power farms will require a new regional network or the existing one will have to be considerably developed. Smaller stations comprising of individual turbines can, in many cases, be connected to the local 10-20 kV network. It depends on the type of turbine, which can have various effects on the network.

Network owners are obliged to provide access to the network – no-one can be denied. If the existing network does not have the necessary capacity, increases will have to be made. The costs of connecting a turbine to the network are, therefore, dependent on whether the network has the capacity and which type of turbine is to be used.

When connecting energy production to high voltage pylons, the shortest horizontal distance between the turbine and the pylon must be the total height of the turbine plus 10m. The state utility for energy, Svenska Kraftnät, has expressed its wish to be included in every case concerning the localisation of power stations in close proximity to its facilities and power lines.

When establishing power stations it is not unusual that new power lines are required. This generally results in the local

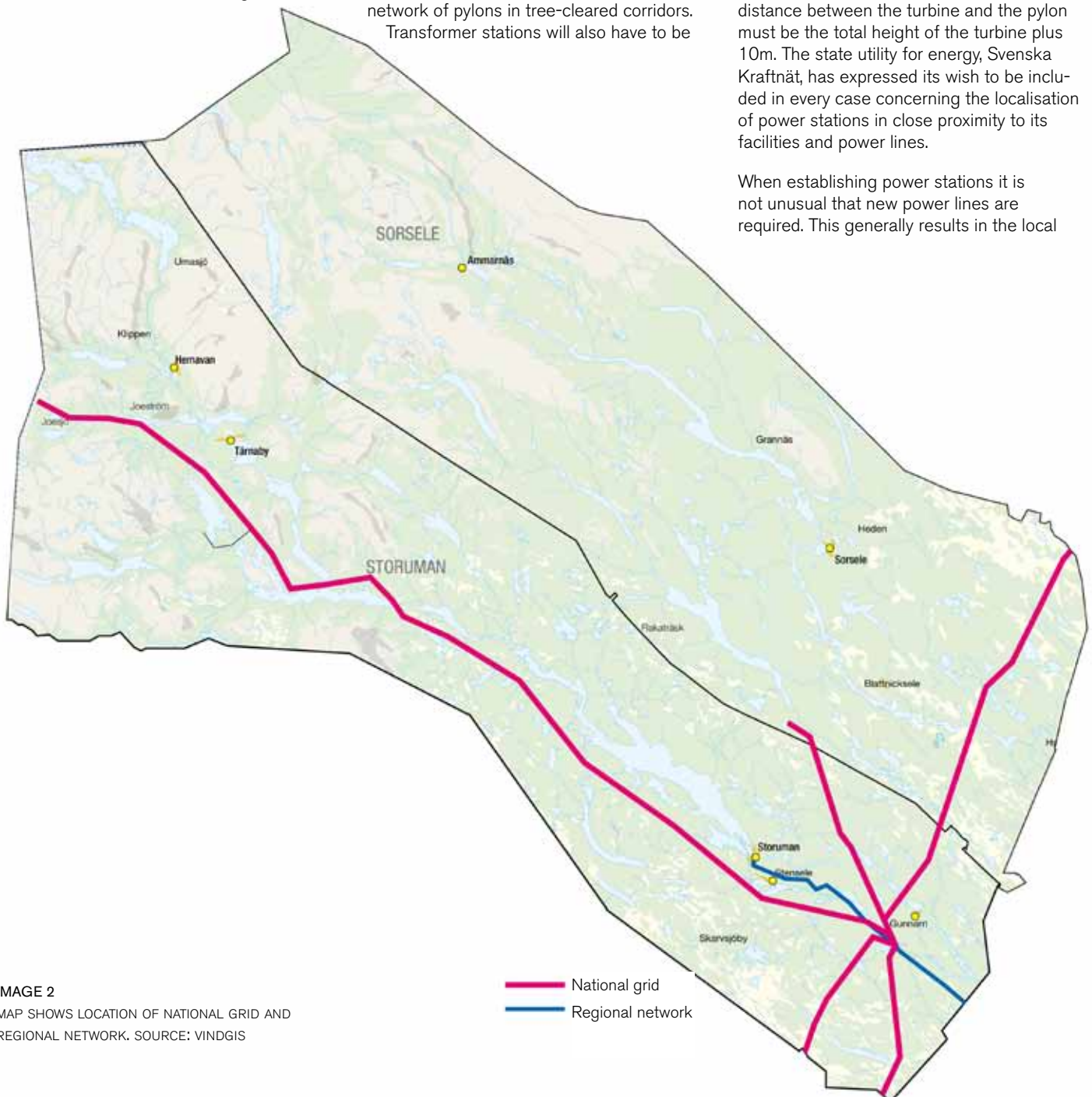


IMAGE 2
MAP SHOWS LOCATION OF NATIONAL GRID AND REGIONAL NETWORK. SOURCE: VINDGIS

environment being affected negatively and special consideration must be given, by the municipality, to reindeer herding, forestry, nature reserves, wetlands and other interests, both regional and national. Good planning and co-ordination reduce any negative effects that construction may have on the landscape.

Infrastructure

A good road network is necessary when building wind power stations. Different types of turbines have different road requirements, but, in general, standard gravel roads are sufficient. Smaller roads, often located in forested areas, will need straightening, strengthening and widening. Building the foundations will require access for truck transport and other heavy duty plant machinery. The turbine, hub and the blades

will be delivered by truck and raised using a large mobile crane. The tower is transported in sections.

The Swedish Transport Administration (Trafikverket) should be informed as early as possible about plans for constructing power stations. It is important that they are able to maintain affected public roads and highways to as high a standard as possible.

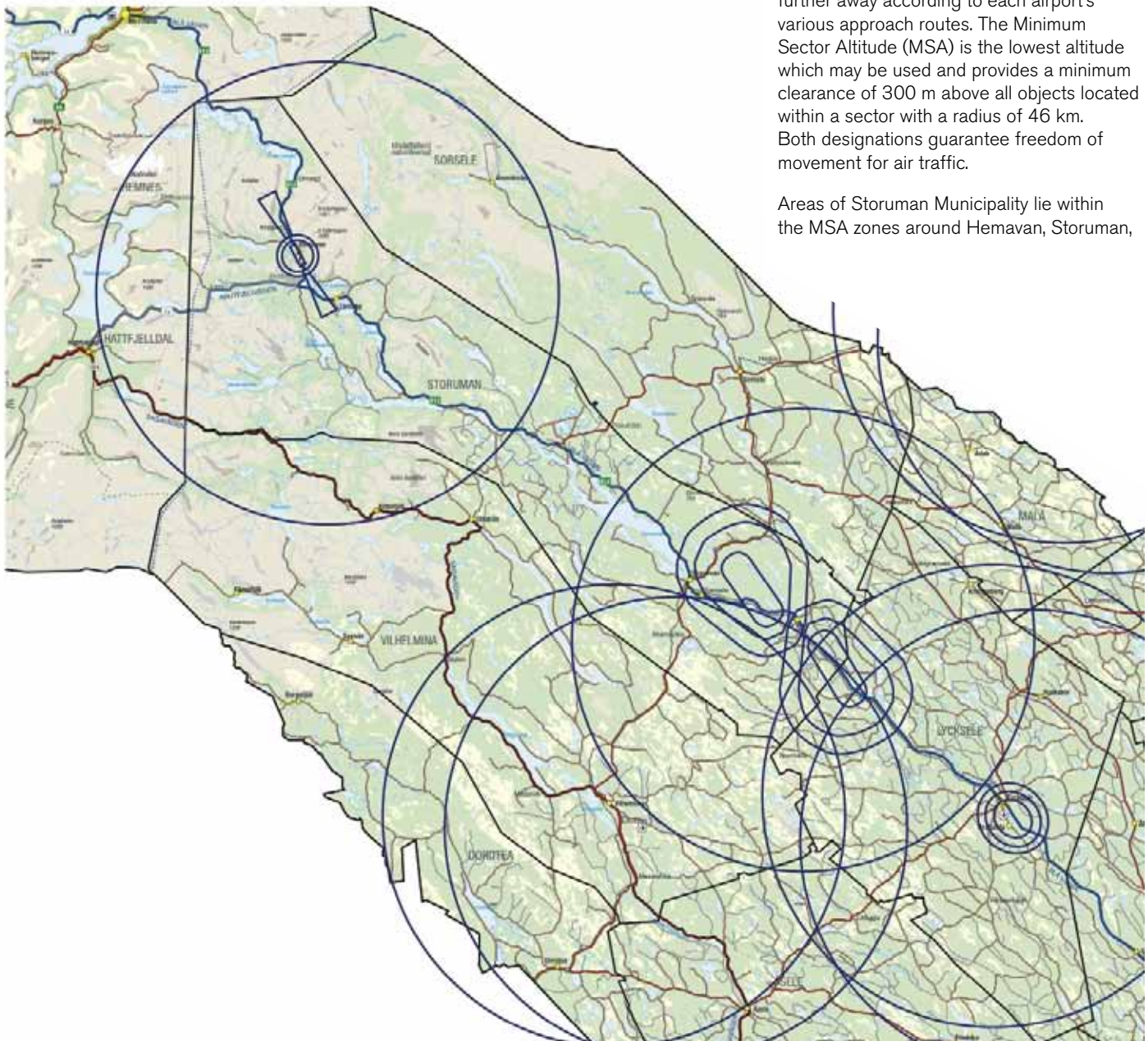
The infrastructure in both municipalities is relatively well developed. The E12 highway, which links Russia to the Norwegian coast, passes through Storuman. It is an important transport corridor due to the close proximity to Norway and the free port in Mo i Rana. The E45 runs north-south through both Storuman and Sorsele. The highway links Sicily, in Italy, with Karesuando in the far north of Sweden. Both roads are classified E routes and, as

such, are of national interest. Route 363 runs through Sorsele and continues down to the coast. Route 1132 connects the E12 with the E45 between Sorsele and Slussfors and is also classified as being of national interest. There are hundreds of miles of gravel roads that bisect the forest in both municipalities.

The railway lines, Inlandsbanan and Tvärbanan, provide access to the main northern line along the coast. However, they carry only a small amount of goods and run a restricted passenger service for tourists during the summer.

In Storuman, there are two airports: Gunnarn and Hemavan. Neighbouring airports include Vilhelmina, Arvidsjaur and Lycksele. Each airport has protection zones in order to safeguard operations. Closest to each airport are areas that have restrictions governing the height of buildings which also apply further away according to each airport's various approach routes. The Minimum Sector Altitude (MSA) is the lowest altitude which may be used and provides a minimum clearance of 300 m above all objects located within a sector with a radius of 46 km. Both designations guarantee freedom of movement for air traffic.

Areas of Storuman Municipality lie within the MSA zones around Hemavan, Storuman,



Vilhelmina and Lycksele airports. Sorsele Municipality is affected by the airports in Hemavan, Storuman and Arvidsjaur. See fig.3. These regulations ensure that any affected airports must be allowed to intervene in discussions about tall buildings or other construction work that might affect their operations.

Airports and the Swedish Transport Agency's aviation department must be contacted if wind power stations are to be established close to these approach routes.

When planning the development of a wind power station it is important to contact the following organisations:

- » **Electricity network companies** (Svenska Kraftnät and Vattenfall eldistribution AB).
- » **Telecommunications companies via the Swedish Post and Telecom Agency** (i.e. Telia-Sonera and Skanova).
- » **Swedish Transport Agency's aviation department.**
- » **Swedish Transport Administration.**
- » **The Ministry of Defence.**

Risk of accidents

Accidents that have occurred at Swedish wind power stations have usually been related to safety harnesses loosening, crushing injuries, or falls from scaffolding. Problems with ice forming are normally associated with turbines in colder climates but it can occur in other weather conditions, e.g. freezing rain, fog or high levels of moisture followed by frost. Recent technical developments to counteract this include heated rotor blades.

Only a few studies have been carried out to examine the risk of accidents to animals. Birds, and particular, birds of prey, appear to be affected negatively as power stations increase the risk of collision or disturbance. The effects on tame or wild mammals appear to be negligible.

The National Board of Housing, Building and Planning (Boverket) recommends that the safety clearance for unprotected visitors, should be the power station's height plus three times the blade diameter.

In order to minimise the risk of colliding with masts or towers during airborne surveys of power lines, there has to be a minimum distance between the power grid and the power station. For more information contact the Transport Agency. According to the Swedish Transport Administration, the minimum distance to a public road is the power station's total height or at least 50 m to any type of road. A suitable distance is approved after consultation with the Transport Administration and other affected parties.

The municipalities can require an assessment of possible risks. A risk assessment is required by the county administration in conjunction with an Environment Impact Study (EIS).

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Winter road



» Legislation governing the establishment of wind power

There is a considerable amount of legislation that governs the construction of a wind power station. Some legislation is more central in nature, such as the Environmental Code and planning and building laws. Applications for permission or consultation may be required by other legislation. If, for example, sites of historical interest could be affected, permission will be needed from the county administration board in accordance with the Heritage Conservation Act. Building powerful electrical power lines will require a licence in accordance with the law governing electricity. Each case will have its own legislative requirements; the form and shape of the station and its buildings, its location and, sometimes, the municipality's local plan. Reindeer herding is a key sector in both municipalities and therefore legislation affecting the sector plays a role in the development of wind power.

Relevant legislation is described below and examples of how it affects local conditions are described in several of the following chapters.

Environmental Code

The Environmental Code (1998:808) is the governing legislation concerning legal aspects of the environment. Its prime objective is to promote sustainable development (chapter 1, section 1). Various environmental interests have to be addressed when applying the code, including public health and the protection of natural and cultural environments. Also covered is energy management, such as extracting energy from the wind, or other renewable sources.

The code specifies certain areas that have a designated purpose, for example, nature conservation, cultural heritage, unbroken areas of mountain terrain and energy. Classifying wind power as of national interest safeguards it as an activity. The Energy Agency has defined 423 locations throughout the country as wind power areas, 74 of these are located in Västerbotten.

The code contains many regulations that affect where wind power stations are sited. This includes the rule of location (choice of location in accordance with the Environmental Code's rule of consideration, chapter 2, section 4) and certain provisions for management.

The code is also used in the assessment of any disturbance caused by noise or shadows. This is done by submitting a report or by applying for a licence to build a station. The code also provides protection for valuable natural and cultural environments..

Legislation governing national interest classification.

Protected areas, which have valuable natural and cultural environments, are covered by the code. This normally entails certain conditions pertaining to land use and ensuring that those that are judged to be of special value are classified as in the national interest.

National interest classifications are regulated in chapters 3 and 4 of the code. The third chapter contains the basic provisions concerning the management of land and water areas and outlines the types which are to be protected. These include natural or cultural aspects, arable practices, certain types of buildings and defence. The fourth chapter covers geographical areas declared by Parliament to be of national interest for their natural and cultural value. There are areas that are already being used correctly according to their national interest classifications.

Environmental Code, chapter 3. Basic provisions concerning the management of land and water areas.

The purpose of the provisions is to identify interests with special significance for the development of community and which can, therefore, be awarded priority status with regards to land and water management.

Municipalities, authorities, courts of law and the government apply the provisions that are governed by the Environmental Code or by laws that are incorporated within the code.

The provisions for water and land use concern the interests of preservation and the interests of utilisation. The provisions can be used as guidelines to help decision-makers solve conflicts of interest. Certain public interests are of local importance which are to be protected as much as possible. This means that these public interests may not always take precedence.

Sometimes, public interests can be of national interest. They are particularly valuable and of importance to the whole country. They, too,

are to be protected to the largest possible extent. This means that no decision can be taken that can have a negative effect on an activity or region that has been classified as of national interest. The code regulates how conflicts between different classifications of national interest are to be resolved. If a location is regarded as being of national interest for more than one designation, priority is given to the designation or designations that provide the best opportunities for long term maintenance of land, water and other physical environmental aspects.

Environmental Code, chapter 4. Special provisions concerning land and water management in certain areas of Sweden

The following have been identified as areas of national interest. Any exploitation of these areas can be only carried out under certain conditions.

The following areas are to be regarded as being of national interest:

- Areas with greater value for tourism and outdoor recreational activity.
- Coastal areas, both undeveloped and heavily developed.
- Sections of mountain regions.
- Watercourses with accompanying catchment areas
- National urban parks
- Natura 2000 areas

Areas are named in the legislation but more detailed geographical descriptions can be found in the local municipalities' structural plan, which will have been developed in consultation with the County Administration Board.

Municipalities, authorities, courts of law and the government apply the provisions that are governed by the Environmental Code or by laws that are incorporated within it the code.

The planning and building legislation (PBL)

The Planning and Building Law (1987:10) regulates the planning of land and water areas and building permission. It plays a significant role in the siting of wind power stations. The PBL awards a large degree of authority to the municipality, but the planning process follows a procedure that guarantees the participation of the county administration board, various authorities, individuals and other organisations. The county administration board and the government have certain limited powers to influence municipal planning.

Formally, cases tried under the PBL are independent and do not affect the same cases that are tried under other legislation. However, there is a general rule of consideration that permission may not be granted if it goes against the detailed plans or provisions for the area.

When planning a wind power station, the municipality can create a local plan or establish provisions for that area (chapter 5, section 1-7 PBL). The detailed local plan regulates management of a particular land or water area within a limited section of the municipality. The plan is legally binding. A

local plan for power stations which require a licence is only required if the stations are to be located in areas which are subjected to intense competition for other land uses. Establishing provisions for the area is one way of making the structural plan legally binding in that limited area. They can only be used to ensure that the objectives of the structural plan are achieved, or that an area of national interest, according to the Environmental Code, is protected.

Heritage conservation legislation

The Heritage Conservation Act (1988:950) contains legislation for the protection of ancient remains, historic buildings, ecclesiastical monuments and place names. According to chapter 1, section 1, "the preservation of our historic environment is a national concern". The responsibility of this is to be shared by all. When planning wind power stations, it is important, at an early stage, to contact the county administration board about ancient remains and historic buildings.

Reindeer Husbandry Act

The reindeer husbandry act regulates the administration, businesses and the use of land and water within the reindeer herding

sector. The legislation stipulates which areas can be used for reindeer herding during different times of the year. The act gives the Sami the right to use land and water for their own maintenance and that of their reindeer. This right is based on tradition from time immemorial and is protected in the Swedish Constitution. It belongs to the Sami people and may be exercised by any member of a Sami village. Property or land owners within the reindeer herding areas, whether they are private or state-owned, may not change the use of land or water that could cause difficulties for the reindeer.

Reindeer Husbandry Ordinance

The ordinance (1992:1433) regulated sales of state-owned land within the reindeer herding area.

Sami Parliament Act

The legislation (1992:1433) assigned the task of monitoring Sami cultural issues to the Sami Parliament of Sweden (Sametinget). The main task of the parliament is to promote and stimulate a vibrant Sami culture, contribute in developing Sami society and protect Sami interests concerning the use of land and water.

Reindeer



» Protected areas within the municipalities of Storuman and Sorsele

Within the mountains and the forests of Sorsele and Storuman are a number of sites that are protected in accordance with the Environmental Code. Legislation covering nature reserves is found in chapter 7. Wind power stations could be sited within a nature reserve only if they do not affect the reserve's purpose.

Mountain nature reserves often have several purposes; not only do they conserve flora and fauna, they also protect outdoor recreational activities and the landscape. These factors have to be taken into consideration when looking for sites with favourable wind conditions for power stations.

The protection provided by chapter 7 could, possibly, be supplemented by a classification of national interest according to chapters 3 and 4 of the Environmental Code.

Natura 2000, is a network consisting of Europe's most valuable natural areas, of which Sweden has been an important member since entering the EU.

Many different areas in Sweden are registered Natura 2000 sites. What they have in common is an exclusive collection of the most valuable natural resources sites in Sweden and Europe. These often coincide with existing nature reserves and are listed as of national interest in chapter 4 of the Environmental Code.

A selection of protected areas in Sorsele and Storuman is presented below. More information (in Swedish) on a specific site is available on the county administration board's website, www.ac.lst.se. For more information about relevant national legislation, read the chapter *Legislation governing the establishment of wind power* in this document.

Rivers of national interest

The river Vindelälven has its source in the mountain region of Vindelfjällen, which lies in the Sorsele Municipality. Its course contains flowing water, lakes, rapids and calmer pools as it travels through pine forests towards the coast. More than 400 plant species can be found along its banks of varied vegetation.

There is also a great number and diversity of animal life and the river is known to be a migratory path for both birds and reindeer.

Rivers of national interest and their catchment areas are, in principle, protected from all forms of exploitation. Environmental code, chapter 4, section 6 and chapter 7, section 14.

Fishing in river Vindelfjällen, a river of national interest, Sorsele Municipality



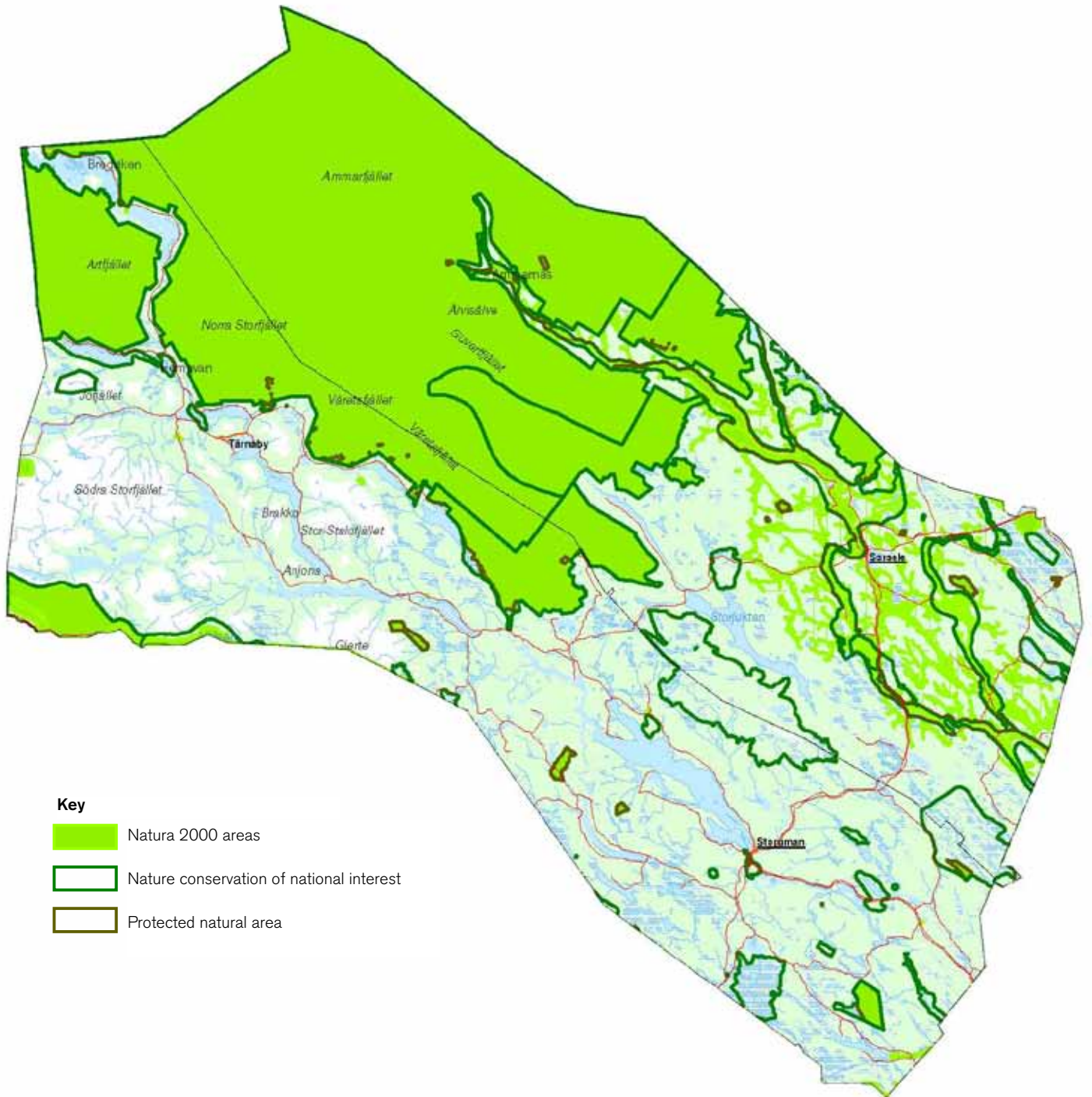


IMAGE 4

MAPS INDICATE AREAS DESIGNATED AS NATURA 2000 SITES, NATURE CONSERVATION AREAS CLASSIFIED AS BEING OF NATIONAL INTEREST AND OTHER PROTECTED NATURAL AREAS.

Natura 2000 sites

There are 36 Natura 2000 sites in Storuman and Sorsele, many of which are incorporated into the nature reserves named above.

One example is the Virisen watercourse, which is part of the river Vapstensälvén's source and catchment area. The river is the largest of all Sweden's rivers which run west into the Atlantic.

Its source comes from three lakes, Över Vapstsjön, Nedre Vapstsjön and Skalvattnet, which receive run-off from a number of small mountain rivers. The highest river is located 1,200m above sea level. During wet periods, and especially during the spring thaw, the river Vapstälven quickly changes character to wild rapids intersected by high waterfalls.

Smalaken, in Sorsele, is a tree-covered hill with two summits joined by a marsh. The pine trees grow short and twisted and are typical of a near-primeval forest on flat bedrock. The

area has been designated a Natura 2000 site due to the forested marsh and interesting wetland and rock-slope vegetation.

While there are no specific restrictions governing the construction of wind power stations in Natura 2000 sites; in practice there have to be strong reasons for establishing a station. Natura 2000 sites are classified as being of national interest according to Environmental Code, chapter 4, section 8.

Reindeer at Lake Virisen



Nature reserves

In Storuman Municipality there are eight nature reserves. Forested reserves include both Buberget and Luspen, which are close to the central town of Storuman. Buberget contains several rare species of fungi and Luspen has glacial remains from the last Ice Age and interesting flora. In Sorsele there are 11 nature reserves, of which Vindelfjällen, Nalovardo and Gimegolts are particularly noteworthy. Nalovardo is an area of treeless high ground amid the forest and Gimegolts has a gorge created during the Ice Age. More nature reserves are being planned.

Both municipalities share the Vindelfjällen nature reserve, the largest proportion lying within Sorsele around the river Vindlalven's source and catchment area. The archipelago of Lake Tärnasjön, the diverse flora of Artfjället and Juktådalen and the untouched alpine forested regions of Kirjesålandet, Matsorliden and Giertsbäckdalen are all part of what is, covering 550,000 hectares, western Europe's largest reserve.

Nature reserves are, in principle, protected from all forms of exploitation. Building wind power stations may not necessarily affect the purpose for which the reserve was created Environmental Code chapter 7.

Luspen nature reserve, Storuman Municipality



Table 1. Summary of national interests according to Environmental Code (EC)

National interests	Extent	Protection
Nature conservation	Encompasses large areas (unspoilt areas, wilderness, valuable flora and fauna etc) in mountains and forests. Makes up the most valuable areas from a national perspective.	Is to be protected from measures that could lead to tangible damage. EC, chapter 3, section 6
Cultural heritage	Encompasses historic grazing, agricultural landscapes in mountains/river valleys, old churches and environments with ancient remains, including those of Sami origin.	Is to be protected from measures that could lead to tangible damage. EC, chapter 3, section 6
Outdoor recreational activities	Areas important for recreational activities and with natural and cultural characteristics, varying landscapes and easy access for the general public are to be protected from measures that could lead to tangible damage.	EC, chapter 3, section 6
Reindeer husbandry	Encompasses large proportional area of the municipalities. It is divided into key areas for grazing, calving, gathering and migration.	Land areas that are important for reindeer herding are to be protected from measures that could impede herding activities. EC, chapter 3, section 5
Tourism and recreational activity	Encompasses large areas of the mountain chain and parts of the forest. As they are natural and cultural environments, they are also classified as being of national interest.	The interests of tourism and outdoor recreation, particularly active pursuits, are to be considered when planning any exploitation or changes to the environment. Exploitation can only be approved if it clearly does not damage the area's natural and cultural value. EC, chapter 4, section 1-2
Unbroken areas of mountain terrain	Encompasses unspoilt areas in the mountains free from roads and buildings. Covers large areas in the two municipalities. Construction in the mountains may only be permitted if it is necessary for reindeer herding, local residents, scientific research or recreational activities	Establishing wind power stations is not permitted. EC, chapter 4, section 5
Defence	Encompasses certain facilities and flight paths in the region.	Land and water areas that are of importance for defence, shall, as far as it is possible, be protected from measures that could counteract those defence purposes. EC, chapter 3, section 9
Communications	Includes highways E12, E45 and route 1132.	These areas should be protected as much as possible from measures that could counteract the use and development of communications. EC, chapter 3, section 9
Substances and materials	Includes Granlidknösen and parts of Svartliden and Stortjärnhobben in Storuman Municipality.	Areas containing finds of substances and minerals that are of national interest are to be protected against measures that may be prejudicial to their extraction. EC 3, section 7
Energy - wind power	Encompasses large areas where wind conditions are favourable.	Identified areas are to be protected from measures that hinder wind power operations. EC, chapter 3, section 8

National interests

Mountains and adjacent regions in Sweden contain a number of national interests. Some areas qualify in chapter 3 through provisions of land and water management while others fall under geographical provisions, as outlined in chapter 4. The mountains are of national interest for nature conservation, cultural heritage, tourism, outdoor recreational activities, reindeer herding, unbroken areas of mountain terrain, communications, valuable substances and materials and defence. As well as taking national interests into consideration, it is also necessary to ascertain what has regional and local importance.

As well as national and public interests, there are other protected areas such as national parks, nature reserves and Natura 2000 sites that are regulated according to chapter 7 of the Environmental Code.

Wind power stations that are to be built in areas identified in the code's legislation can only be granted permission once the case has been assessed in accordance with the legislation. The list below contains a summary of national interests that apply to Sorsele and Storuman.



Children on summit of Atoklinten in Storuman Municipality.

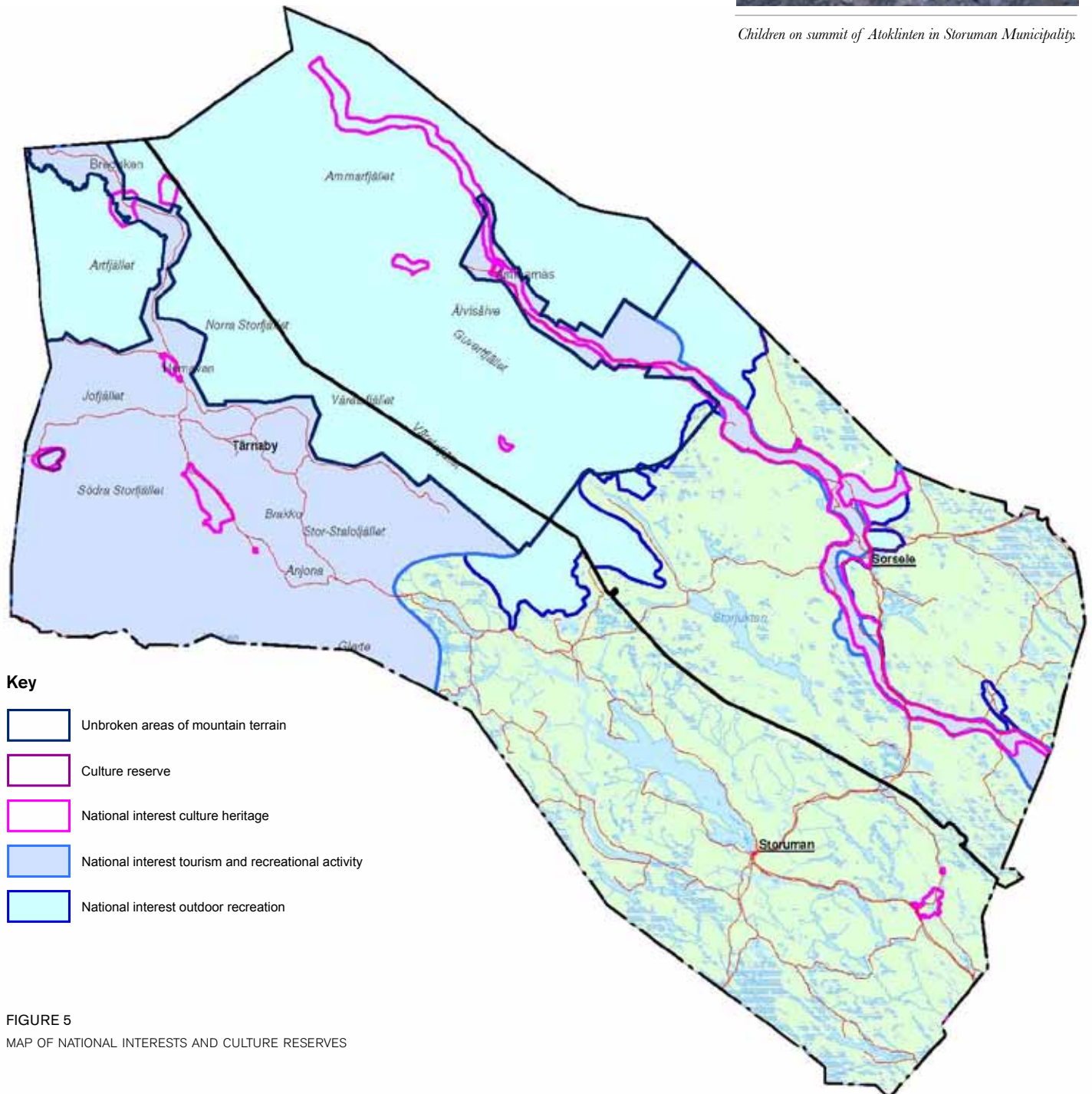


FIGURE 5
MAP OF NATIONAL INTERESTS AND CULTURE RESERVES

Reindeer husbandry

Large areas of Storuman and Sorsele are used for reindeer herding throughout the year. In general, calving and grazing occurs across extensive areas north-west of the cultivation line (odlingsgränsen). Key areas, where much of the calving takes place, are: Södra Storfjället, Arefjäll, Virifjäll, Jofjäll, Löfjäll and Ryfjället. Other key areas are located within the classification, i.e. unbroken area of mountain terrain.

Difficult passages, where herds pass during migration, are located close to Sorsele, Blattnicksele, Vindelkroken and Ammarnäs in Sorsele Municipality. In Storuman Municipality, they are by Skarvsjöby, Forsnacken, Boksjön and in Hemavan.

Winter grazing occurs mainly near coastal areas.

Migration from the winter grazing areas to the calving areas takes place during March and April. The calves are born in May and, during this period, the reindeer are extremely sensitive to disturbances. They spend June recovering in the birch forests and marshes before moving up to higher altitudes in June/July. In September/October, they move back down to the birch forests before being moved, in November, to the winter grazing areas. Some reindeer do, however, remain above the cultivation line all year round. The weather and the wind have a great influence on reindeer herding, which makes it difficult to predict.

The development of wind power is affected by how the land is used for reindeer herding. If several stations are planned, it is better to concentrate them on one farm rather than spreading them across a large area.

They could only be built when reindeer are not in the area, i.e. the summer months as opposed to between March and June which is when reindeer are at their most vulnerable to disturbance.

Consultations with the Sami village which is affected by the development of wind power, must begin at an early stage to ensure its specific interests and requirements are included in any wind farm plans from the beginning.

In Sorsele and Storuman, the Sami villages are; Ubmeje tjeälddie, Vapsten, Ran, Gran and to a certain degree Malå, Svaipa and Maskaur.

Only a few studies have been carried out but those to which the municipality has had access show that the construction of the

Reindeer herding has four critical components:

Key areas – which have the necessary vital conditions to support several activities associated with reindeer herding. Regarded as the core of the business and is central to the life within the Sami village.

Intermediate grazing – during migration, the animals move from grazing area to grazing area. This intermediary grazing is vital in maintaining the migratory paths.

Migration path – a restricted strip of land which varies depending on the terrain and the vegetation. Usually about 300m wide (depends on the topography), the trail links key summer areas with winter grazing.

Difficult passages – where it is critical that the reindeer can pass unobstructed.

Year-round areas - are located north-west of the cultivation line and according to the Reindeer Husbandry Act, land owners are not allowed to change land or water use if it disturbs the reindeer herding sector.

wind farms can cause the some disturbance to reindeer. The building of roads and the facility itself can affect reindeer grazing behaviour, which could result in an increase in the number of people in the area and cause overgrazing in neighbouring areas. The impact, however, could be reduced through careful planning.

The land is used in many ways, such as for forestry and agriculture, and it is often the total impact of wind power which concerns the Sami villages. Areas that are used all year round for reindeer husbandry cannot be made accessible for wind power by the state if there are significant disadvantages for the reindeer. The Sami Parliament is the regulatory authority which protects the use of land and water in the interests of reindeer husbandry.

Any Sami village, which would be affected by the development of wind power must be contacted at an early stage. This ensures that the specific interests and requirements of the Sami are included in the plans from the beginning. Land areas that are important for reindeer herding are to be protected from measures that could impede herding activities. EC, chapter 3, section 5

In some cases it might be necessary to conduct an impact study concerning the reindeer industry, focusing particularly on road and power line construction and disturbance to people.



Separating reindeer herd in Ammarnäs



IMAGE 6
MAP SHOWS AREAS WHERE REINDEER HERDING IS
CLASSIFIED AS BEING OF NATIONAL INTEREST.

Tourism and outdoor recreational activities

In the municipalities of Storuman and Sorsele, there are many beautiful areas that are suitable for outdoor recreation and tourism. The areas that are classified as being of national interest for outdoor recreational activities are to be found in a region that stretches from the Norwegian border to the more central areas of the municipalities. The Vindefjällen nature reserve is included here, as are Skalmoldal and Norra Gardfjället. Södra Storfjället and the region linking it with Norra Gardfjället, are classified as of national interest for outdoor recreational activities, as is the whole of the river Vindelälven and its tributaries.



The interests of tourism and outdoor recreation, particularly active recreational pursuits, are to be considered when planning any exploitation or changes to the environment. EC, chapter 4, section 2 and chapter 3, section 6

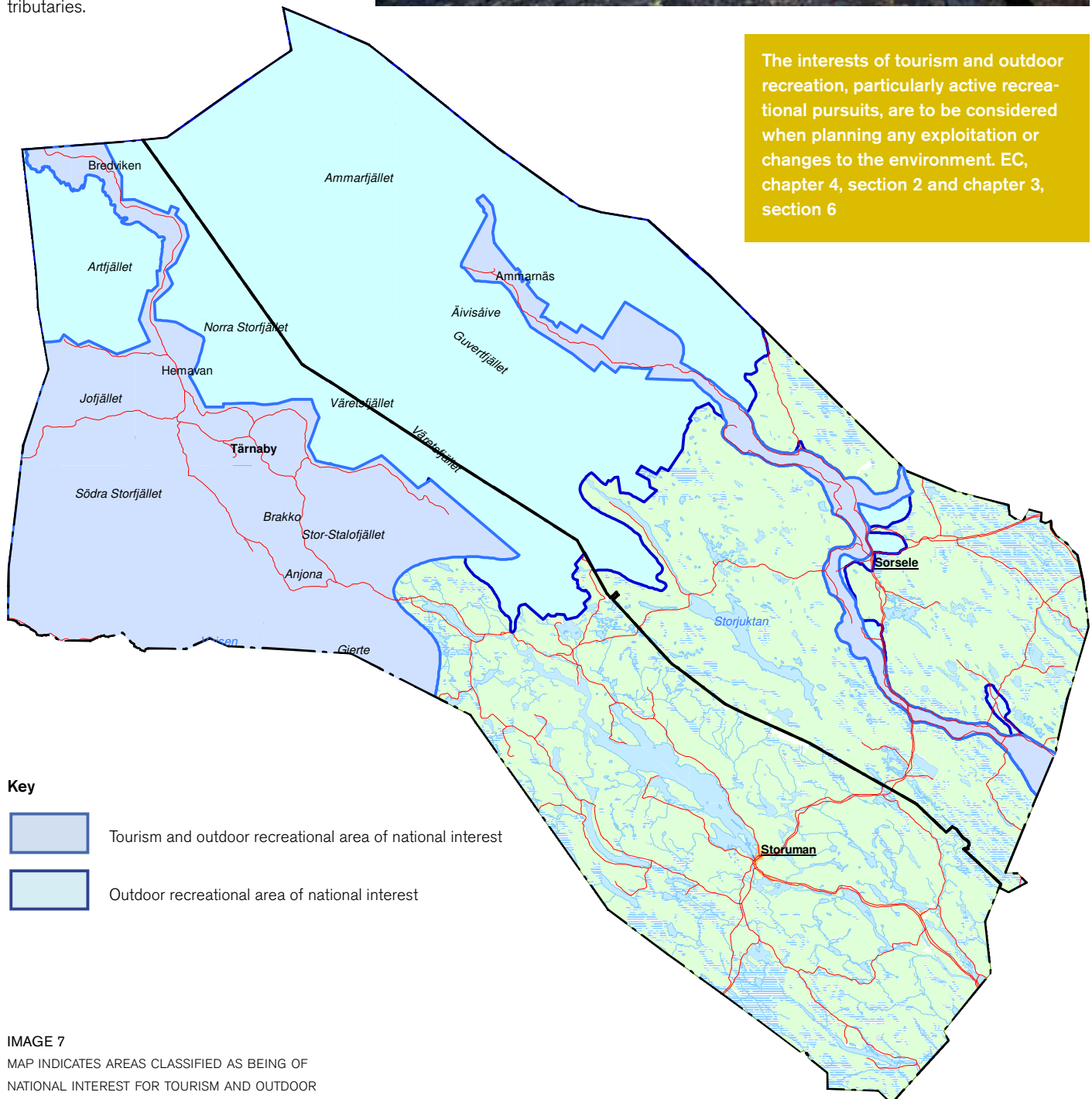


IMAGE 7

MAP INDICATES AREAS CLASSIFIED AS BEING OF NATIONAL INTEREST FOR TOURISM AND OUTDOOR RECREATION.

Cultural heritage

The region has a rich cultural heritage that needs to be preserved. Heritage conservation encompasses historic buildings, ancient remains, cultural heritage sites, ecclesiastical and burial monuments, agricultural landscapes and the national interest classification of cultural environments. Several of these are classified as being of national interest according to the Environmental Code.

In Storuman, Aatoklimpoe, (Atoklimpen) is a cultural reserve that is part of the Sami cultural environment. The area has featured in the nomadic lifestyle of the reindeer-herding Sami from ancient times until the present day. It has spiritual and religious significance and the landscape still bears physical evidence from earlier Sami cultures which help depict the way of life in the mountains.

There are seven areas in Storuman that are classified as being cultural environments of national interest. Brandsfjället is, for example, an ancient Sami settlement with sacrificial sites, a reindeer paddock, tent remains and the foundations of ancient dwellings. In Sorsele there are six areas, including Åkernäset/Överstjuktan, which has buildings, a Sami chapel and a system of hunting pits.

Ancient remains, dating back 8,800 years, have been found in the region. Along the Umeälven and Vindeläven rivers are the remains of settlements, hunting pits and embankments of fire-cracked stones. In Gunnarn, a carved moose head and arrow heads have been found. Many sites are yet to be properly excavated and new finds could be uncovered during the construction of wind power stations. Those areas that have been

identified as being suitable for wind power could later be found to be unsuitable due to the existence of ancient remains. Ancient remains are protected by the Heritage Conservation Act.

New wind power stations cannot be built in areas identified in the Environmental Code without being assessed in accordance with the relevant legislation. EC, chapter 3, section 6

Atoklinten, with its Sami cultural heritage, is a cultural reserve.



Unbroken areas of mountain terrain

A large area of the region is classified as an unbroken area of mountain terrain of national interest. This includes the Vindelfjällen nature reserve, which is free from roads and buildings.

The provisions of the Environmental Code prevent the construction of wind power stations in unbroken areas of mountain terrain. EC, chapter 4, section 5.

Nature conservation

National interest classification Nature conservation is applicable to large areas of the municipalities. This includes the Vindelfjällen nature reserve, the river Vindelälven and its tributaries and the marshland area of Lycksamyran. These are all examples of unspoilt territory and wilderness that contain flora and fauna of national importance.

The areas identified as being of national interest are especially valuable from a national perspective and are to be protected from any measures that lead to tangible damage. EC, chapter 3, section 6

Communications

National interest classification, Communications, include three highways running through the municipalities that are of great significance for international and national transport. Route E12, known as the Blue Route passes through Storuman Municipality in an east-west direction, terminating at Mo i Rana in Norway. The E45 runs north-south through both municipalities and route 1132 connects the two highways between Slussfors and Sorsele.

Areas of land or water that are particularly suitable for communications shall be protected as much as possible against measures that might hinder the development of communications. EC 3, section 8

Substances and materials

What is referred to in the code as of national interest are areas where deposits of substances or minerals that are, or could be, of great importance to the national supply. In such areas, neither the municipalities nor the state authorities are permitted to approve measures that may be prejudicial to their extraction. In Storuman, there are three areas: Granlidknösen and areas around Svartliden and Stortjärnhobben. In Sorsele, there are no such areas, however the whole region is interesting to prospectors and the maps covering approved areas are available from the web site of the Mining Inspectorate (www.bergstaten.se)

Land and water areas that contain valuable substances or materials shall, to the extent possible, be protected against measures that may be prejudicial to their extraction. EC 3, section 7



Energy - wind power

Since 2004, there have been provisions for land and water management that concern wind power. The Energy Agency increased the areas classified as of national interest for wind power in 2008. There are currently 423 areas in 20 counties, roughly corresponding to about two per cent of Sweden's total land area. If an area is classified, this means that the Energy Agency has assessed it as being particularly suitable for electricity production from wind power. The assessment is partly based on the annual average wind speed.

In the municipalities there several areas that have been identified as of national interest by the Energy Agency. Examples include Stor-Blaiken, Ryfjället, Södra Storfjället and Storliden.

The identified areas are to be protected against measures that can have a negative impact on wind power operations. EC chapter 3, section 8

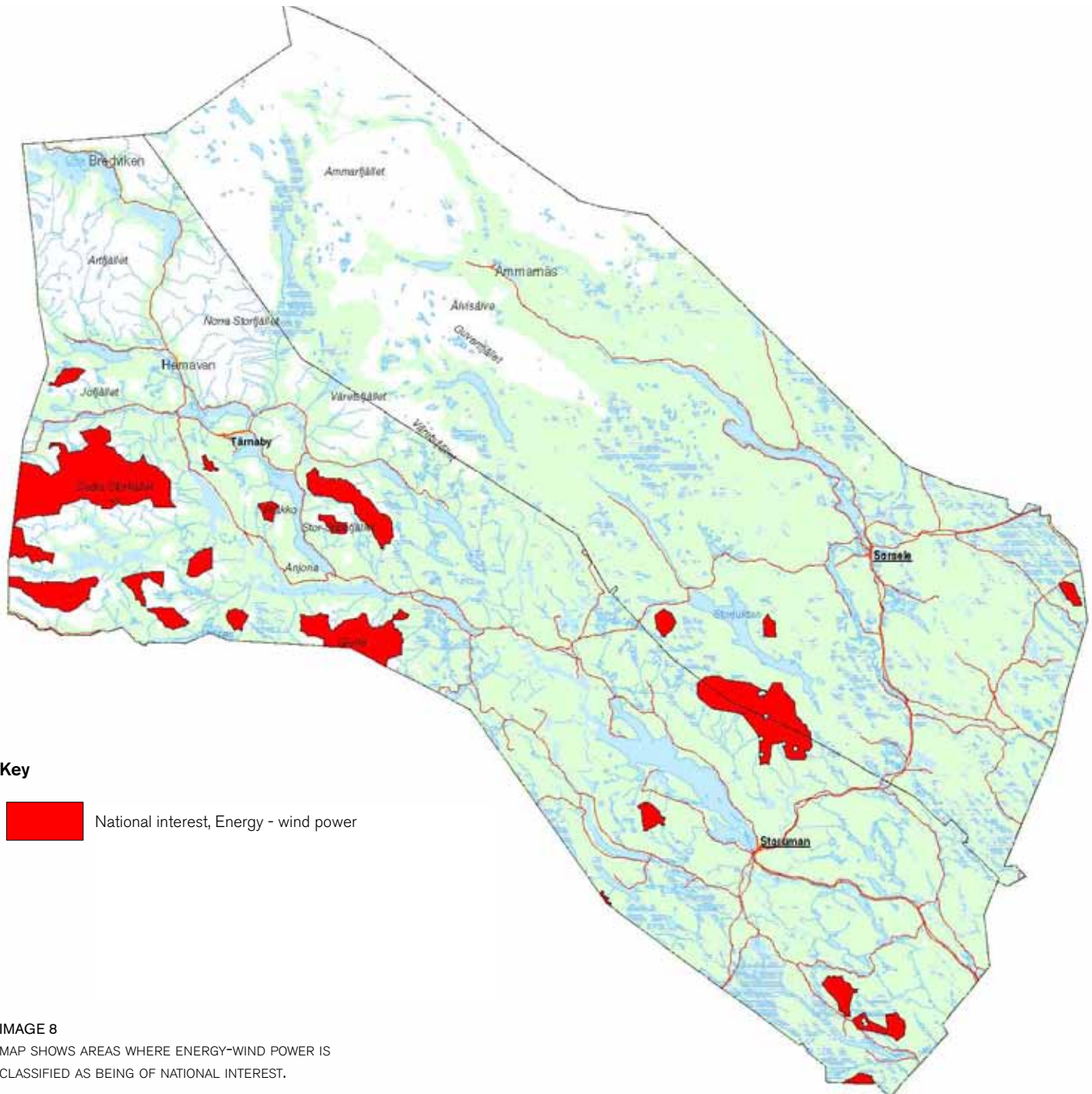


IMAGE 8
MAP SHOWS AREAS WHERE ENERGY-WIND POWER IS CLASSIFIED AS BEING OF NATIONAL INTEREST.

» Other public interests

Outdoor recreation

Outdoor recreational activities are of great importance to local people, which is why their views must be respected and taken into account when planning to develop wind power.

Hunting, fishing, riding snowmobiles, mushroom and berry picking are all part of a community's identity and it is important, therefore, to note the areas where these popular activities take place. Green areas have been established in proximity to towns and villages.

Reindeer husbandry

There are four Sami villages located within the municipalities, all based in the mountains. Some areas of the municipalities are utilised by other Sami villages. Reindeer husbandry and herding is one of the most significant aspects of Sami heritage and living culture. Herding is conducted over large parts of both municipalities. West of the cultivation line, reindeer can graze all year round. East of the line, grazing is permitted between October 1st and April 30th. Grazing is permitted on all land within the area allocated to reindeer husbandry, even on privately owned land.

In Storuman and Sorsele, there are many remains from the Sami cultural heritage that need to be preserved.

Agriculture and forestry

Forestry is intensive in both municipalities, particularly in the east. The sector is a significant source of income for those who live there. Agriculture can be also be found in both municipalities, especially around Gunnarn and along the river Vindelälven. In Storuman Municipality, 16.5% of the workforce is employed in the production of foods or forestry related products. Agricultural land represents 0.2% of the total land area whereas forest covers 40.2% (2007). In Sorsele, 22% of the workforce is employed either in agriculture or forestry related occupations. Agricultural land represents 0.1% of the total land area whereas forest covers 33.6% (2007).

The growth of the forest contributes to combating climate change as photosynthesis binds carbon dioxide to the growing forest. The carbon dioxide, sun and water combine to help create carbohydrates and the forest acts as a carbon sink. The forest also plays an important role for outdoor recreation and

is the home for flora and fauna, many of which are threatened or rare species.

Cultural landscapes

Cultural heritage in both municipalities should be preserved for future generations. Heritage conservation encompasses historic buildings, ancient remains, cultural heritage sites, ecclesiastical and burial monuments as well as agricultural landscapes. Sami cultural heritage sites are of particular interest as reindeer husbandry has long been important in the development of the landscape. Ancient Sami remains, reindeer paddocks, and other settlements are worth preserving. Since the 1700s, pioneers moving into the region have created their own cultural heritage such as the timber floating epoch and hunting. Sorsele has produced a programme outlining the conservation and profiling of its unique cultural heritage.

Communication links

Outdoor recreation and tourism are important sources of income in both municipalities. In order to maintain a growing tourist sector, snowmobile trails and paths for trekking are of major importance. Local inhabitants utilise the trails for snowmobiles extensively during winter. Being able to communicate over the large distances is an important prerequisite for living here, which is why consideration must be given to telecommunication links, roads and other aspects of the infrastructure.

Special consideration must be given to the interests of the general public when developing wind power.



On the lookout

» Local and regional interests

There are other protected natural areas that are not included in the Environmental Code but which can affect the development of wind power. They include the conservation of wetlands, grazing areas and landscape under cultivation. Even forested areas are regarded as being of important local interest in both municipalities.

Wetlands

Approximately 28% of Västerbotten's total area is classified as wetland. Marshes cover 15%, and eight per cent is swamp woodland. The remaining areas are beaches, wet heathlands and meadows. Marshes consist of peat wetlands which are important for a wide range of animal life and plants, providing a resting place for birds and a source of food for forest wildlife such as owls, moose and birds of prey.

One area that has been identified as being of particular interest is Lycksamyran, which is located between Storuman and Sorsele. Given a class 1 certification in the National Marsh Protection Plan, the area will be protected as a nature reserve in the future.

Wetland areas of particular importance are identified in a plan for marsh protection, published in 2007 by the Nature Conservancy Authority, *Myrskyddsplan för Sverige – objekt Norrland*

Agricultural landscape

Storuman and Sorsele have many agricultural areas which have evolved over a long period. Lapland was used mainly for reindeer herding, hunting and fishing up until the 1600s. Between 1700 and the 1800s, pioneers (many of them Sami) settled along the rivers and started small farms.

In certain areas of Västerbotten, there are signs that cultivation in some form has been taking place for more than 4,000 years, while in others, it seems to have only developed within the last 500 years.

Small-scale farming has had a great impact on the environment as successive generations of hunters, farmers, reindeer herders and craftsmen have transformed the natural

landscape into a cultivated one. Villages with agricultural landscapes include Gargnäs in Sorsele, and Gunnarn in Storuman.

The land is returning slowly to its original state and traditional cultivated areas are becoming smaller. It is possible to halt this change and preserve an important historical environment for future generations.

Areas of particular importance are identified in two reports from the county administration. *Det Värdefulla Odlingslandskapet” Meddelande 2, 1993 and Ång- och betesmarker i Västerbottens Län” Meddelande 2, 2004.*

Forests

Extensive areas of forest cover a large proportion of both municipalities forming an important natural habitat and providing the raw material necessary for the forestry industry. The forests are intersected by a

host of rivers, streams, lakes and wetlands. Scots pine trees dominate along the river valleys with spruce taking over on the higher ground. In the mountains, the alpine forests containing mostly birch cover the slopes. The forest was virtually untouched only 150 years ago but today most of the areas have been affected by the forestry industry.

In both municipalities are examples of primeval forests, wooded areas that can only be found on higher ground or in swamps and marshes. These are generally protected in nature reserves, but there are other forms of protection. Some areas have been voluntarily excluded from exploitation and are under the protection of an agreement between the county administration and the logging companies. These agreements have not been tested against the need to establish wind power stations. It might be possible to adapt the power station in such a way that makes the development of wind power in these areas possible. As well as the protection offered by the nature reserves, the Environmental Code covers nature conservation and protection of certain biotopes.

Forest that has been voluntary excluded from exploitation are shown in those areas where they are located.



Autumnal mountain stream

» Registration and licences

Rules vary depending on the height of the wind power station and/or if the station is to be made up of a single turbine or a group of turbines.

Wind power stations on land are regulated by the ordinance (1998:899) covering environmentally dangerous activities and protection of health. Plans must be registered with the municipalities and a licence is applied for from the county administration.

Mandatory applications for wind power station (C class facility)

- If the power station, including the blades, is larger than 50 m.
- Two or more power stations are to be built in the same location.
- One power station is to be built alongside an existing one.

Building permission is required to build power stations which are:

- taller than 20 m above the ground.
- to be placed at a distance to the property border which is less than the power station's total height.
- to be mounted on to a building, or
- has a turbine that has a diameter greater than 3 m.

The municipality has the power to decide whether to remove the need for building permission or insist on extra requirements.

Mandatory licence from the county administration (B class facility)

- When two power stations or more are to be placed together where the total height (including blades) exceeds 150 m or if one of the power stations is taller than 150 m.
- If an additional power station higher than 150 m is installed at an existing power station.
- When seven or more power stations are to be placed together and the total height of the power stations (including blades) exceeds 120 m. This rule applies even if only one of the power stations is above 120 m.
- Additional power stations require a licence if they exceed 120 m (seven turbines or more).

Building permission is not required if the power station is covered by licenses regulated by chapter 9 or 11 of the Environmental Code.

Licences for wind power stations may only be given if the municipality where the station is to be located has given its approval. This is restricted however to those facilities which require a licence according to the provisions made by the government and in accordance with chapter 9, section 6 of the Environmental Code. The government is permitted to approve the construction of a wind power facility if it is deemed of national importance.



Registration with the municipality

Registration must be made with the municipality when the total height of the power station exceeds 50 m (including blades), or two or more power stations are to be placed together, or if an additional power station is to be added to an existing one. The registration should contain all the details, designs and technical data so it can be assessed to be environmentally safe in accordance with the by-law on environmentally harmful operations (1998:899). In certain circumstances, the municipality can call for an environmental impact study and details on what contents the study could contain can be found in chapter 6 of the Environmental Code.

Two copies of the registration and a full copy should be submitted to the municipality, one of which will be sent to the relevant committee and the other to the county administration. Three copies are sometimes required.

After the registration documents have been received, all interested parties are given the opportunity to comment. These could include state or municipal authorities, organisations and individuals. The plans have to be advertised publicly, for example, printed in a local newspaper.

The administrative official will hold meetings with interested parties so that they have the chance to air their opinions. The municipality will then decide the criteria which will have to be met when developing wind power.

When the study has been completed the municipality will decide if the planned wind power station is to be built or not. Most wind power stations will require building permission and applications should be sent to the relevant municipal committee. The documents that need to be submitted are basically the same ones that are required when applying for permission for operations that could have an environmental impact, i.e. description of property, location coordinates, plans showing height including blades, blades diameter, power, noise pollution map, shadow map, tables displaying wind conditions etc. The applicant should even describe how the land will be utilised in an efficient manner.

The planned infrastructure in and around the power station and transport routes to and from it should be made available as early in the process as possible in order to be able to assess the impact these will have.

Licence

A licence from the county administration board is required if the total output exceeds 150 m in height and if the power station is placed in a group consisting of more than two turbines, or, if seven or more turbines are grouped together and the height of at least one turbine exceeds 120 m (see separate information box). The legislation involved is more complex at this level and the developer has to consult all interested parties and complete an environmental impact study before applying for a licence, which requires the following.

1. Consultation

Those who apply to the county administration board are required to consult with all interested parties. Taking place before an application is submitted, this involves informing the relevant authorities, residents and other interested parties about the plans. It is advisable to contact the affected municipalities in order to obtain a preliminary assessment about the proposed area.

The process also requires the provision of printed information detailing the numbers of turbines, location, power cables and roads, potential electricity production and environmental impact. After the consultation process is completed, its results are compiled in a report and the interested parties and

authorities have three weeks to reply. The consultation process is regulated according to the Environmental Code, chapter 4, section 6.

2. Assessment by county administration board

After the consultation process has been completed, the county administration board assesses the viability of the project and what should be included in the environment impact study. It will also look at the need to involve other authorities and assess whether elements of the plan are affected by the Historical Conservation Act.

3. Environment impact study

Permission to develop a wind power station can only be granted if an Environment Impact Study (EIS) is carried out. Its purpose is to describe the direct and indirect effects of building and running a wind power station on the environment. It will need to contain relevant information on public health and the management of land, water and other resources. More detailed information on what is required can be found in the Environmental Code, chapter 6. When the EIS is completed it must be published in the local paper.

An EIS can be required, in certain circumstances, for the installation of smaller stations.

4. Application

When the applicant has completed the consultation process and EIS, an application for a licence is sent to the county administration board. The licence can only be approved by the board if the municipal council has given its support or if the government finds that the plans lie in the national interest.

5. Decision

A decision is taken by the authority's environmental assessment committee and sent in writing to the applicant and to those who have expressed their opinions. The decision is also published in the local paper, with the right to appeal within three weeks.

Smaller stations

Smaller stations are defined as having a height between 20-50 m or a turbine which has a rotor blade diameter that exceeds 3 m. In order to build these smaller stations, building permission is required from the relevant municipal committee.

It is necessary to register construction work if the power station requires building permission.



» Planning process

Municipal structural plans

The structural plan is the municipality's development plan for the physical environment. The plan indicates how national obligations affect the area, provides a strategy on safeguarding and enhancing the environment and should also give a vision of how, in very broad terms, the area should develop, taking into account the interests of the community.

The structural plan has a guiding role, partly when preparing local plans and assessing building permission applications, and partly when drawing up proposals for land and water use. It is not legally binding.

The structural plan reflects different public interests. Its contents and possible consequences should be clearly stated and environmental issues should be described in accordance with the Environmental Code. The inclusion of environmental issues strengthens the plan's guidance role. The contents of different suggestions can be understood easier and discussed at an earlier stage. The production of the structural plan involves the general public, businesses and other interested parties.

Each municipality has a structural plan that encompasses the municipal area. They are normally long-term, 10-20 years, and, therefore, only focus on broad structural changes in water and land use. The interests of the general public are to be included, which will affect decisions on water and land use. Any classifications of national interest, as found in the Environmental Code (chapters 3 & 4), are included separately. The plan should present the basic strategies concerning the use of water and land, the municipality's policy for built-up areas and how it is prepared to safeguard areas of national interest and adhere to the norms of environmental quality.

Today's communities are developing at an increasingly quicker pace and as new projects are planned, it is important to review the structural plan regularly. Certain policies require detailed research, resulting in more plans being added to the document (additional plans). This allows the structural plan to be constantly altered without the need for a total rewrite. The Additional Plan for Wind Power is an example of this.

Local Plan

The local plan is the tool used by the municipality to implement policies on land and water management and the administration of buildings/settlements. The plan is legally binding. Each plan reflects the municipality's policy on how land use is to be changed or preserved. The plan will have taken public interest into consideration as is required by law (PBL, chapter 2). The plan will also have to consider the views of other interest parties.

The process of developing a local plan is open and democratic with a public consultation process for new proposals. The plan has legal effects for both the municipality and individuals. For example, if a land owner wishes to build, it must be done in accordance with the plan's guidelines. If the municipality is responsible for public spaces, they must be maintained to the standard as set out in the local plan.

The local plan can be used to regulate how a specific area is preserved.

In those cases where the power stations are required to have a licence in accordance with the Environmental Code, the inclusion of the local plan is only necessary if the proposed power station is to be located in an area where there is a great demand for land for construction.

Area provisions

Area provisions can be an alternative to local plans in the preservation of valuable built-up areas. They can also provide a basis when planning future changes in land use. Area provisions are binding when assessing building permission.

Despite the advantages of area provisions, they are used extensively. This is because they have been regarded as a minor version of a local plan or that they contained provisions that have had little to do with the local plan's objectives.



» Organisation

Structural planning process

One purpose of the structural plan is to identify and safeguard public interests, national interests and other areas of value to the municipality. It also sets out the basic rules for future development, plays a significant role in planning water and land use and approving building permissions. It can also be used by the county administration board when assessing applications for various licences. According to the planning and building law, all municipalities should have an up-to-date structural plan.

Local plans can be developed using the structural plan as a guide and the process of assessing building permission applications can be speeded up, making the whole process of carrying out the local plan quicker.

Additional Plan for Wind Power has been put together using the available data on how various areas could be affected by the development of wind power. Several aspects have been taken into consideration, including the landscape's characteristics, contents and value, visual effect, sound, safety, impact it will have on animal and plant life, nature conservation, historical conservation and outdoor recreational activities. Wind power could

also affect other interests such as reindeer herding. This additional plan might result in a more efficient process in the development of wind power stations, the results of which are shown in the Proposals section.

The present structural plan for Storuman dates from 1989 and is under revision, with a completion date set for the autumn 2010. Local supplementary plans dating from 1998 focus on Tärnaby and Hemavan. In Sorsele, the structural plan dates from 2001 and there are also supplementary plans that focus on the town of Sorsele and larger villages.

Municipal organisation

The municipalities are responsible for structural plans, with the administration being undertaken by the environment and community committees. After going through several administrative stages, the plan is to be finally approved by the municipal council via the executive committee (see figure 1). "Additional Plan for Wind Power" has to go through the same process. The plan's steering group, which guides the work through its various stages, has been able to draw on a wide range of skills and experience.

Public meetings, local reference groups and other contacts

Public meetings have been held in Hemavan, Sorsele and Storuman in order to gather relevant public opinion about the Additional Plan for Wind Power. Contact with land owners, developers and the general public has been made via interviews, e-mail, telephone etc.

Work with the additional plan has been carried out with the help of reference groups. These have met on several occasions in Tärnaby/Hemavan, Sorsele and Storuman.

The groups represent a broad spectrum of the community, including village committees, snowmobile clubs, Sami villages, farm and forest owners, tourism and businesses. All representatives have been invited to take part in meetings and have received the minutes from those meetings. Representatives from Sami villages that did not attend, have been given opportunities to table their opinions. All Sami villages have contributed comments to the process. The project, via its website, has received input from the county administration board, businesses, landowner interest groups and individuals.

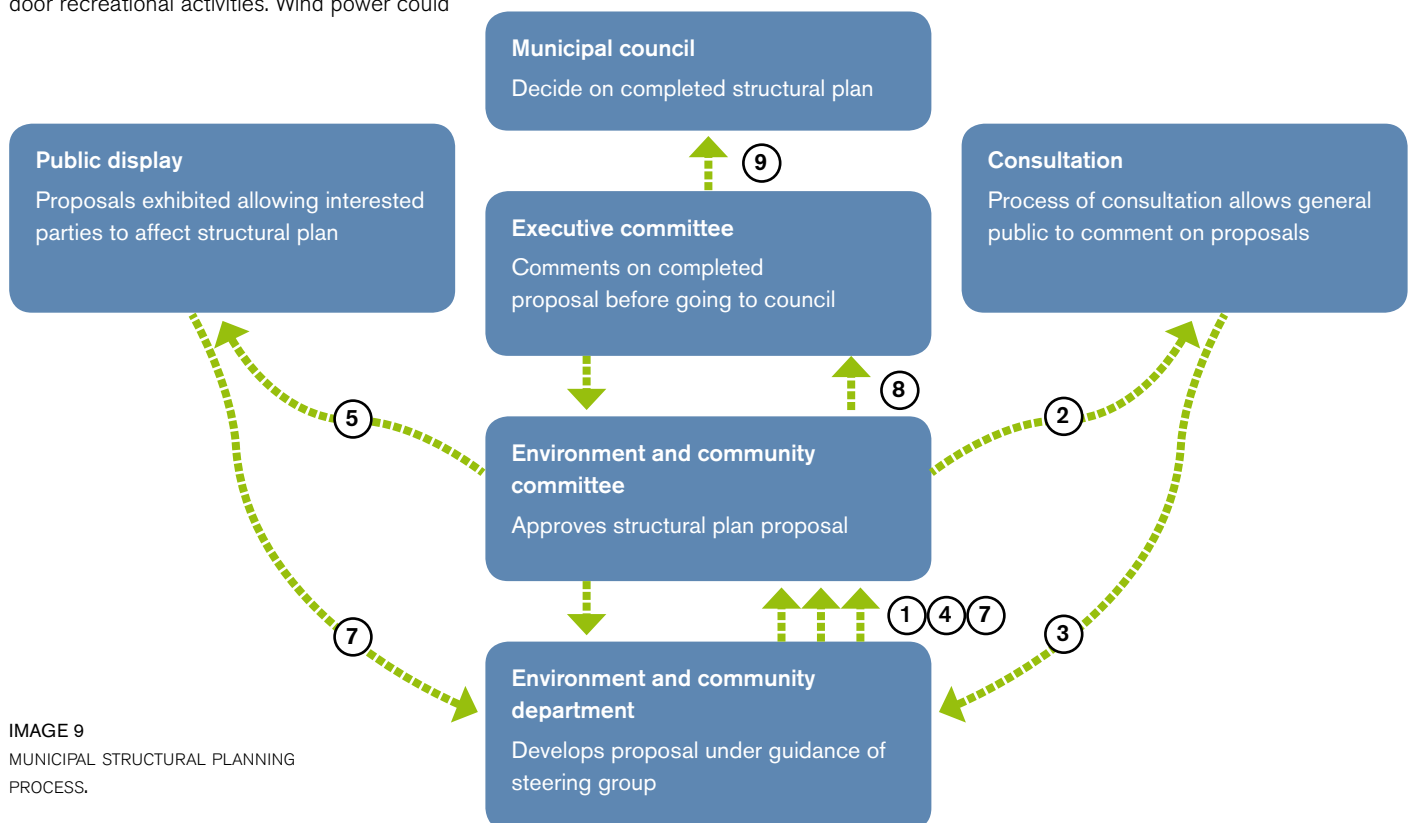


IMAGE 9
MUNICIPAL STRUCTURAL PLANNING
PROCESS.

Part 2. Proposals

This section contains a map indicating the various areas which have been studied, along with information on wind conditions, development potential, possible effects on certain interests. Current assessments on each area are also included.

» Criteria for selection, definition and assessment of favourable wind areas

Each area has been assessed, based on the collected data. The initial selection of favourable wind areas is based on a report from 2007 measuring wind at a height of 103 m. Storuman and Sorsele municipalities selected areas where the average wind strength is greater than 6.5 m/s, 103 m above the chart datum displacement (see chapter How to read Additional Plan for Wind Power).

The information collected about each area was then used as the basis for an assessment.

Due to the lack of available maps at the beginning of the process, the municipalities were not able to assess all areas that have favourable wind conditions. These include Sörberget and Abborrbergen in Sorsele municipality and Vardo, Inre Vekanliden, Sabotsliden, Lubbsberget and Gråtanliden in Storuman municipality. All of these areas have an average wind strength exceeding 6.5 m/s at a height of 103 m. Lubbsberget has also been classified as of national interest for wind power. These areas will be assessed individually in accordance with municipal guidelines.

Choice and assessment of areas was based on:

- Average wind strength exceeding 6.5 m/s (at height of 103 m)
- Protected natural areas (nature reserves, Natura 2000, etc)
- National interest classification (Reindeer husbandry, Unbroken mountain region, Outdoor recreation activities etc)
- General public interests (hunting, fishing, local recreational areas)
- Local and regional interests
- Access to electricity networks and roads
- Other infrastructure (flight paths)
- Calculation of area's potential based on wind conditions at 103 m and a 2 MW wind power station generating 5 GWh per year.
- Calculation of the number of turbines needed based on approximately three turbines per km² (no consideration has been given to topographical or technical factors).

Guidelines for the installation of wind power.

Storuman and Sorsele have produced general guidelines for the installation of wind power. These have been used to determine which areas are suitable or not suitable for wind power development and will be used for assessing new areas in the future.

Guidelines for smaller stations

Smaller stations can be built on private property. Both municipalities welcome the presence of smaller stations as long as the relevant legislation is followed.

The guidelines are as follows;

- Development will adhere to Swedish law.
- The location, planning and design of the power station will be carefully considered.
- The single power station or wind farm should fit in with the surrounding landscape. The turbines will be free from advertising.
- The turbines will have a uniform appearance and be of a light colour.
- New technology and innovative designs should be promoted.
- If rotor blades are to be used, there should be at least three rotor blades to each turbine.
- The turbines should preferably be clustered together in a group, rather than spread out over a large area.
- The shortest distance between the turbine and surrounding houses is to be at least 1000 m (smaller stations exempt)
- The shortest distance between the turbine and nearby reindeer herding and other business activities is to be at least 1000 m.
- In reindeer herding areas, construction can only take place during the summer to reduce the risk of disturbing the reindeer.
- When designing roads and power cables, reindeer herding and other interests must be taken into account.
- Consideration must be given to cultural heritage sites.
- The construction company should use existing roads and electricity networks as much as possible when building the wind farm.
- An all-encompassing environmental strategy should be adopted when establishing a power station (transport, construction, decommissioning)
- Provide an assessment on the risk of damage or injury from falling ice.
- There has to be a decommissioning plan for both individual turbines and wind farms.
- Financial resources have to be earmarked for returning the land to its original state.

» Municipal policy

Both municipalities have assessed each area based on the model described below and using criteria which was regarded as being particularly important. The map below illustrates which areas are favourable (green) and which areas are not (grey).

The municipality regards the green areas as being suitable for wind power and should therefore be given priority. The municipalities will not consider wind power development in grey areas which are regarded as being unsuitable for wind power. This assessment was based on the fact that too many interests would be negatively affected. In most cases, the municipalities recognised the need to give priority to important national and local interests as well as those of the general public.

Applications for licences can be sent to the county administration in areas which are classified as not suitable for wind power.

If conditions change significantly at the chosen site, the municipality can carry out a new assessment. Areas that have not been included in this Additional Plan for Wind Power will be assessed in accordance with Swedish law and the guidelines used by the municipalities.

Assessment model

The municipalities have based their assessments on the assumption that the sites chosen have favourable wind conditions, i.e. an average wind strength of 6.5 m/s at a height of 103 m. The sites have been identified by the Swedish Energy Agency as being in the national interest for wind power and in the process, it has taken other interests and conditions into consideration.

The main national interests outlined in chapter 3 of the Environmental Code can be weighed against each other and a classification of national interest is given priority over other public interests. However, if there is conflict, public interests must be given major consideration by those representing national interests.



If an area which is classified as being in the national interests for wind power contains development that might damage a particular national interest, which has been identified in the special provisions outlined in the fourth chapter of the Environmental Code, then legislation preventing it being carried out comes into effect. The prerequisites for this legislation vary. All cases must follow section 1 of the fourth chapter preventing substantial damage to natural and cultural environments. There are also prerequisites for certain areas, Unbroken areas of mountain terrain and Defence are, for example, not considered suitable for any wind power development.

Public interests and other conditions have been taken into consideration when assessing each site. Those areas which contain intense reindeer herding and husbandry are regarded as being unsuitable for wind power and have been excluded. In some areas that are suitable, special consideration has been given to reindeer herding. As a result certain sections of an area have been excluded, i.e. to protect a migration route. National interests have been weighed against the development potential of renewable energy and the benefits that it brings to the community. Images have been produced to ascertain how the landscape will change when the wind power stations are in place. These images were made available at all meetings.

At certain sites, the municipalities have taken the cultural environment into consideration. Larger wind power farms can affect historical sites due their size and modern design.

The municipalities should be able to assess separately specially designed power stations that are to be sited next to ecological parks or areas that have been voluntarily excluded from the forestry industry.

The areas are divided up according to which municipality they belong. The table contains information on surface area, potential production** and annual average wind strength, *see table 2*.

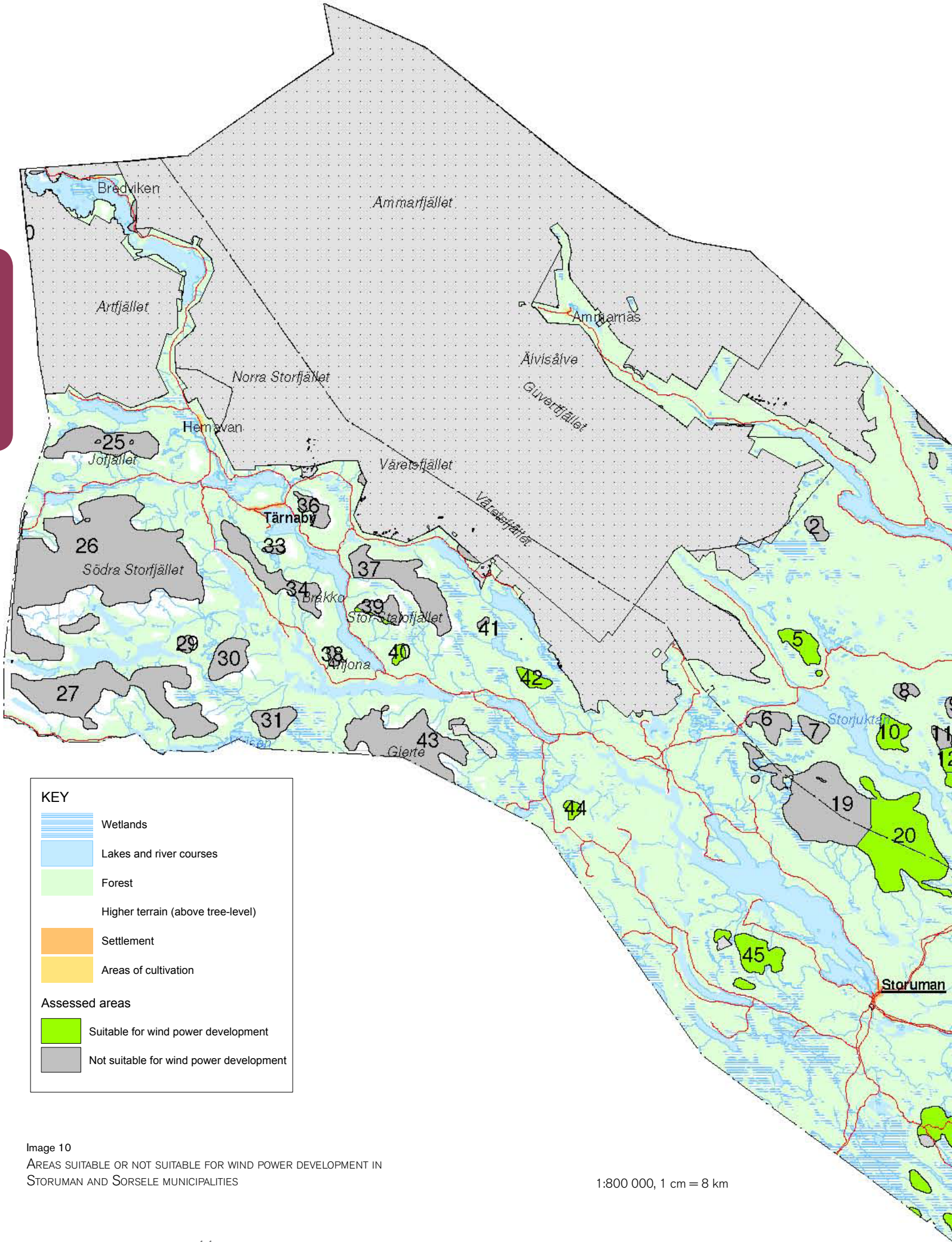
Table 2

Summary of suitable areas and their wind power potential in municipalities of Storuman and Sorsele.

Area	Surface area (km ²)	Annual average wind strength (at a height of 103 m)	Potential production (number of turbines)	Installed effect (MW)	Annual production (GWh)
Sorsele Municipality					
Abmoberget	8	6.5-7.5	24	48	120
Ardnasåjvvie	3	6.5-7.5	9	18	45
Gitåive (Gedneåjvvie)	3	6.5-7.5	9	18	45
Granliden	20	6.5-7.5	60	120	300
Jiltjaurberget	16	6.5-7.5	48	96	240
Sandberget	8	6.5-7.5	24	48	120
Storblaiken	70 (33*)	6.5-7.5	100 (of total 200)	200	500
Storhobben - Kärringberget	8	6.5-7.5	24	48	120
Storliden	16	6.5-7.5	48	96	240
Verboberget	8.5	6.5-7.5	25	50	127
Västra Abborrberget	3	6.5-7.5	9	18	45
Total Sorsele Municipality	126.5	-	380	760	1 900
Storuman Municipality					
Bastanliden	5	6.5-7.5	15	30	75
Barsele-Storberget	7	6.5-7.5	21	42	105
Girjesliden	19.5	6.5-7.5	58	116	290
Lill-Stalofjället and Stor-Stalofjället	20 (5*)	6.5-8.0	15	30	75
Norra Stöttingfjället	60	6.5-7.5	180	360	900
Storblaiken	70 (33*)	6.5-8.0	100 (of total 200)	200	500
Stor-Granliden	2	6.5-7.0	6	12	30
Vallträsk och Vallträskhobben	20	6.5-7.5	60	120	300
Total Storuman Municipality	151.5	-	455	910	2275
Total Storuman and Sorsele municipalities	278	-	835	1 670	4 175

*The total surface area on which it is possible to build and has an annual average wind strength 6.5-8 m/s. No consideration has been given to topographical or technical factors.

** Potential production has been calculated on three turbines per km².



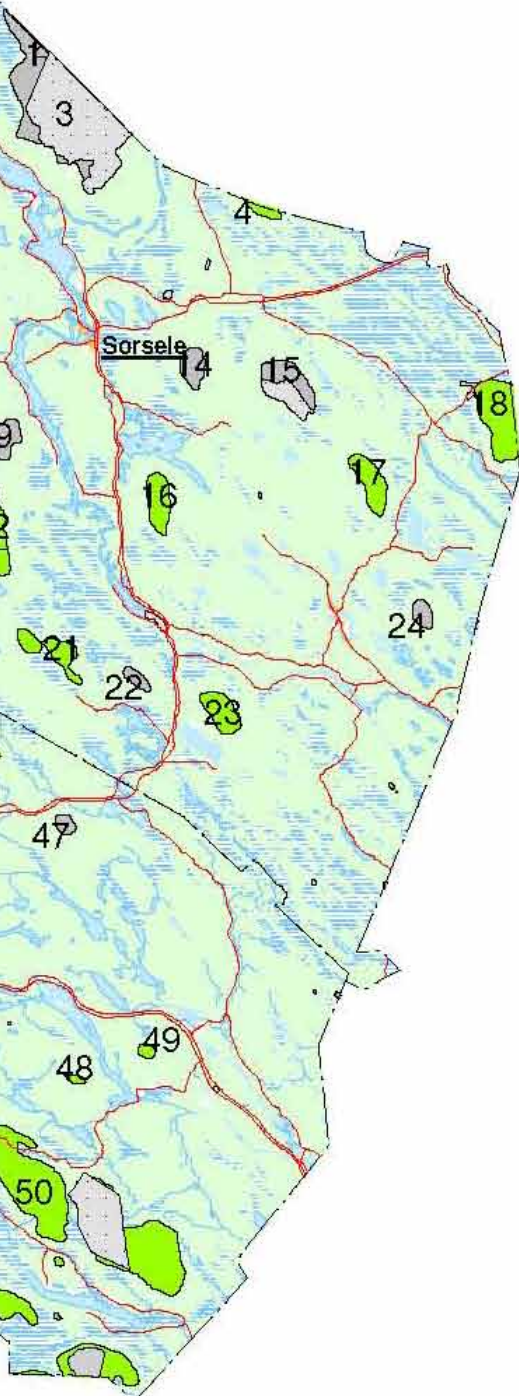
KEY	
	Wetlands
	Lakes and river courses
	Forest
	Higher terrain (above tree-level)
	Settlement
	Areas of cultivation
Assessed areas	
	Suitable for wind power development
	Not suitable for wind power development

Image 10
 AREAS SUITABLE OR NOT SUITABLE FOR WIND POWER DEVELOPMENT IN
 STORUMAN AND SORSELE MUNICIPALITIES

1:800 000, 1 cm = 8 km

Area:

1	Linjeberget	26	Södra storfjället
2	Biriberget	27	Arefjället
3	Nalovardo	28	Virisfjället
4	Ardnasåjvve	29	Luspevardo
5	Jiltjaurberget	30	Löfjället
6	Rönnerberget	31	Gebnafjället
7	Jipmokberget	32	Björkfjället
8	Vatjoberget	33	Gakerevardo
9	Olsberget	34	Brakko
10	Storliden	35	Laxfjället
11	Harrberget	36	Gäutavardo
12	Gitåive (Gedneåjvve)	37	Ryfjället
13	Västra Abborrberget	38	Anjona
14	Staloberget	39	Stor Stalofjället
15	Stor-Smalaken	40	Lill Stalofjället
16	Abmoberget	41	Järvfjället
17	Verboberget	42	Girjesliden
18	Granliden	43	Norra Gardfjället
19	Lillblaiken	44	Bastanliden
20	Storblaiken	45	Vallträskhobben
21	Storhobben-Käringberget	46	Vallträsk
22	Näverliden	47	Stor-Boktjon
23	Sandberget	48	Barsele Storberget
24	Stora Krutberget	49	Stor Granliden
25	Jofjället	50	Norra Stöttingfjället



Municipal policy

The municipality regards the green areas as *being suitable for wind power* and should therefore be given priority. The municipalities *will not consider wind power development* in grey areas which are regarded as being unsuitable for wind power. This assessment was based on the fact that too many interests would be affected negatively. In most cases, the municipalities recognised the need to give priority to important national and local interests as well as those of the general public.

If conditions change significantly at the chosen site, the municipality can carry out a new assessment. Areas that have not been included in this *Additional Plan for Wind Power* will be assessed in accordance Swedish law and the guidelines used by the municipalities.

» Environmental assessment

An environmental assessment is carried out to highlight the effects wind power development can have on other land uses and other interests (EC chapter 6:§11-18). The assessment focuses on the combined sustainability of the project (ecological, economic and social aspects). The environmental assessment has to some extent been included in the background information of the Additional Plan for Wind Power and in the assessment of each area.

The development potential of the areas identified by the municipalities as being suitable is estimated at producing close to 4.2 TWh per year. If this is realised then the target for the region of Västerbotten will be easily reached and Storuman and Sorsele will become important contributors to the national target set for 2015. The benefits to the environment will be great and as the municipalities will be able to produce renewable energy for national and international markets, there will other benefits on local, regional and national levels.

The purpose of the Additional Plan for Wind Power is to assist the development of wind power in the municipalities, partly by establishing common principles for assessment and partly by establishing common development guidelines. Over 50 sites with favourable wind conditions have been researched and assessed for their suitability for development.

Most areas found to be suitable for development are concentrated in forested areas although a few mountain suitable sites have been identified. Wind power development could harm or disturb their immediate surroundings as well as affect the natural landscape. The work on foundations, new road and power lines damage the environment and natural world. Reindeer herding could well be disturbed as well as wetlands and lakes used as sources for drinking water. In each area, these aspects must be considered as part of the assessment. The Sami villages must be contacted early on in the process to make sure that any construction will not disturb reindeer migration routes or grazing areas.

The amount of land needed for the foundations is not regarded as being large enough to significantly damage the environment. The building of roads and power lines must not disturb existing sectors which are of particular importance to the municipalities, i.e. reindeer husbandry and forestry. In order to begin developing wind power, there

has to be a plan for how the station will be decommissioned and how this will be financed. Areas containing nature reserves, rivers of national interest and Natura 2000 sites are not regarded as being suitable for wind power.

Wind power development might well have a local effect on environmental quality objectives such as "A Magnificent Mountain Landscape", "Healthy Forests" and "A Rich Diversity of Plant and Animal Life".

The wind power development which is included in the Additional Plan for Wind Power, is mostly located in the forested regions which automatically reduces the visible effects of wind power in mountain regions. Due to the dangers that wind power stations pose to birds, areas that have bird of prey populations are to be excluded from development. The fact that Nalovardo is situated along bird migratory flight paths is one reason why the area is not suitable for wind power. Vegetation surrounding the construction site might well be damaged but only on a small scale in relation to the environment as a whole.

According to municipal guidelines, the environment as a whole must be taken into consideration. The power station has to be carefully planned and located in such a way that it minimises the effects on the surrounding area and blends in with the landscape. The development of wind power has a positive effect on environmental quality objectives "Limited Influence on

Climate Change", "Clean Air" and "Natural Acidification Only".

From an ecological point of view, the renewable energy source of wind power could replace other fossil-based energy products and nuclear power. This will improve health and establish a more sustainable approach to natural resources. Harmful effects of wind power development on the eco-system are predicted as being negligible as the combined land area needed represents only a small fraction of the total land area. The municipalities have shown their consideration for the ecological perspective by withdrawing nature reserves and other areas which have valuable natural environments. The economic and social benefits to the community, due to increased employment, are self evident as is the fact that wind power development will allow these sparsely populated rural areas to develop. As pointed out earlier in the document, developers should work with existing businesses and avoid large-scale conflicts. The municipalities are, at present, working on a policy to ensure that income from wind power is channeled back to those residents who have been affected by wind power development.

The municipalities of Storuman and Sorsele are positive to wind power development in their region, which could contribute large amounts of renewable energy to both Västerbotten and Sweden as a whole.



» Consultation process

During the period of consultation, the municipalities received more than 26 contributions from authorities, members of the public and other organisations. Their points of view have, in part, been included in the Additional Plan for Wind Power. Minutes from consultation meetings in Sorsele, Storuman and Hemavan appear in appendix 1 a, b and c. All points of view are included in appendix 2.

Before each meeting, the document, Additional Plan for Wind Power was sent to neighbouring municipalities, Sami villages and the county administration. The county administration then sent the information to relevant authorities, associations, game preservation groups and businesses. The meeting was advertised locally. In order to ease access of information, the Additional Plan for Wind Power is available in English and Swedish PDF-format on the project's website, or as an audio recording.

» Project on public display

While the project was put on public display, the municipalities received 15 responses from authorities, businesses, members of the public and other organisations. Their questions have been answered and certain points have been included in the Additional Plan for Wind Power. Comments from the county administration appear in appendix 3.

Before each display was exhibited, relevant information was sent to neighbouring municipalities, Sami villages and the county administration. The display was advertised in the printed media and information sheets were sent to local groups and associations. The project has also been on constant display in Storuman and Sorsele's municipal buildings and websites and also on view in Ammarnäs, Gargnäs and Tärnaby.

Please note!
Key to maps is printed on
flap of last page.

Municipal policy

The municipality regards the green areas as *being suitable* for wind power and should therefore be given priority. The municipalities will not consider wind power development in grey areas which are regarded as *being unsuitable* for wind power.

This assessment was based on the fact that too many interests would be negatively affected. In most cases, the municipalities recognised the need to give priority to important national and local interests as well as those of the general public.

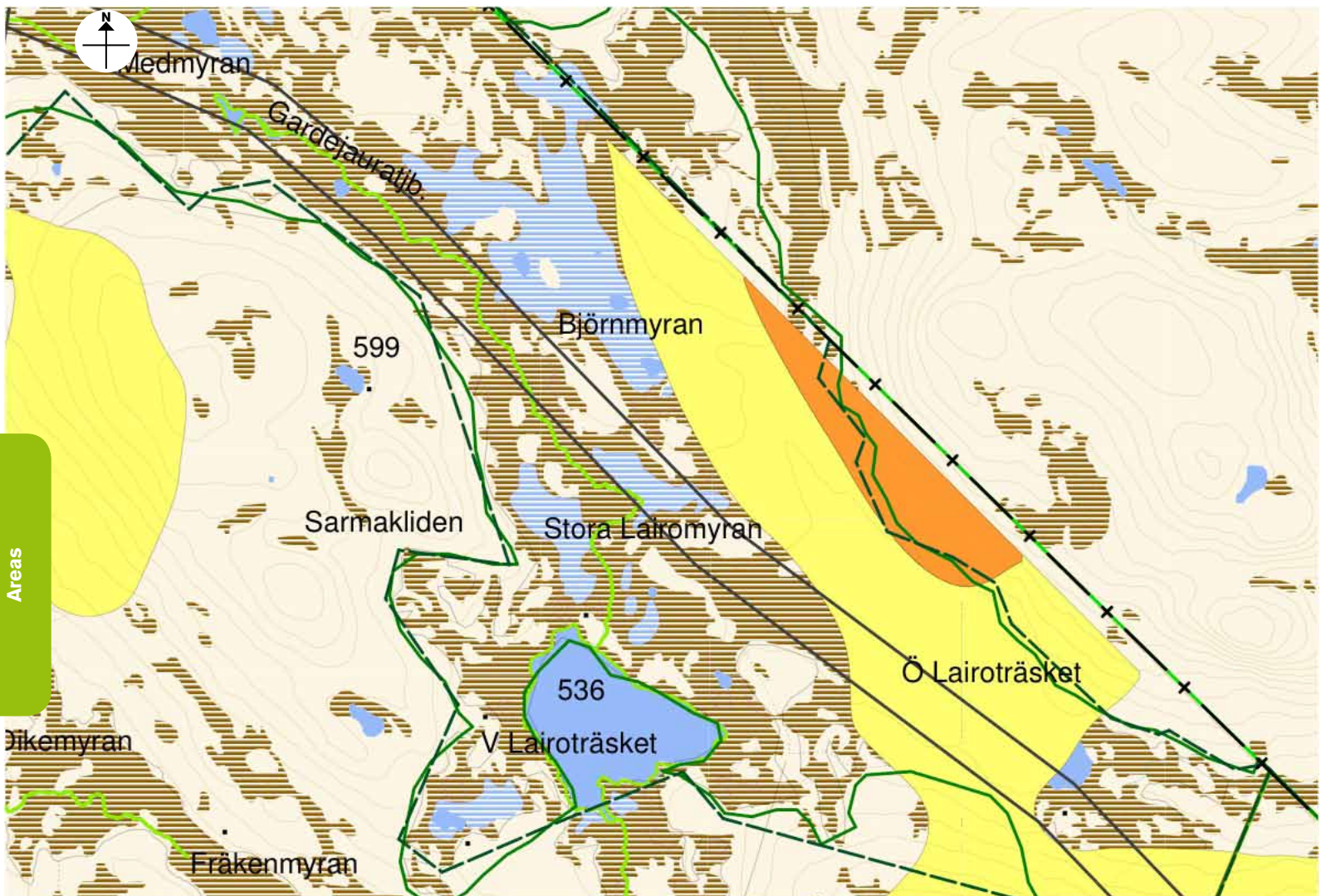
Areas that have not been included in this Additional Plan for Wind Power will be assessed in accordance Swedish law and the guidelines used by the municipalities.

Sorsele Municipality

Areas

1. Linjeberget	50
2. Biriberget	51
3. Nalovardo	52
4. Ardnasåjvvie (Arresåive)	53
5. Jiltjaurberget	54
6. Rönnberget	55
7. Jipmokberget	56
8. Vatjoberget	57
9. Olsberget	58
10. Storliden	59
11. Harrberget	60
12. Gitåive (Gedneåjvvie)	61
13. Västra Abborrhberget	62
14. Staloberget	63
15. Stor-Smalaken	64
16. Abmoberget	65
17. Verboberget	66
18. Granliden	67
19. Lillblaiken	68
20. Storblaiken	69
21. Storhobben - Käringberget	70
22. Näverliden	71
23. Sandberget	72
24. Stora Krutberget	73

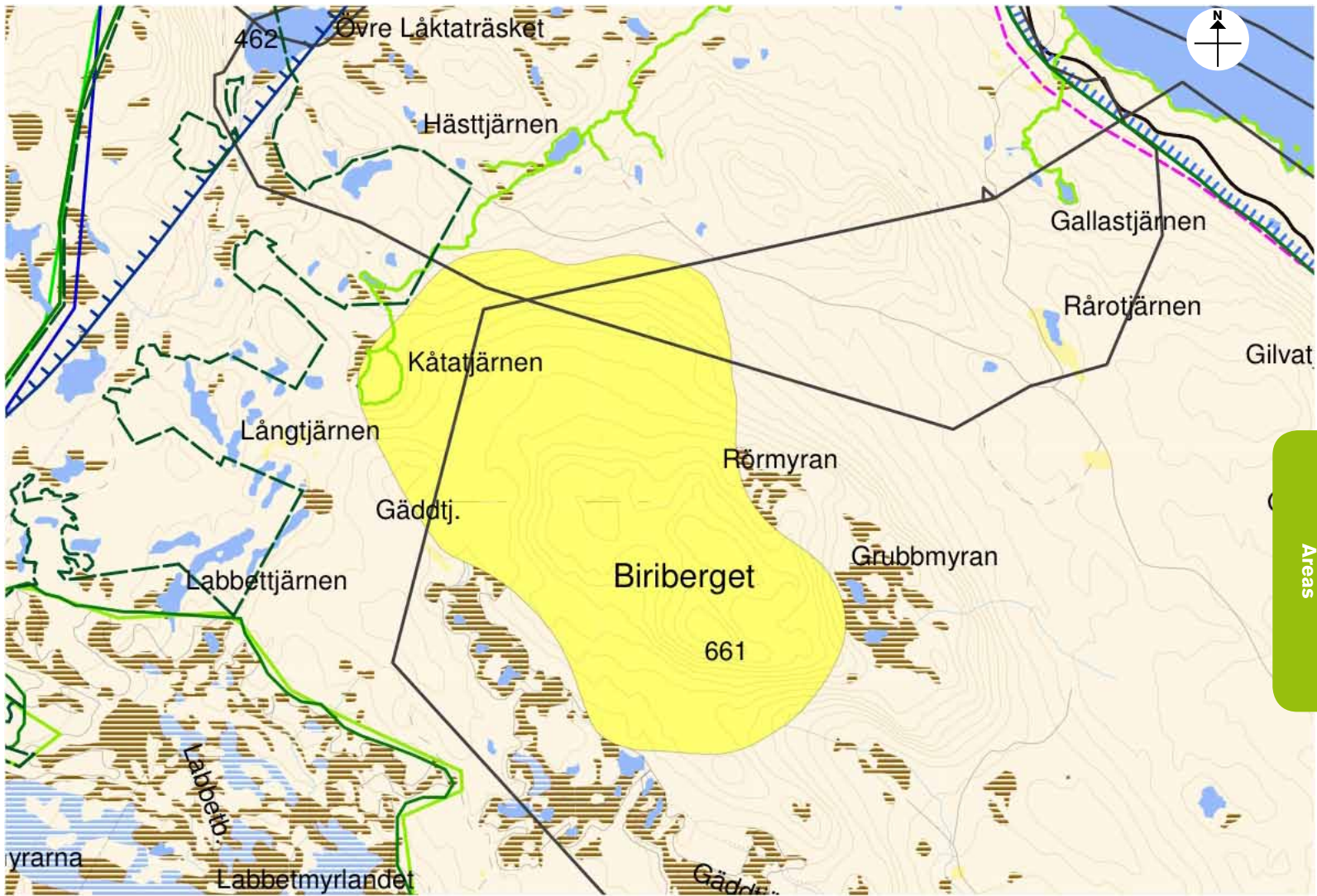
1. Linjeberget



SCALE 1:22 000, 1 cm = 220 metres Resolution: 1000 metre grid

Land type:	Forest and some mountain birch forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 2 km ²
Wind power potential:	approx. 6 turbines (annual production approx. 30 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, migration route for reindeer from Gran Sami village • Natura 2000 area in close proximity (tributaries to river Vindelälven)
Other conditions:	<ul style="list-style-type: none"> • Reindeer herding affected. • Major proportion of area lies within county of Norrbotten. • Telecommunication cables are not affected. • The marshes of Björnmyran and Lairomyran are valuable and complex wetlands which will become a nature reserve in the future. • The area is difficult to access as no new roads can be built through the planned nature reserve (includes primeval forested area of Laisdalen in Norrbotten county).
Assessment	The area is not suitable for wind power. Wind power potential is small. The effect on reindeer herding, existing primeval forest and planned nature reserve are judged to be too large.

2. Biriberget

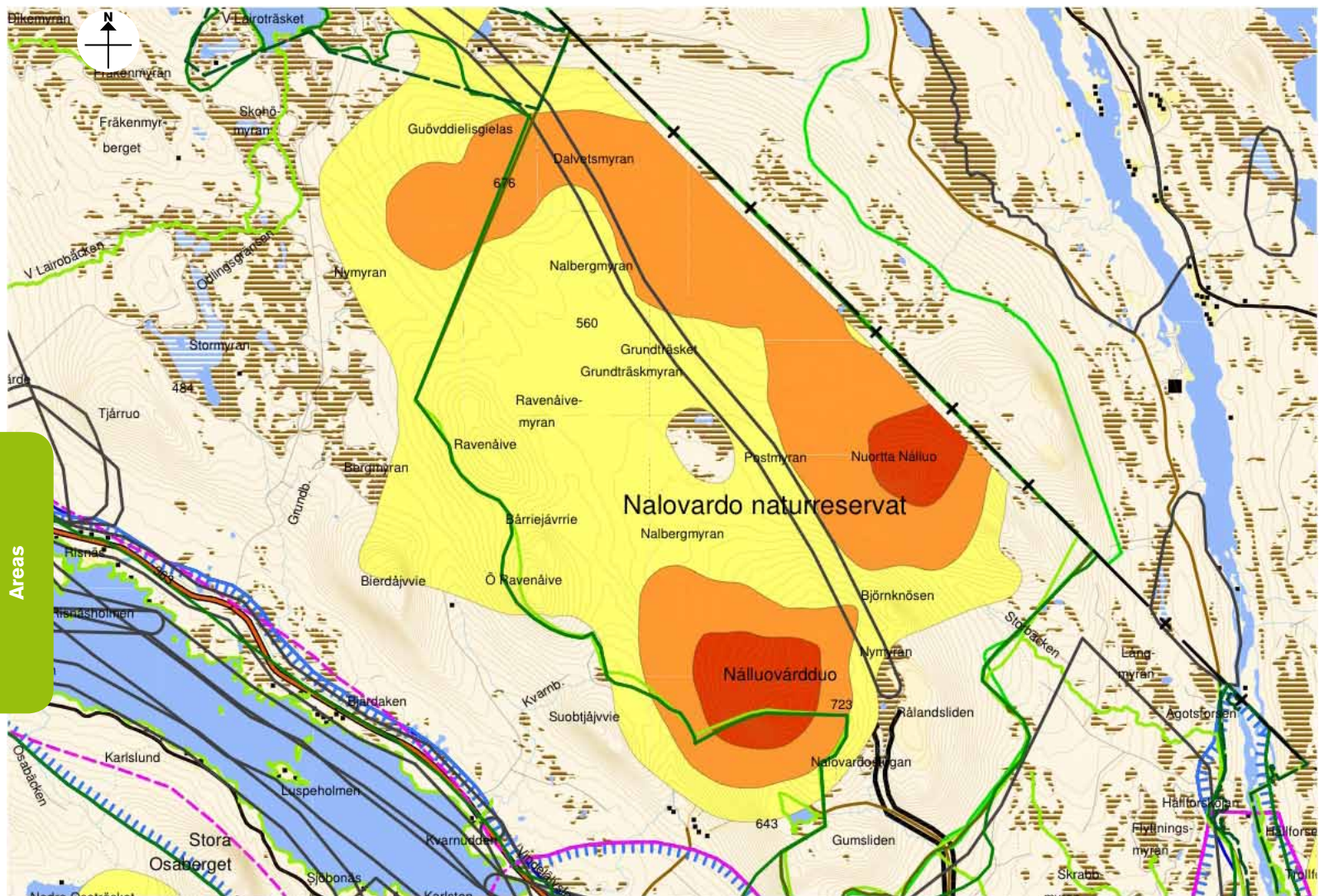


Areas

SCALE 1: 28 000 1 cm = 280 metres Resolution: 1000 metre grid

Land type:	Forest
Annual average wind strength:	Annual average wind strength:6 m/s (at height of 103 m above chart datum displacement)
Surface area:	Surface area: approx. 7 km ²
Wind power potential:	Wind power potential: approx. 21 turbines (annual production approx. 105 GWh)
National interest classifications:	Reindeer herding, key area for Ran Sami village
Other conditions:	<ul style="list-style-type: none"> • Hunting and fishing in area. • Forestry carried out in area. • Reindeer herding affected. • Whole area lies within key area for reindeer herding. • Telecommunication cables are not affected.
Assessment	The area is not suitable for wind power due to the risk of disturbing reindeer herding activities.

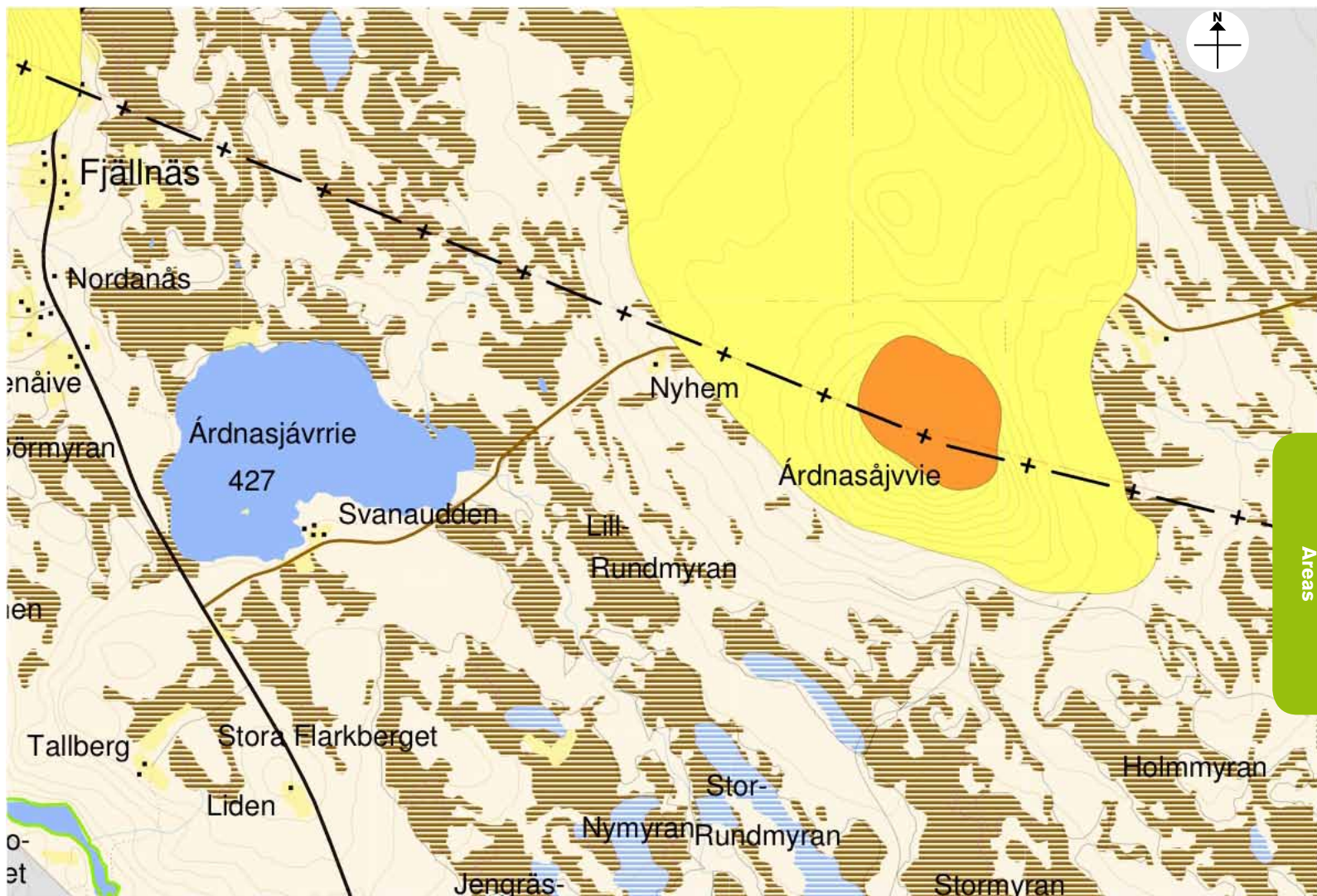
3. Nalovardo



SCALE 1:50 000 • 1 cm = 500 metres • Resolution: 1000 metre grid

Land type:	High ground surround by forest
Annual average wind strength:	6.5 -8 m/s (at height of 103 m above chart datum displacement)
Surface area:	50 km ²
Wind power potential:	approx. 150 turbines (annual production approx. 750 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Nature conservation (Nalovardo). • Reindeer herding, migration route within Gran Sami village. • Natura 2000 area (river Vindelälven) in close proximity.
Other conditions:	<ul style="list-style-type: none"> • Nalovardo is an area of high ground, surrounded by spruce forests and located between the valleys of the rivers Laisälven and Vindelälven. The forest is untouched. • The Nalovardo nature reserve covers nearly all of the area. • Alpine and nordic skiing centres are located within the area. • Tourist businesses use parts of the area. • Nalovardo lies under flight approach path. • Commercial hunting and fishing takes place in the area. • An important area for migrating moose (where two valleys join). • The area has already been exploited. • Wind power can be used in the marketing of the slalom ski centre. • Telecommunication cables are affected. • Ground water source is located in close proximity to area.
Assessment	The area is not suitable for wind power, as the risk of disturbing the areas of national interests, (nature conservation, reindeer herding, Natura 2000), the nature reserve, the bird life and other interests are too high.

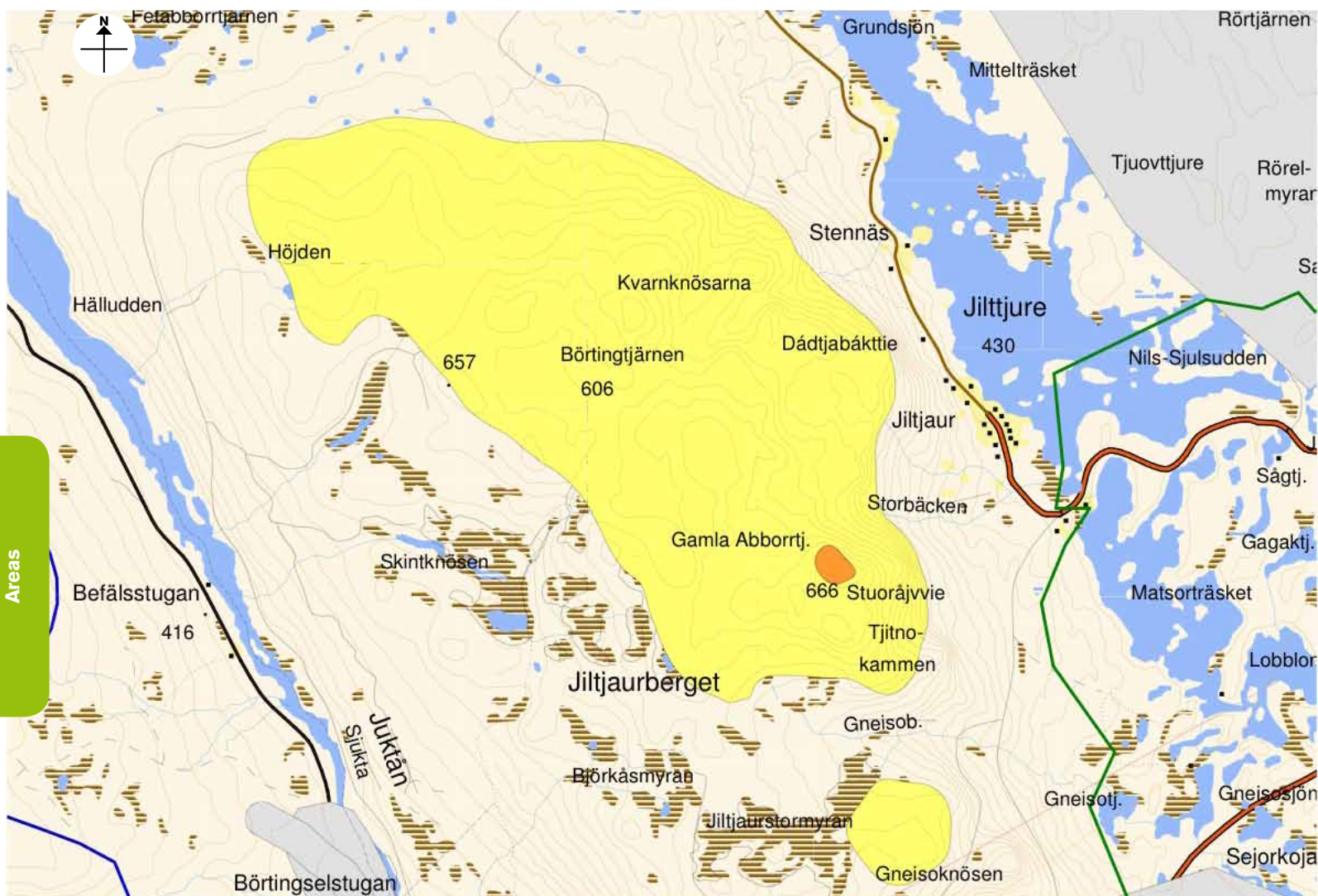
4. Ardnasåjvvie (Arresåive)



SCALE 1:25 000 1 cm = 250 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 3 km ²
Wind power potential:	approx. 9 turbines (annual production approx. 45 GWh)
National interest classifications:	Reindeer herding, close proximity to migration route within Gran Sami village.
Other conditions:	<ul style="list-style-type: none"> • Forestry is carried out in area. • Permanent residences nearby. • Maskaur Sami village also affected. • County of Norrbotten also affected. • Telecommunication cable exists in area. • Ground water source is located east of area.
Assessment	Area is suitable for wind power as the benefits to the community outweigh the interests that are negatively affected. When constructing roads and power lines, special consideration must be given to the migration path close to the area.

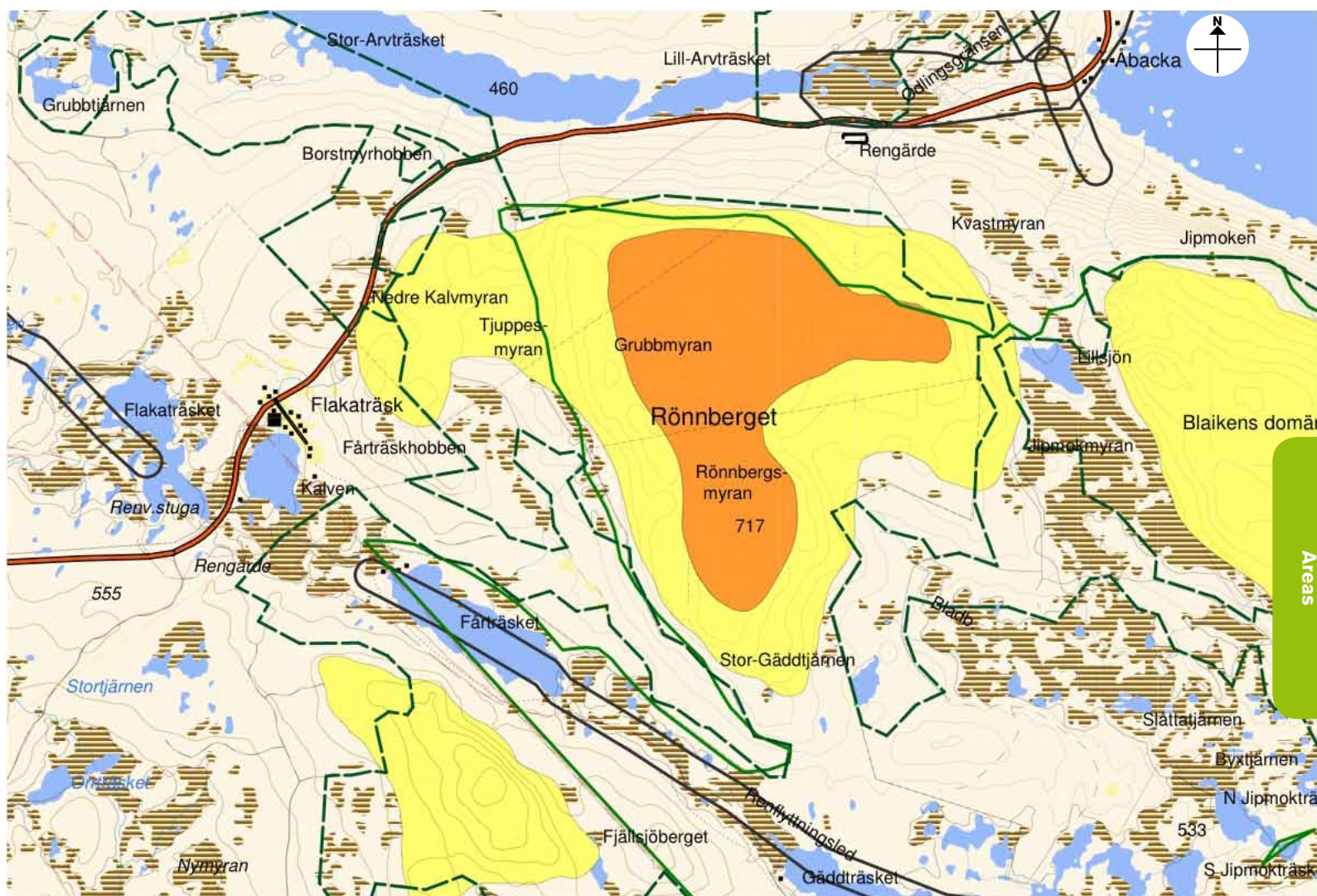
5. Jiltjaurberget



SCALE 1:35 000 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 16 km ²
Wind power potential:	approx. 48 turbines (annual production approx. 240 GWh)
National interest classifications:	<ul style="list-style-type: none"> Nature conservation - at nearby Jiltjaur. Reindeer herding - migration path within Ran Sami village is close to area.
Other conditions:	<ul style="list-style-type: none"> Plantations of contorta pines in area. Much of surrounding forest has been cleared. Hunting in area. Interesting fishing areas are nearby. Telecommunication cables exist in area. Large areas of valuable, class 2 wetlands exist in area. Ground water source is located in western section of area (along river Juktån).
Assessment	Area is suitable for wind power as the benefits outweigh the disadvantages to some interests. When creating a new infrastructure, consideration must be given to nature conservation, reindeer herding and the ground water source.

6. Rönnerberget



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	16 km ²
Wind power potential:	approx. 48 turbines (annual production approx. 240 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Nature conservation, (Lillblaiken and Storblaiken). • Reindeer herding, close proximity to migration route within Ubmeje tjeälddie Sami village. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Hunting in area. • Reindeer paddock is present in the area. • Reindeer herding is affected. • Telecommunication cables are not affected.
Assessment	Area is not suitable for wind power as effects on reindeer herding and other areas of national interest will be too great.

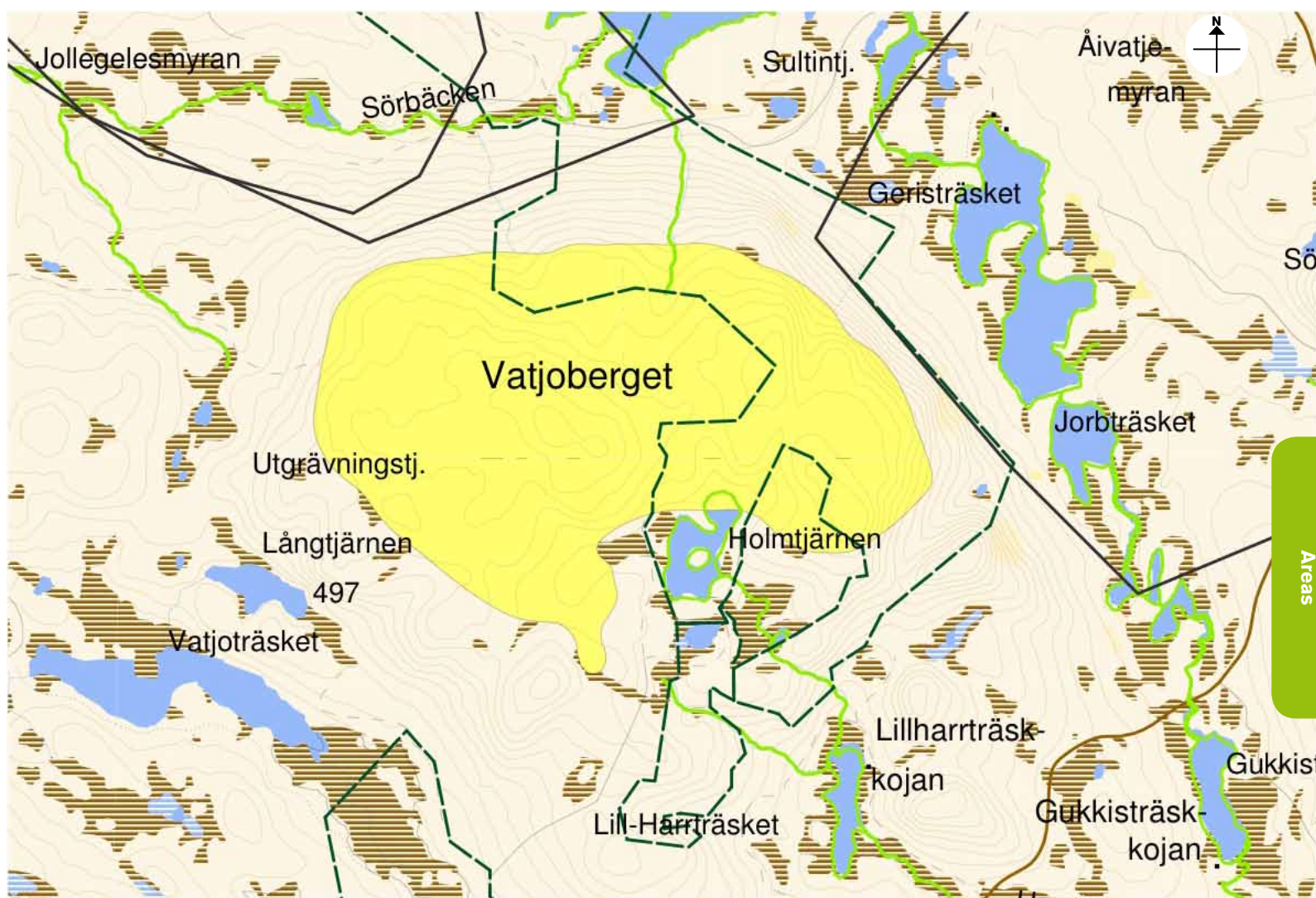
7. Jipmokberget



SCALE 1:35 000 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-8 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 9.5 km ²
Wind power potential:	approx. 28 turbines (annual production approx. 142 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Nature conservation, (Blaiken). • Reindeer herding, close proximity to migration route within Ubmeje tjeälddie Sami village.
Other conditions:	<ul style="list-style-type: none"> • Birds of prey breed in area. • Area of high natural value. • Hunting in area. • Year-round residence within 3-4 km. • Reindeer herding affected. • Telecommunication cables are not affected.
Assessment	Area is not suitable for wind power as the effects on reindeer herding nature conservation will be too great. The risk of disturbing the birds of prey that live there is also judged to be too high.

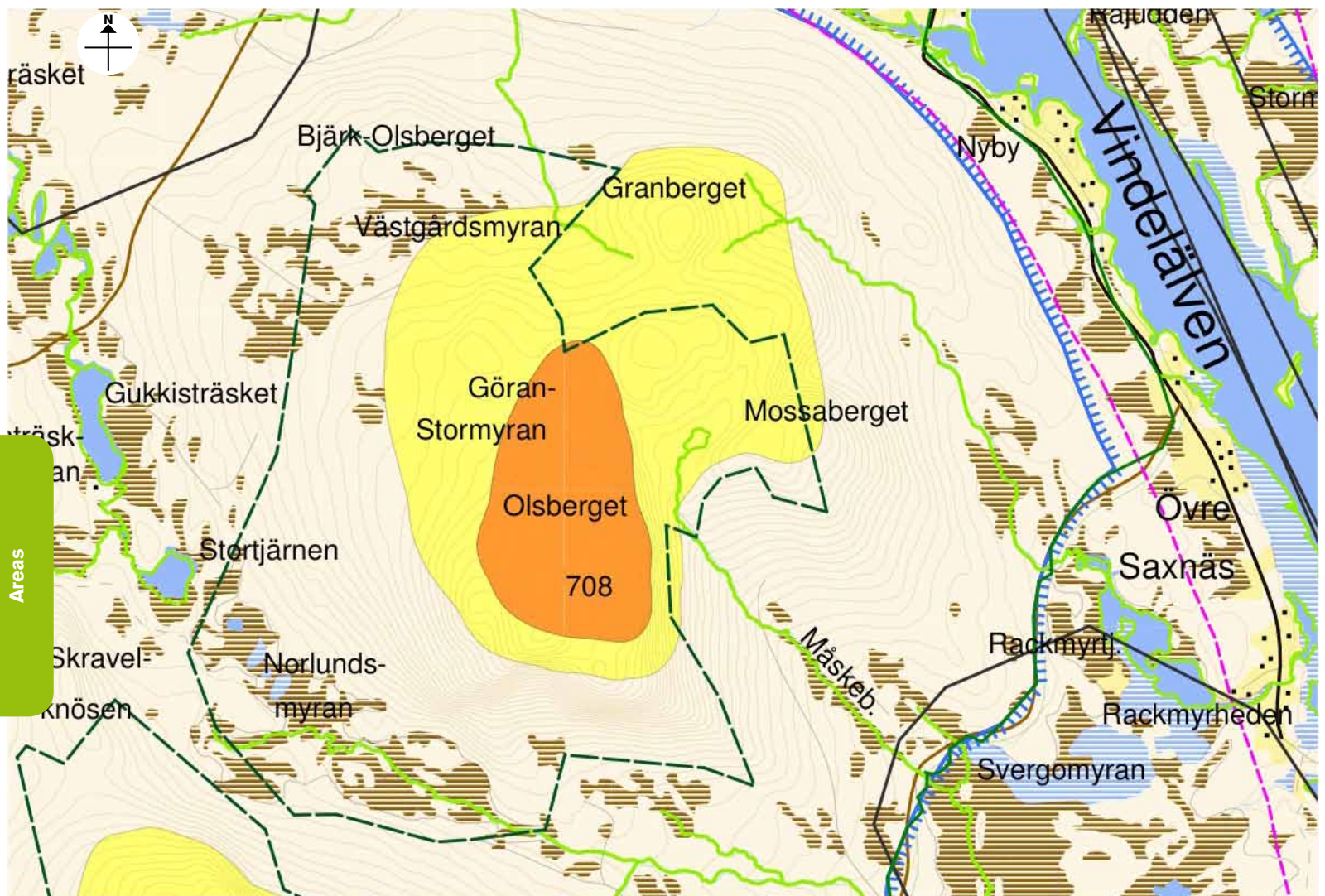
8. Vatjoberget



SCALE 1:25 000 1 cm = 250 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 6 km ²
Wind power potential:	approx. 18 turbines (annual production approx. 90 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ran Sami village. • Natura 2000 area in close proximity (river Vindelälven).
Other conditions:	<ul style="list-style-type: none"> • Stable trout population in lake Holmtjärn. • Two large reindeer paddocks in area. • Birds of prey inhabit area. • Trail used by predatory animals. • Very old section of Douglas pine forest. • Permanent residence 1-2 km from hill. • Part of several combined areas of eastern Storliden, Harrberget and Olsberget that should be retained for recreational purposes. • Reindeer herding is affected. • Telecommunication cables are not affected
Assessment	Area not suitable for wind power as it is an important recreational area and the effect on reindeer herding would be too great. It is part of a larger area, including Olsberget and Harrberget that should be retained for recreational use.

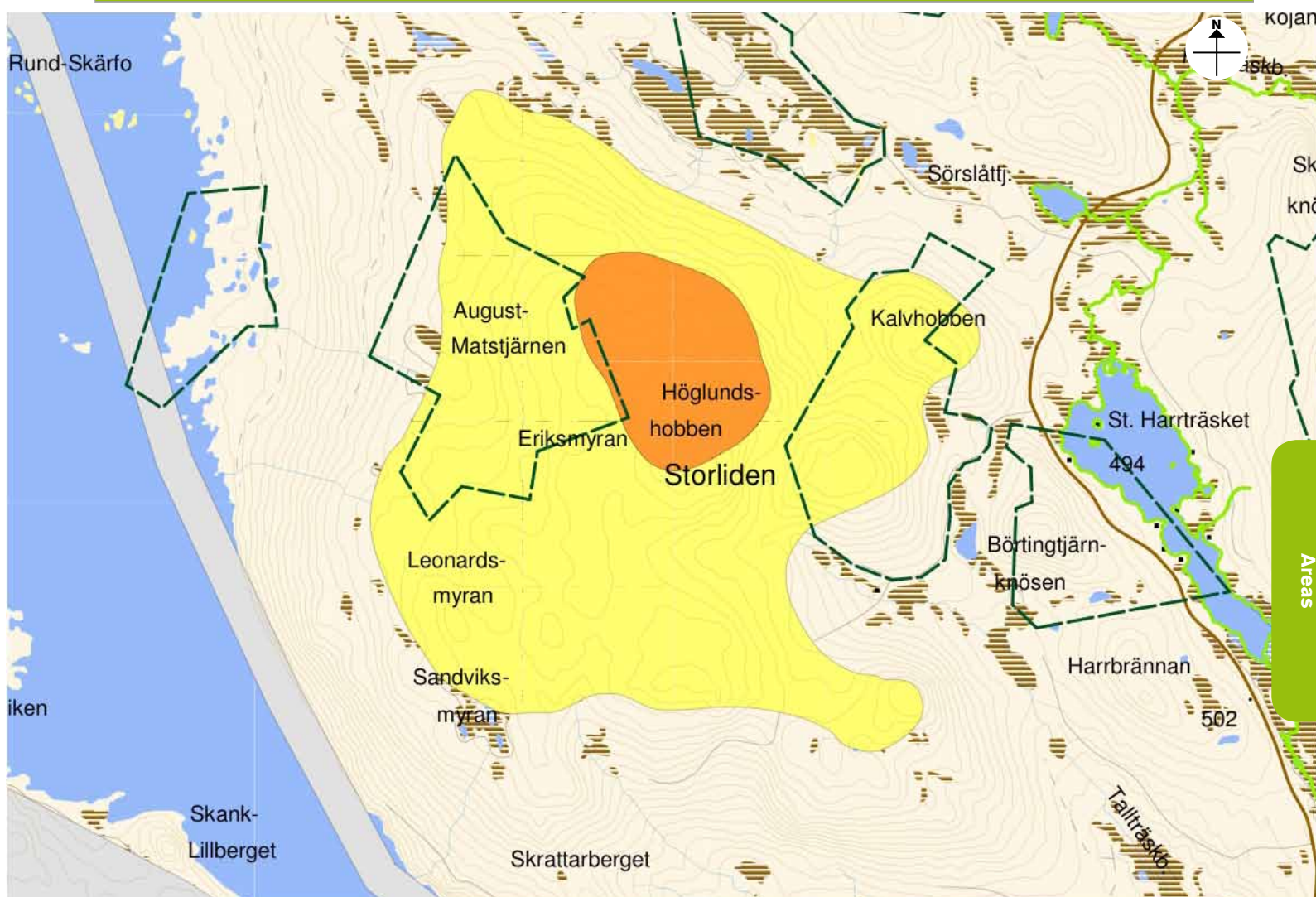
9. Olsberget



SCALE 1:25 000 • 1 cm = 250 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 7 km ²
Wind power potential:	approx. 21 turbines (annual production approx. 105 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ran Sami village. • Natura 2000 in close proximity (river Vindelälven). • Nature Conservation in close proximity (river Vindelälven). • Outdoor recreation (river Vindelälven).
Other conditions:	<ul style="list-style-type: none"> • Birds of prey inhabit area. • Part of several combined areas of eastern Storliden, Harrberget and Vatjöberget that should be retained for recreational purposes. • Reindeer herding is affected. • Telecommunication cables are not affected. • Ground water source is located in adjoining area.
Assessment	Area not suitable for wind power as it is an important recreational area and the effect on reindeer herding would be too great. It is part of a larger area, including Vatjöberget and Harrberget that should be retained for recreational use.

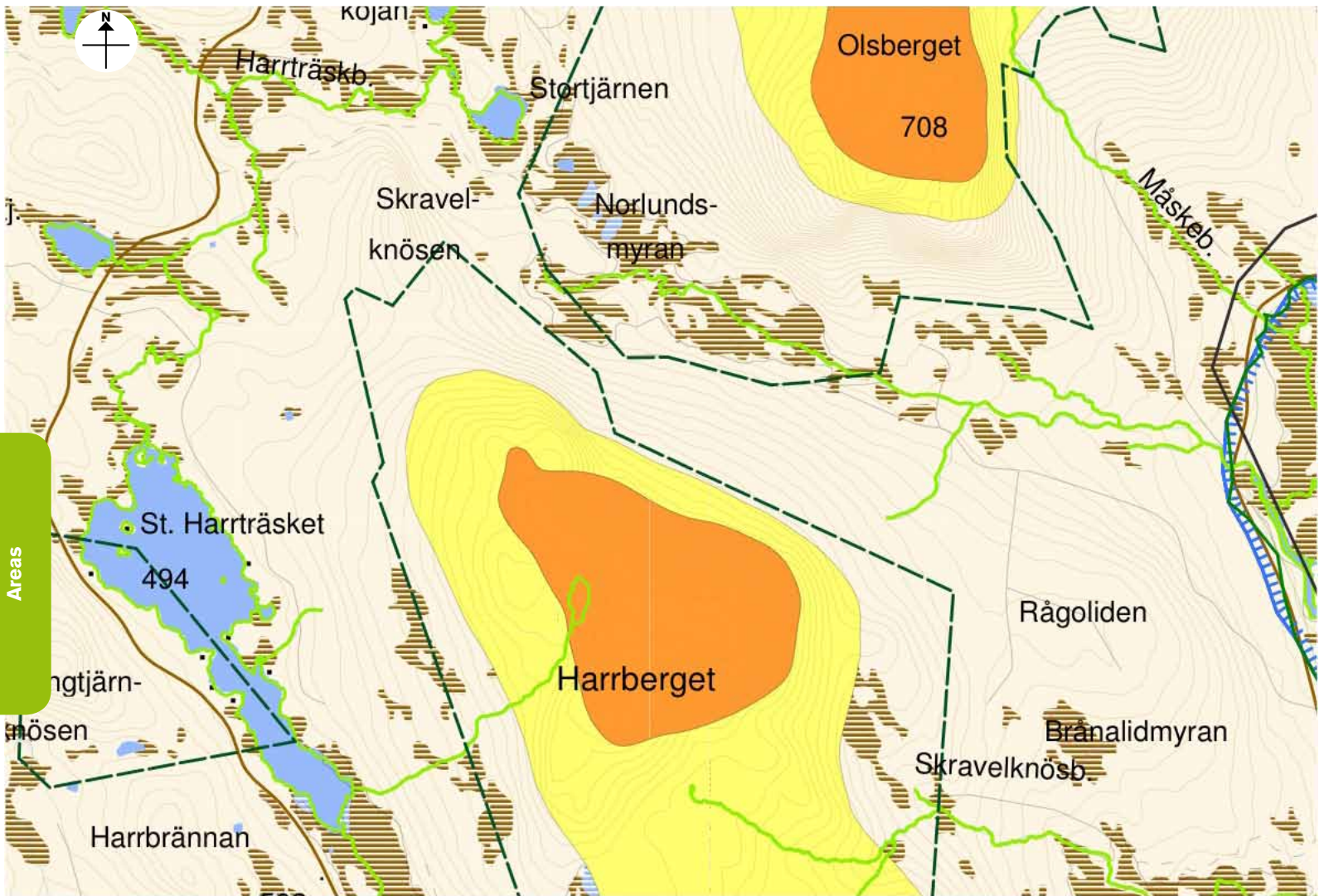
10. Storliden



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 16 km ²
Wind power potential:	approx. 48 turbines (annual production approx. 240 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ran Sami village. • Natura 2000 in close proximity (river Vindelälven). • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Hunting in area. • Affected by forestry. • Important area for recreation. • Western section, towards Juktan, is not as important for recreation as eastern section. • Close to existing infrastructure and borders Storblaiken which has been identified as suitable for wind power. • Reindeer herding is affected. • Telecommunication cables are not affected. • August/Matstjärnen and Eriksmyran are stretches of forest on the north-west side of the area that have been voluntarily excluded from the forestry industry.
Assessment	Area is suitable for wind power as the benefits outweigh the disadvantages to some interests. Consideration must be given to the areas of forest that have been voluntarily excluded from forestry and to reindeer herding which occurs in close proximity to the area.

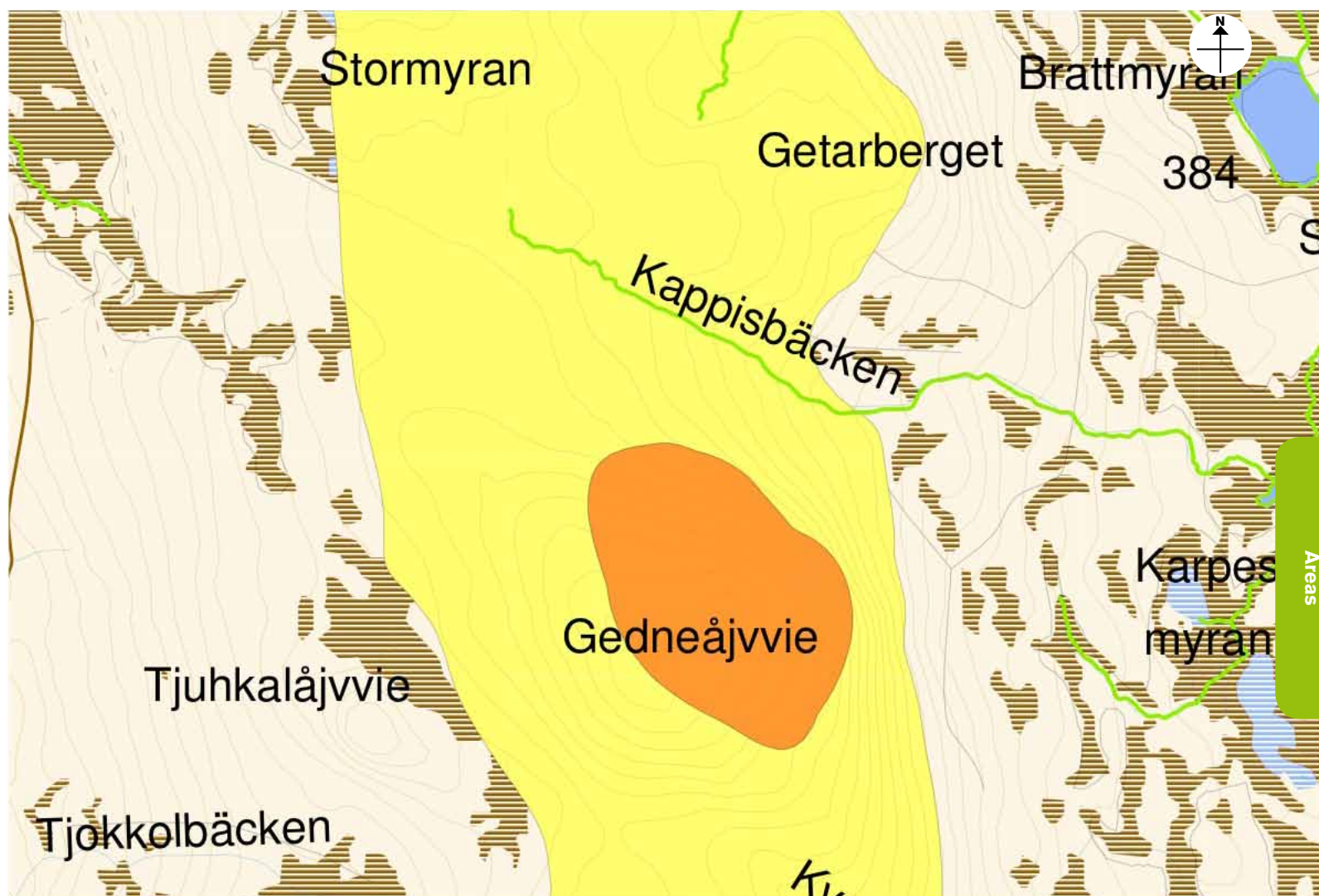
11. Harrberget



SCALE 1:20 000 1 cm = 200 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-8 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 7.5 km ²
Wind power potential:	approx. 22 turbines (annual production approx. 112 GWh)
National interest classifications:	Natura 2000 – in close proximity to river Vindelälven.
Other conditions:	<ul style="list-style-type: none"> • Unusually large area of unbroken forest, of great importance to wildlife. • The hill has several summits covered with untouched forest. • Private and commercial hunting takes place in area. • The Harrträsk river system has recently been restored and contains some of the largest specimens of grayling found in Sweden. • Is part of several combined areas of Olsberget and Vatjöberget that are important for recreational purposes. • The unspoilt region is important for tourists. • Reindeer herding is affected. • Telecommunications are not affected. • Ground water source is located close to area.
Assessment	Area is not suitable for wind power due to the natural value of the forest and the importance of recreational activities. It is part of a larger area, including Olsberget and Vatjöberget that should be retained for recreational use.

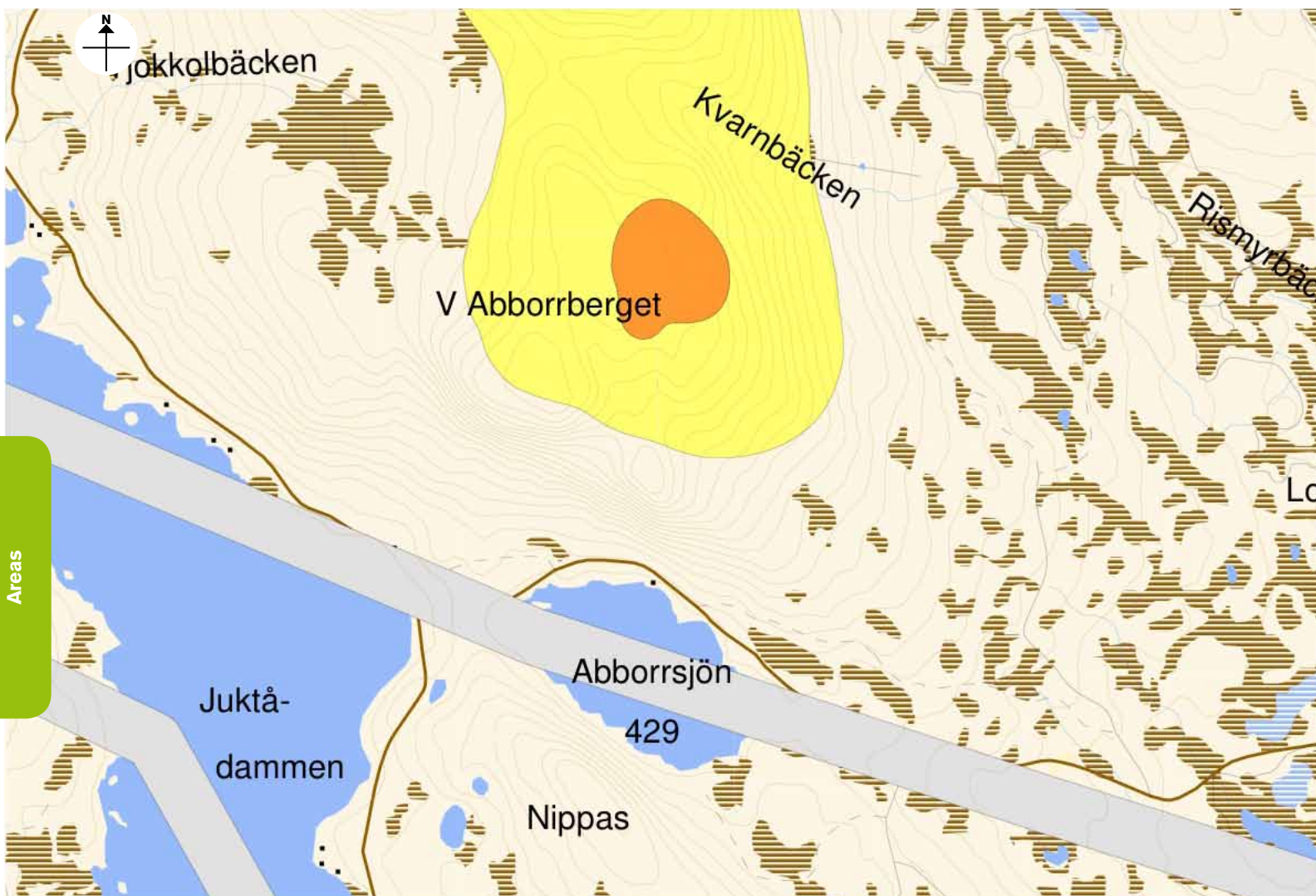
12. Gitåive (Gedneåjvvie)



SCALE 1:15 000 1 cm = 150 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 3 km ²
Wind power potential:	approx. 9 turbines (annual production approx. 45 GWh)
National interest classifications:	None.
Other conditions:	<ul style="list-style-type: none"> • Hunting and forestry in areas. • No cottages in area. • Reindeer herding affected. • In close proximity to infrastructure and can be regarded as part of Storblaiken which is suitable for wind power. • Telecommunication cables are not affected. • Sections of the area are considered to be important for wildlife.
Assessment	Area is suitable for wind power as the benefits outweigh the disadvantages to some interests. It is also close to existing infrastructure.

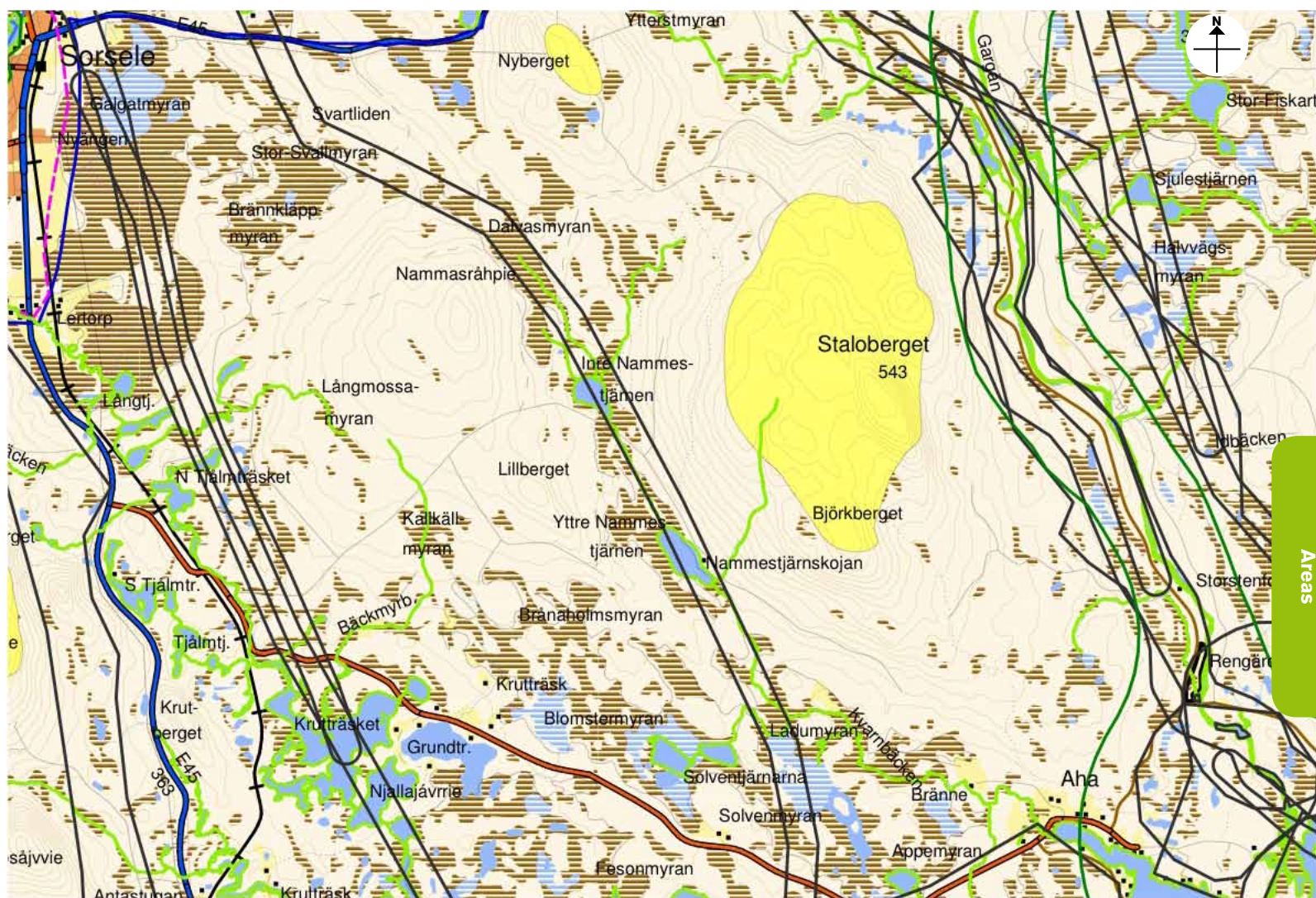
13. Västra Abborrhberget



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 3 km ²
Wind power potential:	approx. 9 turbines (annual production approx. 45 GWh)
National interest classifications:	None
Other conditions:	<ul style="list-style-type: none"> • Hunting and forestry in areas. • Hill is already partly affected. • At the base of the hill, on the shore of lake Storjuktan, are several cottages. • Reindeer herding is affected. • In close proximity to infrastructure and can be regarded as part of Storblaiken which is suitable for wind power. • Telecommunication cables are not affected. • Sections of the area are considered to be important for wildlife.
Assessment	Area is suitable for wind power due to the few conflicting interests. It should be possible to build 9 turbines which could produce approx. 45 GWh per year.

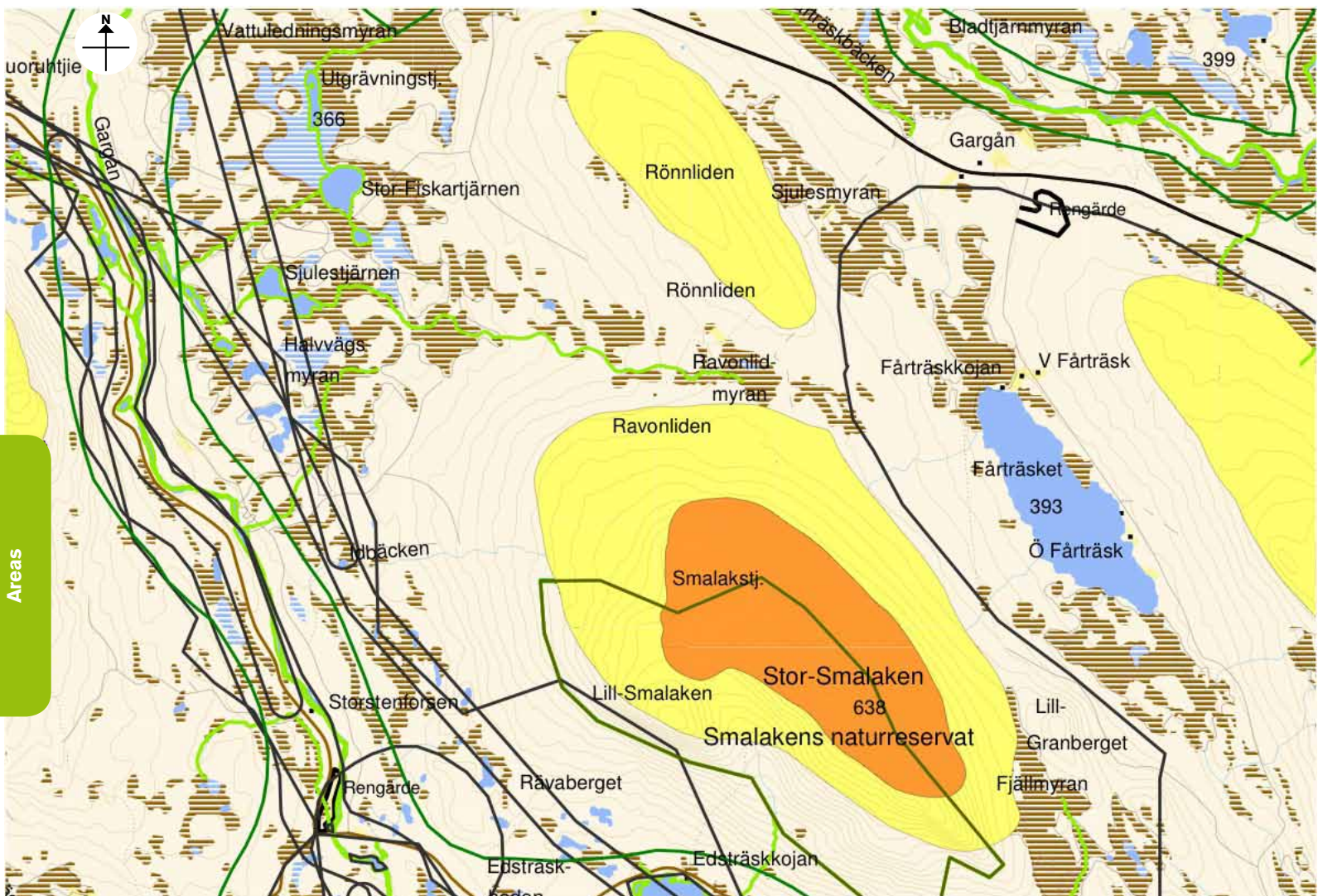
14. Staloberget



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 5 km ²
Wind power potential:	approx. 15 turbines (annual production approx.75 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key areas and migration routes of Malå, Gran and Svaipa Sami villages. • Nature conservation, in close proximity to river Gargån.
Other conditions:	<ul style="list-style-type: none"> • Hunting and fishing in area. • Forestry is conducted in area. • Reindeer migration paths in area. • Reindeer herding affected. • Telecommunication cables are not affected. • Ground water source is located close to area.
Assessment	Area is not suitable for wind power due to the effect on reindeer herding.

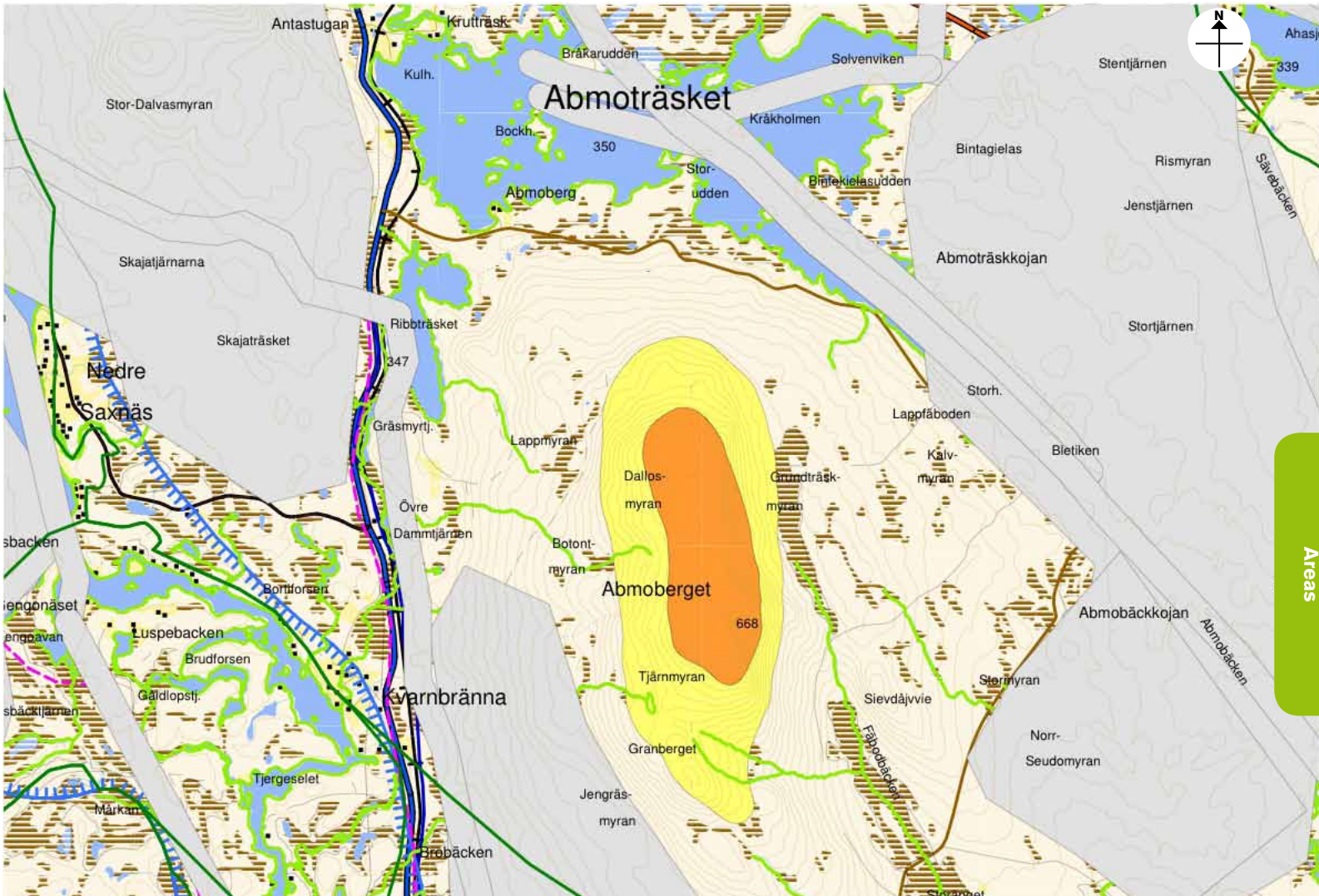
15. Stor-Smalaken



SCALE 1:35 000 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-75. m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 12 km ²
Wind power potential:	approx. 36 turbines (annual production approx. 180 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key areas and migration routes of Malå, Gran and Svaipa Sami villages. • Nature conservation, in close proximity to river Gargån. • Natura 2000 – Smalaken nature reserve.
Other conditions:	<ul style="list-style-type: none"> • Hunting in area. • Fishing in close proximity to area. • Nature reserve - Smalaken. • Smalaken nature reserve contains a tall forest-covered hill with two summits, Lill-Smalaken and Stor-Smalaken. Between these two summits is an area of marshland. The flat rock landscape of the summits is home to a thin covering of short, twisted pine trees. Most of the surface area is located within the reserve. • Reindeer herding affected. • Telecommunication cables are not affected. • Ground water source is located close to area (in west).
Assessment	Area is not suitable for wind power due to the effects on reindeer herding, nature conservation and Natura 2000. Rönnerbergets nature reserve would be disturbed by wind power development.

16. Abmoberget

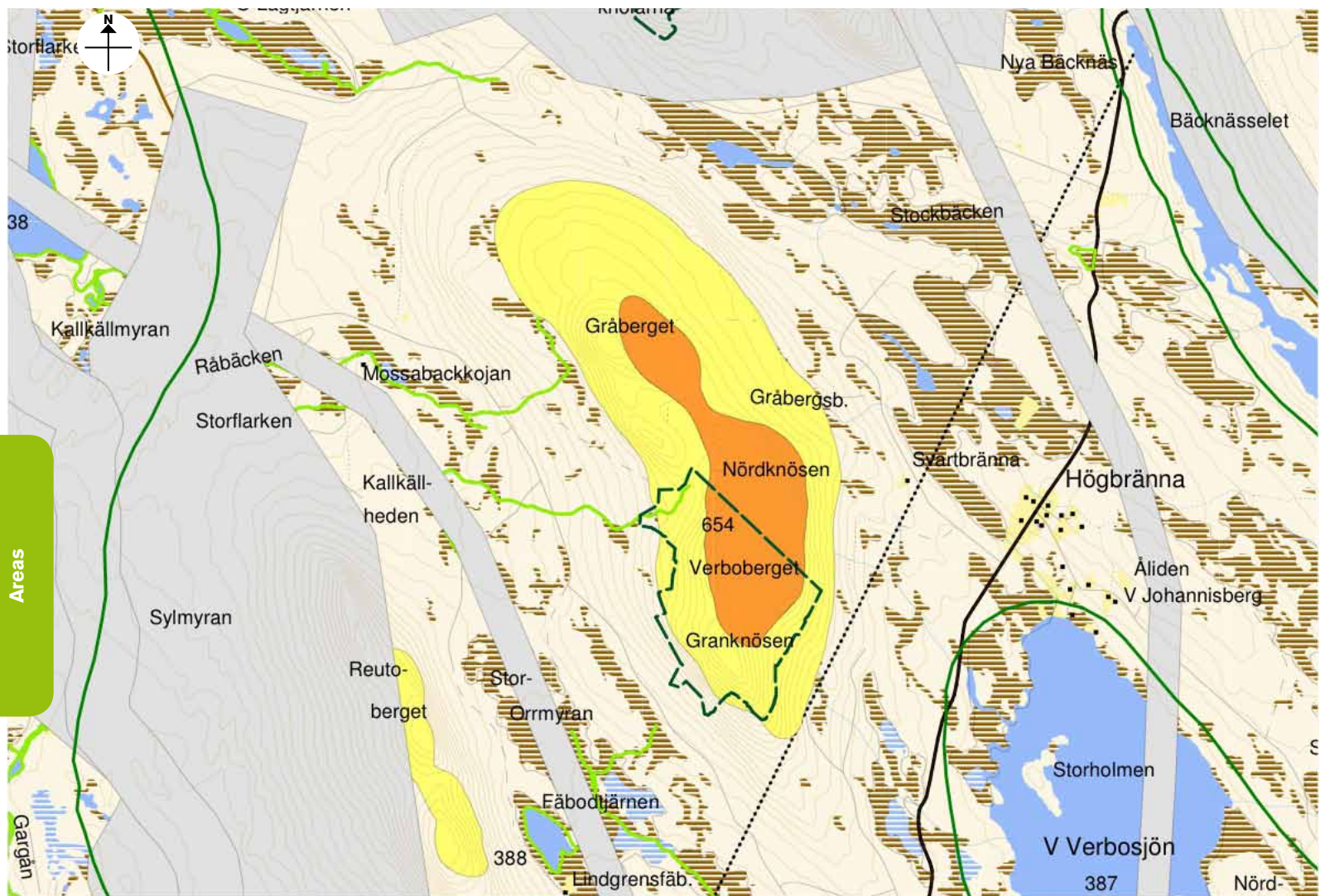


Areas

SCALE 1: 35 000 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 8 km ²
Wind power potential:	approx. 24 turbines (annual production approx. 120 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding and grazing within Ran Sami village occurs close to area. • Cultural heritage conservation, river Vindelälven is in close proximity. • Natura 2000 is close to area (tributaries to river Vindelälven). • Nature conservation – Blattnicksele is close to area.
Other conditions:	<ul style="list-style-type: none"> • Popular recreational area with trail to summit. • Snowmobile trail to and from many villages. • Birds of prey nest in area. • Area contains many bears. • A private building is located on summit. • The hill is visible from many villages. <ul style="list-style-type: none"> • There is an agreement concerning nature conservation on private land near the summit. • Close to E45 highway. • Telecommunications are not affected. • Sections of the area are considered to be important for wildlife. • Ground water source is located close to area.
Assessment	The area is suitable for wind power as the benefits outweigh the disadvantages to some interests. The section of Abmoberget which affects reindeer herding is, however, not suitable for development. When constructing a new infrastructure, special consideration must be given to reindeer herding, snowmobile trails and paths as well as other interests that affect the general public.

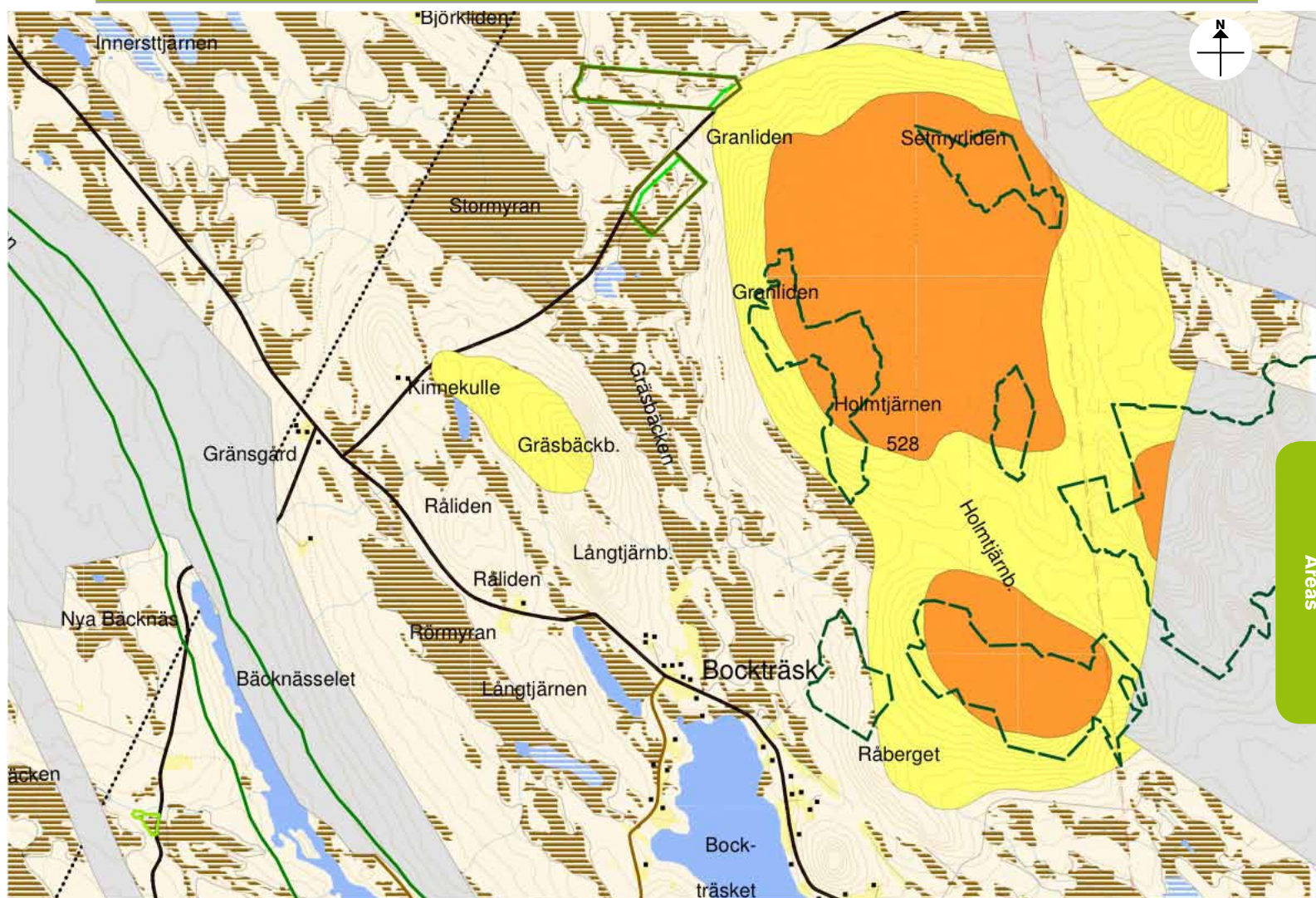
17. Verboberget



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 8.5 km ²
Wind power potential:	approx. 25 turbines (annual production approx. 125 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route and key area within Gran and Malå Sami villages. • Natura 2000, in close proximity to river Vindelälven.
Other conditions:	<ul style="list-style-type: none"> • Forestry is conducted in area. • Hunting in area. • Summer pastures for grazing animals in area. • Reindeer herding is partly affected. • Telecommunication cables are not affected. • There are stretches of forest in southern section that have been voluntarily excluded from forestry activities.
Assessment	The area is suitable for wind power as the benefits outweigh the disadvantages to some interests. When constructing a new infrastructure, special consideration must be given to stretches of forest that have been voluntarily excluded from forestry and to reindeer herding which occurs close to the area.

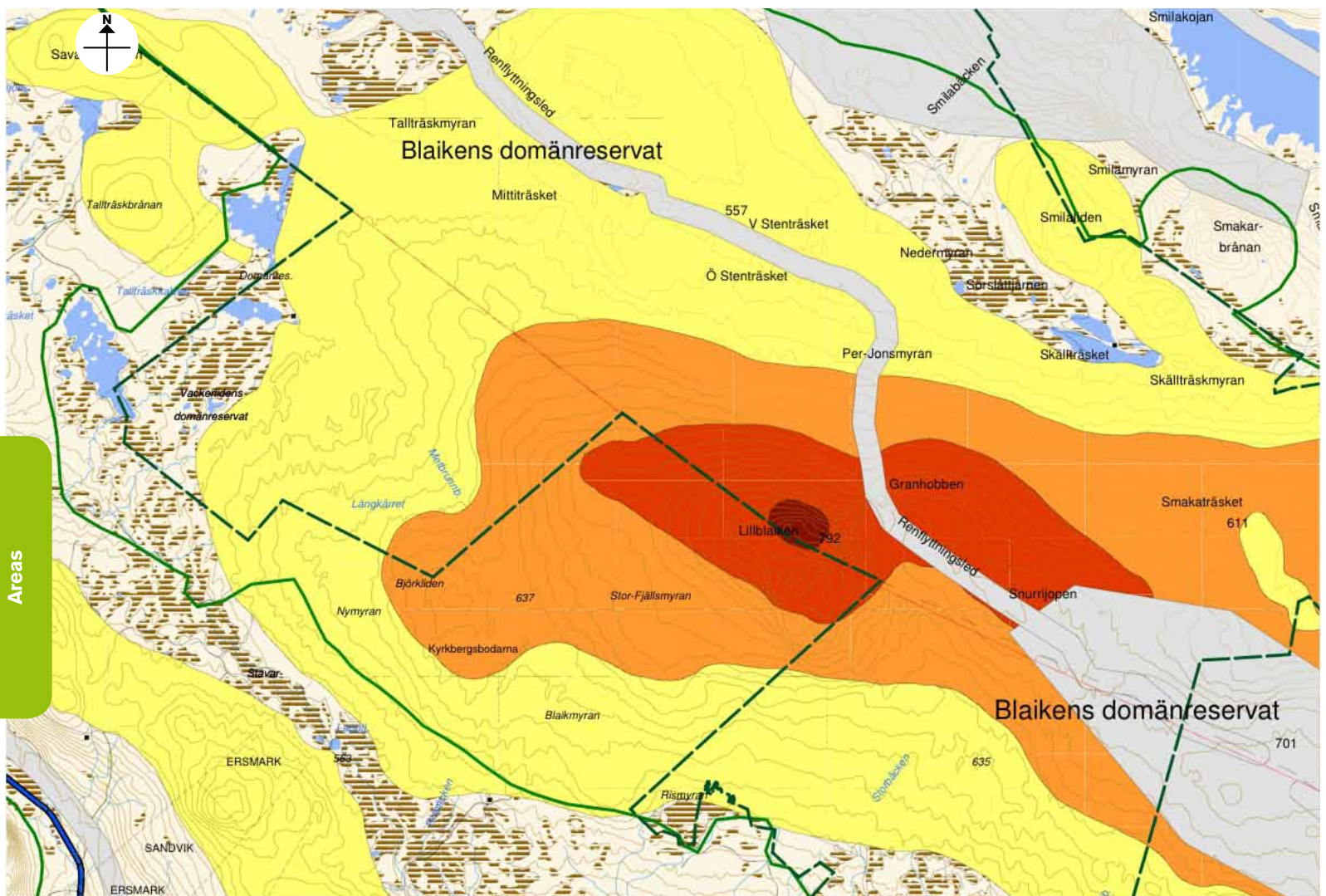
18. Granliden



SCALE 1:35 000 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 20 km ²
Wind power potential:	approx. 60 turbines (annual production approx. 300 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, close to key area for Malå Sami village. • Nature conservation, close to Granliden nature reserve. • Nature reserve, Granliden. • Natura 2000, Granliden. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Nature Reserve - Granliden, contains spruce forest, similar in kind to primeval forest. Marsh wetlands can also be found in the reserve. • Tourism is established in Granliden. • Hunting is carried out in area. • Contorta plantation in western section of area. • Close to roads 1019 and 1026. • Telecommunications are affected. • Stretches of forest in the central section of Granliden (Sveaskog) have been voluntarily excluded from forestry activities.
Assessment	The area is suitable for wind power as the benefits outweigh the disadvantages to some interests. The section of Granliden which affects reindeer herding and the nature reserve is, however, not suitable for development. Special consideration must be given to reindeer herding and to the stretches of forest that have been voluntarily excluded from forestry activities.

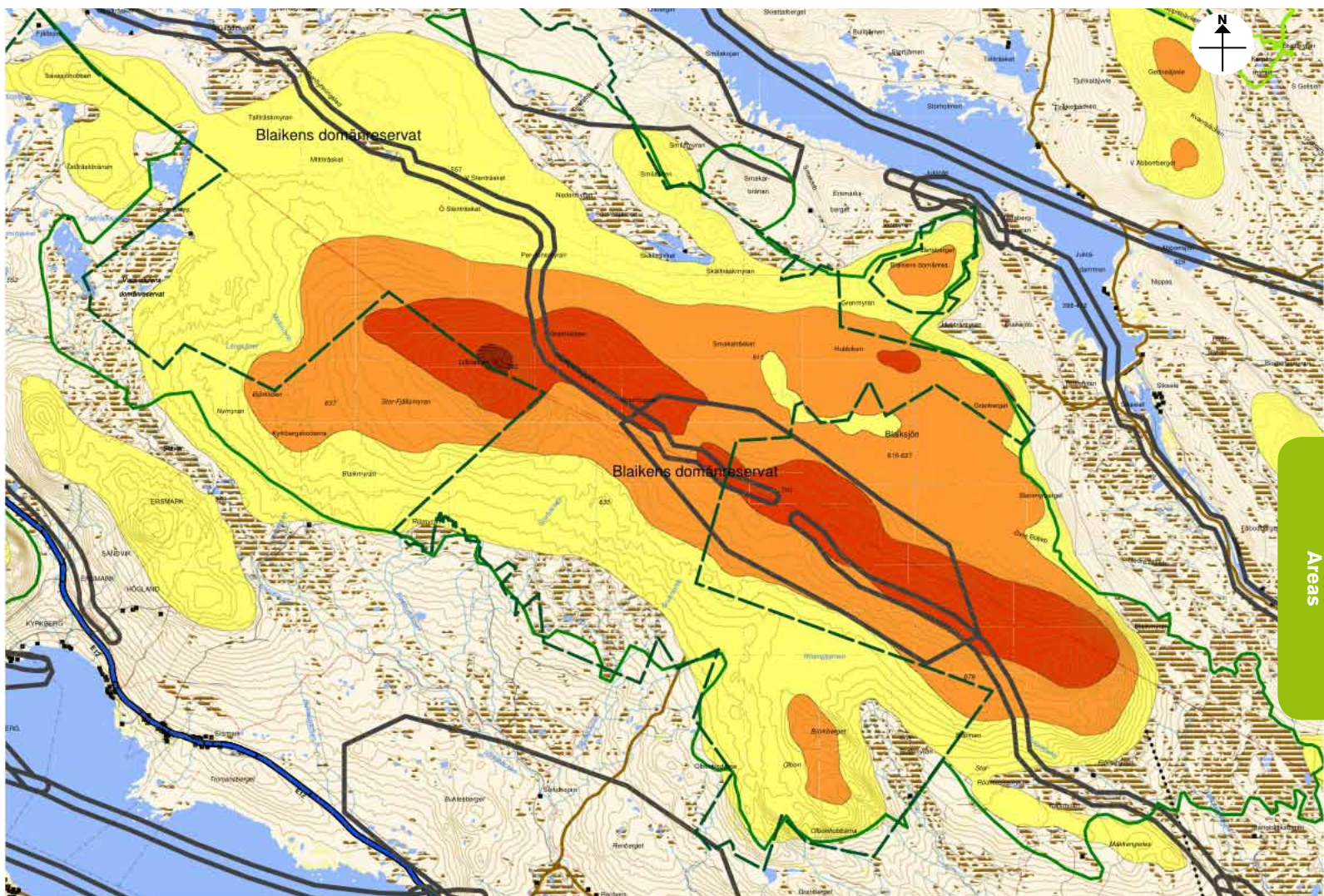
19. Lillblaiken



SCALE 1:45 000 1 cm = 450 metres Resolution: 500 metre grid

Land type:	Forest and treeless higher ground
Annual average wind strength:	6.5-8 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 90 km ²
Wind power potential:	approx. 270 turbines (annual production approx. 1350 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, migration route within Ubmeje tjeälddie Sami village. • Nature conservation, reserve at Storblaiken-Lillblaiken. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Lillblaiken is a unique area of treeless higher ground which has a lime-rich bedrock. It is a considerable distance from the mountains to the west. • Some residents regard Lillblaiken as having cultural importance due to its significance to pioneers settling in Lapland. • Recreational activity is important. • Four snowmobile trails meet up on Lillblaiken which improves access during winter. • Lillblaiken is considered to be important for wildlife. • New nature reserves are being planned for the future. • Interesting geological site from quaternary period- (moraine formations, glacial remains and landscape developments). • Affects both Storuman and Sorsele municipalities.
Assessment	Area is not suitable for wind power, as the effects on reindeer herding, nature conservation and the planned nature reserves would be too large. The area of Storblaiken is already heavily affected which increases the need to protect Lillblaiken as a recreational area.

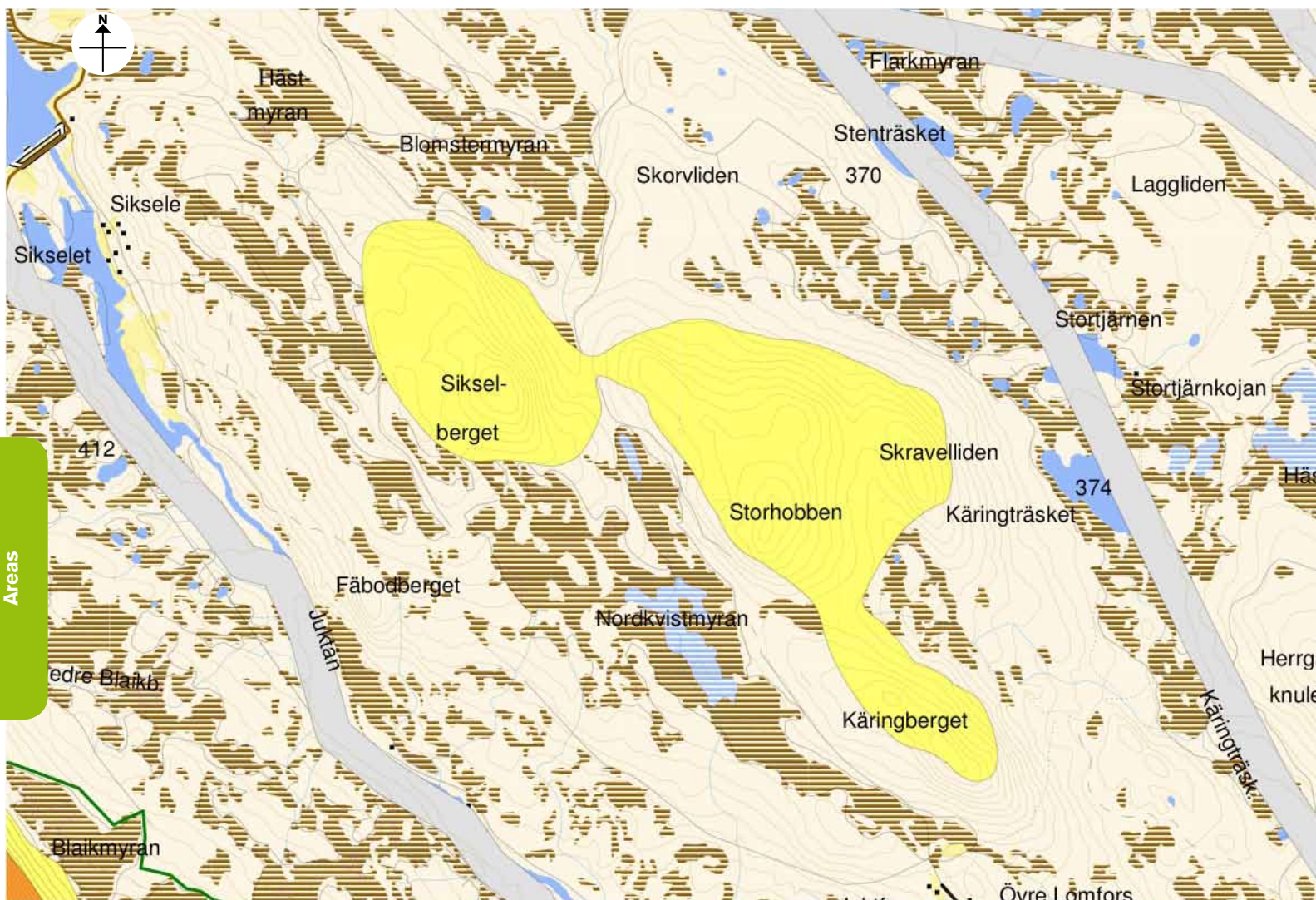
20. Storblaiken



SCALE 1:90 000 1 cm = 900 metres Resolution: 500 metre grid

Land type:	Forest and tree-less area of high ground
Annual average wind strength:	6.5-8 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 140 km ²
Wind power potential:	approx. 420 turbines (annual production approx. 2.1 TWh)*
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, migration route within Ubmeje tjeälddie Sami village. • Nature conservation, reserve at Storblaiken-Lillblaiken. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Important recreational area. • Hunting is carried out in area. • Several snowmobile trails pass through area which improves access for winter recreational use. • Many berry pickers visit the area during autumn. • Storblaiken is already affected by the power station, dam and mine. • Mineral mining takes place in the area and lake Blajksjön is used as a water reservoir. • A power cable passes through Storblaiken. • Building permission has already been granted to erect 100 turbines on Storblaiken. • Telecommunication cables exist in area. • A new nature reserve is planned to protect the system of wetlands that exist close to area. • Interesting geological site from quaternary period- (moraine formations, glacial remains and landscape developments). • Affects both Storuman and Sorsele municipalities.
Assessment	The area is suitable for wind power, as it is already affected by other activities and has relatively few conflicts of interest. Consideration must be given to the planned nature reserve. *The number of turbines is to be restricted to 200.

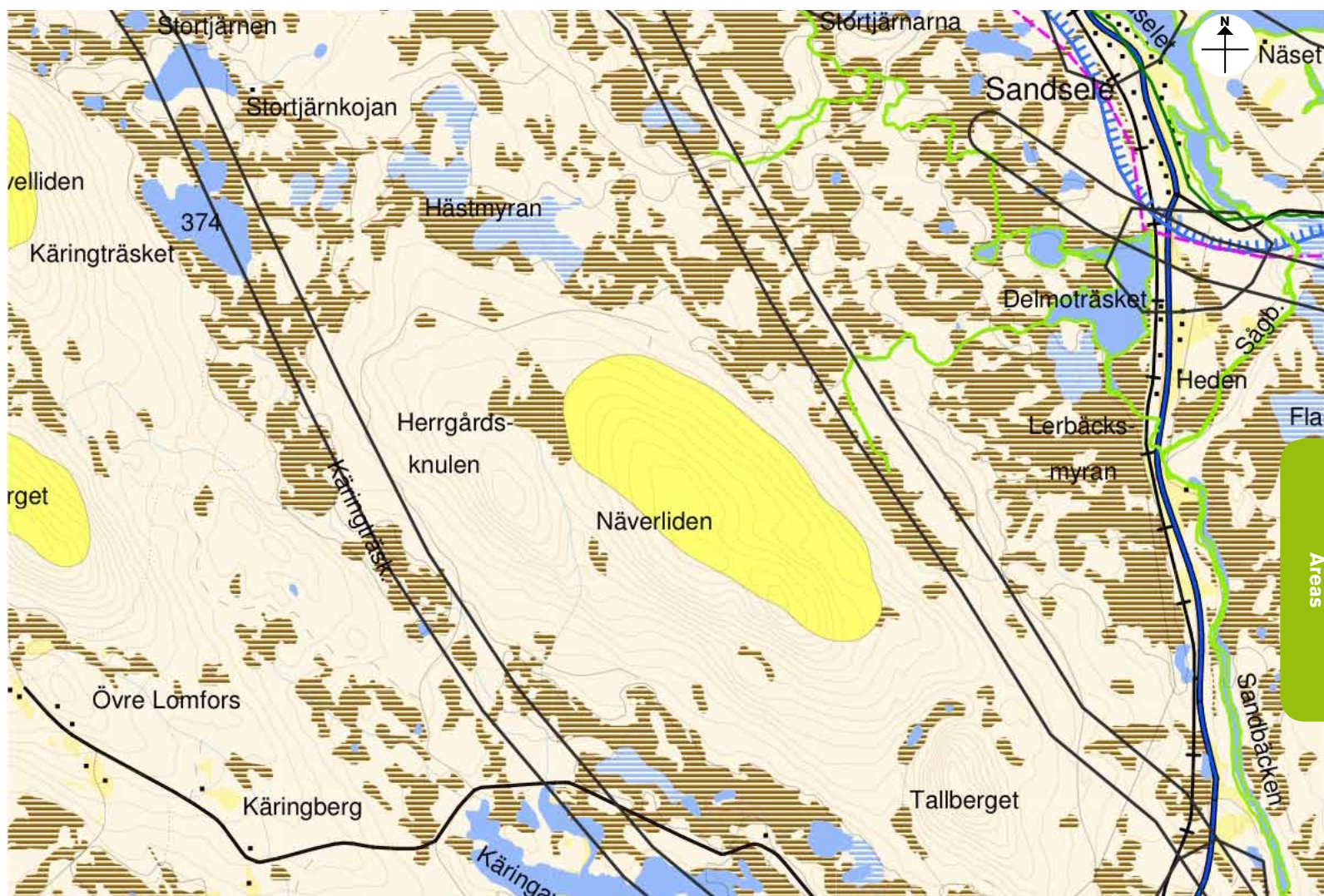
21. Storhobben - Käringberget



SCALE 1:30 000 • 1 cm = 300 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 8 km ²
Wind power potential:	approx. 24 turbines (annual production approx. 120 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ran Sami village.
Other conditions:	<ul style="list-style-type: none"> • Hunting is carried out in area. • Telecommunication cables are not affected. • A major ground water source is located close to area (along river Juktån). • Close to existing power lines.
Assessment	The area is suitable for wind power as the benefits outweigh the disadvantages to some interests. When building a new infrastructure, special consideration must be given to reindeer herding and to the existence of a ground water source close to the area.

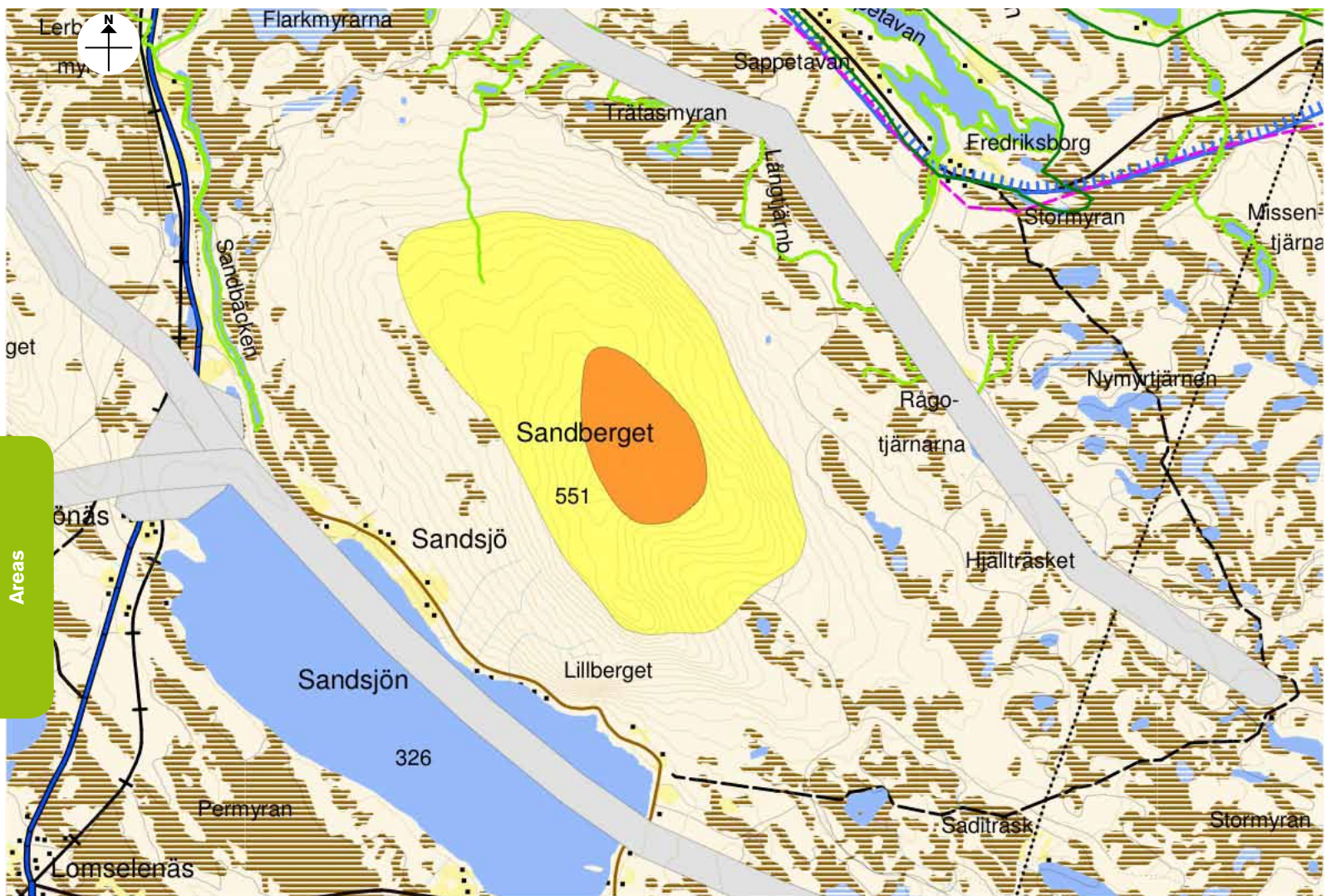
22. Näverliden



SCALE 1: 30 000 1 cm = 300 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 2 km ²
Wind power potential:	approx. 6 turbines (annual production approx. 30 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ran Sami village.
Other conditions:	<ul style="list-style-type: none"> • There are no roads in the area. • It is close to the electricity network. • Hunting and forestry is carried out in the area. • Reindeer herding is affected. • Ground water source is located close to source.
Assessment	Area is not suitable for wind power due to the effect on reindeer herding and the fact that the surface area is too small.

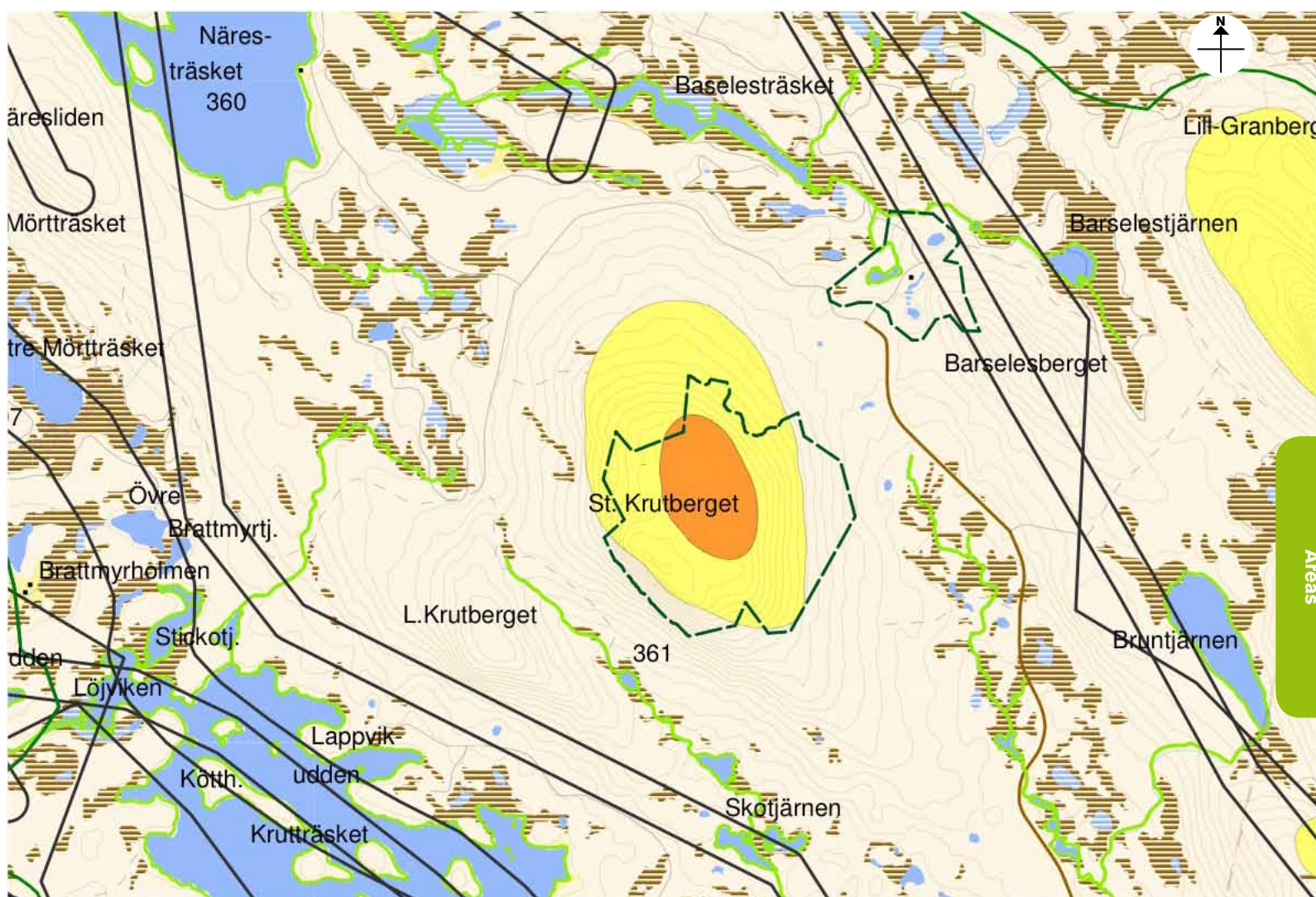
23. Sandberget



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 8 km ²
Wind power potential:	approx. 24 turbines (annual production approx. 120 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ran Sami village. • Natura 2000 area close to site (tributaries to river Vindelälven).
Other conditions:	<ul style="list-style-type: none"> • Summit has been cleared of forest. • Forestry is conducted in the area. • Hunting is carried out in the area. • Sandsjön has a good fish biotope. • Many gravel roads already exist in the area. • One telecommunications mast already exists in the area. • Nature conservation agreements exist concerning northern section of the area. • Close to E45 highway. • Close to power lines. • Telecommunication cables are not affected. • Ground water source is located close to area.
Assessment	The area is suitable for wind power as the benefits outweigh the disadvantages to some interests. When building a new infrastructure, special consideration must be given to the migration route close to the area.

24. Stora Krutberget



SCALE 1:30 000 • 1 cm = 300 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 6 km ²
Wind power potential:	approx. 18 turbines (annual production approx. 90 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Malå Sami village. • Natura 2000 area close to site (river Vindelälven).
Other conditions:	<ul style="list-style-type: none"> • Birds of prey exist in area. • Hunting is carried out in area. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power due to the effect on reindeer herding and the existing birdlife.

Please note!
Key to maps is printed on
flap of last page.

Municipal policy

The municipality regards the green areas as *being suitable* for wind power and should therefore be given priority. The municipalities will not consider wind power development in grey areas which are regarded as *being unsuitable* for wind power.

This assessment was based on the fact that too many interests would be negatively affected. In most cases, the municipalities recognised the need to give priority to important national and local interests as well as those of the general public.

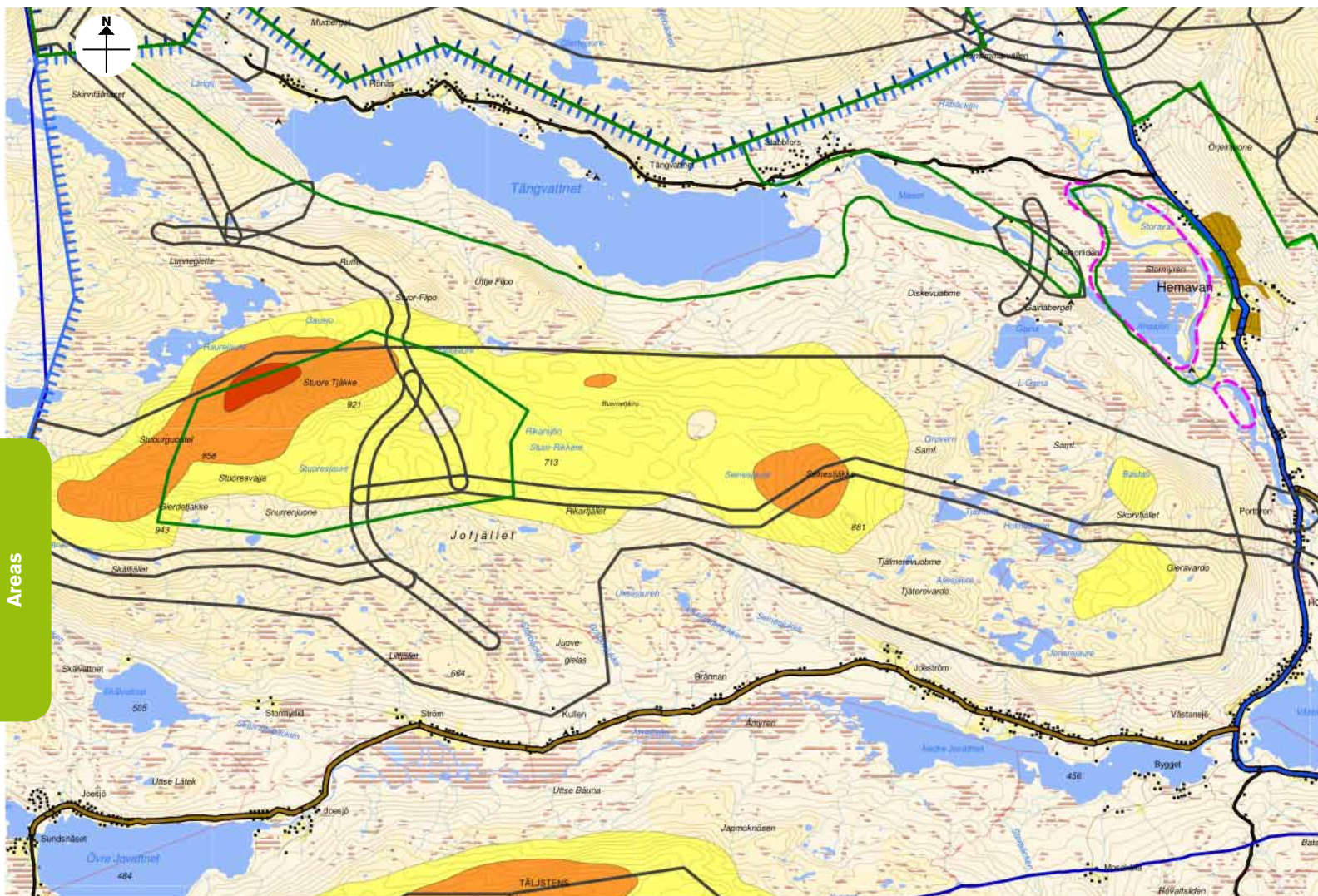
Areas that have not been included in this Additional Plan for Wind Power will be assessed in accordance Swedish law and the guidelines used by the municipalities.

Storuman Municipality

Areas

25. Jofjället _____	76
26. Södra Storfjället _____	77
27. Arefjället _____	78
28. Virisfjället _____	79
29-30. Luspevardo och Löfjället _____	80
31. Gebnafjället _____	81
32. Björkfjället _____	82
33. Gakerevardo _____	83
34. Brakko _____	84
35. Laxfjället _____	85
36. Gäutavardo/Gäutafjället _____	86
37. Ryfjället _____	87
38. Anjona _____	88
39-40. Stor- och Lill-Stalofjället _____	89-90
41. Järvfjället _____	91
42. Girjesliden _____	92
43. Norra Gardfjället _____	93
44. Bastanliden _____	94
45-46. Vallträsk och Vallträskhobben _____	95
47. Stor-Boktion _____	96
48. Barsele - Storberget _____	97
49. Stor - Granliden _____	98
50. Norra Stöttingfjället _____	99

25. Jofjället

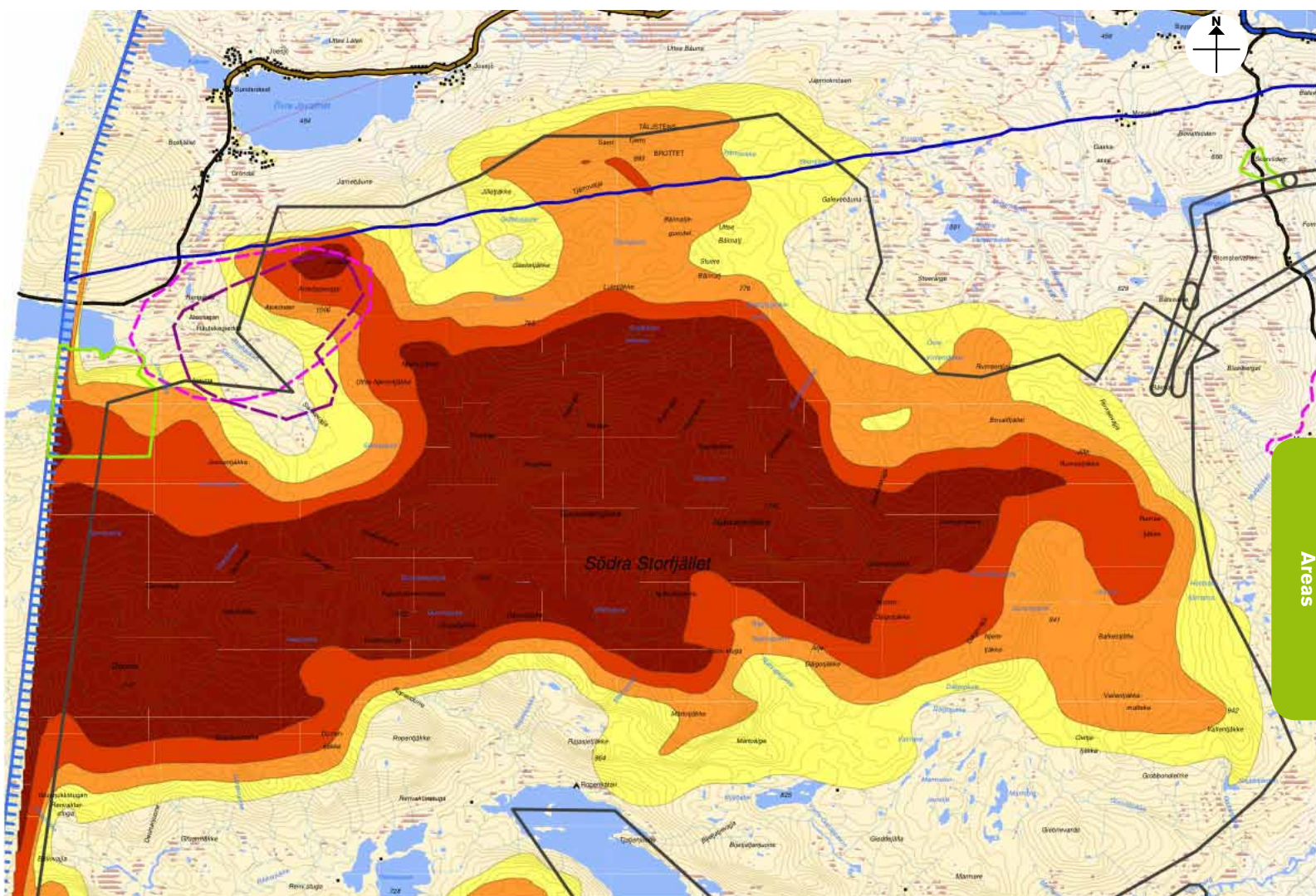


Areas

SCALE 1:70 000 1 cm = 700 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-8 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 46 km ²
Wind power potential:	approx. 138 turbines (annual production approx. 690 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Ubmeje tjeälddie Sami village. • Tourism and recreational activity. • Recreational activity, Vindelfjällen. • Nature conservation, Jofjället. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Known as the "flower mountain". • Easy access from all directions. • Hunting carried out in area. • Popular tourist destination during summer and winter. • Ancient Sami remains in area. • It is the view to the west for the whole of Hemavan. • Contains many lakes and marshes – an important breeding habitat for birds. • A road to Norway passes through. • A 220 k volt power cable is in area. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power due to the effect on many national interests (except wind power) and other conditions named above (except power cable).

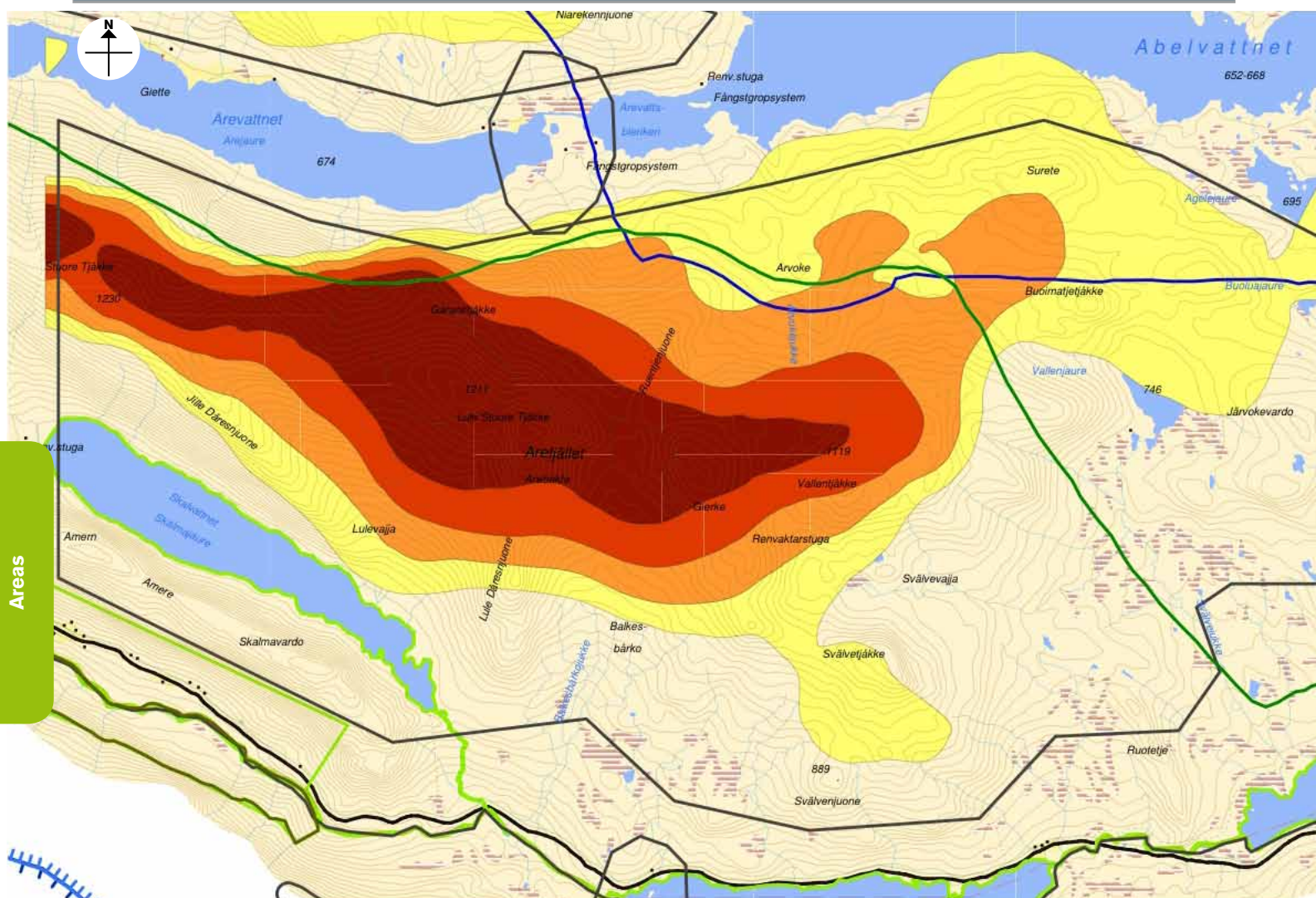
26. Södra Storfjället



SCALE 1:80 000 1 cm = 800 metres Resolution: 1000 metre grid

Land type:	Treeless high ground	
Annual average wind strength:	6.5-10.5 m/s (at height of 103 m above chart datum displacement)	
Surface area:	approx. 150 km ²	
Wind power potential:	approx. 450 turbines (annual production approx. 2250 GWh)	
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Vapsten Sami village. • Tourism and recreational activities. • Recreational activity, in close proximity to recreational area Vindelfjällen. 	<ul style="list-style-type: none"> • Natura 2000, at Guorte and Joesjö. • Cultural heritage, Atoklimpen. • Cultural reserve, Atoklimpen. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • The Natura 2000 areas at Guorte and Joesjö are in the north-western region of the mountains. The area covers 480 hectares and is home to Vasterbotten's only known site of a rare type of wild carnation. • The Atoklimpen cultural reserve is on the north-west side of the region and the area features the nomadic lifestyle of the reindeer herding Sami from ancient times to the present day. It has spiritual and religious significance and the landscape still bears physical evidence from earlier Sami cultures which help depict the way of life in the mountains. 	<ul style="list-style-type: none"> • Important recreational area, during winter and summer. • Hunting carried out in area. • Many visitors come to area due to east access. • Area is crossed by many trekking trails. • Sites of cultural heritage (Sami remains) in area. • Reindeer herding affected. • Close to power cable (in eastern section).
Assessment	Area is not suitable for wind power due to the effect on many national interests (except wind power). The other conditions named above will be significantly affected by a large development.	

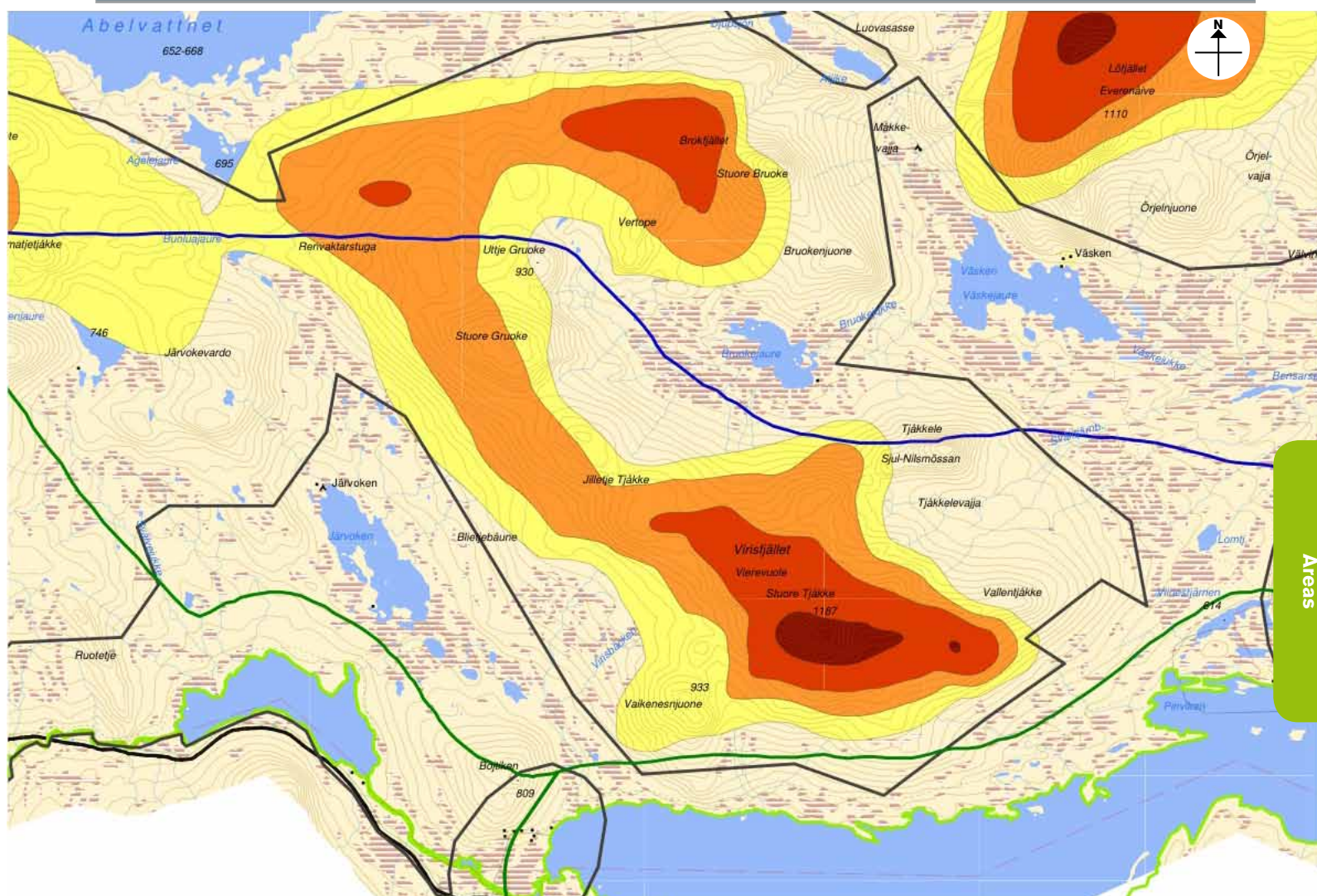
27. Arefjället



SCALE 1:50 000 1 cm = 500 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-9 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 61 km ²
Wind power potential:	approx. 180 turbines (annual production approx. 900 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Vapsten Sami village. • Tourism and recreational activity. • Nature conservation, Arefjällen, Vardofjällen, Lasterfjällen. • Recreational activity, Vilhelminafjällen. • Natura 2000, at Vardofjällen, Lasterfjällen and Fjällfjällen. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Natura 2000 covers a large part of the area. The region is an area of unbroken mountains and wilderness with varying topography of mountain birch-covered valleys between isolated mountain summits with vegetation worth protecting. • Hunting carried out in area. • Trails for trekking lead to Skalmodal. • Remains of Sami graves. • Commercial hunting and fishing is conducted in area. • Large, unbroken and unspoilt mountain region. • Reindeer herding affected.
Assessment	Area is not suitable for wind power due to the effect on many national interests and a valuable Natura 2000 area. The Sami cultural remains and trekking trails are to be preserved for the future.

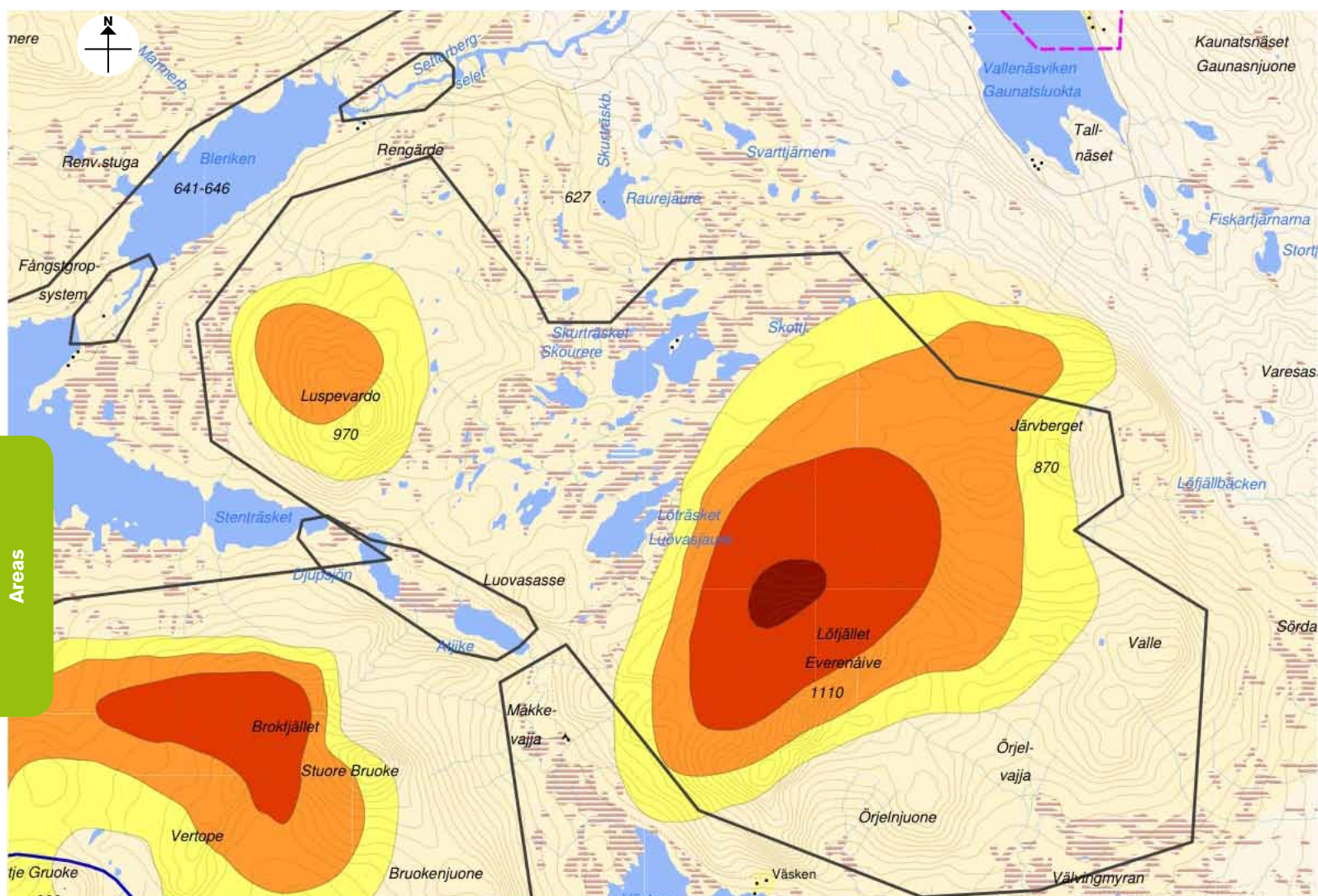
28 Virisfjället



SCALE 1:60 000 1 cm = 600 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-8.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 45 km ²
Wind power potential:	approx. 135 turbines (annual production approx. 675 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Vapsten Sami village. • Tourism and recreational activity. • Recreational activity, Vilhelminafjällen. • Nature conservation, in close proximity to Virisen. • Natura 2000, in close proximity to Virisen river system. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Birds of prey have been seen in the area. • Trails for trekking pass through area. • Only a narrow passage for reindeer exists in area. • Tourists visit area, attracted by the silence of the environment. • Reindeer herding is affected. • Ground water source is located close to area (to the west).
Assessment	Area is not suitable for wind power, partly due to the effect on national interests and the fact that the area is regarded as unspoilt and would be significantly affected by wind power development.

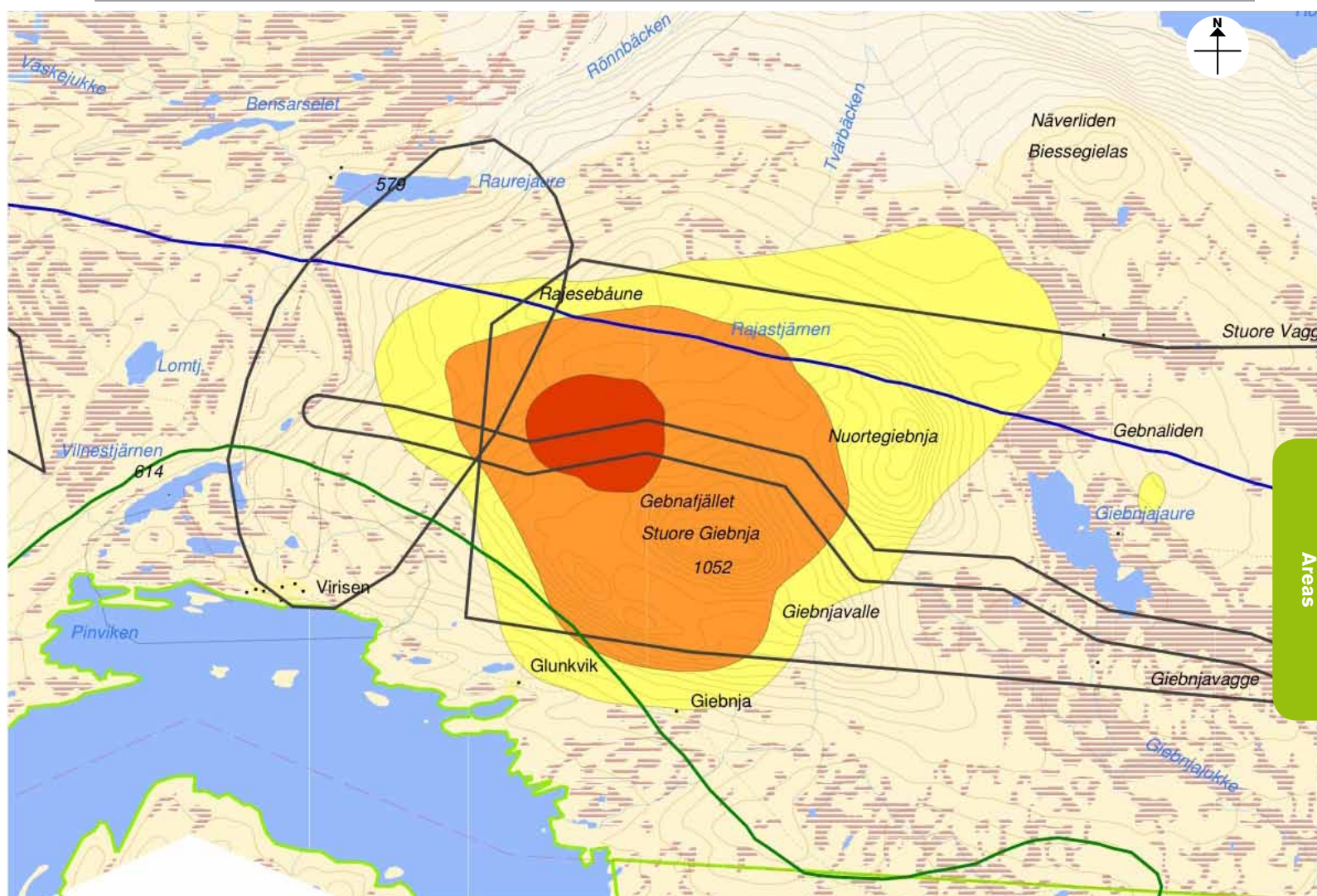
29-30 Luspevardo och Löfjället



SCALE 1:45 000 1 cm = 450 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-8.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 27 km ²
Wind power potential:	approx. 80 turbines (annual production approx.400 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Vapsten Sami village. • Tourism and recreational activity.
Other conditions:	<ul style="list-style-type: none"> • Very important area for transportation of reindeer as they only use a narrow pass. • Reindeer herding is affected. • Ground water source is located close to area (south of Luspevardo). • Close to power line.
Assessment	Area is not suitable for wind power due to the effect on national interests, in particular on the movement of reindeer.

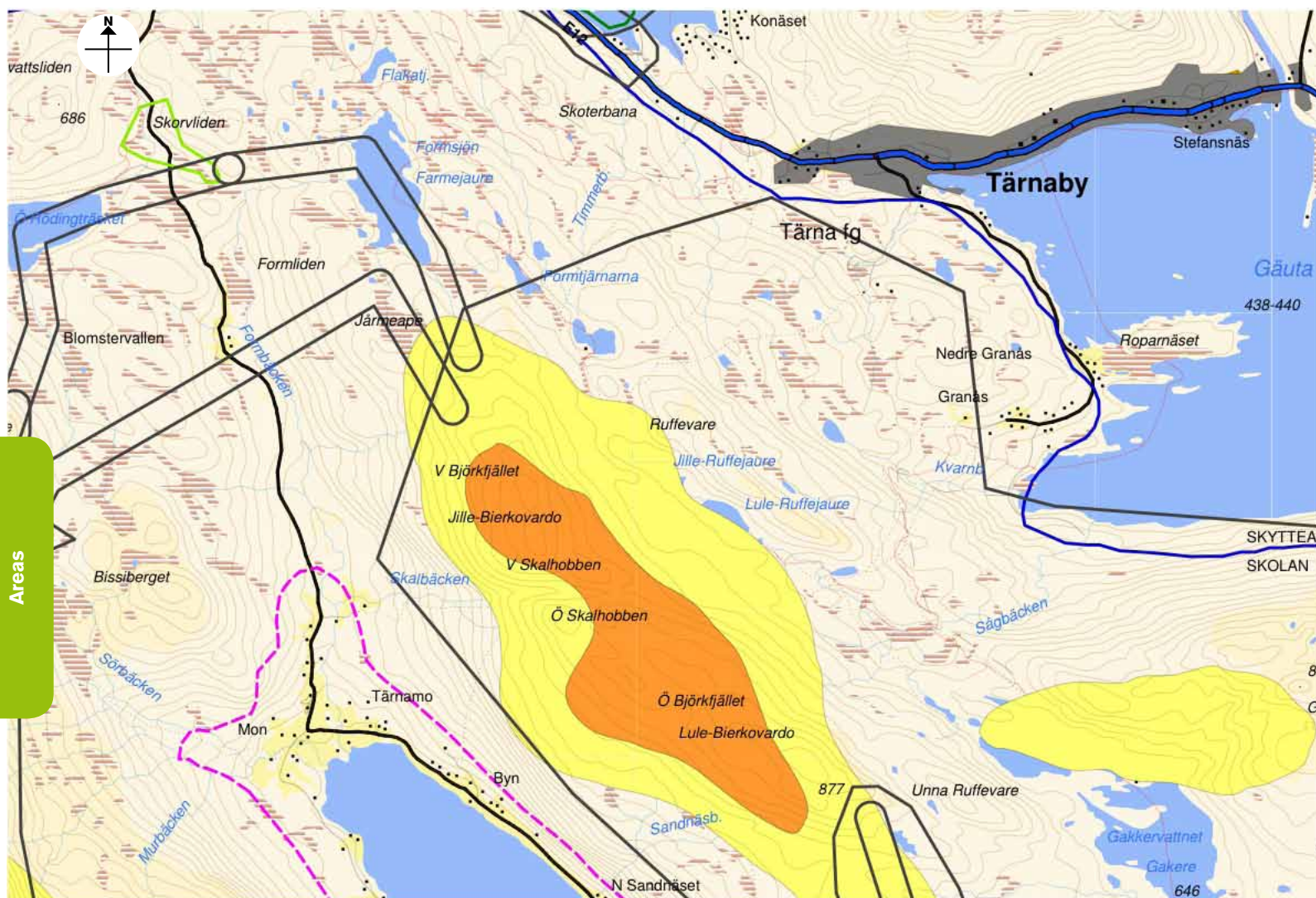
31. Gebnafjället



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 20 km ²
Wind power potential:	approx. 60 turbines (annual production approx. 300 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Vapsten Sami village. • Tourism and recreational activity. • Recreational activity, Vilhelminafjällen. • Nature conservation, in close proximity to Virisen. • Natura 2000, in close proximity to Virisen water course. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Birds of prey have been seen in the area. • Trails for trekking pass through area. • Only a narrow passage for reindeer exists in area. • Tourist visit area, attracted by the silent environment. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power due to the effect on many national interests (except wind power). Tourism and birdlife would also be affected as development would greatly alter the landscape and increase the risk of injury to birds of prey.

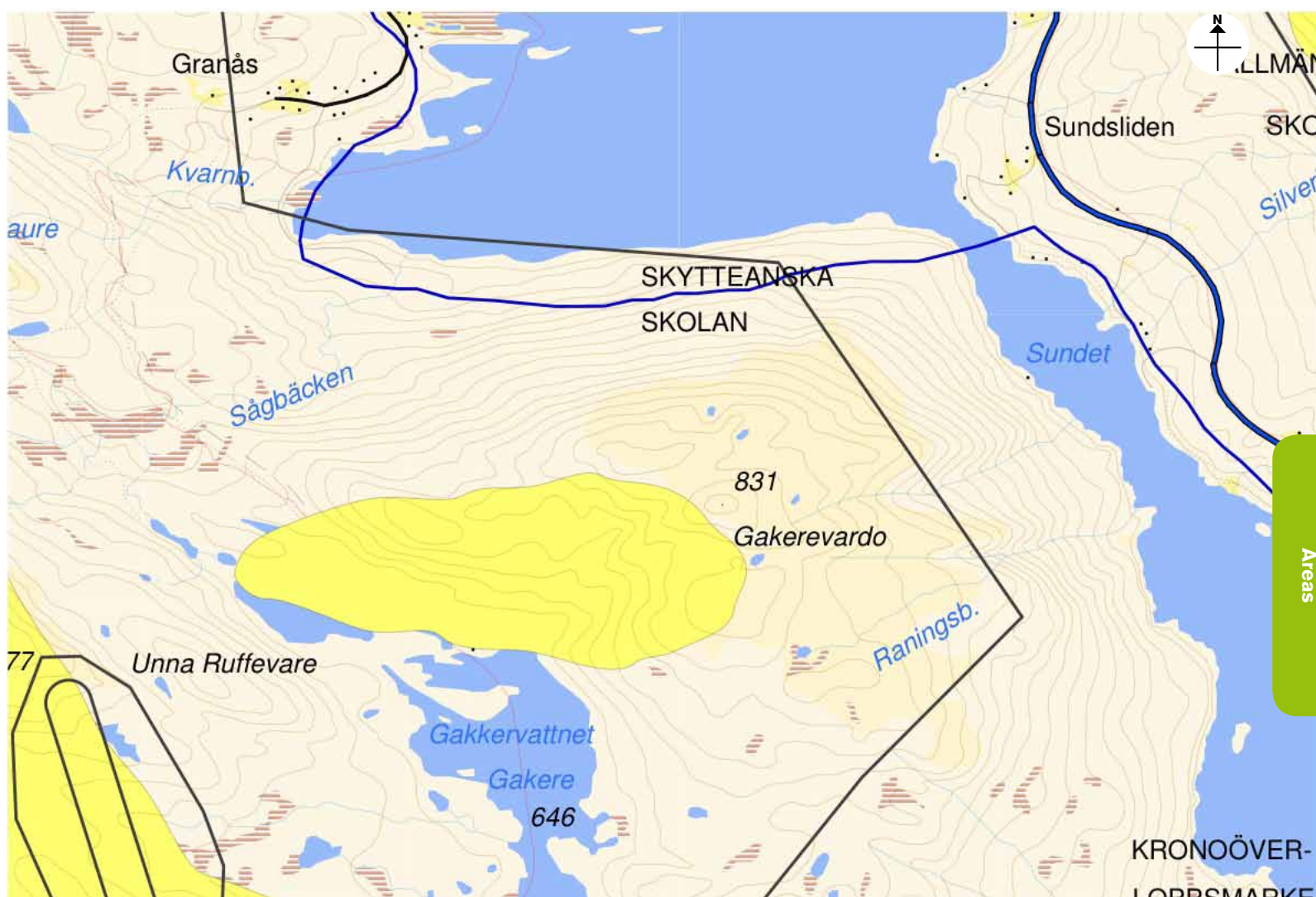
32. Björkfjället



SCALE 1:35 000 • 1 cm = 350 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 10 km ²
Wind power potential:	approx. 30 turbines (annual production approx. 150 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Vapsten Sami village. • Tourism and recreational activity.
Other conditions:	<ul style="list-style-type: none"> • Easily accessible recreational area. • Hunting in the area. • Cultural heritage sites in area, "church paths" and Sami graves. • There are several different important biotopes in the area. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power due to the effect on national interests. The whole site is a key area within Vapsten Sami village and contains valuable cultural heritage sites that need to be preserved.

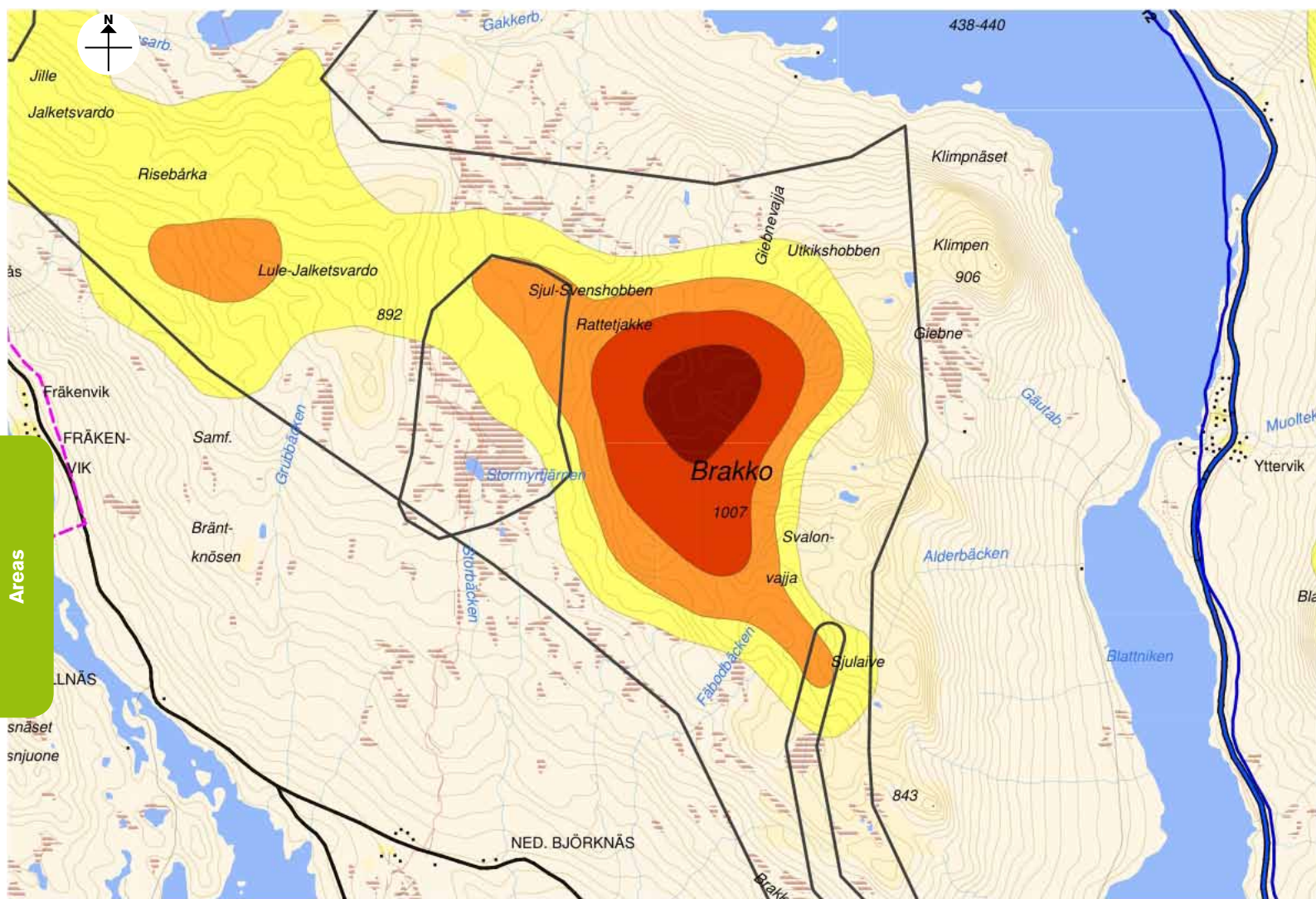
33. Gakerevardo



SCALE 1:25 000 1 cm = 250 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 3 km ²
Wind power potential:	approx. 9 turbines (annual production approx. 45 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Vapsten Sami village. • Tourism and recreational activity.
Other conditions:	<ul style="list-style-type: none"> • Easily accessible recreational area. • Hunting in the area. • Cultural heritage sites in area, "church paths" and Sami graves. • There are several different important biotopes in the area. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power due to the effect on national interests. The whole site is a key area within Vapsten Sami village and any development would significantly disturb the reindeer husbandry that is carried out at Gakerevardo.

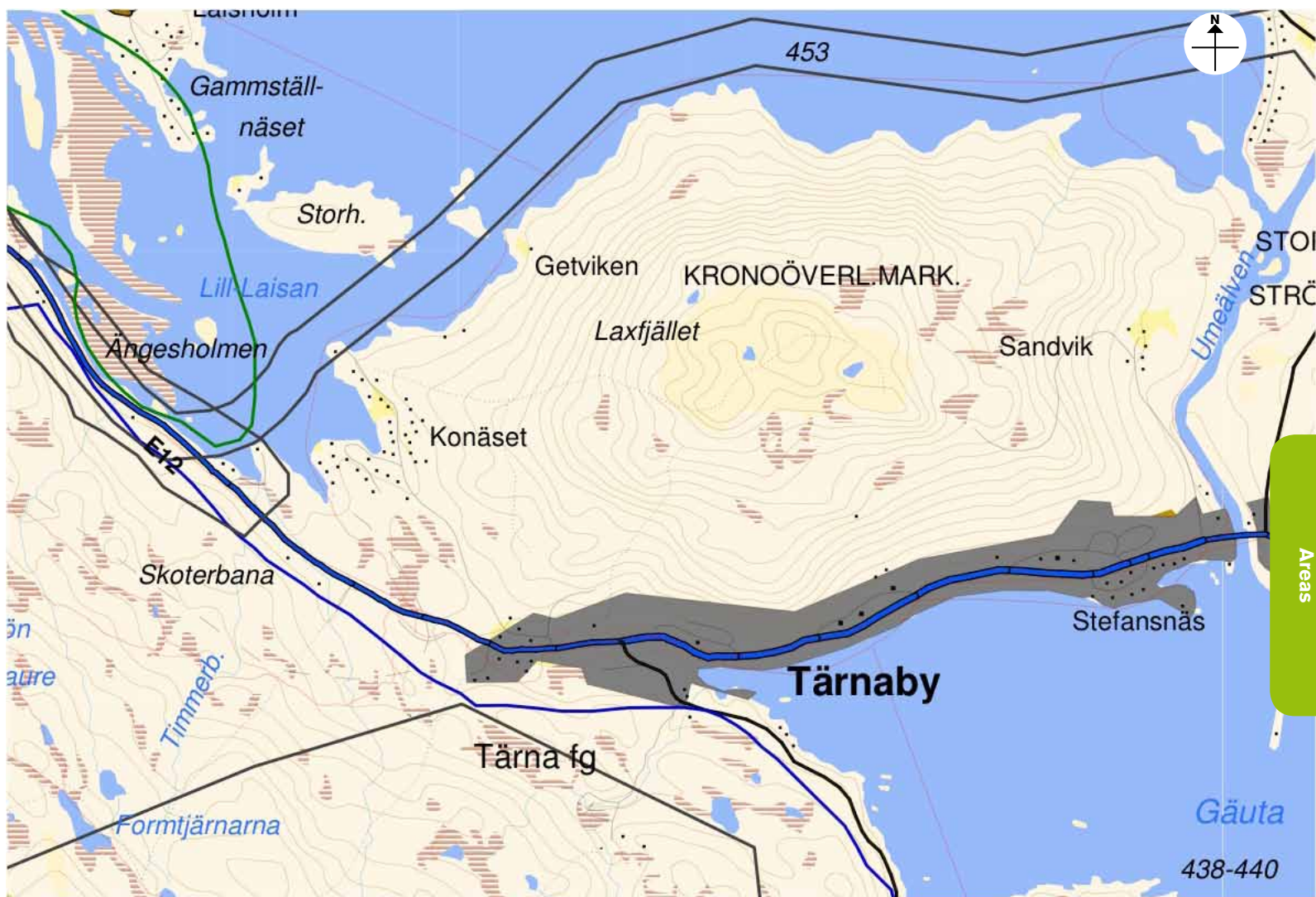
34. Brakko



SCALE 1:25 000 1 cm = 250 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-8.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 10 km ²
Wind power potential:	approx. 30 turbines (annual production approx. 150 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area with narrow passage within Vapsten Sami village. • Tourism and recreational activity. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Easily accessible recreational area. • Hunting in the area. • Cultural heritage sites in area, "church paths" and Sami graves. • There are several different important biotopes in the area. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power due to the effect on national interests (except wind power). The whole site is a key area within Vapsten Sami village and any development would significantly disturb the reindeer husbandry. Sami cultural heritage sites are very important in the area and should be protected.

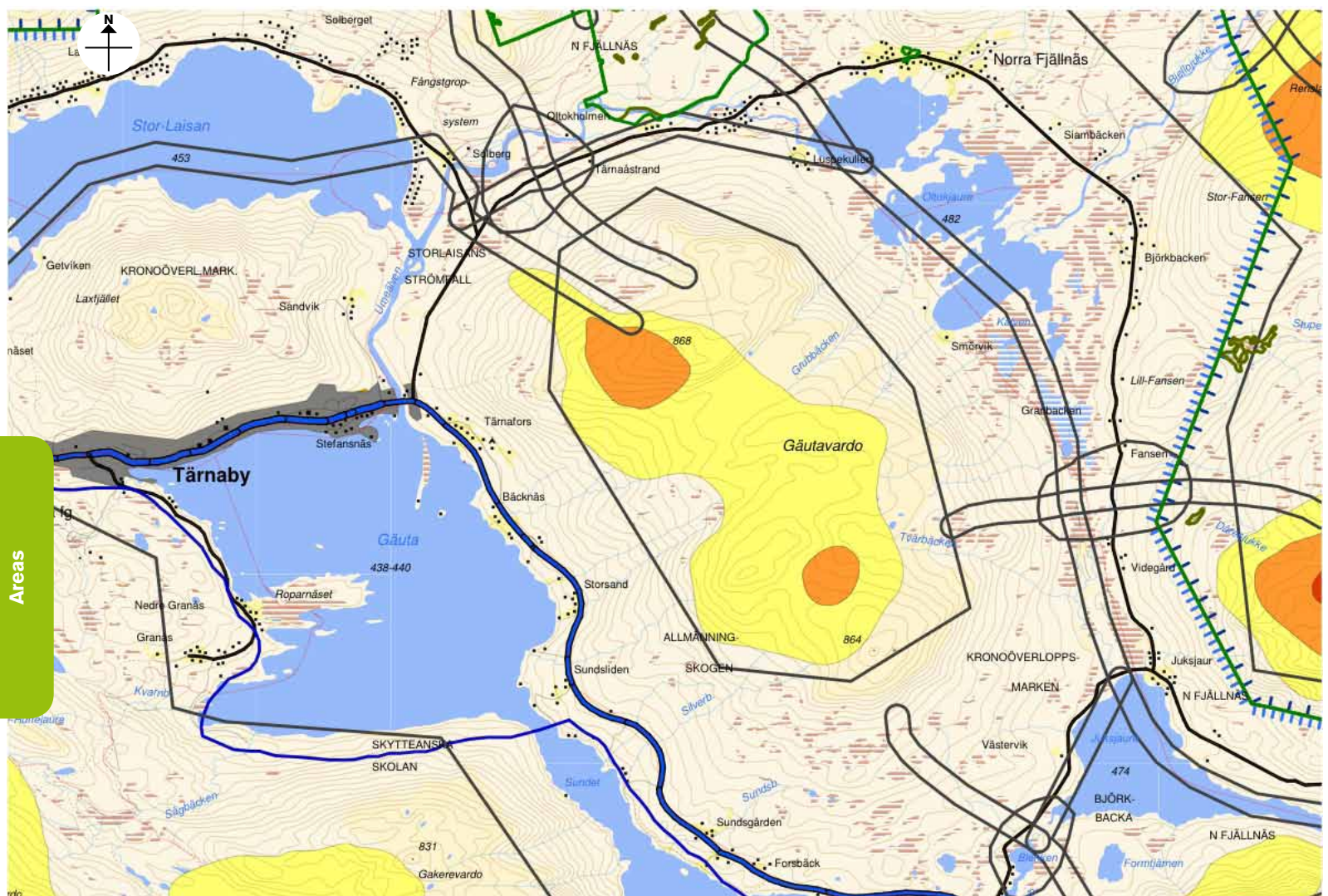
35. Laxfjället



SCALE 1:25 000 1 cm = 250 metres Resolution: 1000 metre grid

Land type:	Treeless area of high ground
Annual average wind strength:	6 m/s (at height of 103 m above chart datum displacement)
Surface area:	less than 1 km ²
Wind power potential:	approx. 3 turbines (annual production approx. 15 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ubmeje tjeälddie Sami village. • Tourism and recreational activity. • Recreational activity, Vindelfjällen.
Other conditions:	<ul style="list-style-type: none"> • Important area for hunting, tourism and recreational activities. • When planning to develop tourism, municipality will include whole area of Laxfjället. • Area affects slalom and ski lift facilities. • It can be advantageous to market "green" tourism. • Roads exist in area. • Close to E12 highway. • Within flight path zone of Hemavan airport. • Ground water source is located close to area (to the east).
Assessment	Area is not suitable for wind power as it would significantly disturb Hemavan airport's flight path. The wind power potential does not outweigh the disadvantages to national interests and other local interests.

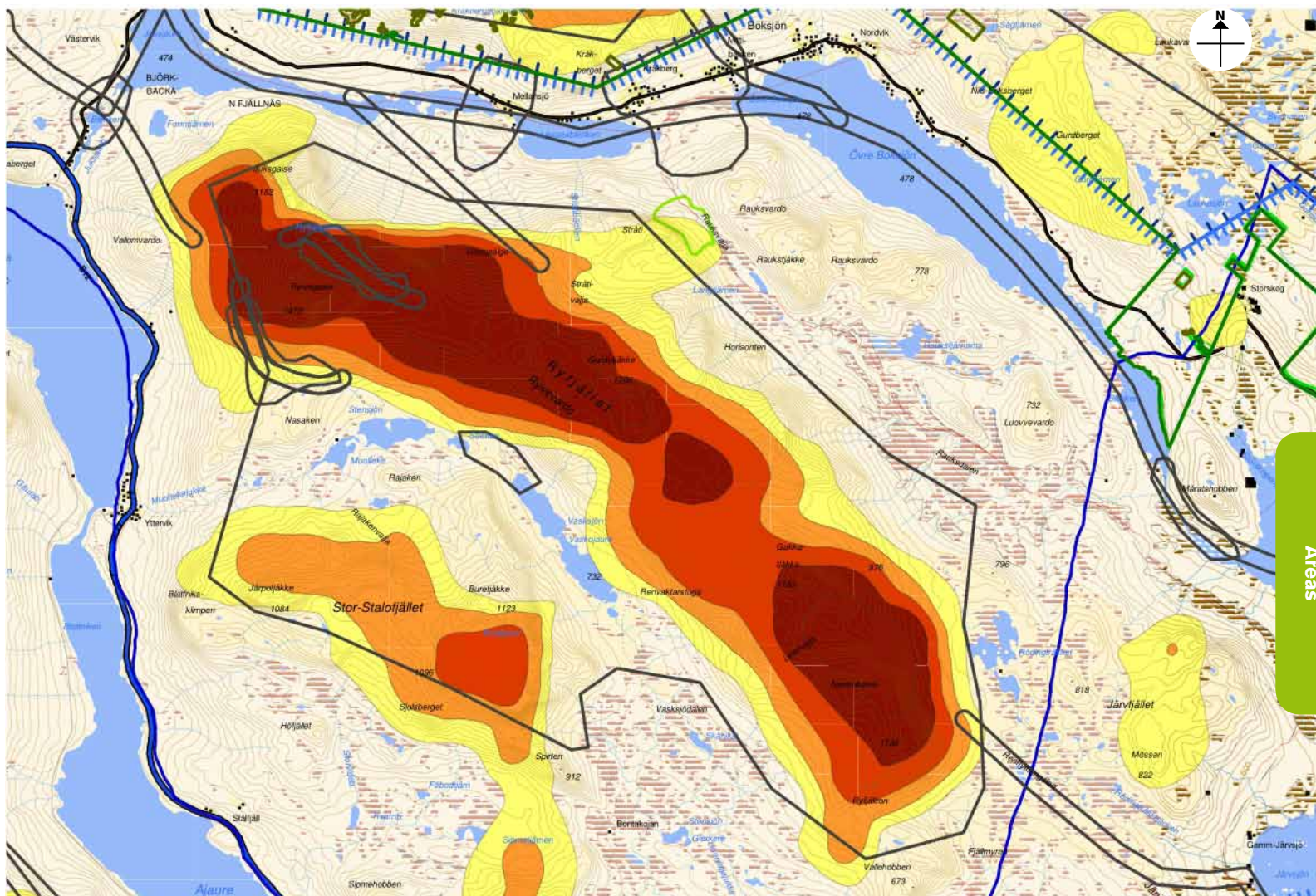
36. Gäutavardo/Gäutafjället



SCALE 1:50 000 • 1 cm = 500 metres Resolution: 1000 metre grid

Land type:	Treeless area of high ground
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 12 km ²
Wind power potential:	approx. 36 turbines (annual production approx. 180 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, resting area and migration route within Ubmeje tjeálddie Sami village. • Tourism and recreational activity. • Recreational activity close by in Vindelfjällen.
Other conditions:	<ul style="list-style-type: none"> • Used for recreation during summer and winter. • Hunting in area. • Close to roads. • Can be easier to construct roads compared to other mountain areas. • Reindeer herding is affected. • Close to E12 route and road 1115. • Ground water source is located close to area (north, south-east and north-east).
Assessment	Area is not suitable for wind power due to the significant effects on national interests (reindeer, tourism and recreational activities). The area is not classified as being of national interest for wind power.

37. Ryfjället

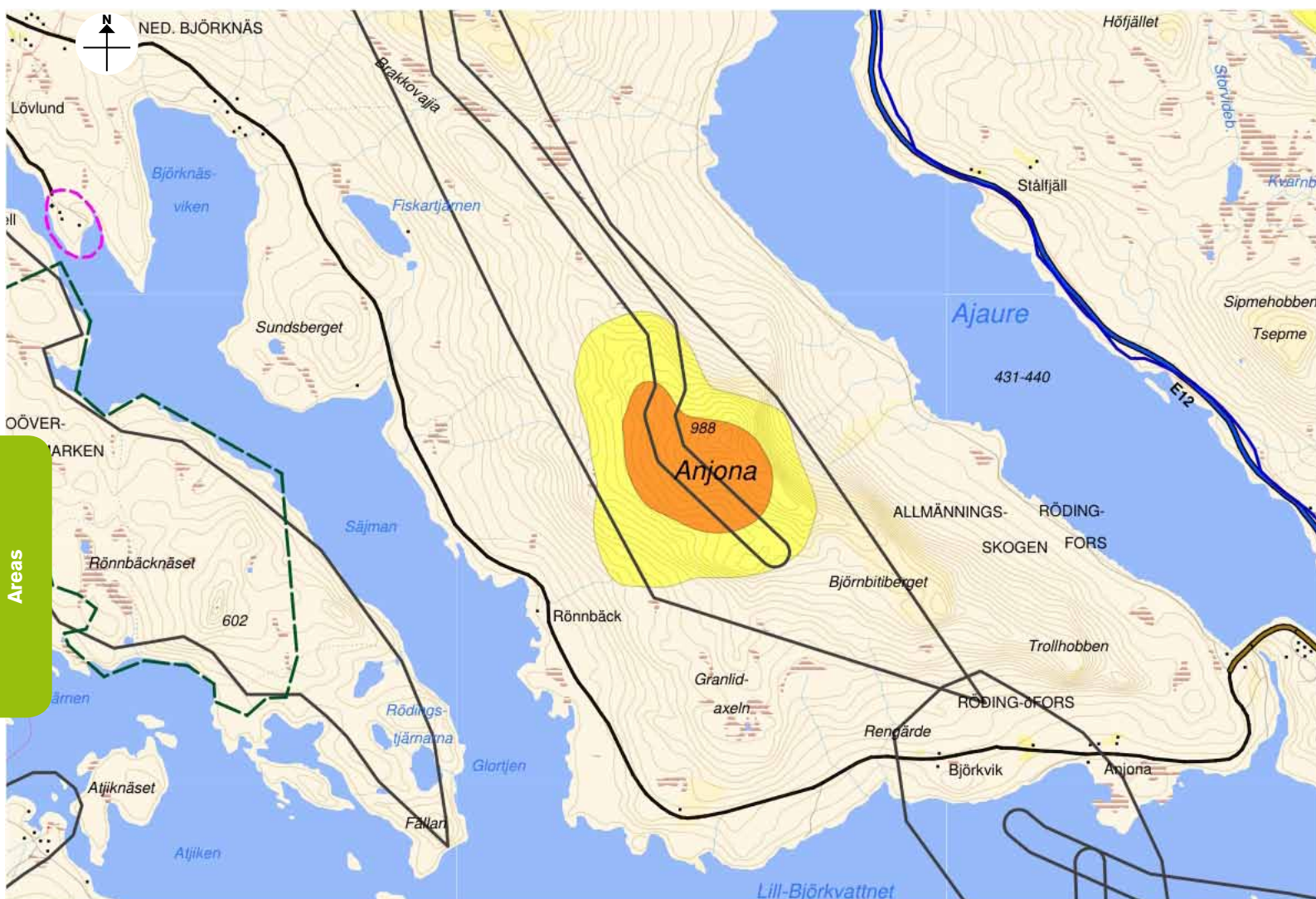


SCALE 1:70 000 1 cm = 700 metres Resolution: 1000 metre grid

Land type:	Treless high ground
Annual average wind strength:	6.5-8 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 52 km ²
Wind power potential:	approx. 156 turbines (annual production approx. 780 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area and migration route within Ubmeje tjeälddie Sami village. • Tourism and recreational activity. • Recreational activity, Vindelfjällenfjällen. • Nature conservation and in close proximity to Natura 2000 area (Rauksvaja). • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Cultural heritage sites in area (Sami site of sacrifices). • Popular trekking trail up to summit. • Ryfjället is very steep and it could be difficult to construct a road to any wind farm on the summit. • Ryfjället's profile is often used as a symbol for the region and for the municipality. • The area is often visited by slalom skiers and helicopters bring grouse hunters during the hunting season. • Reindeer herding is affected. • Ground water source is located close to area (north-west).
Assessment	Area is not suitable for wind power as the effects on national interests would be too great (except wind power). The main arguments against wind power come from the tourism sector and a cultural heritage perspective.

Areas

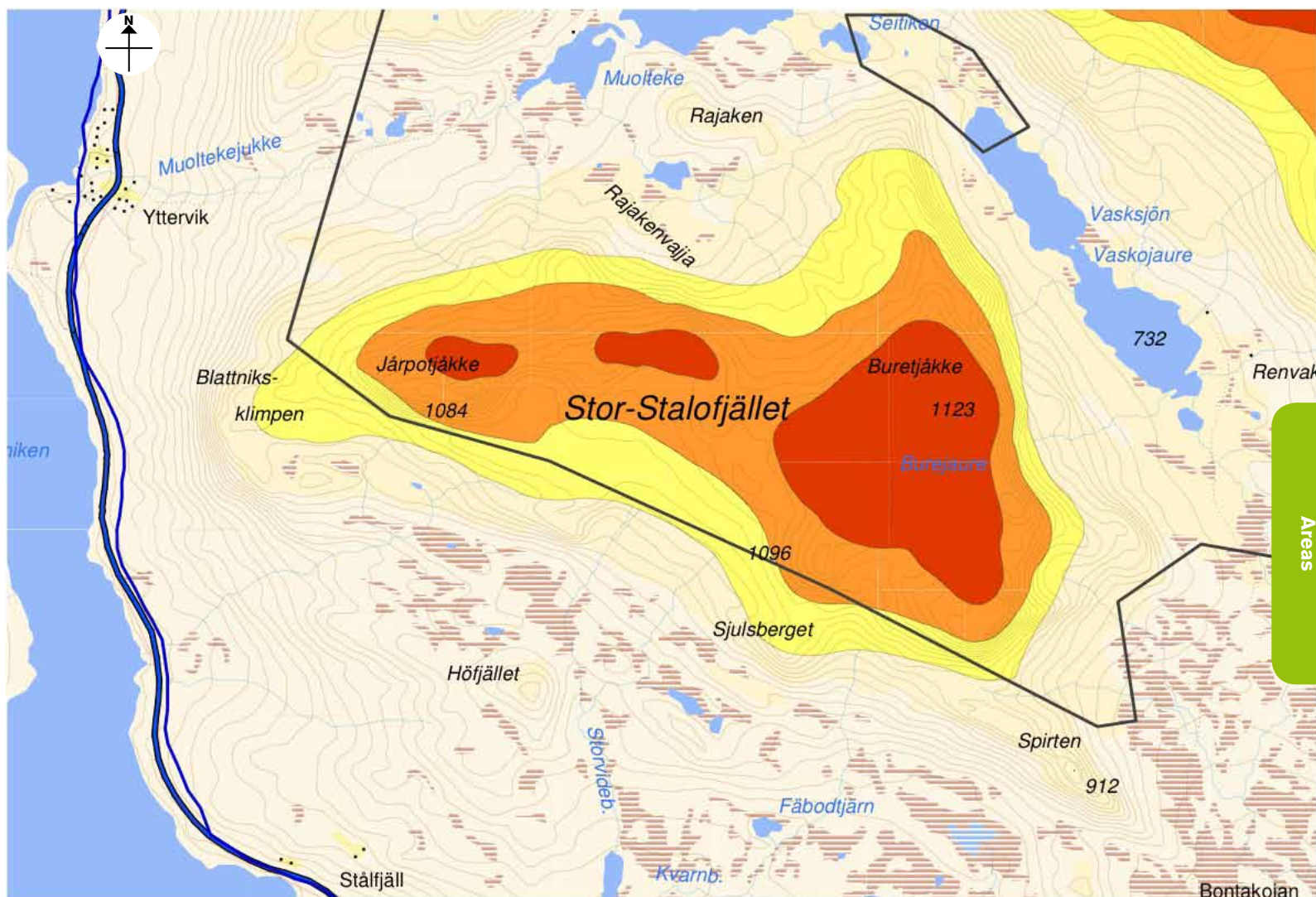
38. Anjona



SCALE 1:40 000 • 1 cm = 400 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-7.5m/s (at height of 103 m above chart datum displacement)
Surface area:	4.5 km ²
Wind power potential:	approx. 13 turbines (annual production approx. 67 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area and migration route within Vapsten Sami village. • Tourism and recreational activity.
Other conditions:	<ul style="list-style-type: none"> • Recreational area for berry and mushroom pickers. • Hunting is carried out in area. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power as the effects on national interests (tourism and recreational activities) would be too great.

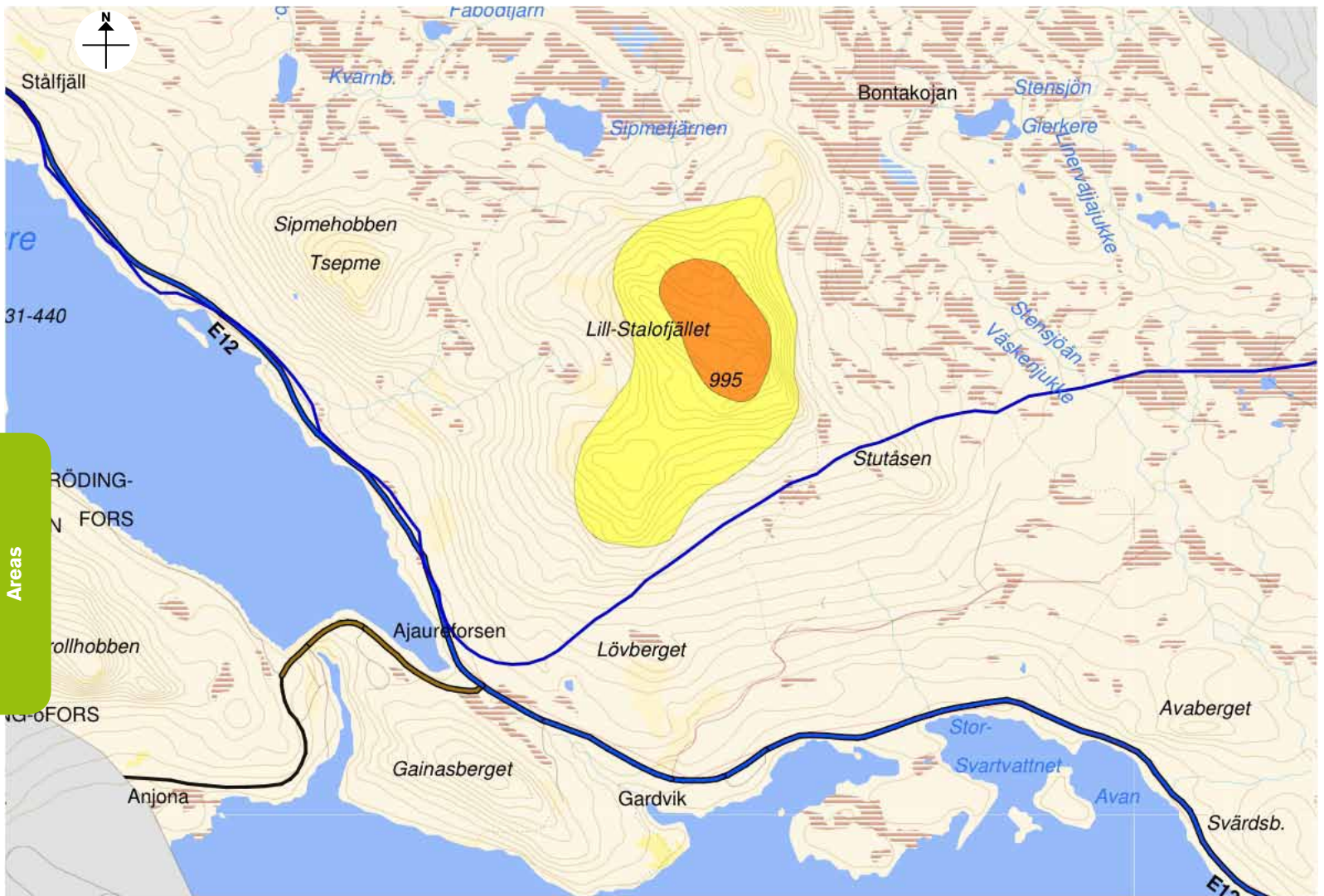
39-40 Stalofjället (Stor-Stalofjället och Lill-Stalofjället, se karta nästa sida)



SCALE 1:30 000 1 cm = 300 metres Resolution: 500 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-8 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 20 km ²
Wind power potential:	approx. 15 turbines (annual production approx. 75 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, key area within Ubmeje tjeälddie Sami village. • Tourism and recreational activity. • Recreational activity, Vindelfjällen. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Key area for Sami village covers large part of area. • Snowmobile trail leads to Forsmark. • Any installation could be linked with Sipmehobben as it is close to power cables and not far from the road. • Close to E12 highway. • Close to power cable. • Reindeer herding is affected. • Area containing important wildlife. • Recreational area.
Assessment	Lill-Stalofjället and Stor-Stalofjället are suitable areas for wind power development except for those sections of Stor-Stalofjället that have national interests for reindeer herding. When building new infrastructure, special consideration must be given to reindeer herding.

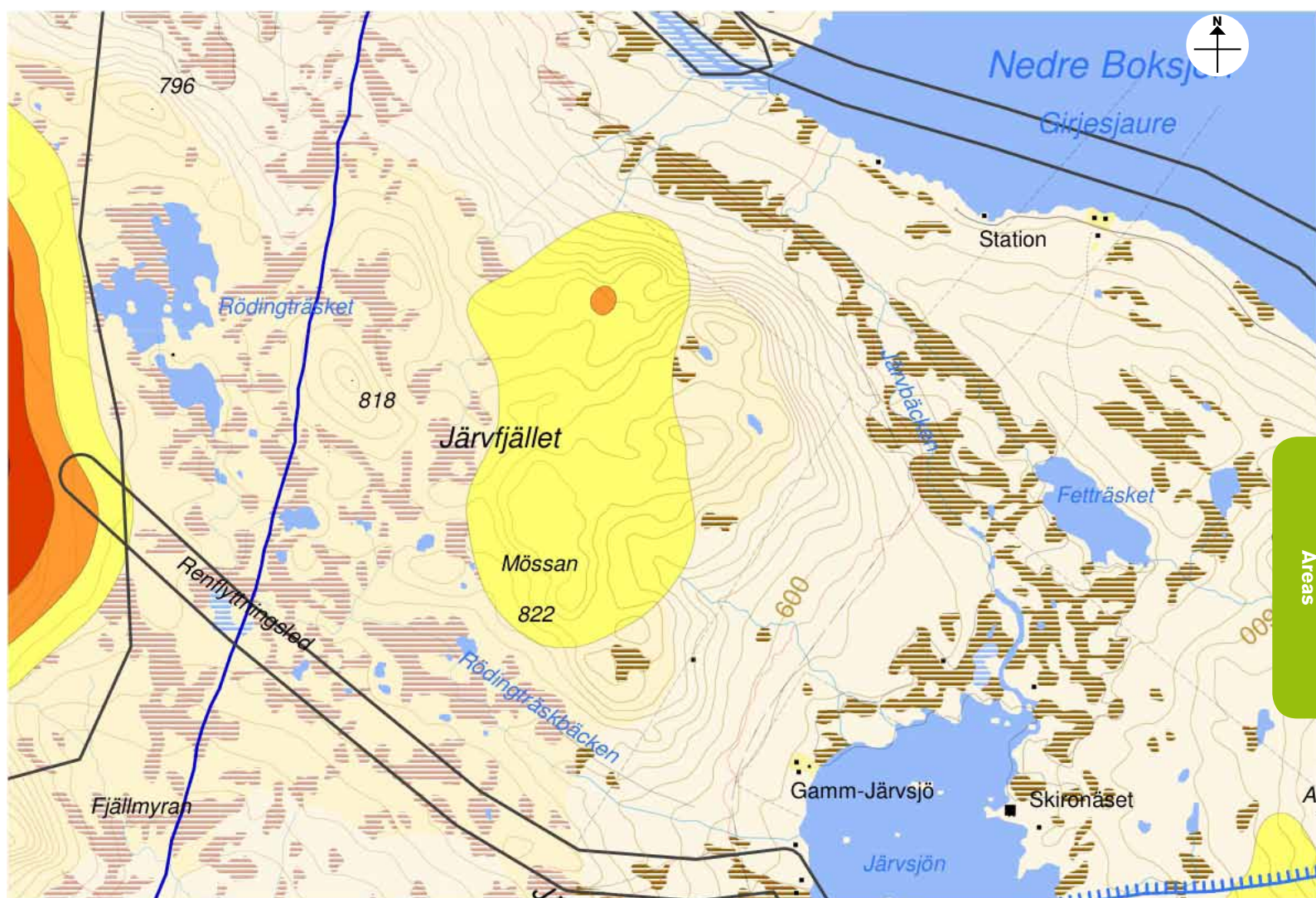
40. Lill-Stalofjället



SCALE 1:30 000 1 cm = 300 metres Resolution: 500 metre grid

Areas

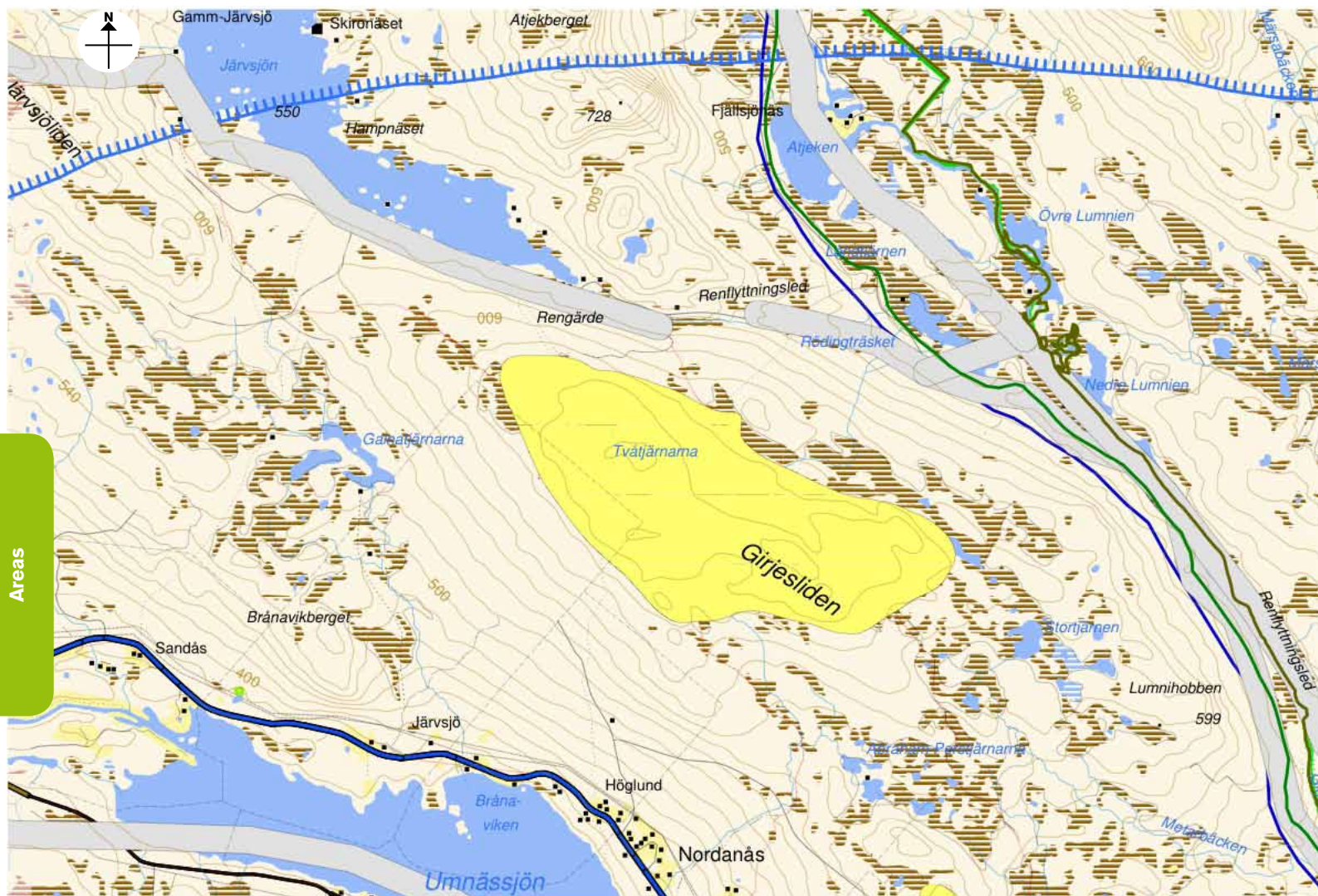
41. Järvfjället



SCALE 1:30 000 • 1 cm = 300 metres Resolution: 1000 metre grid

Land type:	Treeless high ground
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 4 km ²
Wind power potential:	approx. 12 turbines (annual production approx. 60 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Tourism and recreational activity.
Other conditions:	<ul style="list-style-type: none"> • Important recreational activities during summer and winter. • As it is a popular destination, there is heavy snowmobile traffic during winter.
Assessment	Area is not suitable for wind power as the wind power potential does not outweigh the effects it may have on tourism and recreational activities. The interests of the general public have been taken into consideration in the assessment of this area.

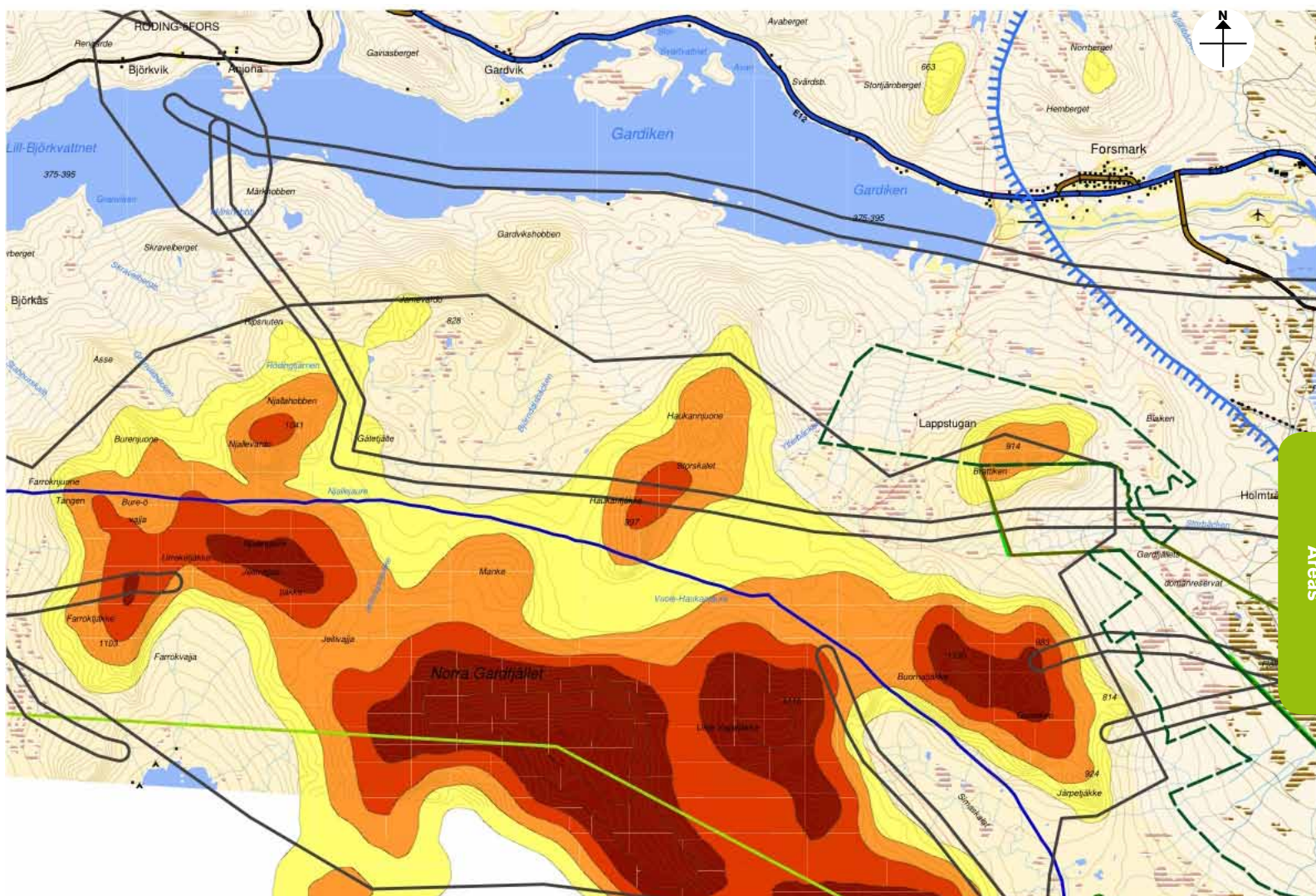
42. Girjesliden



SCALE 1:45 000 • 1 cm = 450 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 19.5 km ²
Wind power potential:	approx. 58 turbines (annual production approx. 290 GWh)
National interest classifications:	• None
Other conditions:	<ul style="list-style-type: none"> • Commonly used in winter by snowmobile traffic. • Gravel roads exist in area. • Hunting is carried out in area. • Recreational area. • Close to power lines. • Close to E12 highway. • Large sections of area are class 2 wetlands.
Assessment	Area is suitable for wind power as the benefits outweigh the disadvantages to the few interests that exist. When building new infrastructure, special consideration should be given to the large areas of wetlands.

43. Norra Gardfjället

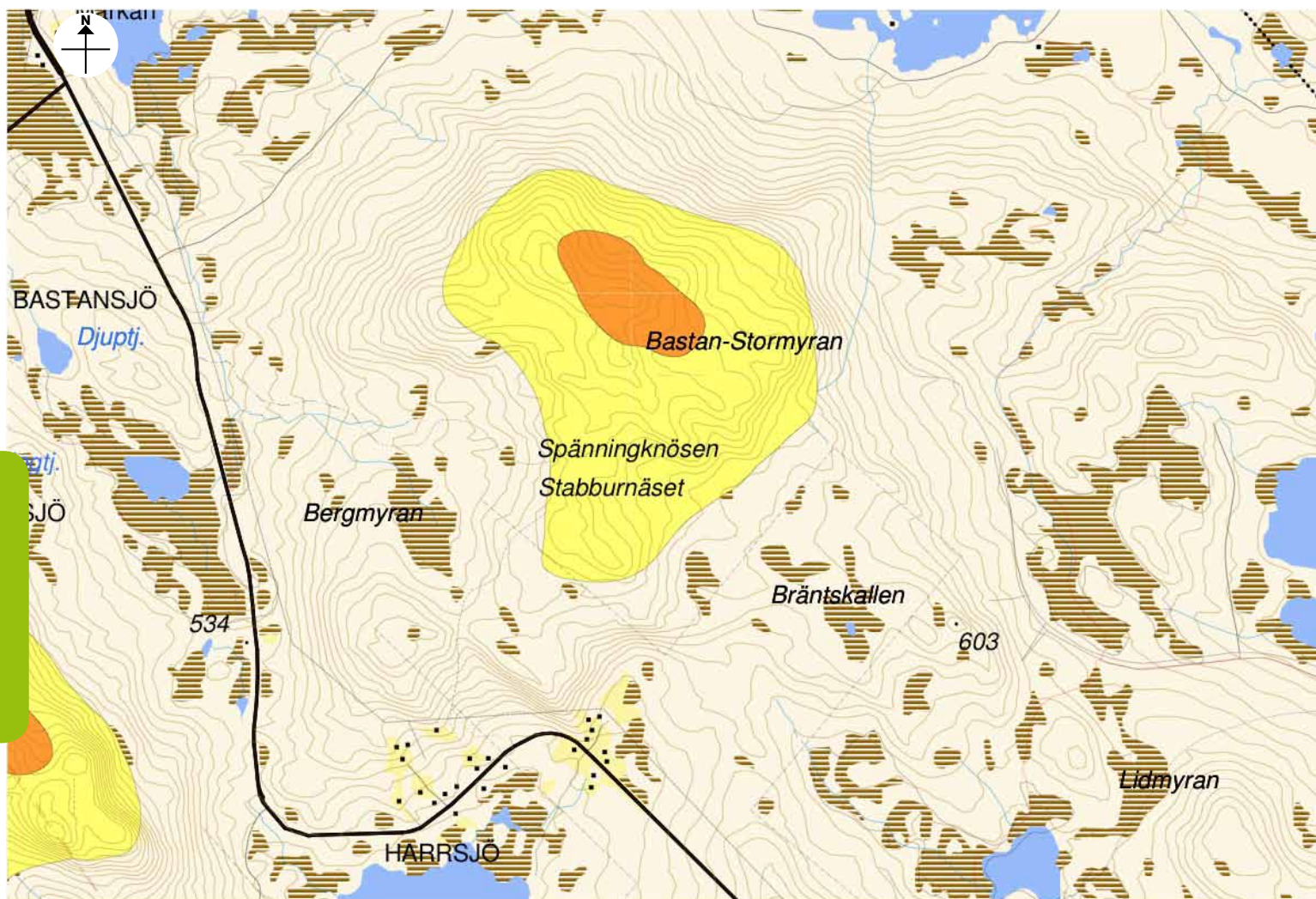


SCALE 1:60 000 1 cm = 600 metres Resolution: 500 metre grid

Land type:	Mountain birch forest and treeless higher ground	
Annual average wind strength:	6.5-9.5m/s (at height of 103 m above chart datum displacement)	
Surface area:	approx. 70 km ²	
Wind power potential:	approx. 15 turbines (annual production approx. 75 GWh)	
National interest classifications:	<ul style="list-style-type: none"> • Tourism and recreational activity. • Reindeer herding, key area and migration route within Vapsten Sami village. • Recreational activity, Vilhelminafjällen. 	<ul style="list-style-type: none"> • Protected natural area, Brattiken reserve. • Natura 2000, Södra Gardfjället and Brattiken. • Nature reserve, Brattiken. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Brattiken is a nature reserve and Natura 2000 area, which stretches from the summit of Brattiken in the west to flatter, marsh-dominated terrain in the east. The marsh is registered as class 1 in the inventory of wetlands. • In Vilhelmina municipality, Gardfjället is identified as a Natura 2000 area of national interest (southern Gardfjället) • The surrounding villages use the area for recreational purposes during winter and summer. • Hunting is carried out in the area. • Gardfjället is visible along a 70 km stretch of the E12 highway (Blakern to Gardvik). 	<ul style="list-style-type: none"> • The area contains trails for trekking. • Power cables are connected to a telecommunications mast in the area. • Power cables from the turbines will not have to be drawn through the Natura 2000 area. • Reindeer herding is affected. • The area contains land that is used throughout year round within reindeer husbandry. • The northern and north-eastern side of Brattiken will contain areas of forest that have been voluntarily excluded from forestry activities (Sveaskog).
Assessment	The area is not suitable for development due to the effect on national interests, the nature reserve, the area used for recreation and the stretches of forest that are to be voluntarily removed from forestry activities. The wind power potential does outweigh these combined interests.	

Areas

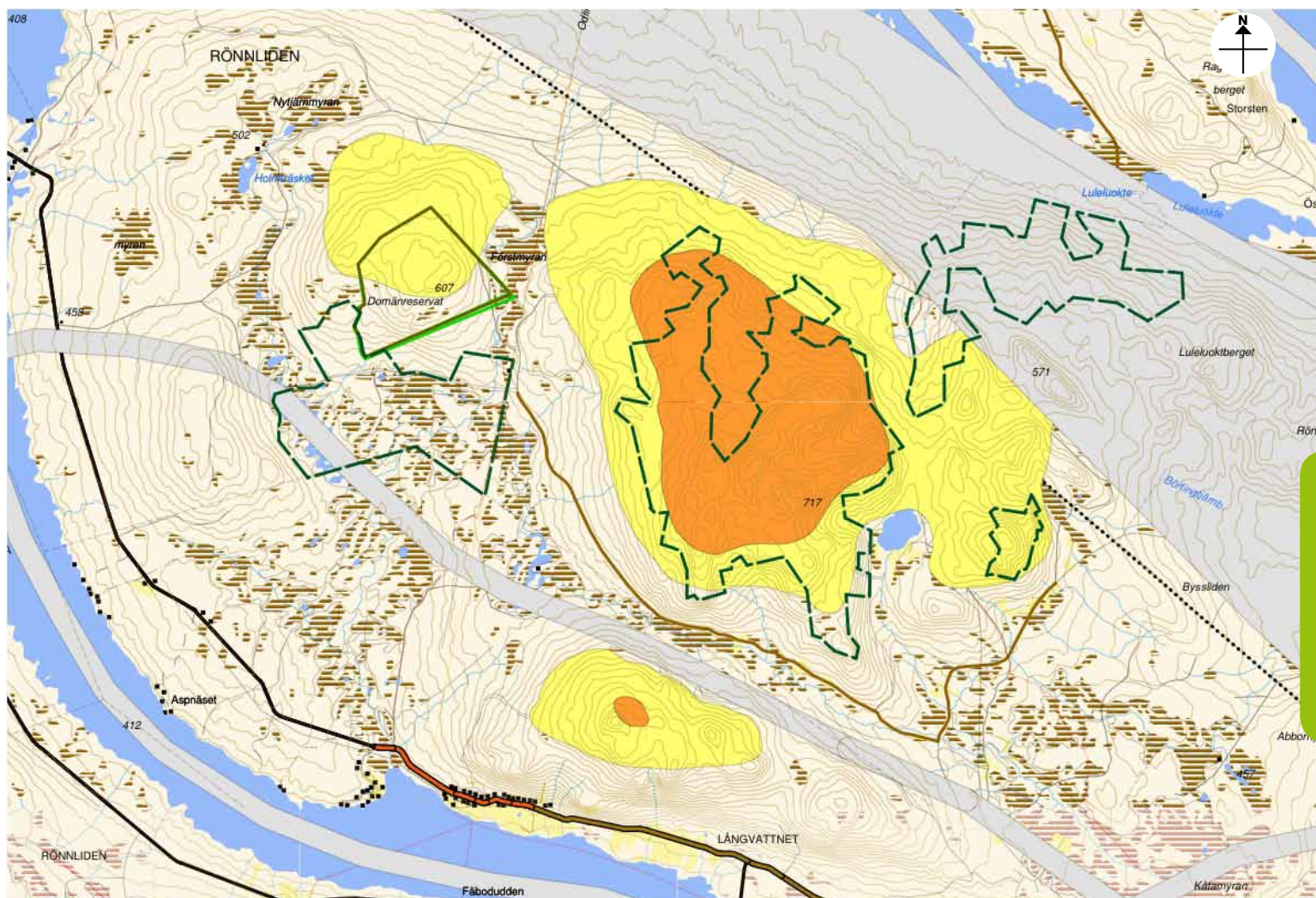
44. Bastanliden



SCALE 1:20 000 • 1 cm = 200 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 5 km ²
Wind power potential:	approx. 15 turbines (annual production approx. 75 GWh)
National interest classifications:	• None
Other conditions:	<ul style="list-style-type: none"> • Hunting is carried out in area. • Being a popular recreational destination, it has a wind shelter at the top. • A station would be visible over a wide area. • Reindeer husbandry of Vapsten Sami village would be affected. • Year-round land use for reindeer herding.
Assessment	Area is suitable for wind power as the benefits outweigh the negative affects on the few interests that exist. Special consideration is to given to reindeer husbandry.

45-46 Vallträsk / Vallträskhobben

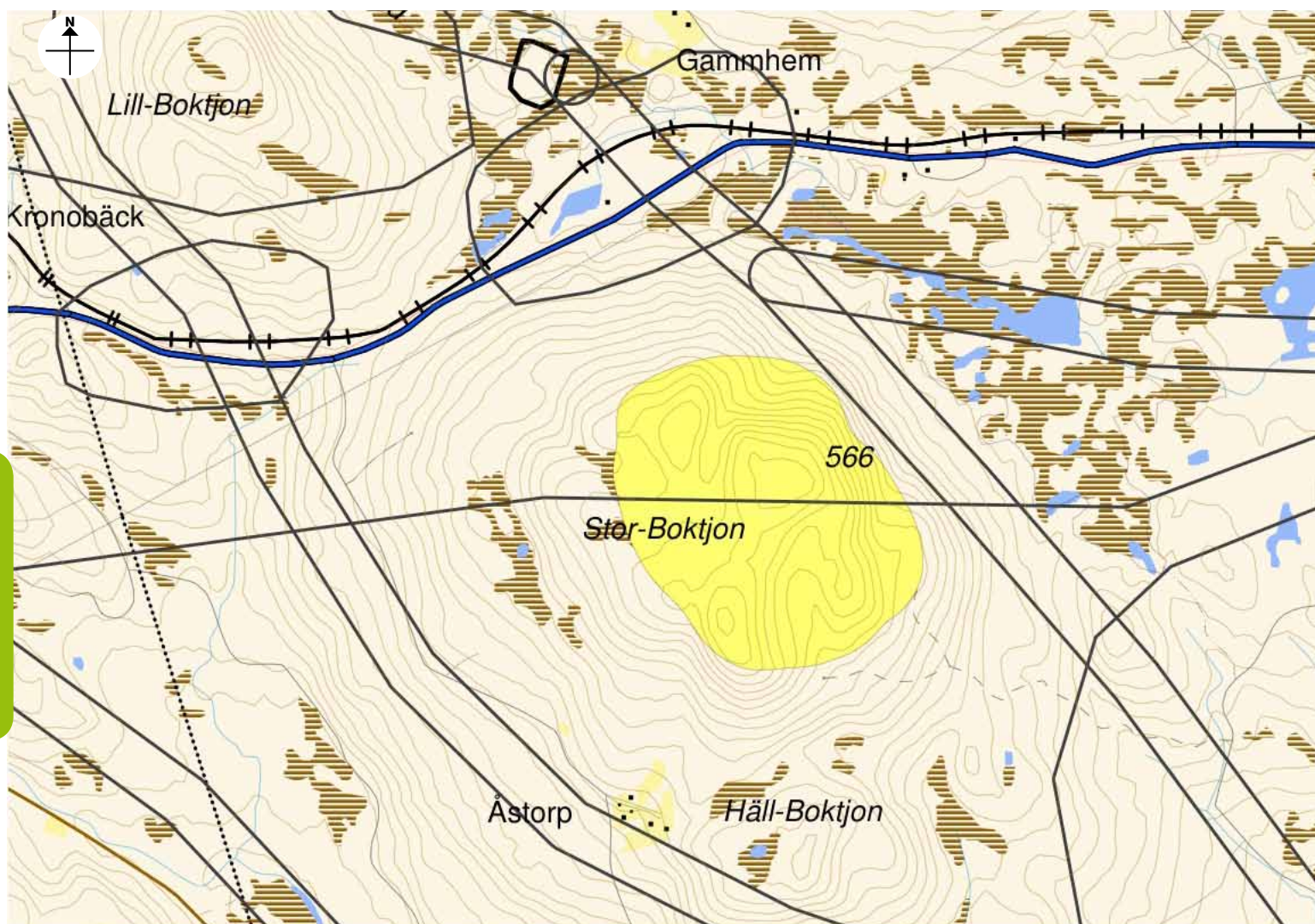


Areas

SCALE 1:50 000 • 1 cm = 500 metres Resolution: 500 metre grid

Land type:	Forest	
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)	
Surface area:	approx. 20 km ²	
Wind power potential:	approx. 60 turbines (annual production approx. 150 GWh)	
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, migration route within Vapsten Sami village. • Protected natural area, Rönnberget reserve. 	<ul style="list-style-type: none"> • Nature reserve, Rönnberget. • Natura 2000, Rönnberget. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Rönnberget is an area 500-600 m above sea level, which consists of a hill covered in spruce-dominated original forest and small marshes. The forest is varied and contains trees of varying ages. • Hunting is carried out in area. • The area surrounding Vallträskhobben is especially important due to its size, to the continuous stretch of unspoilt landscape and to the fact that it contains valuable sites for cultural heritage and wildlife. • Close to power cables. 	<ul style="list-style-type: none"> • Close to road 1100. • The area is close to Storuman and demand for tourist destinations in areas such as Vallträskhobben will probably increase in the future. • Reindeer herding. • There are stretches of forest that are excluded from forestry activities (Sveaskog). • An small source of ground water is located close to area (west of village Långsjöby).
Assessment	Area is suitable for wind power with the exception of Rönnberget nature reserve and southern sections of the area which is covered by the national interest for reindeer husbandry. Special consideration should be given to reindeer herding and the stretches of forest that have been voluntarily excluded from the area.	

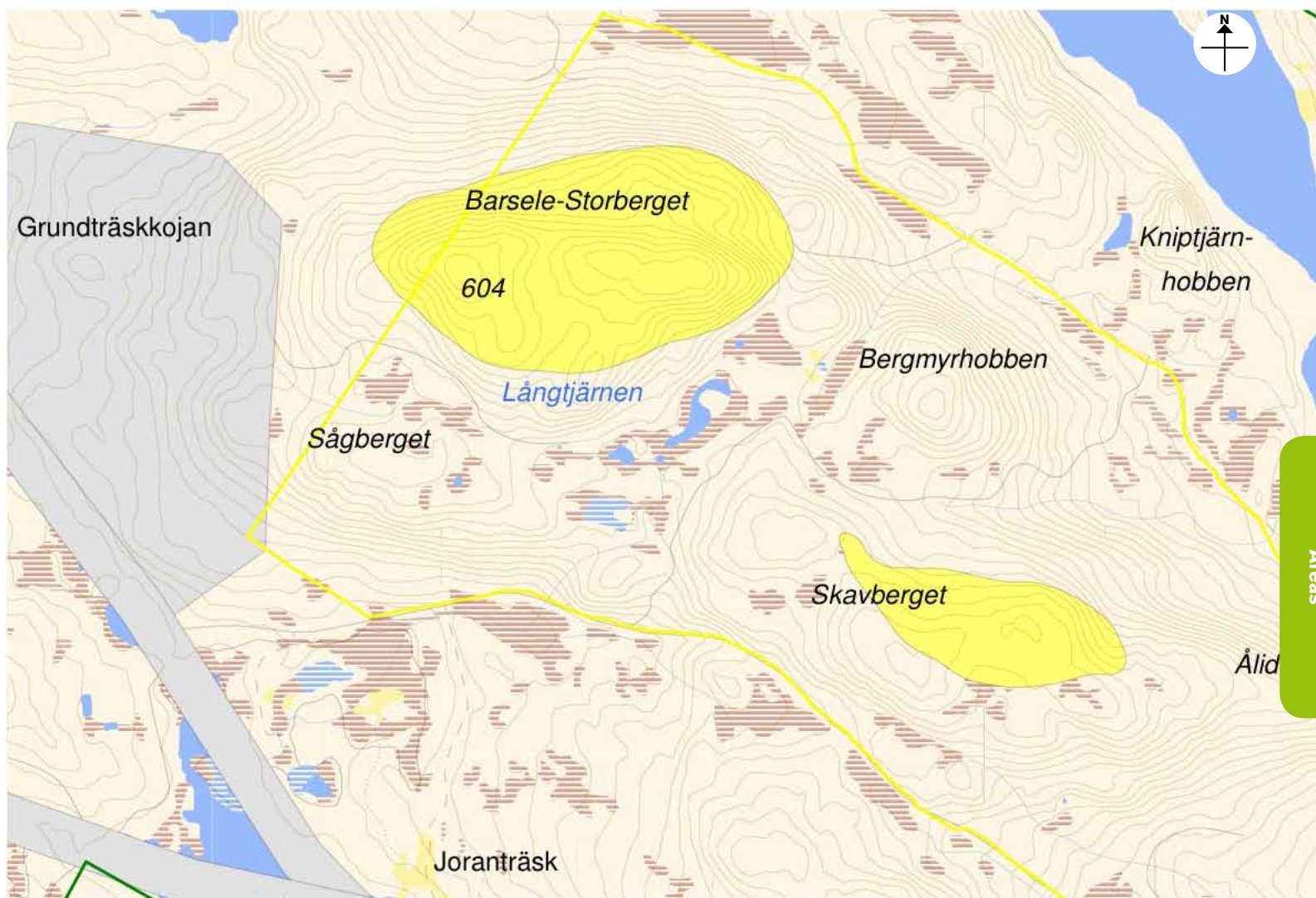
47. Stor-Boktjon



SCALE 1:25 000 • 1 cm = 250 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 3 km ²
Wind power potential:	approx. 15 turbines (annual production approx. 75 GWh)
National interest classifications:	Reindeer herding, key area within Ubmeje tjeälddie Sami village.
Other conditions:	<ul style="list-style-type: none"> • Hunting is carried out in the area. • Forestry is conducted in the area. • Reindeer herding is affected.
Assessment	Area is not suitable for wind power as it would have too great an effect on reindeer herding. The wind power potential does not outweigh the value of preserving the interests of the general public for hunting and forestry.

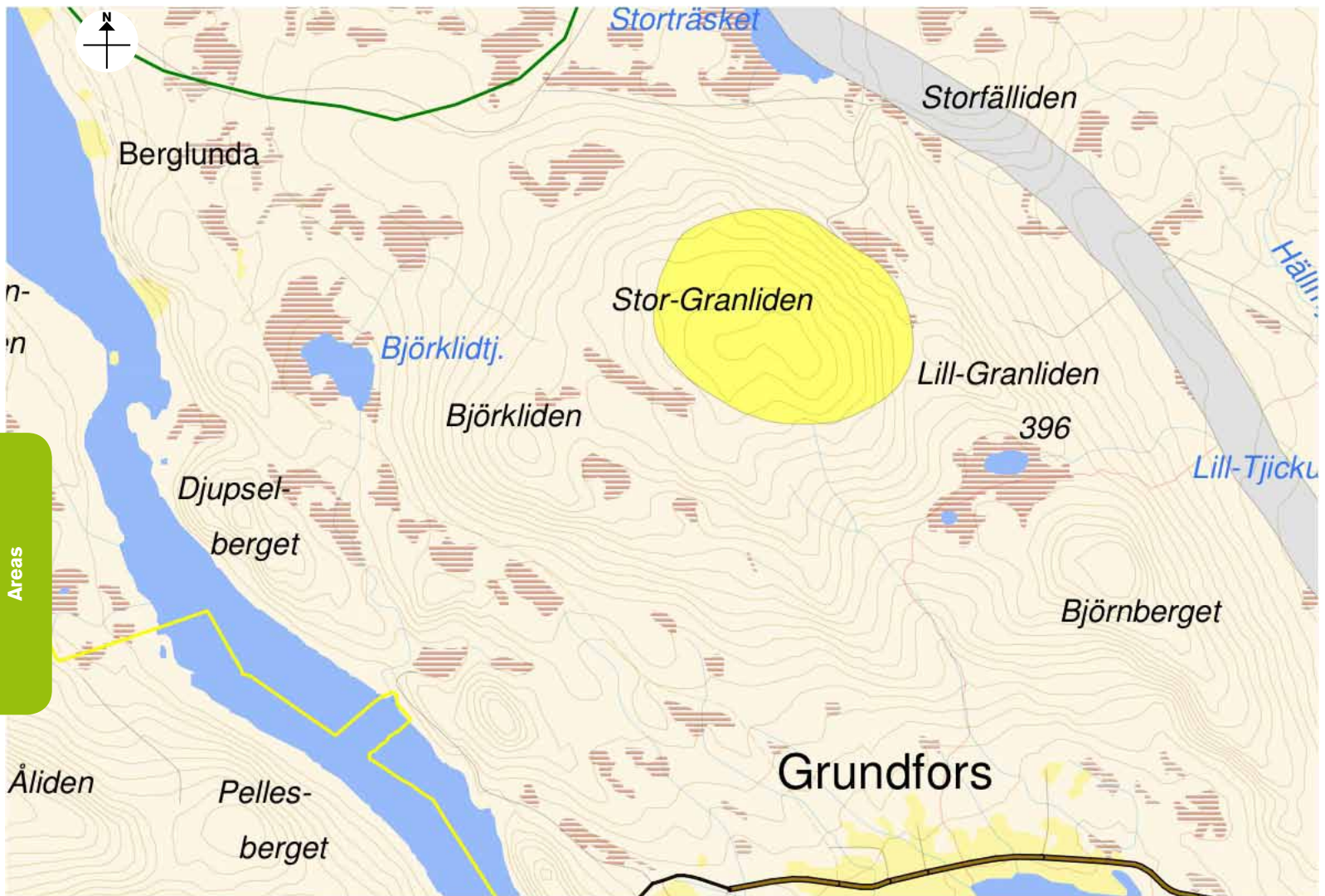
48. Barsele - Storberget



SCALE 1:25 000 • 1 cm = 250 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 7 km ²
Wind power potential:	approx. 21 turbines (annual production approx. 105 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to Vapsten Sami village.
Other conditions:	<ul style="list-style-type: none"> • Incorporated into Jovan Ekopark (Sveaskog). • Jovan Ekopark is an area of old forest with varying landscapes which benefits a wide diversity of wildlife. • Power lines pass through area. • Ground water source is located close to area (north). • Contact with Storuman airport should be made during planning phase.
Assessment	Area is suitable for wind power as there are few interests in conflict with potential development. It will be necessary to examine documents governing the Jovan Ekopark before any development commences.

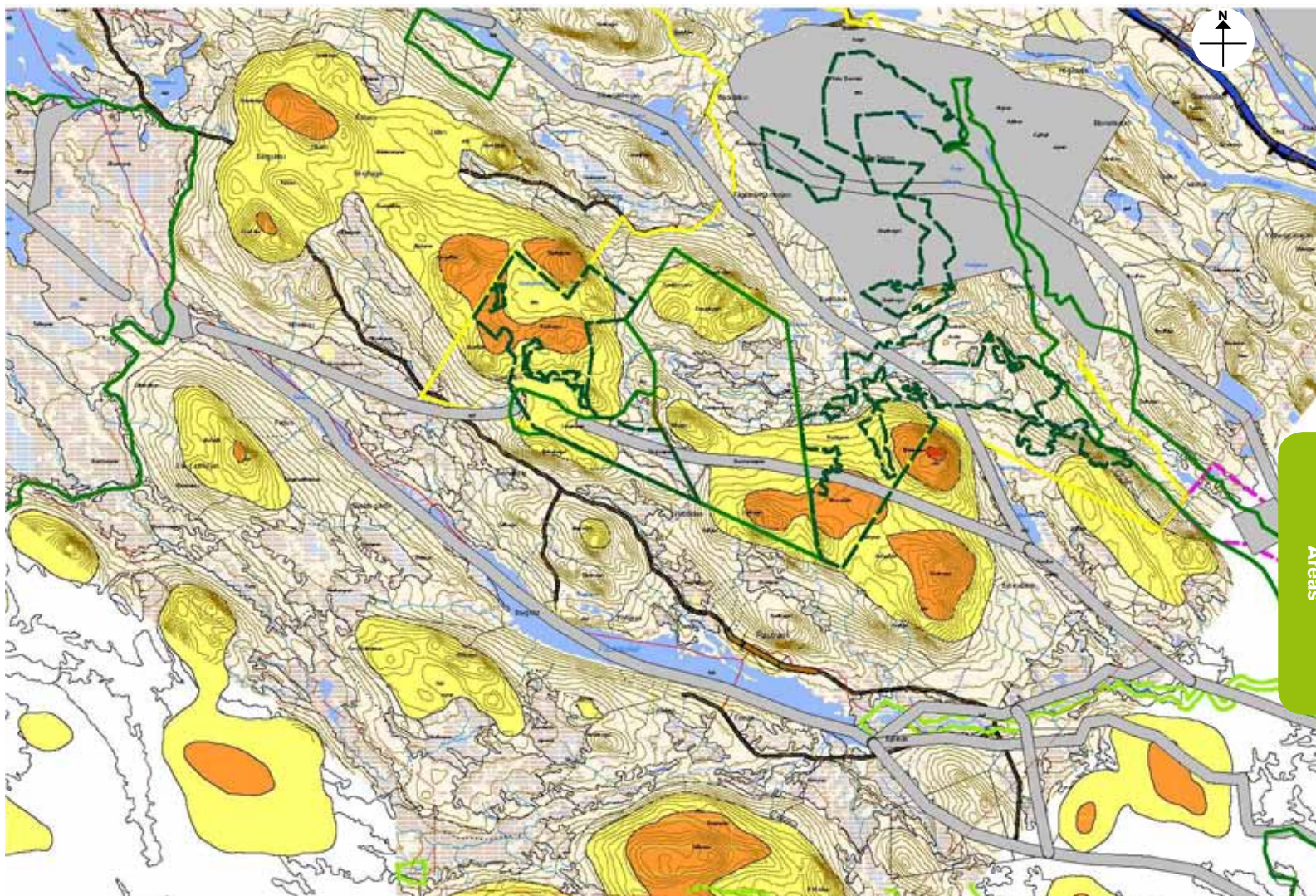
49. Stor - Granliden



SCALE 1:20 000 • 1 cm = 200 metres Resolution: 500 metre grid

Land type:	Forest
Annual average wind strength:	6.5-7 m/s (at height of 103 m above chart datum displacement)
Surface area:	approx. 2 km ²
Wind power potential:	approx. 6 turbines (annual production approx. 30 GWh)
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, in close proximity to migration route within Ubmeje tjeälddie Sami village. • Nature conservation, in close proximity to Skiträsket.
Other conditions:	<ul style="list-style-type: none"> • Hunting is carried out in area. • Clearly visible from the village of Gunnarn (Cultural environment of national interest). • Installation of wind power would be affected by close proximity to airport. The developer has to contact the airport to check if the development of wind power can proceed and, if so, under which terms. • Ground water source is located close to area (north, south and east).
Assessment	Area is suitable for wind power but special consideration must be given to reindeer herding conducted close to the area. The effects on the cultural environment around the village of Gunnarn is judged to be insignificant.




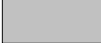


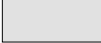






50. Norra Stöttingfjället







SCALE 1:100 000 • 1 cm = 1 kilometres Resolution: 500 metre grid

Land type:	Forest	
Annual average wind strength:	6.5-7.5 m/s (at height of 103 m above chart datum displacement)	
Surface area:	approx. 60 km ² (north-western, southern and south-western sections)	
Wind power potential:	approx. 180 turbines (annual production approx. 900 GWh)	
National interest classifications:	<ul style="list-style-type: none"> • Reindeer herding, migration route within Vapsten Sami village. • Nature conservation, Buberget nature reserve. 	<ul style="list-style-type: none"> • Natura 2000, Buberget reserve. • Wind power.
Other conditions:	<ul style="list-style-type: none"> • Protected natural area, Buberget reserve. • Jovan Ekopark is an area of old forest with varying landscapes which benefits a wide diversity of wildlife. The park covers a considerable proportion of the area. • The reserve at Buberget is a mixed forest area which has clearly been affected by natural fires, the last one occurring in 1900. The 90 year-old forest has regrown amidst the remains of old stumps which are still part of the landscape. • To the north-west are roads and it is not far to the nearest power lines. • Hunting is carried out in the area. • Berry pickers visit the area. 	<ul style="list-style-type: none"> • The area is inhabited all year round. • In Vilhelmina municipality, part of the area is a cultural reserve. • Reindeer herding is affected. • Trees have the right type of lichen which has advantages for reindeer herding. • Close to roads 960, 969 and 970. • Quaternary geological area of interest (glacial flutes, moraines and potential evidence of inland glacier). • Ground water sources are located close to area (east of area's north-eastern sector, west of village Pauträsk and south-east of Pauträsk). • Contact should be with airport in Gunnarn and with local military authorities
Assessment	Area is suitable for wind power as the benefits outweigh the national interests that exist. The nature reserve is, however, not suitable for wind power development an special consideration must be given to reindeer husbandry and to geological aspects in the area. It will be necessary to examine documents governing the Jovan Ekopark before any development commences.	

Key

	Voluntarily exempted from forestry/planned nature reserve
	Ecopark
	Nature conservation
	Reindeer husbandry (suitable area)
	Reindeer husbandry (non-suitable area)
	Protected natural area
	Non-suitable section of area
	Natura 2000 site
	Culture reserve
	Cultural heritage
	Outdoor recreational activities
	Unbroken areas of mountain terrain
	Tourism and outdoor recreational activities

Average wind strength according to MIUU-model.
103 m above the chart datum displacement.
Uppsala University 2009

	6.5-7.0 m/s
	7.0-7.5 m/s
	7.5-8.0 m/s
	8.0-11.0 m/s



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