

Lantmäteriet's Role in the Fight Against Forest Fires During the Summer of 2018

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SUMMARY

During the summer of 2018 Sweden experienced extremely high temperatures and close to no rainfall. This summer has been considered as a historically warm and dry summer, in Sweden as well as in many other countries in Europe. July has never been as hot as this year since the collection of Swedish weather data started 260 years ago. As a result, there have been many and large wildfires in the forests mainly in the northern parts of the country. In total it is estimated that more than 25 000 hectares of land were affected and almost 3 million cubic meter wood were destroyed by those fires. An approximate value of the disaster is calculated to 900 million Swedish Kronor, or just over 100 million US dollars.

During the 2018 forest fires, Lantmäteriet organized a stationary and mobile function, called the Geocell, that provided support to local authorities, staff and IT systems. In addition to providing geographical information, support included, local presence of GIS experts, equipped hardware such a computers, printers and plotters that could collect, analyze and print out maps based on the needs of rescue services, the police, country administrative boards, etc.

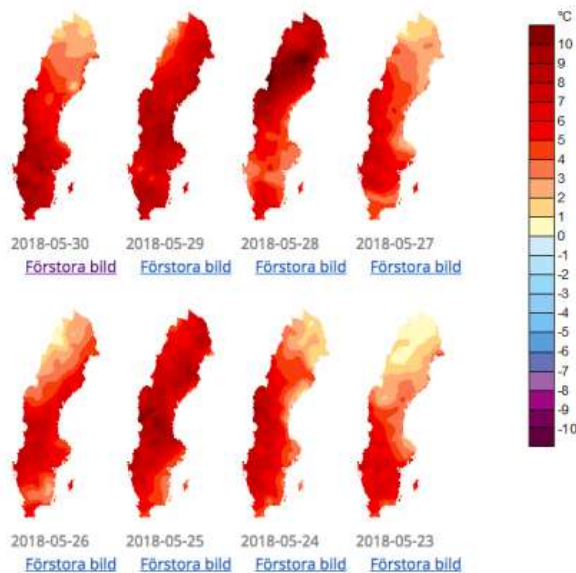
This paper describes Lantmäteriet's competence effort and qualified respond during the forest fires 2018 and the related cadastral issues that Lantmäteriet are facing now. The paper also emphasizes the importance of collaboration between Lantmäteriet and other authorities as well as a stakeholder organization of land owners.

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1. BACKGROUND

The temperatures in Sweden, during the summer of 2018, were so unusually high that they broke several records according to the Swedish Meteorological and Hydrological Institute (SMHI). For example, eight maps of Sweden, see below, represent eight days in May 2018 with the dark red color signifying 10 degrees in Celsius warmer than normal.



Source: SMHI (Swedish Meteorological and Hydrological Institute)

Several cities and towns had warmest day in May since records began 150 years ago. For example, Gothenburg with 31,1 Celsius and Karlshamn with 29 Celsius. Elsewhere in Sweden, Malmö and Borås had their warmest day since year 1946 and Karlstad was the warmest since year 1903. Even overnight temperatures were so high that they were almost classed as tropical.

For warm weather to arrive so early for Sweden was very unusual.

Month of June provided some brief respite, but the warm weather returned as soon as July began. During the July, temperatures were above 30 Celsius for weeks in continuation.

Warm weather in combination with no rain created extremely high risk for outbreaks of fires.

There may be even human factor involved in starting of fires. Because weather was warm a lot of people spend time outside of their homes using portable grill and sometimes forgetting to secure that grill is off while leaving it behind.

However, the exact reason for how and why the fires started has never been defined.

2. FOREST FIRES

2.1 The extent of the fires

The fires started, all over the country, in the middle of July and were declared under control in the end of July. Four most affected districts were: Västmanland, Jämtland, Gävleborg and Dalarna. Even Lapland, above the north pole circle has suffered wildfires. The total area affected by forest fires was estimated to be 25 000 – 30,000 hectares.



2.2 Support from other actors

Many government agencies in Sweden contributed, as much as they could, depending of their responsibility.

- The Swedish Armed Forces contributed by providing: helicopters for water bombing and monitoring, air transport, drones, logistic and medical support, personnel, vehicles and control over airspace.
- The Swedish Transport Administration contributed by providing: communication equipment, personnel and rail vehicles.
- Lantmäteriet (the Swedish mapping, cadastral and land registration authority) helped by providing: personnel for geocell, printers and spatial information.
- Police authorities helped with evacuation and monitoring area affected by fires.
- The Swedish Meteorological and Hydrological Institute (SMHI) contributed by producing weather forecast and fire risk forecast.
- Swedish coastguard helped by aerial surveillance and flight coordination.
- Swedish Maritime Administration assisted by helping with flight coordination.
- Swedish Forest Agency helped with controlled firing.
- MSB (the Swedish Civil Contingencies Agency) supported in the form of materials such as forest fire depots or assists operators in negotiating resources.

Help, including personal staff and equipment, was even provided from other Europe countries as: Norway, Poland, Italy, France, Germany, Denmark, Portugal, Finland and Lithuania. Approximately 2000 people in Sweden have registered as volunteers to the Red Cross.

3. FORESTRY IN SWEDEN

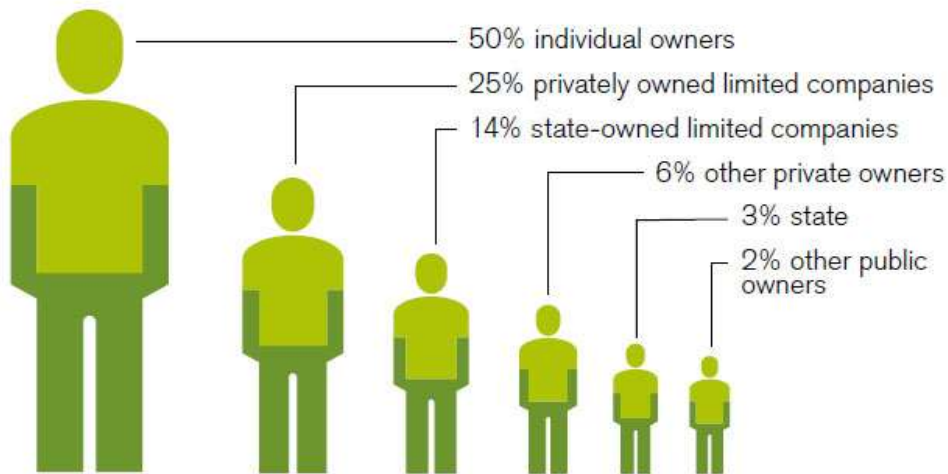
3.1 Importance of forestry in Sweden

Forest in Sweden cover 56 % of the total area and 95 % of all forest are used for forestry. Forestry is very important for the Sweden's national economy. Sweden holds just under one percent of the world's commercial forest areas, but provides ten percent of the sawn timber, pulp and paper that is traded on the global market according to Swedish Forest Agency. The forest products industry plays a major role in the Swedish economy, and accounts for between 9 and 12 % of Swedish industry's total employment, exports, sales and value.

Many Swedes have jobs connected directly to forestry as to example: forest engineer, forest inspector, forest biologist, forestry workers regarding planting, distribution, sale, clearing of forest, wood-consuming industries etc. Even those who are not closely working with and in forestry like to spend time in forest as for example: hunters, backpackers, nature enthusiasts enjoying outdoor activities, nature enthusiasts willing to pick berries, mushrooms, etc.

3.2 Ownership of forest in Sweden

About half of all forest land in Sweden is owned by family enterprises. Large Industrial forest enterprises own approximately 25 % of all forest land. Most of the state forest belongs to the state-owned company Sveaskog, which accounts for approximately 14 % of all forest land in Sweden. The rest of the public-sector-owned forests account for approximately 5 % of the forest land, of which 3 % is state-owned and 2 % owned by other public bodies such as local and country councils.



Source: Sveaskog

4. LANTMÄTERIET'S ROLE

4.1 What is geocell

Geocell is stationary or mobile function that provides support for dressings, personnel and IT systems. The main purpose of the Lantmäteriet's geocell was to deliver geographic information. The support also includes data capture, database maintenance, counseling and the production of digital and analogue follow-up products.

Emergence of need to build a geocell came as an inquiry from Swedish Armed Forces to Lantmäteriet in order to establish a cell from Lantmäteriet to help defend the fires.

Lantmäteriet build a cell operated by 4 persons who were sent to dangerous fire affected area in order to provide help within geospatial information.

4.2 Establishment of geocell

In the evening of July 18th, 2018, Lantmäteriet received, in conjunction with the many fires, a court order from the County Administrative Board and MSB (the Swedish Civil

Contingencies Agency) to provide GIS support with expertise and equipment on site in place called Färila.

On July 19th, resources from Lantmäteriet went to the site to understand the scope and need of equipment to provide the best support.

On July 20th, Lantmäteriet established in cooperation with the Swedish Armed Forces, so-called *geocell* in Färila, with the possibility to prioritize even other areas affected with fires all around the country. Geocell was staffed by GIS-knowledgeable employees from Lantmäteriet and the hardware from the Armed Forces, which in connection with the staff helped to produce specific map views and position pictures of the fire areas.

When the first representatives from Lantmäteriet came into place, they were met by a firefighter who kneeled on the floor flipping through maps and had difficulty understanding how they are hanging together. Lantmäteriet's employees updated maps of the fire spread, in requested formats, and provided daily support to emergency services, police, military, MSB, County Administrative Board and other actors on site. Geocell was also available as competence support in geo-questions and help to analyze produced maps.

Lantmäteriet was also prepared at headquarters in Gävle, where additional support was on place, ready to help with fast handling of distribution permits, in order to facilitate the spread of images in connection with the documentation of the work which has been done. At the Unit for Public Authorities in Stockholm, Lantmäteriets's employees were ready to produce high volume maps for further distribution if necessary.

4.3 What worked well

- Telephone meetings worked very well even though no one was in the office.
- Parallel work was carried out directly from the first request to the official request approved by the Armed Forces.
- Communication between different authorities.
- Review of each other's work – quality control – easy to miss things when personal is tired or stressed.
- Practical needs regarding access to new A3 printers.
- Continuous follow-up meetings between the parties involved during the autumn winter 2018-2019.

4.4 What can be improved

- Have a better check of where the personnel are especially during the holiday season.
- There must be a procedure for the decision regarding to cancel the holiday

- Because of service mobile on vacation is left in the office there is a need to update private mobile numbers of personel.
- Clearly to point out that it is voluntary work (not everybody has get information about that).
- There should be a routine description for how to activate a geocell.
- Training of personnel who will serve in geocell.
- Analyzes were requested to quickly get contact information to property owners in affected areas. How to solve this legally?
- There should be manual with proposal for shift schedule to make it easier for geocell to make a schedule even from home with frameworks for working hours etc.
- Faster printers.

5. CONCLUDING REMARKS

The fires that ravaged Sweden during the summer of 2018 are in line with what the researchers expect as more greenhouse gases increase and the climate gets warmer. Great effort has been done by all actors who were involved in fight against forest fires during the summer of 2018. However, there is some improvement potential that could bring more structure and better planning when acute situation occurs in the future. Exactly what can be improved is reported in text above.

Hopefully, work will continue with developing and improving of the Geocell, within the Lantmäteriet, so that future efforts can show even better results.

REFERENCES

Swedish Meteorological and Hydrological Institute (SMHI) (2018) *Maj 2018 - Sommarväder med rekordvärme*

<https://www.smhi.se/klimat/klimatet-da-och-nu/manadens-vader-och-vatten-sverige/manadens-vader-i-sverige/maj-2018-sommarvader-med-rekordvarme-1.134781>

Accessed 27 January 2019

Lantmäteriet (2018), *intern article*

<https://insikten.lm.se/nyheter/2018/gemensamt/lantmateriet-ar-en-viktig-part-i-kampen-mot-skogsbranderna/?qry=skogsbranderna>

Accessed 28 January 2019

Swedish Forest Agency, 2019. Skogsstyrelsen – *Forests and Forestry in Sweden*

https://www.skogsstyrelsen.se/globalassets/in-english/forests-and-forestry-in-sweden_2015.pdf

Accessed 28 January 2019

Sveaskog, 2018, *What is Swedish forestry?*

<https://www.sveaskog.se/en/forestry-the-swedish-way/short-facts/brief-facts-1/>

Accessed 27 December 2018

BIOGRAPHICAL NOTES

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