LANTMÄTERIET

2024-02-28

PRODUCT DESCRIPTION

Topography 10 Download, vector

DOCUMENT VERSION: 1.14

Figure 1 Section from Topography 10 Download, vector

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1 General description

1.1 Contents

This document describes how Topography 10 Download, vector is structured upon delivery. The contents are well suited for graphical presentation in the scale area of 1:5,000 – 1:20,000.

Topography 10 Download, vector is based on Lantmäteriet's basic geographical databases, where information has been collected with varying quality concerning positional uncertainty, contents, and update frequency.

Topography 10 Download, vector includes, among other things, buildings, land cover, roads, and hydrography.

Topography 10 Download, vector contains Lantmäteriet's reviewed and established names that are included in the Place Name Register.

Topography 10 Download, vector can be combined with the products.

- Cadastral Parcels Download, vector
- Land Regulation Download, vector
- Right Download, vector

1.2 Geographic coverage

Nationwide.

1.3 Geographic section

Sweden, county, municipality, grid index, and optional polygon.

1.4 Coordinate system

Plane: SWEREF 99 TM

Height: RH 2000

For information on what other coordinate systems the product can be delivered in, refer to the document Avgifter och leveransinformation för Lantmäteriets geodata (pdf, in Swedish) about fees and delivery information for Lantmäteriet geodata on Lantmäteriet's website.

2 Quality description

The quality marking aims to provide information about the quality of stored objects. Based on the method of measurement, an expected positional accuracy has been set for the object types.

The objects in the database are stored with information about, amongst other things, history, and positional accuracy.

For more information about the various quality parameters used in the product description, refer to HMK Ordlista (pdf, in Swedish) and HMK Geodatakvalitet (pdf, in Swedish).

2.1 Purpose and utility

Topography 10 Download, vector is Lantmäteriet's most detailed map.

It includes, among other things, buildings, land use, and roads. Combine the product with Cadastral Parcels Download, vector Land regulation Download, vector and Rights Download, vector to get a good overview of property division, plans, regulations, and rights.

The vector format allows you to customize the map to your own business needs.

You can:

- add and link your own information to objects on the map
- integrate map information in your own system
- display information as required using the layer division.

2.2 Data capture

2.2.1 LINEAGE

During the years 1992 - 1997, the analogue information was digitized, and a first digital version of basic data was created. The goal was to create a nationwide database in the scale of 1:10,000. The only area missing was the mountain areas in the north. The data set was complemented and further developed with, for example, improved positional accuracy in the construction of Basic Geographical Data (GGD) in 1995-2004. The mountain areas were mapped between 2006-2012.

Today, no fieldwork is conducted according to the previous model. The collection in-house is conducted through interpretation in stereo aerial photographs and orthophotos. Much of the information is collected in collaboration with other government agencies, municipalities, and organisations. Roads and railways are obtained from the Swedish Transport Administration.

2.3 Maintenance

The update of topographical objects is conducted partly in-house and partly in collaboration with the authorities or organisations responsible for each type of information.

Today, collection and updates at Lantmäteriet are performed with, among other things, through stereo cartography in three dimensional aerial photographs or through screen digitalization with the help of orthophoto.

Nationwide collaboration takes place for buildings, roads, electricity transmission lines, NSL objects (national shoreline), nature conservation areas

and military areas. However, photogrammetric updating is required to achieve completeness. Where no collaboration takes place, data is updated by aerial image interpretation.

2.3.1 MAINTENANCE FREQUENCY

Topography 10 Download, vector, which is ordered through Lantmäteriet, is either retrieved from pre-produced data or directly from the database. Pre-produced data is updated weekly.

For pre-produced data, delivery of county and Sweden extractions with SWEREF99 TM or municipal extractions with local SWEREF zone is available. Other deliveries are made with extractions directly from the database.

The date is noted when each object is stored or changed in the database.

Topographic information is updated at varying intervals depending on the type of object. Periodic updating takes place in-house at Lantmäteriet and more continuously in collaboration with other government agencies, municipalities, and organisations. The collection in-house is done by interpretation of aerial stereo photographs and orthophotos. Therefore, the timeliness in different areas depends on the image provision program, and the agreements with the collaboration partners.

2.4 Data quality

2.4.1 COMPLETENESS

Completeness is related to the selection of each object type. To learn more about selection for each object type, see the sections that describe detailed layers in the product description. There are also some generalization rules for the information in Topography 10 Download, vector, which means that not all objects are represented on the map.

2.4.2 LOGICAL CONSISTENCY

The structure of point objects, line objects, and area objects has such requirements for geometric positions that it should be possible to easily create topology.

When storing objects in the database at Lantmäteriet, it is checked that the objects follow the geometric and topological rules that are in place, and that the information corresponds to OGC's (Open Geospatial Consortium) requirements for geometries. Value ranges and object types are also checked for validity before being stored in the database.

2.4.3 THEMATIC ACCURACY

The process for thematic classification of topographic data is reviewed during field studies. This involves discussing classification based on the interpreter's aerial images compared to reality.

2.4.4 POSITIONAL UNCERTAINTY

Information on positional uncertainty depends on the measurement method, generalization and how distinct the object is.

Positional uncertainty describes how well a given position corresponds to the actual position in the terrain for the object that has been positioned in relation to the principal coordinate system.

Geometrical requirements for positional uncertainty depend on the objects' distinctness within a geographically limited area. Concrete objects have higher requirements than objects with diffuse boundaries in aerial image interpretation.

The mean error is specified with millimetre accuracy.

3 Contents of the delivery

3.1 Folder structure at delivery

The files delivered are Geopackage files with containing data, and a JSON-file with a description of the contents of the data file.

The Geopackage files can be ordered from Geotorget.

Other files for styling and symbols are available for download on the product page.

3.2 Delivery format

The information is delivered in the Geopackage format.

3.3 File sets

The information is delivered in a gpkg file, and a description of the data content is delivered in a json file.

3.4 Layering

In the delivery of Topogafi10, the information is divided into different themes, where each theme is delivered in a Geopackage file, containing several layers. The layer names are based on the theme, object, and geometry type. The layer names begin with the theme and extent before the layer name when imported into software. For example, kommunikation_xxxx ralstrafik, where xxxx can be the extent coordinates, municipality code, or county code. The attribute set varies between the different layers and is described in detail in Chapter 5.

4 Layout and plotting of data

4.1 Distribution

The theme for land is divided into 10 km grids to improve the drawing performance, when plotting the data.

4.2 On-screen presentation

The styling of the product is optimized for scales ranging from 1:5,000 to 1:50,000.

Therefore, this scale can be considered suitable for the on-screen presentation of vector styling.

For styling, a LYR file is provided for ArcGIS/ArcMap and a LYRX file for ArcGIS Pro. In ArcGIS/ArcMap, data should be saved in a geodatabase to achieve full functionality.

For QGIS, a QLR file is provided for styling.

The styling files contain a proposed drawing order for the layers.

Symbols specific to Lantmäteriet's data are provided in a symbol file, LMTopografisymboler.ttf.

The styling file and symbol file are available for download on the product page.

4.2.1 TEXT

When plotting text, the attribute **detaljtyp** determines the style and colour, while **thojd** determines the size. Other attributes used are **tjust** (insertion-point) and **trikt** (orientation). Text strings are not drawn with spaced characters. This is only indicated in the **tsparr** attribute as a percentage of how much the delivered text represents in relation to the original text. The recommended point size of the text is included as information in the **thojd** attribute.

4.3 Installation of fonts

The text in the styling file uses the Window's standard font, Arial.

4.3.1 SYMBOLS

Regardless of which software is being used, the included font in the file LMTopogradisymboler.ttf must be installed in the Windows font catalogue (c:\\Windows\Fonts), to obtain a correct symbol presentation.

During symbol styling, the attribute rotation has been used to obtain a correct symbol orientation.

5 Layer description and code list

Each object has information about the original organisation according to the following list of values:

Table 1 List of values Organisation

Value	Description
Lantmäteriet	Collection conducted by Lantmäteriet.
Samverkan Nationella vägdatabasen	Lantmäteriet retrieves data about roads from Trafikverket (Swedish Transport Administration).
Kommunsamverkan	Lantmäteriet has collected data with help of the municipalities.
Samverkan Nationell strandlinje	Lantmäteriet and Sjöfartsverket (Swedish Maritime Administration) collect data which is stored at Lantmäteriet.
Samverkan Kraftbolag	Lantmäteriet collects data from electric power companies.
Samverkan Naturvårdsverket	Lantmäteriet collects data from Naturvårdsverket (Swedish Environmental Protection Agency).
Samverkan Luftfartsverket	Lantmäteriet collects data from Luftfartsverket (Air Navigation Service of Sweden)
Samverkan Försvarsmakten	Lantmäteriet collects data from Försvarsmakten (Swedish Armed Forces).
Samverkan Nationell järnvägsdatabas	Lantmäteriet collects data about railways from Trafikverket (Swedish Transport Administration).

5.1 Land cover

This product provides land cover data as lines and polygons in the following layers:

Table 2. Layers included in the Land cover theme.

Land cover	Layer name
Land cover	mark

Land cover	Layer name
Land cover boundary lines	markkantlinje
Wetland	sankmark

5.1.1 DATA CAPTURE

LINEAGE

For original lineage see chapter 2.2.1.

Water

Water surfaces belong to hydrography but are also included in the land cover coverage to provide a comprehensive image of the land cover surfaces. See more information about hydrography in chapter 5.2.

Built-up areas

Since 2004 built-up areas have been collected using aerial photograph interpretation and screen digitalisation, often with the support of property boundaries.

Built-up areas are created for urban areas with more than 1 000 inhabitants. The selection has been made with input from Statistics Sweden (SCB).

Agricultural land

Since 2004, agricultural land has been collected using aerial photograph interpretation and since 2011 also with support from The Swedish Board of Agriculture's block database.

Wetlands

Wetlands have been digitized using the economic map as a basis and, to a certain point, adapted to newer material with aerial photograph interpretation.

Areas of the country, where wetlands were not mapped according to GGD, were supplemented with data from the Road map in scale 1:100,000. Aerial photograph interpretation and the national elevation model provided additional support.

Forest and open land

Other land was all that remained after arable land, water, and built-up areas were mapped in the collection before GGD But in 1994, it began to be divided into several types of forest and open land.

The terrain map, in scale 1:50,000, that was developed from 1988 to 2004 already had this division. Coniferous and mixed forest, deciduous forest, as well as subalpine birch forest was mapped with support of infrared colour images during the construction of the Terrain map. The terrain map was used as support in combination with aerial photograph interpretation for the division. The same forest classification was later used in GGD without any major adaptation.

Glaciers have been measured with stereo mapping.

A basic collection of town squares was made in the early 2000s.

5.1.2 MAINTENANCE FRQUENCY

Built-up areas, arable land, alpine tundra, and other open land is updated according to the image provision program.

Glaciers are updated with satellite data and aerial photographs. Updates is done every three years.

Wetlands are only updated in conjunction with land development. Most wetlands have not been updated since the first-time mapping of the Economic map.

Different types of forest have not been updated since GGD was completed in 2004.

New town squares can be updated through the municipalities' collaboration agreements with Lantmäteriet. Otherwise, they are not updated.

5.1.3 DATA QUALITY

COMPLETENESS

High completeness.

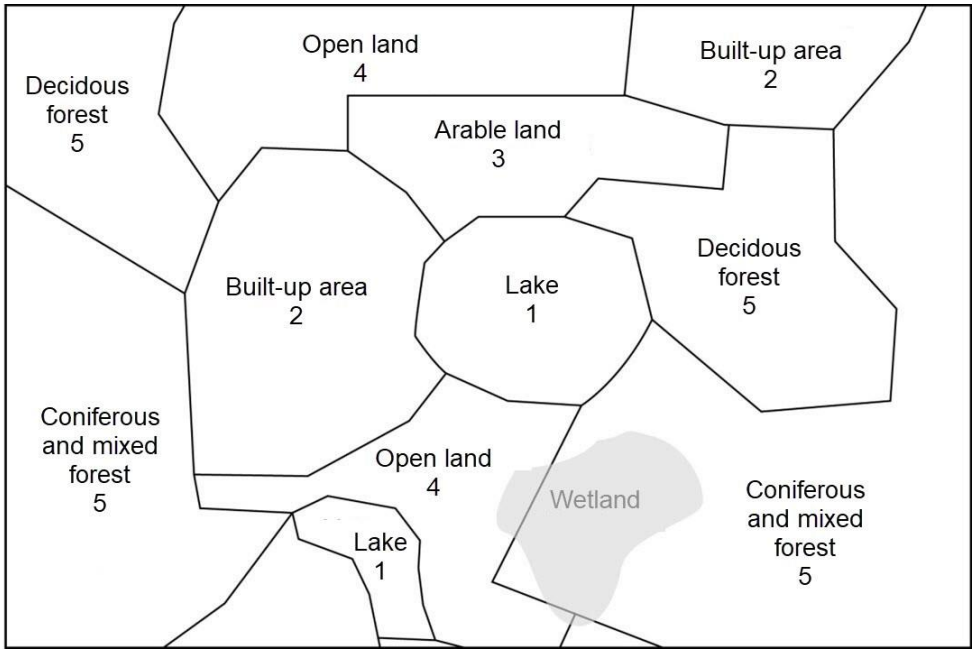
LOGICAL CONSISTENCY

The land cover coverage is managed as a comprehensive layer with surfaces that do not overlap each other. The exception is wetlands that are managed as a separate layer with independent surfaces.

The boundary lines are coherent, meaning that they form a geometric network structure.

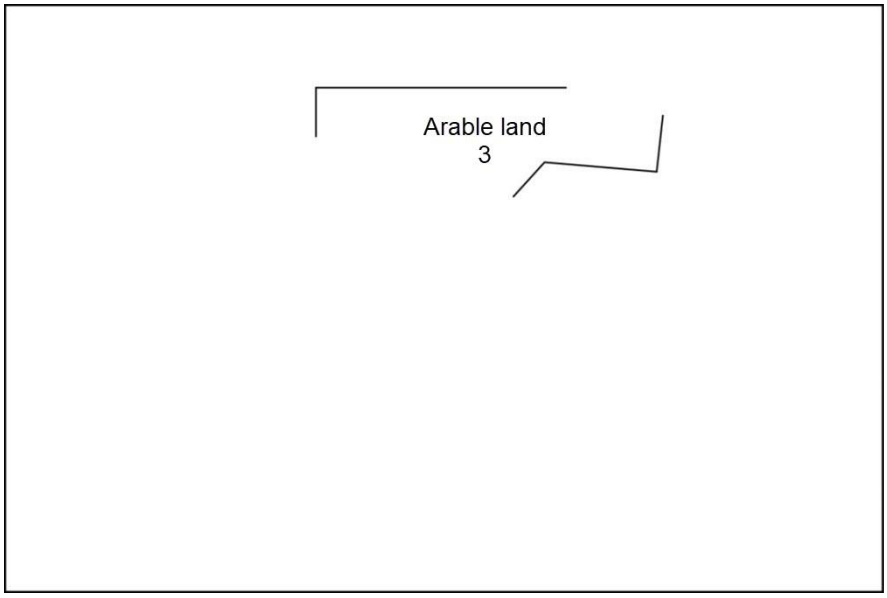
The boundary lines of the areas are given codes according to a predetermined hierarchal priority order. The Shoreline has the highest priority, followed by the boundary for built-up area, etc. (figure 2). Therefore, the different types of shorelines are the only boundary lines that can create coherent surfaces.

Figure 2 Comprehensive land cover layer with boundaries, including an independent wetland.



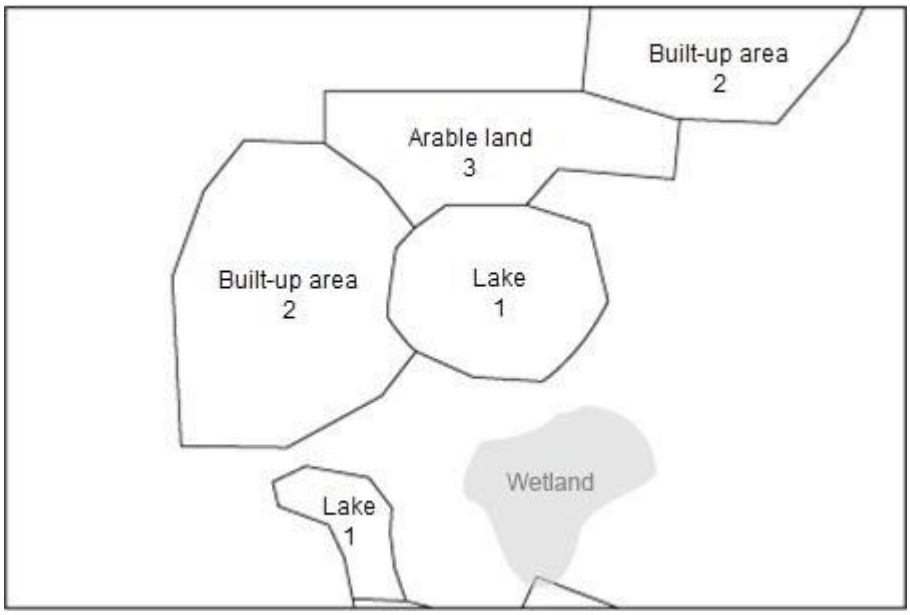
Only arable land provides an incomplete classification without the hierarchically superior boundary lines (Figure 3).

Figure 3 Only arable land with missing boundaries against surrounding, superior, land cover types.



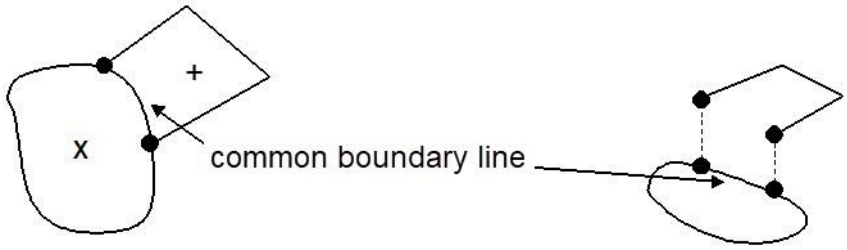
Arable land, together with the superior boundary lines for water and built-up areas, provides a complete classification (figure 4).

Figure 4.Arable land with surrounding superior land cover types, providing a contiguous area for arable land.



The boundary line is common between two adjacent polygons (basic geometry). Lines are divided at all connection points (figure 5). The lines can also be divided between the connection points.

Figure 5 Polygons with intersection points on the line against the adjacent polygon's line.



THEMATIC ACCURACY

Large polygons are usually easy to map and have high thematic accuracy. For example, dense forest, open water and ploughed arable land. This also applies to built-up areas.

In the following examples, the thematic accuracy is lower because the theme is more difficult to determine:

- Land cover types that are difficult to distinguish from each other. For example, wetlands and water surfaces covered by vegetation or arable land and open land.
- Gradual transitions where multiple land cover types can be difficult to define. For example, gradually sparse tree layers.
- Division of built-up areas into different types, for example, low, high and industry areas.

POSITIONAL UNCERTAINTY

Uncertainties in the definitions of where the boundary between two land cover types is located makes it difficult to determine the positional uncertainty.

Different types of boundary lines may have been collected using differing methods. Each land cover type (polygon) is surrounded by different types of lines. Therefore, the positional uncertainty cannot be specified per land cover type but is related to the type of boundary line.

Table 3 Positional uncertainty for Land cover.

Object type	**Requirement for planar positional uncertainty (m)**
Shoreline (Sea, lake, watercourse surface, artificial water)	5
Shoreline with the attribute “diffuse = yes”	10
Boundary of built-up area	5
Boundary of industrial and retail area	5
Boundary of agricultural land	5
Boundary of open land	15
Boundary of forest land	20
Boundary line for unmapped area	10
Water	10
Built-up area, low	5
Built-up area, high	5
Closed built-up area	5
Industrial and retail area	5
Arable land	5
Fruit orchard	5

Object type	Requirement for planar positional uncertainty (m)
Open land	15
Alpine tundra	15
Glacier	15
Coniferous and mixed forest	20
Deciduous forest	20
Subalpine birch forest	20
Unmapped area	10
Town square	5
Wetland, firm	20
Wetland, soaked	20

5.1.4 LAND COVER

Table 4. Contents in Land cover (Layer name: mark).

Object type	Object type number	Definition	Description	Comment
Closed built-up area	2636	land consisting of closed coherent neighbourhood blocks with multiple floors	Closed build-up area that are usually located in the centre of urban area, where lower building may be included. The development may have occasional openings to allow for transportation to and from the inner part of the block. At least three sides of the neighbourhood block should be closed. All associated land such as roads, parking	Presented for one or more entire adjacent neighbourhood blocks of closed built-up area. Parts of a block may also be presented, if they are larger than approximately 10,000 square metres (1 hectares). Buildings with planned object status is not

Object type	Object type number	Definition	Description	Comment
			spaces and land with other buildings are included.	included in built-up areas.
Built-up area, high	2637	land consisting of detached buildings with apartments that have three or more floors	Detached buildings with apartments that have three or more floors (approximately 9 metres to edge of roof). Individual, lower buildings may occur. All associated land such as roads, parking spaces and other buildings are included.	Presented for one or more whole adjacent neighbourhood blocks of high buildings. Parts of neighbourhood blocks can be presented, if they are larger than approximately 10,000 square metres (1 hectares). Offices and retail may be included. Building with planned object status is not included.
Built-up area, low	2638	land consisting of buildings with planned neighbourhood blocks with detached two-family houses, terraced houses, semi-detached houses, or apartment buildings with, maximum two floors	Single higher buildings may be included. All associated land such as roads, parking spaces and other buildings are included.	Presented for one or more entire adjacent neighbourhood blocks of low buildings. Parts of neighbourhood blocks can be presented, if the area are larger than approximately 10,000 square metres (1 hectare). Offices and retail may be included. Building with planned object status is not included.
Industrial and retail area	2639	land primarily used for industry and	All associated land such as roads, parking spaces, stores and land	Presented for one or more entire adjacent neighbourhood blocks of

Object type	Object type number	Definition	Description	Comment
		commercial activities	with other buildings are included.	industry and retail Parts of neighbourhood blocks can be presented if they are larger than approximately 10,000 square metres (1 hectare). Offices and retail may be included.
Arable land	2642	land that has been ploughed for cultivation of grain, forage crops, oilseeds, root vegetables and vegetables	Arable land also includes grazing land that is occasionally ploughed and sown, as well as pasturelands that are part of the crop rotation Fallows and energy forests are presented as arable land.	Meadowlands and gardens adjacent to dwellings are not included. Fruit orchards smaller than 20,000 square metres (2 hectares) are included. The minimum size for mapping is approximately 900 square metres. The minimum size for mapping impediments is approximately 100 square metres. The minimum width for elongated impediments is approximately 5 metres. The minimum width for impediments where roads divide the arable land is approximately 10 metres.

Object type	Object type number	Definition	Description	Comment
Fruit orchard	2643	land used for cultivation of fruit and berry trees		The minimum area for mapping is approximately 20,000 square metres (2 hectares. Fruit orchards covering an area between approximately 900 square metres and approximately 20,000 square metres (2 hectares) are mapped as arable land. In cases where multiple small fruit orchards are near each other, the total area of these can be added up and each individual area can be mapped as a fruit orchard even if each sub-area does not meet the minimum requirement.
Open land	2640	land below the treeline, mainly including natural open land, unmanaged and extensively managed meadow	Open land where the height of vegetation is less than approximately 1,5 metres but where individual trees, bushes, and smaller groves higher than 1,5 metres may be included. Also included are former agricultural land, low production pastures, natural meadows and grasslands, plot of lands and gardens with an open character outside built-up areas, undeveloped allotment areas, moorlands, sandy beaches,	The minimum mapping size are approximately 900 square metres. Smaller areas may occur on islands, and impediments in arable land.

Object type	Object type number	Definition	Description	Comment
			and shingle fields. Land leased for special activities are also included, such as ski slopes, firing ranges, gravel pits and quarries. Areas by the coast with rock outcrops are also classed as open land.	
Alpine tundra	2644	all land above the tree line, except for water surfaces and glaciers	Low trees, bushes and smaller groves may occur.	The minimum size for mapping is approximately 10,000 square meters (1 hectare).
Town square	2641	open, usually paved area in an urban area intended for temporary retail, public events and as a meeting place	Mapped for town squares with names within built-up areas, where the name has been reviewed and established by Lantmäteriet's place name section.	
Coniferous and mixed forest	2645	land with coniferous trees or mixed coniferous and deciduous trees, including forested park land and clear-cut areas	All types of trees and bushes may be included.	The minimum size for mapping is approximately 900 square meters. Smaller areas may occur on islands, and impediments in arable land.
Deciduous forest	2646	forested land below the upper boundary of the coniferous forest, where the canopy is mainly consisting of deciduous forest	Also includes clear-cut areas. The percentage of deciduous forest must be at least 90%.	The minimum size for mapping is approximately 80,000 square metres (8 hectares). Special, smaller areas with important deciduous trees (oak, elm, maple etc.) at least

Object type	Object type number	Definition	Description	Comment
				approximately 40,000 square metres (4 hectares) are also included. Smaller areas may occur on islands, and impediments in arable land within a deciduous forest area.
Subalpine birch forest	2647	birch forest above upper limit of the coniferous forest, which extends up to the border of the alpine tundra	Individual coniferous trees may occur. Above the upper limit of the subalpine birch forest, clusters of individual trees may occur.	The minimum mapping size is approximately 80,000 square metres (8 hectares). Areas of approximately 80,000 square metres (8 hectares) with a mix of open land and subalpine birch forest adjacent to homogeneous subalpine birch forest areas can also be included.
Unmapped area	2648	an area that has not been mapped	Includes areas outside of the national border.	
Sea	2631	waterbody that receives water from waterbodies located on land and that are coherent with other seas	The sea level should be mapped in the normal water level if possible. Water with sparse and/or temporary reeds should be mapped as Sea. Dense, persistent belts of reeds should be mapped as Wetland, soaked.	Sea is mapped for the index squares that include the economic zone. Islands are distinguished from the water surface if they are 20 square metres or larger. Within NSL areas, islands smaller than 20 square metres are

Object type	Object type number	Definition	Description	Comment
				mapped as Above water rock. Within NSL areas, shorelines may be mapped down to 12 square metres if it is a dolphin (structure).
Lake	2632	permanent, widespread regulated or unregulated surface water body on land without significant flow velocity	Natural standing water or with limited impact by a low dam threshold. Also includes smaller surface waterbodies such as forest ponds or similar.	The minimum mapping size are areas larger than approximately 400 square metres. The extent of the water is mapped, if possible, at the normal water level. Water with sparse and/or temporary belts of reeds are mapped as Lake. Dense, persistent reeds are mapped as Wetland, soaked. Regulated reservoirs are limited to the highest dam limit. If the water level was low at the time of photographing, the highest dam limit should be mapped if it can be interpreted. Because the shoreline is interpreted from an aerial photograph, the height level may deviate from the value of the limit in a water judgement.

Object type	Object type number	Definition	Description	Comment
				Islands are distinguished from the water surface if they are larger than 20 square metres. Within the NSL area, islands smaller than 20 square metres are presented as Above water rock. Within the NSL area, shorelines may be mapped down to 12 square metres if it is a dolphin (structure).
Watercourse surface	2633	surface waterbody with significant flow velocity connecting to lakes or seas	Including both natural and artificial water bodies.	The watercourse width should be at least about 6 meters wide. Islands are distinguished from the water surface if they are 20 square metres or larger. Within NSL areas, islands smaller than 20 square metres are mapped as Above water rock. Within the NSL areas, shorelines can be mapped down to 12 square metres if it is a dolphin (structure).
Artificial water	2634	surface waterbody for swimming,	Artificial water has been created by humans. Swimming	

Object type	Object type number	Definition	Description	Comment
		treatment, or storage of water without inflow or outflow	pools, treatment ponds, infiltration ponds, leachate ponds, wastewater ponds, retention basin and fire ponds are included. Regulation reservoirs are mapped as *Lakes*.	
Glacier	2635	permanent mass of snow and ice in high mountains that slowly slide down the mountain slope	The data is collected with the support of information from the Natural Geographic Institution at Stockholm University.	The minimum mapping area is approximately 20,000 square meters (2 hectares). Separate parts from a larger glacier are mapped if they are larger than approximately 5000 square meters (1/2 hectare). Permanent protruding rock/solid land that is larger than approximately 5000 square meters (1/2 hectare) is separated from the glacier. Smaller sections of protruding rock/solid land can be included in the glacier, as well as ice filled moraines that are connected to the glacier.

Table 5 Attribute sets for Land cover (Layer name: Mark)

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not

Attribute	Type	Length	Definition	Description
				changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organisat-ion	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions

Attribute	Type	Length	Definition	Description
				are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of land cover	Range of values for valid values.
vattenytaid	Text	36	identity to keep together all water surfaces that belong to the same object	It is only specified for the object types of *Sea, Lake, Watercourse surface, Artificial water, and Glacier*. The attribute is not mandatory for the objects *Sea, Lake, Watercourse surface, Artificial water,* or *Glacier*.

Attribute	Type	Length	Definition	Description
hojd_over_havet	Text	20	indicates the water surface elevation in meters above sea level	Is only specified for the object types of *Lake* and *Watercourse surface*.
reglerat_vatten	Text	255	indicates whether the water level is regulated	Is only specified for the object types of *Lake* and *Watercourse surface*. It is a mandatory attribute. Range of values: Ja/Nej/Ingen information (Yes/No/No information.)

5.1.5 LAND COVER BOUNDARY LINE

Table 6 Contents in the layer Land cover boundary line (Layer name: markkantlinje)

Object type	Object type number	Definition	Description	Comment
Boundary line, unmapped area	2611	land cover boundary line for unmapped area	Used to delimit and close surfaces in the land cover layer that are adjacent to unmapped areas.	Mapped completely for areas bordering unmapped areas. Mapped along the national border with Norway. The national border with Finland is mainly formed by boundary rivers (Torneå-, Könkämä-, Muonio rivers). The water surface of the boundary river shall be delimited by a shoreline on the Swedish side and by a boundary line for unmapped area on the

Object type	Object type number	Definition	Description	Comment
				Finnish side of the national border.
Shoreline, sea	2612	land cover boundary line between sea and land	Boundary line between sea and built-up areas, industrial and retail aera, agricultural land, open land, or forest.	Is either diffuse or not diffuse. Against a lake or a watercourse surfaces the land cover boundary line *Closure against sea* is used.
Shoreline, lake	2613	land cover boundary line between lake and land	Boundary line between lake and glacier, built-up area, industrial and retail area, agricultural land, open land, or forest.	Is either diffuse or not diffuse. Against a watercourse surfaces, the land cover boundary line C*losure* is used. Against the sea, the land cover boundary line *Closure against the sea* is used.
Shoreline, watercourse surface	2614	land cover boundary line between water course surface and land	Boundary line between water course surface and glacier, built-up area, industrial and retail area, agricultural land, open land, or forest.	Is either diffuse or not diffuse. When it is against a lake, the land cover boundary line C*losure* is used. When it is against the sea the land cover boundary line *Closure against the sea* is used.
Shoreline, artificial water	2615	land cover boundary line between artificial water and land	Boundary line between artificial water and built-up area, industrial and retail area, agricultural land, open land, or forest.	

Object type	Object type number	Definition	Description	Comment
Closure against the sea	2616	land cover boundary line between sea and lake or watercourse surface	C*losure against the sea* is a constructed, usually straight line used to separate the sea from a lake or a watercourse surface.	
Closure	2617	land cover boundary line between lake or watercourse surface	*Closure* is a constructed, usually straight line used to separate lakes from watercourse surfaces. It is also used where there are two adjacent lakes or two or more main watercourse branches joining. *Closure* is also used for regulation ponds as well as the beginning and end of locks.	
Glacier boundary	2618	land cover boundary line for glacier		Presented between glaciers and alpine tundra but is replaced with *Shoreline, lake* or *Shoreline, watercourse surface* against surfaces that are bordered by these.
Built-up area boundary	2619	land cover boundary line for grouped built-up areas		Presented for *Closed built-up area, Built-up area, high* and *Built-up area, low*, but is replaced with *Shoreline (sea, lake, watercourse surface or artificial water)* against surfaces bordered by these. The outermost boundary of the

Object type	Object type number	Definition	Description	Comment
				built-up area should be registered in the natural claim (for example, plot boundary, fence, hedge etc.) at the transition between ground that belongs to the built-up area and undeveloped ground. Used for built-up areas with more than 1000 inhabitants. Smaller areas may be included if they are approximately 200 metres or closer. The minimum area is approximately 1 hectare. A larger building with a solitary and prominent location may be separated from built-up areas when a significant amount of the surrounding neighbourhood block is made up of undeveloped ground such as parks. The generalisation rules describe minimum dimensions of areas, distances to other surfaces and how to manage parking spaces for example.

Object type	Object type number	Definition	Description	Comment
Industry and retail area boundary	2620	land cover boundary line for industry and retail areas		Presented for industry and retail buildings but is replaced by *built-up area boundary* and *shoreline (sea, lake, watercourse surface or artificial water)* against surfaces bordered by these. Presented only in connection with building boundaries.
Arable land boundary	2621	land cover boundary line for arable land or orchard		Presented for arable land and orchards but is replaced by *industry and retail area boundary*, *built-up area boundary*, and *shoreline (sea, lake, watercourse surface or artificial water)* against surfaces that are bordered by these.
Open land boundary	2622	land cover boundary line for open land, town squares or alpine tundra		Presented for open land, town squares or alpine tundra but is replaced by *agricultural land boundary, industry and retail area boundary*, and *shoreline (sea, lake, watercourse surface or artificial water)* against surfaces bordered by these.

Object type	Object type number	Definition	Description	Comment
Forest land boundary	2623	land cover boundary line that distinguishes between coniferous and mixed forest, deciduous forest, and subalpine birch forest		Presented for coniferous and mixed forest, deciduous forest and subalpine birch forest but is replaced by *open land boundary*, *agricultural land boundary*, *industry and retail area boundary*, and *shoreline (sea, lake, watercourse surface or artificial water)* against surfaces bordered by these.

Table 7 Attribute set land cover boundary line.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.

Attribute	Type	Length	Definition	Description
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be

Attribute	Type	Length	Definition	Description
				the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of land cover boundary line	Range of values for valid values.
diffus	Integer	1	unclear or variable shoreline	Diffuse shoreline is used in case of: - Variable shoreline, caused by currents and winds for example. – Unclear and difficult to determine shoreline. For example, where the transition to soaked wetlands and reed areas are not distinct. – Dried, or partially dried, riverbeds downstream of a dam. Clearly determinable shorelines between water and land are mapped as non-diffuse. It is only specified and is mandatory for the object types that describe shorelines for sea, lakes, and water course surfaces. Diffuse shoreline is not used for

Attribute	Type	Length	Definition	Description
				stretches shorter than approximately 200 metres. Exceptions may occur within the NSL area, for example, around islands with a shoreline shorter than the recommended 200 m as mentioned above. Value range: 1/0 (True/False).

5.1.6 WETLANDS

Table 8 Contents in wetlands (Layer name: sankmark)

Object type	Object type no.	Definition	Description	Comment
Wetland, firm	2651	peat-forming wetlands on comparably firm peat	Peat-forming wetlands (bog or fen) where shrub or semi-grass vegetation binds the peat Rough or smooth surface. The ground is normally accessible by foot.	Minimum area for mapping is approximately 2500 square metres. If a pond or lake is present in the wetland, separated and with open deep water, it should be represented as a water surface if the area is large enough, approximately 400 square metres. Dried out or drained wetlands that have become productive forests, are not classified as wetland.
Wetland, soaked	2652	wetland that is often or constantly filled with water	Includes various wetlands, such as peat-forming wetlands with spares vegetation, quagmires, calcium sediment pools, reed	The minimum mapping area is approximately 2500 square metres. If a pond or lake is present in

Object type	Object type no.	Definition	Description	Comment
			belts in shallow water, overgrown lakes as well as floodplains adjacent to lakes and water courses. The ground is usually difficult to access due to the water level.	the wetland, separated and with open deep water, it should be represented as a water surface if the area is large enough, approximately 400 square metres. A wet mire covered with shallow water delimited by strings of dense vegetation in a repetitive pattern is not mapped as lake, nor any type of water. Dried-out or drained mires that have become productive forests, are not classified as wetland.

Table 9 Attribute set for wetlands.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique

Attribute	Type	Length	Definition	Description
				within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version

Attribute	Type	Length	Definition	Description
				number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of wetland	Range of values for valid values.

5.2 Hydrography

Table 10 Layers included in the Hydrography theme.

Hydrography	Layer name
Hydro facility line	hydroanlaggningslinje
Hydro facility point	hydroanlaggningspunkt
Hydrographically interesting place (line)	hydrografiskt_intressant_plats
Hydro line	hydrolinje
Hydro point	hydropunkt

5.2.1 DATA CAPTURE

LINEAGE

For the original lineage see chapter 2.2.1.

Information about certain objects (such as water, breakers and above water rocks) along the coast and larger lakes, have been collected in collaboration with the Swedish Maritime Administration through the National Shoreline project (NSL). The purpose has been to develop a common shoreline. More information is available from the Swedish Maritime Administration.

From 1995 to 2004, shorelines were measured with stereo cartography. They are now being updated in the NSL project with regular updates by Lantmäteriet.

Breakers and above water rocks are measured with photogrammetric methods, except for a few objects that are measured geodetically by the Swedish Maritime Administration. The collection of NSL objects started in 2005 and was completed in 2020. The work now continues with maintenance and management.

In the current version of Topography 10 Download, vector, many streams in the forests are remnants from the creation of the Economic map.

Flow direction arrows, flume lines, waterfalls and rapids are based on field measurements from the Economic map and from the development of *Basic Geographic Data* (GGD).

Information about the objects such as piers, quays, quay fenders, pile fenders, dolphins and smaller dolphins along the coast, the larger lakes and Göta Canal have been collected in collaboration with the Swedish Maritime Administration through the project *National Shoreline* (NSL).

The objects dam, jetty and pier are also included in the collaboration agreement with municipalities.

5.2.2 MAINTENANCE FREQUENCY

At Lantmäteriet, hydrographic objects are periodically updated using aerial photograph interpretation according to the aerial photograph interval in the image provision program.

The updates also depend on previous collection through fieldwork for the objects that have not changed since the collection.

At least once every three years, Lantmäteriet reviews the entire NSL and updates the shoreline.

5.2.3 DATA QUALITY

COMPLETENESS

For lakes, larger water courses and waterfalls the completeness is very high.

Breakers and above water rocks have a very high completeness in NSL-mapped areas, the objects are not included in other areas.

Streams and rapids have high completeness.

Flume lines have a low completeness because they are difficult to update.

Pier (boundary line), Pier (centre line), Quay (centre line), Quay (boundary line), quay fenders, pile fenders and dolphins have very high completeness within NSL areas, where the Swedish Maritime Administration also reviews mapped information. The objects also occur outside of NSL areas, but completeness is not controlled there.

Smaller dolphins have very high completeness within NSL areas where the Swedish Maritime Administration performs completeness controls. In other areas, smaller dolphins are not included.

LOGICAL CONSISTENCY

Lakes and larger watercourses are surfaces.

Streams are coherent and connected to lakes and larger watercourses; but to obtain a complete network, see the service Hydrography Download.

Flow direction arrows, rock awash, above water rocks, waterfalls, flume lines and rapids are independent objects and are not connected to other objects.

THEMATIC ACCURACY

The thematic accuracy between objects is very high in all layers for hydrography.

POSITIONAL UNCERTAINTY

The shoreline is measured at the normal water line, except in regulated lakes and rivers where it is measured at the highest dam limit. The position of the shoreline can vary due to different water levels. Updates are therefore only performed when a significant and lasting change has occurred.

The positional uncertainty of streams is low on open surfaces but varies in the forest, as it difficult to see through the forest crown. Larger errors are gradually corrected in streams using laser and elevation data in forest areas.

Objects in water have very low positional uncertainty. For NSL objects, marked with * in the table below, have a standard requirement of 1 metre positional uncertainty. In stereo mapping, it can be difficult to meet this requirement, therefore Lantmäteriet's in-house requirement is set to 2 metres.

Other hydrography objects have very low positional uncertainty.

Table 11 Positional uncertainty for Hydrography.

Object type	**Requirement for planar positional uncertainty (m).**
Dam construction	2
Jetty	2
Pier	1-2*
Quay	1-2*
Quay fenders	1-2*

Object type	Requirement for planar positional uncertainty (m).
Pile fenders	1-2*
Flume line	5
Aqueduct	5
Lock gate	5
Dolphin, smaller	1-2*
Rapids	-
Waterfall	5
Watercourse	5
Rock awash	2
Above water rock	2
Flow direction arrow	-

5.2.4 HYDRO FACILITY LINE

Table 12 Contents in Hydro Facility Line (Layer name: hydroanlaggningslinje)

Object type	Object type number	Definition	Description	Comment
Dam construction	1903	permanent barrier over a water course that dams or controls its flow		Construction for creation of mirror ponds is not included.
Jetty	1902	construction that extends into the water, intended for mooring of smaller ships	The jetty can also be used for swimming etc.	Fully mapped. Minimum requirement for mapping is 20 metres measured from the shoreline. Jetties that follow the

Object type	Object type number	Definition	Description	Comment
				shoreline should not be presented. Within NSL area: minimum requirement for mapping is 10 metres measured from the shoreline. Jetties that follow the shoreline should be mapped.
Pier	1907	long, anchored structure used to protect harbours and anchorages from waves	Often extends from the shore into the water but can also be surrounded by water and without connection to the shoreline.	If the pier is wider than 6 metres and longer than 10 metres: -Within NSL area, it is mapped as a pier measured by edge line. -Outside of NSL area, it is mapped as the shoreline. If the pier is narrower than 6 metres and longer than 20 metres: -Within and outside of NSL area, it is mapped as a pier measured by centre line. If the pier is narrower than 6 metres and longer than 10 metres: -Within NSL area, it is mapped as pier measured by centre line. -Outside of NSL areas, it is not included.

Object type	Object type number	Definition	Description	Comment
Quay	1905	construction connected to the shoreline, with a vertical side facing deep water, where ships can moor, unload, and load.	The construction has a horizontal top surface for handling goods and can be made of concrete, stone, or wood.	Only mapped within NSL area. If the quay is wider than 6 metres, it is reported as quay measured by edge line. If the quay is narrower than 6 metres and the extended part of the structure is longer than 10 metres, it is mapped as a quay measured by centre line.
Quay fenders	1901	protective and shock absorbing structure for ships at a quay		Only mapped within NSL area. Quay fenders longer than 8 metres are mapped.
Pile fenders	1906	protective and shock absorbing structure	The pile fenders guide ships through narrow passages such as bridges, ferry slips and entrances to locks and protects bridge pillars from passing ships.	Only mapped within NSL area. Pile fenders longer than 8 metres are mapped. Are mapped coherently under bridges.
Dolphin	1904	Seabed-anchored device consisting of a group of piles attached to a foundation for mooring or redirect ships.	Dolphins can be made of different materials, such as wood and concrete.	Only mapped within NSL area. Mapped with a line coinciding with the shoreline. Dolphins with an area greater than or equal to 12 square metres are presented as *Dolphin*. Dolphins with an area less than 12 square metres is mapped

Object type	Object type number	Definition	Description	Comment
				as *Dolphin, smaller*.
Flume line	1910	construction for transporting water or timber using gravity	Mapped for all flume lines longer than about 200 metres and which are a part of or connected to mapped water courses.	Flume line and log flumes.
Aqueduct	1911	structure for transporting water courses over an obstacle	The obstacle can be a valley, road, railway, or another water course.	The aqueducts in Håverud, Kungs Norrby and Ljungsbo are mapped.

Table 13 Attribute set for Hydro facility line.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of	Date/time of latest change. Specified in the format:

Attribute	Type	Length	Definition	Description
			versions (does not refer to the validity of information or decision dates)	2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the

Attribute	Type	Length	Definition	Description
				version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	specifies the type of hydro facility line	Range of values for valid values.
matlage	Text	255	specifies which part of the object is measured	Mandatory value for *Pier* and *Quay*. See value range Measurement mode.

Table 14 Value set Measurement mode.

Value	Description
Mitt *(Center)*	Object measured by centre line.
Kant *(Edge)*	Object measured by edge line.
Ingen information *(No information)*	No information about how the object has been measured.

5.2.5 HYDRO FACILITY POINT

Table 15 Contents in Hydro Facility Point (Layer name: hydroanlaggningspunkt)

Object type	Object type number	Definition	Description	Comment
Lock gate	1922	construction for raising and lowering the water level in a waterway to enable boat traffic	A lock always consists of at least two lock gates.	Presented completely.

Object type	Object type number	Definition	Description	Comment
Dolphin, smaller	1921	a smaller, seabed-anchored device consisting of a group of piles attached to a foundation for mooring or redirect ships	Dolphins can be made of different materials, such as wood and concrete.	Only mapped within NSL area. Dolphins with an area less than 12 square metres are mapped as *Dolphin, smaller*. Dolphins with an area larger than or equal to 12 square metres is mapped as *Dolphin.*

Table 16 Attribute set for Hydro Facility Point.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000

Attribute	Type	Length	Definition	Description
			information or decision dates)	
lagesosakerhetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosakerhethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprunglig_organisation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the

Attribute	Type	Length	Definition	Description
				above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of *hydrographic facility point*.	Range of values for valid values.
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anti-clockwise rotation. Orientation is given in degrees (360 degrees in a circle).

5.2.6 HYDROGRAPHICALLY INTERESTING PLACE (LINE)

Table 17 Contents in Hydrographically interesting place (Layer name: hydrografiskt_intressant_plats)

Object type	Object type number	Definition	Description	Comments
Rapids	1583	fast flowing watercourse or series of smaller waterfalls in several steps	Part of a watercourse where the water is turbulent, due to speed, slope, and bottom conditions.	Presented in watercourses that are 6 metres or wider *watercourse surface* to show the character and navigability of the watercourse. The minimum length for presentation is approximately 50 meters.
Waterfall	1584	part of a watercourse where the water falls from a higher level to a lower level, more or less vertically		Fully presented in watercourses that are at least approximately 20 metres wide. In narrow watercourses down to approximately 6 meters, only

Object type	Object type number	Definition	Description	Comments
				significant waterfalls are presented.

Table 18 Attribute set Hydrographically interesting place.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosakerhetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.

Attribute	Type	Length	Definition	Description
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	

Attribute	Type	Length	Definition	Description
objekttyp	Text	255	indicates type of hydrographically interesting place	Range of values for valid values.

5.2.7 HYDRO LINE

Table 19 Contents in Hydro Line (Layer name: hydrolinje).

Object type	Object type number	Definition	Description	Comment
Watercourse	1581	natural or man-made flowing water that is part of a drainage system	A visible water courses narrower than approximately 6 metres are presented with a line. Running water wider than approximately 6 metres is presented as *Watercourse surface*. The shortest distance presented for watercourses that do not connect hydrographic objects (e.g., lakes and wetlands) is 250 metres. A simplified presentation is applied in the coverage area for Lantmäteriet's mountain range information (see appendix 1).	

Table 20 Attribute set for Hydro line.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised

Attribute	Type	Length	Definition	Description
				procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request.

Attribute	Type	Length	Definition	Description
				The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	specifies the type of hydro line	Range of values for valid values.
vattendragsid	Text	36	common identity for all included parts of water courses from source to mouth	Watercourse ID can be found on all line-represented watercourses.
storleksklass	Text	255	specifies the water courses size	In this product, all watercourses are class 1.
kanal	Text	255	man-made water course for ships	Value range: Yes, No.

5.2.8 HYDRO POINT

Table 21 Contents in Hydro point (Layer name: hydropunkt)

Object type	Object type number	Definition	Description	Comment
Rock awash	1591	a solid landmass that is located between 2 decimetres above and 5 decimetres below the current reference level	A shallow located so close to the water surface that waves break over it.	Only mapped within NSL area. Only breakers located more than 10 metres from the shoreline should be mapped. Two or more breakers that are closer than 10 metres to each other are generalised into one breaker, which is placed at the centre of gravity of the two breakers. When breaker and above water rocks are closer than 10 metres to each other; they are generalised into one above water rock.
Above water rock	1595	a solid landmass that is located more than 2 decimetres above the current reference level		Only mapped within NSL area. All islands and above water rocks that are smaller than 20 square metres are mapped. Larger islands are mapped as shorelines. Above water rocks located more than 10 metres from the shoreline should be mapped. Two or more above water rocks

Object type	Object type number	Definition	Description	Comment
				that are closer to each other than 10 metres are generalised into one above water rocks, which is placed at the centre of gravity of the two over water rocks. When a rock awash and above water rocks are closer to each other than 10 metres; they are generalised into an above water rock.
Flow direction arrow, small	1596	symbol for flow direction on narrower watercourses		Used for watercourses narrower than 6 metres and is placed on the watercourse line. Placed in such a way that the flow direction can be read.
Flow direction arrow, large	1597	symbol for flow direction in watercourses or along narrower watercourses		Used for watercourses that are 6 metres or wider (*watercourse surface*). If space is limited, the arrow is placed next to the watercourse surface. Placed in such a way that the flow direction can be read.

Table 22 Attribute set for Hydro point.

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created

Attribute	Type	Length	Definition	Description
				in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of hydrographic facility point	Range of values for valid values.
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anti-clockwise rotation. Orientation is given in degrees (360 degrees in a circle).

5.3 Structures

Table 23. Included layers in the Structures theme.

Structures	Layer name
Building (polygon)	byggnad
Building facility line	byggnadsanlaggningslinje
Building facility point	byggnadsanlaggningspunkt
Building point	byggnadspunkt

5.3.1 DATA CAPTURE

LINEAGE

Buildings

Building has their origin partly from Lantmäteriet's development and maintenance of GGD and partly from collaboration with Sweden's municipalities.

When GGD was constructed, buildings in rural areas and urban areas with fewer than 4000 inhabitants were mapped. For larger urban areas, the building presentation consisted only of built-up areas in the ground layer, except for larger community functions, which were also separately presented as individual buildings.

With the first collaboration agreements for addresses, buildings and topography, known as ABT-agreements, signed with the municipalities, the built-up areas started to be filled with geometry for the individual buildings. The development, which was completed in 2010, involved the municipalities first providing a basic delivery of buildings. The buildings that were missing from the GGD were added, and the buildings that were already in the GGD were replaced with those delivered by the municipalities After the basic deliveries, the municipalities switched to only sending updates. This is done at least twice a year, according to the agreement.

The responsibility for updating the geometries of buildings is delimited by the established areas of responsibility. The areas of responsibility are listed in an appendix to each municipality´s agreement. Within these areas, the municipalities are responsible for the updating, while Lantmäteriet is responsible for updating outside of these areas. Updates by Lantmäteriet take place at periodic intervals that comply with the image provision program. Municipalities can also make updates outside the areas of their responsibility.

It is most common for the municipality's areas of responsibility to include localities or so-called primary map areas. However, this varies from municipality to municipality. The area of responsibility may include the entire area

of the municipality, the municipality's localities or only the largest locality. This depends on the municipality's ability to continuously keep the areas updated. Some municipalities have not made agreements on updating building geometries so, they have no areas of responsibility at all. In such cases Lantmäteriet updates the entire municipality.

In 2011 the geometric representation of the buildings in GGD was merged with the register information that had been compiled and updated by municipalities since the mid-1990s in the building section of the Real Property Register. Map information and register information for each building are kept together and stored as one object in the database after the merger.

After the merger, more information was added for the buildings, such as information about the buildings' purpose and detailed purposes. Other information that already existed on the buildings could, in some cases, be changed due to changes in the source of the information.

For new buildings outside the municipalities' area of responsibility, Lantmäteriet classifies the buildings' purposes and detailed purposes. For existing buildings, this is only done in exceptional cases during updating. In general, the municipality is responsible for the classification of purpose.

Outside municipalities' area of responsibility, building geometry has mainly been collected through photogrammetric detailed measurement by Lantmäteriet and external actors in the construction phase. Updating has been managed by Lantmäteriet. Inside the municipalities' area of responsibility, building geometries have been collected by the municipality and delivered to Lantmäteriet, which has then processed and stored the information. Data from municipalities may have different origins. Geodetic and photogrammetric detailed measurement are common methods, but other measurement methods also occur.

Buildings may have names designated by the municipality. These names have been quality assured by Lantmäteriet in accordance with a developed framework.

Building facility lines

Collection and updating is performed by Lantmäteriet through photogrammetric measurements in aerial photographs as well as through collaboration agreements with the municipalities. Previously field controls were performed in case of uncertainties but are no longer conducted.

Building facility point and Building point

Collection and updating is performed by Lantmäteriet with photogrammetric measurements in aerial photographs as well as through collaboration agreements with the municipalities. Previously field controls were performed in case of uncertainties but are no longer conducted.

5.3.2 MAINTENANCE FREQUENCY

BUILDINGS

Buildings outside the municipal areas of responsibility for building geometry are updated according to the image provision program. Refer to information on the production plan for Orthophoto.

Within the municipalities' area of responsibility, data is delivered to Lantmäteriet at least twice a year according to the ABT agreement. Some municipalities deliver more frequently. Municipalities that have switched to service-based updating of buildings can update continuously via their own business system.

Lantmäteriet conducts periodic regular collection and updating of data, while municipalities' collection and updating are often governed by needs, such as for detailed planning, registration of real property and building permits. Therefore, the timeliness of the different responsibility areas within a municipality may vary. Not all areas need to be updated between each data delivery to Lantmäteriet.

Register information of buildings (not geometry) is continuously updated by municipalities via Lantmäteriet's collection application (LINA) or via service-based updating in the municipalities' own business systems.

BUILDING FACILITY LINES

The timeliness in different areas depends partly on image provision program which indicates when the aerial photographs were taken.

BUILDING FACILITY POINT AND BUILDING POINT

The timeliness in different areas depends partly on image provision program which indicates when the aerial photographs were taken.

5.3.3 DATA QUALITY

COMPLETENESS

Buildings

Within the municipalities' responsibility areas Lantmäteriet performs completeness controls in a few municipalities per year. For some sub-areas, the buildings on the map are compared with new aerial photographs taken from a low altitude. The result from the controls varies between municipalities and the different sub-areas but generally show a high completeness. The results indicate around 4% deviations in the form of commission or omission on the national level.

The completeness level for buildings outside the municipalities' areas of responsibility is high in areas that have been reviewed recently in the periodic updating. Since mapping is conducted by aerial photographs, it is possible that small buildings are obscured by vegetation or that misjudgements occur in interpretation, but these errors are relatively small. The opportunities of obtaining good completeness also depend on the altitude the photograph is

taken from and the resolution the aerial image, refer to the image supply program image provision program. Lantmäteriet does not conduct field checks. See also chapter 5.3.1 Data Capture and 5.3.2 Maintenance Frequency.

Building facility lines

High completeness.

Building facility point and Building point

Building facility point and Building point have high completeness.

LOGICAL CONSISTENCY

Buildings

Lantmäteriet checks that building geometries and other building information are valid and, in accordance with current geodata specifications, maintain very high quality.

Business rules decide which controls are done. The information is controlled in conjunction with the collection via interfaces and services. This means that the deviations that exist have their origins from previous storage environments and systems.

Building facility lines

There are no topological rules set up for reindeer fences and line traffic.

Building facility point and Building point

The objects are independent point objects and have no requirements for logical consistency.

THEMATIC ACCURACY

Buildings

Deviation may occur mainly regarding the classification of other buildings, agricultural buildings, and accessory buildings.

Deviations can also originate from earlier storage environments and systems as well as the assessments that are done by the municipalities and by Lantmäteriet during aerial photographs interpretation. Lantmäteriet does not conduct field checks.

Building facility lines.

The classification that occurs during measurements of aerial photographs involves a degree of uncertainty, but thematic accuracy is still considered high for these facilities.

Reindeer fences within the Lantmäteriet’s coverage area for mountain range information are collected via field controls and contact persons, which provides a very high thematic accuracy.

Objects that are collected via municipality collaborations have high thematic accuracy.

Building facility point and Building point

The classification is made during measuring in aerial photographs, which induces a certain uncertainty. The classification is still considered high.

POSITIONAL UNCERTAINTY

Buildings

The buildings' planar positional uncertainty is indicated in the attribute *lagesosakerhetplan*. Buildings with a lower mean error (25 millimetres to approximately 500 millimetres) usually originate from municipal measurements where more accurate methods are used such as geodetic measurements. The given mean errors from Lantmäteriet are calculated values based on measurement method, flight altitude and scale.

The attribute *insamlingslage* (collection position) indicates where on the building the measurement has been done. Note that value 4 (illustrative mode) for *insamlingslage* indicates only that the building is schematically presented in both extent and position. No measurement of the building has been made.

Building facility lines

Depending on the flight altitude and image quality, the measurement accuracy may vary slightly, but generally the planar position has a low positional uncertainty.

Objects delivered by collaboration between municipalities usually have a low positional uncertainty since they are often measured geodetically or with DGPS.

Building facility point and Building point

Depending on the flight altitude and image quality, the positional accuracy may vary slightly, but generally the position in plane has high or very high accuracy for built-up area symbols.

Table 24. Positional uncertainty for Structures.

Object type	Requirement for planar positional uncertainty (m).
Building (polygon)	2
Reindeer fence	5
Cable traffic	5
Chimney	5
Mast	5

Object type	Requirement for planar positional uncertainty (m).
Lighthouse	5
Church	5
Lean-to	10
Windmill	5
Sami cot	10
Tower	5
Rest cabin	10
Bell tower	5
Wind turbine	5
Blast shelter	10

5.3.4 BUILDING (POLYGON)

Table 25. Contents in building (polygon) (Layer name: byggnad)

Object type	Object type number	Definition	Description	Comment
Residential	2061	building primarily used for leisure or permanent accommodation	Leisure or permanent accommodation.	Mapped for all buildings larger than 15 square metres. Buildings smaller than 15 square meters may also be included.
Industrial	2062	building primarily used for manufacturing products and processing of raw materials		Mapped for all buildings larger than 15 square metres. Buildings smaller than 15 square meters

Object type	Object type number	Definition	Description	Comment
				may also be included.
Public	2063	building primarily used for citizens' activities in community life		Mapped for all buildings larger than 15 square metres. Buildings smaller than 15 square meters may also be included.
Commercial	2064	building primarily used for commercial purposes	More than 50% of the building should be used for other than residences, such as hotels, offices, retail, restaurants, or car park.	Mapped for all buildings larger than 15 square metres. Buildings smaller than 15 square meters may also be included.
Agricultural	2065	building primarily used for agricultural, forestry, or comparable industry		Mapped for all buildings larger than 15 square metres. Buildings smaller than 15 square meters may also be included.
Accessory building	2066	building that belongs to a detached house	Includes, for example shed, garage, carports, cisterns, storage room, boathouses, or garden sheds. Buildings without walls may be included.	Mapped for all buildings larger than 15 square metres. Buildings smaller than 15 square meters may also be included.
Other building	2067	building whose purpose is not *Residential, Industrial, Public, Commercial, Agricultural* or *Accessory building*	Includes, for example, allotment cottage, lean-to, Sami cots, tower, windmill, bell tower, lighthouse, detached roof of durable construction.	Mapped for all buildings larger than 15 square metres. Buildings smaller than 15 square meters may also be included.

Table 26. Set of attributes for (Building (polygon).

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created

Attribute	Type	Length	Definition	Description
				in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of building	Range of values for valid values.
insamlingslage	Text	255	indicates what building area in plan refers to	See value range *Collection mode*.
byggnadsnamn1	Text	255	name of building	Main name.
byggnadsnamn2	Text	255	name of building	Other name

Attribute	Type	Length	Definition	Description
byggnads-namn3	Text	255	name of building	No values are available.
husnummer	Integer	4	a unique number within the register unit	Building designation consist of the register unit's designation and house numbers. House numbers can be reused.
huvudbygg-nad	Text	255	refers to a building, in a larger complex of buildings, on a property as the main building	Used on buildings where there is a need to highlight that a main building exists, primarily for presentation purpose. Value range: Ja/Nej (Yes/No)
andamal1	Text	100	main purpose	Indicates the main purpose for the entire building. See value range *Purpose.*
andamal2	Text	100	other purpose	The building can have multiple purposes.
andamal3	Text	100	other purpose	The building can have multiple purposes.
andamal4	Text	100	other purpose	The building can have multiple purposes.
andamal5	Text	100	other purpose	The building can have multiple purposes.

Table 27. Value set Collection mode.

Value	Description
Fasad	Location description representing the façade of the building inside the roof edge

Value	Description
(Façade)	
Takkant *(Roof edge)*	Location description that represents the boundary lines of the roof.
Illustrativt läge *(Illustrative mode)*	Location description that indicates that the building is either: -lacks a measured position (standard geometry), or - is located under a road or other facility.
Ospecificerad *(Unspecified)*	

Table 28. Value set Purpose.

Object type	Purpose	Description
Bostad *(Residential)*	Småhus friliggande *(Detached house)*	Single-family house with a residence that is not connected to another house
Bostad *(Residential)*	Småhus kedjehus *(Semi-detached house)*	Two or more residencies connected by garage, storage rooms or similar
Bostad *(Residential)*	Småhus radhus (*Terraced house)*	Small houses located in a row of at least three houses where the residential parts are directly attached to each other, and each residence has its own property
Bostad *(Residential)*	Småhus med flera lägenheter *(Detached house with multiple apartments)*	Detached house with multiple residencies located on the same property.
Bostad *(Residential)*	Flerfamiljshus *(Multi-family house (apartment building)*	Building with at least three residencies and may contain offices, retail, hotels, restaurants and similar. At least 50% must be used for residential purposes.
Bostad *(Residential)*	Ospecificerad (*Unspecified)*	Residence with unknown residential purpose. Cannot be used for new registrations.

Object type	Purpose	Description
Industri *(Industrial)*	Annan tillverkningsindustri *(Other manufacturing industry)*	Other manufacturing industry: building for industrial activity with manufacturing.
Industri *(Industrial)*	Industrihotell *(Industry hotel)*	Building containing multiple different industries.
Industri *(Industrial)*	Metall- eller maskinindustri *(Metal or machinery industry.)*	Industry for production and processing of metal and machinery.
Industri *(Industrial)*	Textilindustri *(Textile industry)*	Industry that manufactures yarn, fabric and similar as well as prepares them
Industri *(Industrial)*	Trävaruindustri (*Wood industry)*	Industry for refinement of forest materials
Industri *(Industrial)*	Övrig industribyggnad (*Other industrial building)*	Building for other industrial activities that are not manufacturing
Industri *(Industrial)*	Ospecificerad *(Unspecified)*	Industry with unknown purpose.
Samhällsfunktion *(Public)*	Badhus *(Public baths)*	Building with public swimming facilities
Samhällsfunktion *(Public)*	Brandstation (*Fire station)*	Building for fire and rescue services
Samhällsfunktion *(Public)*	Busstation (*Bus station)*	A larger bus stop or bus terminal with multiple lines and a building.
Samhällsfunktion *(Public)*	Djursjukhus (*Animal hospital)*	Building for stationary care of sick animals
Samhällsfunktion *(Public)*	Högskola *(Higher education institution)*	Post gymnasium school as classified in *Higher education ordinance.*
Samhällsfunktion *(Public)*	Ishall (*Ice rink)*	Indoor, artificially frozen, ice facility.
Samhällsfunktion	Järnvägsstation	Station or stop that dispatches passenger or freight traffic

Object type	Purpose	Description
(Public)	(*Railway station)*	
Samhällsfunktion *(Public)*	Kommunhus *(Town hall)*	Main building for municipal management.
Samhällsfunktion *(Public)*	Kriminalvårdsanstalt (*Prison)*	Institution for serving prison sentences.
Samhällsfunktion *(Public)*	Kulturbyggnad (*Cultural building)*	Building for cultural purposes
Samhällsfunktion *(Public)*	Multiarena *(Multi-purpose arena)*	Flexible, large arena for the practising of sports, culture, and hosting various events
Samhällsfunktion *(Public)*	Polisstation (*Police station)*	Building for police operations
Samhällsfunktion *(Public)*	Ridhus (*Riding stables)*	Building with an indoor riding arena.
Samhällsfunktion *(Public)*	Samfund (*Religious community)*	Building for organised religious community
Samhällsfunktion *(Public)*	Sjukhus (*Hospital)*	Institution for inpatient care and specialised outpatient care
Samhällsfunktion *(Public)*	Skola (*School)*	Building for education
Samhällsfunktion *(Public)*	Sporthall (*Sport hall)*	Indoor facility for sports and athletics.
Samhällsfunktion *(Public)*	Universitet (*University)*	Post gymnasium school as classified in *Higher education ordinance*.
Samhällsfunktion *(Public)*	Vårdcentral (*Health centre)*	Unit for open healthcare.
Samhällsfunktion *(Public)*	Ospecificerad *(Unspecified)*	Community function with unknown purpose

Object type	Purpose	Description
Verksamhet *(Commercial)*	-	Function with unknown purpose
Ekonomibyggnad *(Agricultural)*	-	Agricultural building with unknown purpose.
Komplement-byggnad (Accessory building)	-	Accessory building with unknown purpose.
Övrig byggnad *(Other building)*	-	Other building with unknown purpose.

5.3.5 BUILDING FACILITY LINES

Table 29. Contents in Building facility line (Layer name: byggnadsanlaggningslinje).

Object type	Object type no.	Definition	Description	Comment
Reindeer fence	1980	fence intended to lead reindeer between different pastures and to collection points		Presented completely apart from capture fences shorter than 200 metres at *reindeer enclosures*.
Cable traffic	1978	wire-borne transportation system with carriages, baskets, loops, sticks or harness that run above ground level	Cable cars and ski lifts.	Mapped if it is operating and at least 200 m long. Also used for funicular aerial tramways, gondolas chair lift, drag lift or zipline.

Table. 30. Set of attributes for Building facility line.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not

Attribute	Type	Length	Definition	Description
				changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions

Attribute	Type	Length	Definition	Description
				are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of building facility line.	Range of values for valid values.

5.3.6 BUILDING FACILITY POINT

Table 31. Contents in Building facility point (Layer name: byggnadsanlaggningspunkt).

Object type	Object type	Definition	Description	Comment
Chimney	2022	vertical pipe-shaped construction to divert smoke.		Free standing or as a part of a building. All prominent chimneys in the landscape that are at least approximately 25 meters tall are to be

Object type	Object type	Definition	Description	Comment
				mapped. Free standing chimneys with an area of at least 15 square metres are also mapped as *building*. The point is placed at the bottom of the point object.
Mast	2019	tall and vertical construction erected on a small area, often anchored with cables	Not intended to contain or hold a notable space (in comparison to a tower).	Mapped for tele, radio and TV masts that are at least 25 metres high. Exceptions for masts on alpine tundra which are mapped even if they are lower than 25 m.

Table 32. Set of attributes for Building facility point.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is

Attribute	Type	Length	Definition	Description
				checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system.

Attribute	Type	Length	Definition	Description
				When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of building facility point	Range of values for valid values.
hojd	Floating point	3.0	height above ground	
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anti-clockwise rotation. Orientation is given in degrees (360 degrees in a circle).

5.3.7 BUILDING POINT

Table 33. Contents in Building point (Layer name: byggnadspunkt).

Object type	Object type number	Definition	Description	Comment
Lighthouse	1051	device for sea traffic that, through light or other signals, provides positional controls or warnings		Historical lighthouses and coastal lighthouses are mapped. Lighthouses with a surface of at least approximately 15 square metres are also mapped as *Building*.

Object type	Object type number	Definition	Description	Comment
Church	1042	building permanently used for religious worship within the Church of Sweden	A building in the landscape with a distinct character of a church, whether ancient or contemporary.	Chapels may be included if there is no reported church nearby. Processed material with support from information provided by the Church of Sweden and the Swedish National Heritage Board.
Lean-to	1046	basic building for outdoor activities with the purpose to provide hikers protection from wind and rain	The building has three walls and a roof, such as a gap shelter or lean-to	Mapped along hiking trails. Within the coverage area of Lantmäteriet's mountain range information (see appendix 1) lean-tos are also mapped even if they are not located near a trail. Lean-tos with a surface of at least approximately 15 square metres are also mapped as *Building*.
Windmill	1047	building erected to mill grains using wind power		Mapped for all windmills with a characteristic building form. Sails may be missing. Windmills with a surface of at least approximately 15 square metres are also mapped as *Building*.
Sami cot	1044	basic conical or dome		Updated only within the

Object type	Object type number	Definition	Description	Comment
		shaped building in mountain regions intended for stays.		coverage area for Lantmäteriet's mountain range information (see appendix 1). *Cot* (Lavvu) with a surface of at least approximately 15 square metres are also mapped as *Building*.
Tower	1045	tall and vertical structure built on a relatively small area or on another building	intended to contain or hold a notable space (in comparison to a mast)	All towers that are prominent in the landscape are included. Towers with a surface of at least approximately 15 square metres are also mapped as *Building*. The point is placed at the bottom of the point object.
Rest cabin	1050	cabin that can be used for protection or for rest and is always unlocked	Rest cabin according to the government's trail network, often have emergency phones.	Information is obtained from county administration boards, municipalities, STF (Swedish Tourist Association), the tourism industry, designated contact persons or through field controls and by image interpretation.
Bell tower	2016	tower-like, free standing construction built for church bells often adjacent to a church		Fully mapped. Bell tower with a surface of at least approximately 15 square metres are also mapped as *Building*.

Object type	Object type number	Definition	Description	Comment
Wind turbine	2025	tower or mast with a device that converts wind energy to electricity		Mapped for all wind turbines that are at least 25 metres high, including the maximum heights of the rotor blades above the ground. Wind turbines with a surface of at least approximately 15 square metres are also mapped as *Building*. The point is placed at the bottom of the point object.
Blast shelter	1052	space under ground for protection during rocket launches or other types of shooting		Presented within Esrange space centre.

Table 34. Set of attributes for Building point.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a

Attribute	Type	Length	Definition	Description
				property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never

Attribute	Type	Length	Definition	Description
				have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	Indicates the type of Building point.	The value range describes valid values.
hojd	Floating point	3.0	height above ground	Given in the unit metres.
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anti-clockwise rotation. Orientation is given in degrees (360 degrees in a circle).

5.4 Facility area

Table 35. Included layers in the Facility area theme.

Facility area	Layer name
Facility area (polygon)	anlaggningsomrade
Facility area point	anlaggningsomradespunkt
Runway (polygon)	start_landningsbana

Facility area	Layer name
Airport area (polygon)	flygplatsomrade
Airport point	flygplatspunkt

5.4.1 DATA CAPTURE

LINEAGE

Facility areas

Collection and updates are performed by Lantmäteriet through photogrammetric measurements in aerial photographs, through collaboration agreements with the municipalities as well as with editorial collection.

Editorial collection means that objects and information text are gathered by an "editorial team" at the office, who verify information with the help of the internet and contacts with other authorities, organisations, and stake holders to get information from a source with good knowledge of the objects in the entire Sweden.

Previously, field checks were also conducted in cases of uncertainty in classification or position, but this is not done at present. A facility area is presented as a polygon object where the outer limit is along the edge of the area, such as in a fence.

Facility area point

Swimming areas are gathered through aerial photograph interpretation and municipality collaboration. Harbour for small boats is gathered through aerial photograph interpretation. Guest harbour is gathered through editorial collection, aerial image interpretation and municipality collaboration. Sea rescue stations are gathered through editorial collection.

Airports

Collection and updating are done out by Lantmäteriet through photogrammetric measurements from aerial photographs and through editorial collection.

5.4.2 MAINTENANCE FREQUENCY

FACILITY AREAS

The update intervals follow the image provision program.

FACILITY AREA POINT

The update interval for objects collected through aerial photograph interpretation follows the image provision program

AIRPORT

Continuous updating.

5.4.3 DATA QUALITY

COMPLETNESS

Facility areas

High completeness.

Facility area point

Completeness is low to medium.

Currently, no campervan pitches are gathered, and no updates are made of (industrial) harbours.

Airports

High completeness.

LOGICAL CONSISTENCY

Facility areas

The geometry must be coherent. No gaps, overhang, self-intersecting lines, or overlaps are allowed.

Facility area point

The objects are independent point objects and have no requirements for logical consistency.

Airports

The geometry of airport areas and runways must be coherent. No gaps, overhang, self-intersecting lines, or overlaps are allowed.

A helicopter pad is an independent point object and have no requirement for logical consistency.

THEMATIC ACCURACY

Facility areas

Measurements and thematic interpretations in aerial photographs cause a certain degree of uncertainty due variations in the ability to distinguish details in the images. Previously collected facilities are considered to have high thematic accuracy since they have been checked in the field when needed. Facilities delivered by municipalities under the ABT agreement are considered to have high thematic accuracy.

Facility area point

High thematic accuracy.

Airports

High thematic accuracy.

POSITIONAL UNCERTAINTY

Facility areas

The facility area is presented as a polygon object by creating a boundary line on the edge of the area, such as in a fence. Depending on the flight

altitude and the image quality, measurement accuracy may vary slightly, but in generally, positions in plane have a mean accuracy of 5 m.

Facilities provided through municipality collaboration usually have better positional uncertainty since they have been measured geodetically or by using Network RTK.

Facility area point

The point represents an area that may be difficult to determine the exact boundary for, such as a swimming area.

Airports

The airport area is presented as a polygon object by creating a boundary line on the edge of the area, such as in a fence. Depending on the flight altitude and the image quality, measurement accuracy may vary slightly, but generally positions in plane have a mean accuracy of 5 metres.

Table 36. Positional uncertainty of facility area.

Object type	Requirement for planar positional uncertainty (m).
Facility area, polygon	5
Facility area point	10
Runway	2
Airport area	5
Helicopter pad	5–20

5.4.4 FACILITY AREA (POLYGON)

Table 37. Layer description for Facility area (polygon) (Layer name: anlaggningsomrade).

Object type	Object type number	Definition	Description	Comment
Industrial area	2831	a facility area primarily used for industrial activities.		Energy production, mining areas, test track, quarries and reindeer enclosures are mapped regardless of their size.

Object type	Object type number	Definition	Description	Comment
				Industrial area, unspecified is used for larger facilities to keep the area together and where it is not adjacent to a locality. Unspecified areas larger than 100,000 square meters (10 hectares) are mapped. Areas of 30,000-100,000 square meters (3-10 hectares) are mapped if they are mostly undeveloped. *Industrial area, unspecified* is not included when the area coincides with an industrial- and retail area in the layer *Ground*.
Community function	2832	facility area used for socially beneficial activities		
Recreation	2833	facility area primarily used for activities related to sport, leisure, or culture		Motorsport facility Within a motorsport facility the facility area with the sports purpose *Car racing track* can be mapped. Sports facility Facility area intended only for track and field is presented as

Object type	Object type number	Definition	Description	Comment
				Track and field facility. Within a sports facility can facility areas with the sports purpose *Ball field, Soccer field, Running track, Tennis court* be mapped.
Civil firing range	2834	a restricted area where civilian dangerous, such as firing with live ammunition, detonations, or rocket launching are regularly conducted		
Sports field	2835	a defined and prepared field or court on which sport activities are performed	It often has standardized measurements.	Fields or courts located within a larger facility are also included.

Table 38. Set of attributes for Facility area (polygon)

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a

Attribute	Type	Length	Definition	Description
				property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosakerhetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosakerhethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprunglig_organisation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never

Attribute	Type	Length	Definition	Description
				have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	states type of facility area.	Value range for valid values.
andamal	Text	255	States activity	See value range for industrial area purpose, community function purpose, recreation purpose and sports field purpose below.
skjutfaltstyp	Text	255	type of firing range	Value range for valid firing range types. Valid only for the object type *Civil firing range*. Is mandatory for the object type *Military firing range.* See value range *Firing range type*.
skjutfaltstext	Text	100	informative text for firing range	Valid only for the object type *Civil firing range.*

Table 39. Value range for Industrial area purpose

Value	Definition	Description	Comment
Energiproduktion *(Energy production)*	transformation of energy source to electricity or heating	Biogas plant, oil power plant, power heating plant, natural gas, solar cell park, wave power plant, nuclear power plant.	
Gruvområde *(Mining area)*	area where mining activities take place	Also includes sludge reservoirs and land with facilities for the mining operations.	Mapped if the mining facility is in use.
Rengärde *(Reindeer enclosure)*	enclosure intended to be used during separation and slaughter or calf marking of reindeers		Mapped if the reindeer enclosure is in use. Abandoned reindeer enclosures are mapped if there is a stone wall around it. Reindeer enclosure is presented within the coverage area for Lantmäteriet's mountain range information (see appendix 1).
Testbana *(Test track)*	testing facility for motor vehicles		
Täkt *(Quarry)*	facility area where stone, gravel, or peat is extracted	Example: Mountain quarry, gravel pit or peatery.	
Ospecificerad *(Unspecified)*	unspecified industrial activity		

Table 40. Value range for Community function area purpose

Value	Definition	Description	Comment
Avfallsanläggning *(Waste facility)*	area for reception of waste		Car dismantling, landfill and recycling central are mapped. Recycling station is not included.

Value	Definition	Description	Comment
Begravningsplats *(Cemetery)*	area used for the storage of the remains or ashes of the deceased	Cemetery, funeral place, or memorial grove.	
Civilt övningsfält *(Civil practice field)*	area used for training and education in the field of rescue, safety, and emergency preparedness	Used for e.g., rescue services, police, and ambulance care.	The Rescue Services practice field are mapped.
Kriminalvårdsanstalt *(Prison)*	fenced area for the enforcement of prison sentences		
Sjukhusområde *(Hospital area)*	area with a hospital or other healthcare institution	In the area, there is at least one workplace with 350 employees within healthcare sectors, and typically a larger hospital building.	According to Statistics Sweden's definition, a workplace refers to each address, property, or group of properties where the company conducts its operations. This includes the 99 largest hospital areas in Sweden in 2023. This may change depending on factors such as maintenance and updates.
Skolområde *(School area)*	school buildings with attached grounds	School areas for preschool class, compulsory school, special school, private school, Sami school, upper secondary school, University areas.	Statistics Sweden is responsible for the collection of areas for preschool class, compulsory school, and Sami school. Statistics Sweden is responsible for points for private school, upper secondary school. Based on these points, Lantmäteriet creates polygons. Statistics Sweden provides data for university areas. The areas have, if necessary, been edited and supplemented by

Value	Definition	Description	Comment
			Lantmäteriet, with the support of ortho-photos and map data (as well as, where applicable, the school's website and street view on the Internet). Example: Schoolyard, campus
Trafikövnings-plats *(Traffic training area)*	specially prepared road course for training in manoeuvring and slippery driving, e.g., as part of a driver's licence training	Also called slippery course.	
Ospecificerad *(Unspecified)*	unspecified community activities.		

Table 41. Value range for Recreation purpose

Value	Definition	Description	Comment
Aktivitetspark *(Activity Park)*	prepared outside area with several types of activities for training, playing and sports	Clearly defined area. Not mapped separately if it is included in another facility area. Private activity parks on private plots are not mapped.	Example: Skatepark, larger playground, outdoor gym, obstacle course, pump track.
Badanläggning *(Swimming facility)*	fenced in swimming pool or nature swimming with prepared services	facilities provided such as a bathing jetty, lifebuoy, and toilet	
Besökspark *(Visitor Park)*	usually fenced in park with entry fees visited for leisure and experiences	For example: Astrid Lindgrens World, Gröna Lund or Kolmården zoo.	
Campingplats *(Camp site)*	prepared area for overnight stays in a cabin, camper van, motor home		All camp sites listed in the following designations should be included:

Value	Definition	Description	Comment
	or tent with attached services		- The Swedish Camping Association www.scr.se - Independent campsites in Sweden www.husvagnochcamping.se - Caravan Club www.caravanclub.se In addition, camp sites collected with municipalities are also included.
Friidrottsanläggning *(Track and field facility)*	prepared area where the main activity is track and field		In track and field facility, facility area with sports field purpose is presented with *Running track.*
Golfbana *(Golf course)*	prepared area for golf		A nine-hole course and larger.
Hundsportanläggning *(Dog sport facility)*	area where dog sport is practiced	Example: greyhound racing track	
Hästsportanläggning *(Equestrian facility)*	area where equestrian sports are practiced		Larger facilities with stables and courses for several types of equestrian sports, such as trotting, galloping, dressage, jumping, field competition and driving. In the equestrian facility, an area with sports field purpose *Gallop racecourse* or *Trotting racecourse* can be included.
Idrottsanläggning *(Sports facility)*	larger sports and athletics facility (sports field)		
Koloniområde *(Allotment area)*	area for gardening and cultivation activities in the form of allotment	An allotment garden can be built with an allotment cottage	

Value	Definition	Description	Comment
	garden and/or cultivation plots.	and a basic greenhouse. A cultivation plot is primarily intended for the cultivation of vegetables, fruit, berries, and flowers. There may also be a small shed on the cultivation plot.	
Kulturanläggning *(Culture facility)*	area to show various cultural interpretations	Examples: Open-air Museum, local heritage museum, or cultural village.	
Motorsportanläggning *(Motorsport facility)*	prepared area for motor sports	Example: Motocross track.	
Parkområde *(Park area)*	larger garden area where grass, flowers, bushes, and tree plantations are crossed with a system of walking paths	Channels and ponds together with sculptures, fountains, pavilions as well as other smaller buildings are often included.	
Skjutbaneområde *(Shooting range area)*	prepared area for training or competition in shooting	Examples: Hunting, pistol, larger archery, and clay pigeon ranges of a permanent nature.	Within the shooting range area, the facility area point is mapped with sports field purpose *Shooting range* or *Shooting range, smaller*.
Vintersportanläggning *(Winter sports facility)*	prepared area for winter sports	Examples: Ski jumping slope, alpine skiing facility, ski stadium, bobsleigh- and luge course.	
Ospecificerad *(Unspecified)*	unspecified recreation purpose		

Table 42. Value range for Firing range type.

Value	Definition	Description	Comment
Skjutfält (Firing range)	Firing range on land		
Skjutområde (Firing area)	Firing range on water		

Table 43. Value range for Sports field purpose

Value	Definition	Description	Comment
Bollplan *(Ball field)*	field for ball games	Examples: American football, baseball, soft ball, cricket, lacrosse, field hockey, rugby, basketball, beach volleyball, beach handball, multi-purpose field, padel.	
Fotbollsplan *(Football field)*	field prepared for football		All fields where organized football activities take place. Boundary lines should be clearly visible.
Galoppbana *(Gallop racecourse)*	racecourse prepared for gallop competitions.	Examples: Göteborg, Jägersro, Bro Park	Main courses according to Svensk galopp.
Isbana *(Ice rink)*	field with ice prepared for sports	Examples: Ice hockey rink, bandy field.	
Löparbana *(Running track)*	track and field course for running.	Generally, an oval-shaped track.	
Motorsportbana *(Motorsport course)*	course prepared for motorsport		The racetracks within the motorsport facilities are only presented for the larger facilities like Anderstorp Raceway, Falkenbergs motorbana, Gotland Ring, Karlskoga motorstadion,

Value	Definition	Description	Comment
			Kinnekulle Ring, Linköpings motorstadion, Mantorp Park, Mittsverigebanan, Ring Knutstorp, Sturup Raceway and Tierp Arena.
Tennisbana *(Tennis court)*	court prepared for tennis		Private tennis court on an independent property are not included.
Travbana *(Trotting racecourse)*	racecourse prepared for trotting competitions		Selection according to www.travsport.se
Ospecificerad *(Unspecified)*	unspecified purpose for sports field		

5.4.5 FACILITY AREA POINT

Table 44. Content in Facility area point (Layer name: anlaggningsomradespunkt)

Object type	Object type no.	Definition	Description	Comment
Industrial area, point	2841	a facility area represented by a point primarily used for industrial activities		
Community function, point	2842	facility area, represented by a point, used for public contexts		
Recreation, point	2843	facility area represented by a point, primarily used for activities related to sport, leisure, or culture		

Object type	Object type no.	Definition	Description	Comment
Sports field, point	2844	delimited and prepared field or course, represented with a point, where sports or athletic activities take place	Often has standardized measurements. Examples: American football, baseball, soft ball, cricket, lacrosse, field hockey, rugby, basketball, beach volleyball, beach handball, multi-purpose field, padel.	A field or course inside a larger facility is also included.

Table 45. Set of attributes for Facility area point

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000

Attribute	Type	Length	Definition	Description
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektvers-ion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.

Attribute	Type	Length	Definition	Description
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	states type of facility point	Range of values for valid values.
andamal	Text	255	States facility	See value range Industrial purpose, Community function purpose, Recreation purpose and Sports field purpose below.
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anticlockwise rotation. Orientation is given in degrees (360 degrees in a circle).

Table 46. Value range for Industrial purpose

Value	Definition	Description	Comment
Hamn *(Harbour)*	area, where ships can anchor and moor, meant for protection, loading, unloading and storage	Examples: Fishing harbour, industrial harbour.	Editorial collection takes information from the Swedish Maritime Administration's port register. Guest harbour is not included but is instead presented as *Guest harbour.*

Table 47. Value range for Community function purpose

Value	Definition	Description	Comment
Sjöräddningsstation *(Sea rescue station)*	rescue station with a stationed sea rescue unit	The stations are operated by the Swedish Sea Rescue Society.	

Table 48. Value range for Recreation purpose

Value	Definition	Description	Comment
Badplats *(Swimming area)*	swimming pool or nature swimming with prepared services	facilities provided such as a bathing jetty, lifebuoy, and toilet	
Gästhamn *(Guest harbour)*	harbour (marina) prepared with boat berths, available for temporary visiting recreational boats for a fee	Editorial collection from: - The Guest Harbour guide (Gästhamnsguiden) - Swedish Guest Harbours (Svenska Gästhamnar) In addition to these, guest harbours collected in collaboration with the municipalities are also mapped.	
Småbåtshamn *(Small boat harbour)*	harbour (marina) prepared for mooring of leisure boats		
Ställplats *(Motorhome pitch)*	a parking space designated for temporary parking and overnight stay of motorhomes		

Table 49. Value range for Sports field purpose

Value	Definition	Description	Comment
Skjutbana (Shooting range)	prepared range for training or competition in shooting	Examples: Shooting range for rifle, field shooting or automatic weapon as well as longer hunting shooting range.	A permanent range which is at least 300 m long.
Skjutbana, mindre (Shooting range, smaller)	smaller prepared range for training or competition in shooting	Examples: Hunting shooting, pistol, larger bow shooting and clay pigeon course.	A permanent range.

5.4.6 RUNWAY

Table 50. Content in Runway (Layer name: start_landningsbana)

Object type	Object type no.	Definition	Description	Comment
Runway	2853	prepared surface for take-off and landing of airplanes	Runway within an airport.	Runways within mapped airport areas. Also mapped for former airports. Taxiways are not included.

Table 51. Set of attributes for Runway

Attribute	Type	Length	Definition	Comment
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000

Attribute	Type	Length	Definition	Comment
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektvers-ion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.

Attribute	Type	Length	Definition	Comment
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	states that the type is runway	A text value that should always be runway.
flygplatssta-tus	Text	255	states if the airport is operational or closed	See value range for Airport status.

Table 52. Value range for Airport status

Value	Definition	Description	Comment
I drift *(Operational)*	the airport is operational		
Nedlagd *(Closed)*	the airport is closed		

5.4.7 AIRPORT AREA

Table 53. Content in Airport area (Layer name: flygplatsomrade)

Object type	Object type no.	Definition	Description	Comment
Airport area	2854	facility area for departure and arrival by aviation	The facility area includes runways as well as buildings, parking spaces and other facilities related to the airport.	Aviation activities conducted according to the list AIP, published by Air Navigation Services of Sweden, is mapped. The Air Force's flotilla and training airfields are part of AIP. Aviation without any official statues (e.g., flight clubs) can also occur, but not model airplanes or seaplanes.

Table 54. Set of attributes for Airport area

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created

Attribute	Type	Length	Definition	Description
				in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	states that the type is airport area	The object type is Airport area.
iata	Text	3	three-digit identification code for airports	IATA-codes are only available for airports with regular flights, for example, ARN – Stockholm Arlanda Airport.
icao	Text	4	four-lettered code of the geographic	ICAO-codes are available both for

Attribute	Type	Length	Definition	Description
			position of airports, only used by pilots and air traffic control	airports with regular flights as well as small airports with only private aviation, for example, ESSB (Europe Sweden Stockholm Bromma).

5.4.8 AIRPORT POINT

Table 55. Content in Airport point (Layer name: flygplatspunkt)

Object type	Object type no.	Definition	Description	Comment
Helicopter pad	2852	designated spot from which air traffic or helicopter traffic originates	Helicopter pads normally have one or more helicopter landing pads and may have limited infrastructure such as fuel stations, hangars, and workshops.	They are mapped if they are licensed by the Air Navigation Service of Sweden (Luftfartsverket) according to AIP, except for within the coverage area of the Lantmäteriet´s mountain range information where all helicopter landing sites are mapped.

Table 56. Set of attributes for Airport point

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object,

Attribute	Type	Length	Definition	Description
				such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never

Attribute	Type	Length	Definition	Description
				have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	states that the type is airport are	The object type is Airport area.
iata	Text	3	three-digit identification code for airports	IATA-codes are only available for airports with regular flights, for example, ARN – Stockholm Arlanda Airport.
icao	Text	4	four-lettered code of the geographic position of airports, only used by pilots and air traffic control	ICAO-codes are available both for airports with regular flights as well as small airports with only private aviation, for example, ESSB (Europe Sweden Stockholm Bromma).
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anticlockwise rotation. Orientation is given in

Attribute	Type	Length	Definition	Description
				degrees (360 degrees in a circle).

5.5 Communication

Observe that the object identities for road lines and road points are not unique.

Table 57 Included layers in the Communication theme.

Communication	Layer name
Road line	vaglinje
Road point	vagpunkt
Ferry route (line)	farjeled
Other road (line)	ovrig_vag
Mountain transport route (line)	transportled_fjall
Mountain point of interest	ledintressepunkt_fjall
Rail traffic (line)	ralstrafik
Rail traffic station (point)	ralstrafikstation

5.5.1 DATA CAPTURE

LINEAGE

For original lineage see chapter 2.2.1.

Road line

NVDB (National Road Database) is one of society's basic databases and includes a reference road network and a large amount of data linked to the road network. This means that it contains all of Sweden's roads and streets as well as a subset of the cycle paths and footpaths.

NVDB is a collaboration between the Swedish Transport Administration, Sweden's municipalities and regions, the forest industry, the Swedish Transport Agency and Lantmäteriet. The Swedish Transport Administration is the owner of NVDB.

Table 58 Suppliers for NVDB.

Organisation	Responsibility area
The Swedish Transport Administration	Provides data on the state road network and the private road network that receive state grants for maintenance.
Sweden's municipalities and counties	All 290 municipalities in Sweden provide data about the municipal road network and about private roads in designated areas.
Forest industry	Provides data about the private road network that is of interest to the forest industry.
Lantmäteriet	Provides data about the other private road networks.
The Swedish Transport Agency	Provides traffic rules (such as speed limits, prohibited direction of travel or no overtaking zones) from all decision-making authorities.

From NVDB, the Swedish Transport Administration creates several data products. The roads in Topography 10 Download, vector is obtained from the Swedish Transport Administration's data product *Vägslag* (Road type), which describes the entire Swedish road network in a form where each road section has been classified based on a combination of primary function and form.

Several of the Swedish Transport Administration's data products are used completely or partly to create *Road type*. The generation of the data product *Road type* is done in two steps; first a homogenization where multiple data products are combined, and in the second step, attribute values are updated according to regulations.

The roads in Vägslag have a different classification than the roads that were in the product GSD-Property map, vector. These classifications cannot be translated between each other.

Note that Table 61 specifies whether attributes are obtained from the Swedish Transport Administration's product Road type. Other attributes come from Lantmäteriet's data storage.

Road point

Interchanges and roundabouts have been obtained from the Swedish Transport Administration's data product *Korsning* (Junction). Processing has been done by Lantmäteriet to derive a centre coordinate that represents the position for the interchange and roundabout.

Locked gates or barriers have been obtained from the Swedish Transport Administration's data product *Väghinder* (Roadblock). The rotation has been calculated by Lantmäteriet in relation to the road on which it is located.

Rest areas have been collected from the Swedish Transport Administration's data product *Rastplats* (Rest area).

Turnarounds have been collected from the Swedish Transport Administration's data product *Vändmöjlighet (Turnaround*).

Note that Table 65 specifies whether attributes are obtained from the Swedish Transport Administration's product *Korsning, Rastplats, Vändmöjlighet* or *Väghinder*. Other attributes come from Lantmäteriet's data storage.

Other roads

Objects that are included in the layer of other roads are updated through aerial photograph interpretation, but also in collaboration with the municipalities that can deliver footpaths, illuminated tracks and hiking trails through the ABT agreement. Tractor roads are only updated through aerial photograph interpretation.

Mountain transport route and Mountain point of interest

The information has been collected through image interpretation, field work and contact persons.

Rail traffic

The National Railway Database, NJDB has been developed by the Swedish Transport Administration in collaboration with the Swedish Transport Agency with the goal of describing the entire Swedish railway network.

Heritage railways, tramways, subways as well as some decommissioned railways are collected by Lantmäteriet.

5.5.2 MAINTENANCE FREQUECY

ROADS

Vägslag (road type) is updated continuously by the Swedish Transport Administration. Lantmäteriet retrieve change data from the Swedish Transport Administration daily.

OTHER ROADS

As part of the ABT agreement, municipalities can provide Lantmäteriet with hiking trails and illuminated tracks if they have geometries for them. Changes are to be reviewed once a year, but it is not mandatory to provide according to the agreement.

MOUNTAIN TRANSPORT TRAIL AND MOUNTAIN POINT OF INTEREST

The information is primarily updated through field controls and information gathering from the network of contacts in mountain regions. The contact network consists of county administrative boards, municipalities, Sami

communities, tourist companies, snowmobile clubs and mountain rescue organisation etc.

The information is updated by area every fourth year. Some updates via the contact network can occur in between.

RAILWAY

The railways are updated once a year.

5.5.3 DATA QUALITY

COMPLETENESS

Roads

The completeness of roads is generally high because several different collaborators deliver information to the NVDB.

There is a lack of attributes for the attribute “uppsamlande” collected in the layer *Road line*, see the description for “uppsamlande”.

Other roads

The completeness for Other roads is low to medium.

In the layer Other roads, objects are removed and adjusted, but not much new information is added. Tractor roads are updated with less certainty in aerial photograph interpretation. Footpaths can be difficult to see in the aerial images.

Cycle paths and park roads are generalised, which means that not all roads are included in the map, for further presentation see NVDB.

Mountain transport trail and Mountain point of interest

The completeness is generally good. Objects that are difficult to completely control during field work and that Lantmäteriet has limited information about through collaboration have lower completeness.

Railway

The completeness of railways is generally high. In the previous product GSD Property Map, vector, a generalisation of rail tracks was made, especially in rail yards, but now all rail tracks are included.

LOGICAL CONSISTENCY

Roads

The Swedish Transport Administration has information on the logical consistency.

Other roads

For the layer of other roads, there are checks that they are intersected at the connection points but there is no requirements and controls for network compatibility.

Mountain transport trail

Trails do not create a coherent network and lack connections to the road network.

Mountain point of interest

Symbols are stored with an object code and orientation.

Railway

The Swedish Transport Administration has information on the logical consistency.

THEMATIC ACCURACY

Roads

Public roads from NVDB generally have good thematic accuracy. The lower classes (ex. neighbourhood road, parking road) are more difficult to distinguish.

Other roads

Hiking trails and illuminated tracks are mainly from municipal collaboration. Lantmäteriet does not perform any controls of this classification.

Mountain transport trail and Mountain point of interest

The thematic accuracy is generally good.

Railways

The thematic accuracy for railways is good.

POSITIONAL UNCERTAINTY

Roads

In NVDB the road network is divided into four quality classes, which means that a motorway has a higher quality requirement than a forest road. Because collaboration takes place with different collaboration partners to the NVDB the positional uncertainty also depends on their collection methods. There is a higher requirement for positional uncertainty for the state and municipal road network than the private road network.

Other roads

The requirement for positional uncertainty from aerial photograph interpretation is 2 metres, but the accuracy is usually about 1 metre.

Mountain transport trail and Mountain point of interest

The positional uncertainty is lower for these objects (50 metres) than for other objects.

Railways

The Swedish Transport Administration has information on the positional uncertainty.

Heritage railways, tramways, and subways are delivered through collaboration agreement with municipalities, which means that the positional uncertainty can vary between municipalities.

Positional uncertainty for Communication.

Table 59 Positional uncertainty for Communication

Object type	**Requirement for planar positional uncertainty (m).**
Roads	-
Road point	-
Ferry route (positional uncertainty refers to start and end points)	2
Cycle path/park road	2
Footpath	10
Illuminate tracks	5
Tractor road	5
Hiking trail	10
Hiking and winter trail	20
Mountain transport route	50
Mountain point of interest	50
Railway	-
Heritage railway	2
Tramway	2
Subway	2
Railway station	10
Subway station	10
Tram stop	10

5.5.4 ROAD LINE

Table 60 Contents in Road line (Layer name: vaglinje).

Object type	Object type number	Definition	Description	Comment
Motorway	1801	road that corresponds to traffic regulations for motorways		Selection according to the Swedish Transport Administration's product *Road type*.
Two-lane expressway	1802	road that corresponds to the regulations for a two-lane expressway		Selection according to the Swedish Transport Administration's product *Road type*.
Divided road	1803	road where oncoming traffic is separated by a median barrier	Motorways and two-lane expressways are not included. However, other four lane roads and regular roads where traffic directions are separated by a median barrier is included.	Selection according to the Swedish Transport Administration's product *Road type*.
Country road	1804	main road with one lane in each direction separated by a centre line		Selection according to the Swedish Transport Administration's product *Road type*.
Country road, small	1805	state road with road number >499		Selection according to the Swedish Transport Administration's product *Road type*.
Small road	1806	private road, suitable for cars	Included here are state-funded private roads that are allowed to be	Selection according to the Swedish Transport

Object type	Object type number	Definition	Description	Comment
			trafficked as well as private roads outside of built-up areas that the municipality has classed as a good car road and in some cases receive municipal contributions. The road often has a basic standard and can normally be trafficked by car.	Administration's product *Road type*.
Small road, basic standard	1807	private road, less suitable for cars	A private road, with a basic standard, often without winter maintenance. Forest roads are included. Generally motor vehicle traffic is not allowed without permission. Roads with a road barrier are often of this type.	Selection according to the Swedish Transport Administration's product *Road type*.
Arterial road	1808	road that is a part in the main network for car traffic.	Examples include routes, throughfares, ring roads and entrances to towns and built-up areas.	Selection according to the Swedish Transport Administration's product *Road type*.
Main street	1809	road within a built-up area that is part of the main network for car traffic	Main street in a built-up area. Often maintained by municipality.	Selection according to the Swedish Transport Administration's product *Road type*.
Local street, large	1810	road that is part of the local car traffic network.	Designed for mixed traffic with unprotected road users. Collecting local roads are usually included.	Selection according to the Swedish Transport Administration's product *Road type*.

Object type	Object type number	Definition	Description	Comment
Local street, small	1811	smaller road that is part of the local car traffic network	Pedestrian streets are included. Also includes streets within pedestrian zones, which are regulated for vehicles to travel at walking speed.	Selection according to the Swedish Transport Administration's product *Road type*.
Neighbourhood road	1812	alley or neighbourhood road i.e., road outside of the street network	A smaller road within built-up areas that are only used for car traffic and transports to and from properties.	Selection according to the Swedish Transport Administration's product *Road type*.
Parking area road	1813	road outside of the street network or through an area with parking spaces.		Selection according to the Swedish Transport Administration's product *Road type*.
Entrance and exit road	1814	road section on neighbourhood ground leading to a parking area or neighbourhood road		Selection according to the Swedish Transport Administration's product *Road type*.
Delivery road	1815	road to industry buildings or goods intake	Address location may occur.	Selection according to the Swedish Transport Administration's product *Road type*.
Unclassified	1816	road that has not been classified	May be a provisional road that has not yet been classified.	Selection according to the Swedish Transport Administration's product *Road type*.

Table 61 Attribute set for Road line.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. Retrieved from *Road type*, attribute property_oid.
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000. Retrieved from *Road type*, attribute valid_from.
ursprunglig_organisation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of road line	Retrieved from *Road type*, attribute typ.

Attribute	Type	Length	Definition	Description
avfartsvag_pafartsvag	Text	255	indicates if the road section is included in a slip road	Retrieved from *Road type*, attribute avfartsvag_pafartsvag.
genomgaende_vagnummervag	Text	255	road type for road with coherent road number	Is used to show a coherent road type through built-up areas. See the value range *Coherent road type.* Retrieved from *Road type*, attribute genomgaende_vagnummervag.
uppsamlande	Text	255	indicates if the road section has a collective function for the traffic	Value range: Ja/Nej/Ingen information (Yes/No/Unknown). The attribute uppsamlande writes out 3 instead of No. This has been reported to the Swedish Transport Administration as a deficiency. Collected from *Road type*, the attribute uppsamlande.
cirkulationsplats	Text	255	indicates if the road section has a traffic regulation for a roundabout	Value range: Ja/Nej/Ingen information (Yes/No/Unknown). Retrieved from *Road type*, attribute cirkulationsplats.
bro_och_tunnel	Text	255	indicates if the road section includes any form of bridge or tunnel.	See value range Level. Retrieved from *Road type*, attribute bro_och_tunnel.
gagata	Text	255	indicates if the road section has a traffic	Value range: Ja/Nej/Ingen

Attribute	Type	Length	Definition	Description
			regulation for a pedestrian road	information (Yes/No/Unknown). Retrieved from *Road type*, the attribute gagata.
gangfartsomrade	Text	255	indicates if the road section has a traffic regulation for a pedestrian zone	Value range: Ja/Nej/Ingen information (Yes/No/Unknown). Retrieved from *Road type*, attribute gangfartsomrade.
bussgata	Text	255	road section with traffic regulations stating that the lane is reserved for vehicles in public transport	Value range: Ja/Nej/Ingen information (Yes/No/Retrieved). Retrieved from the Swedish Transport Administration's product *Road type.*
industrivag	Text	255	road section serving as an industrial road	Value range: Ja/Nej/Ingen information (Yes/No/Unknown). Retrieved from the Swedish Transport Administration's product *Road type.*
gatunamn	Text	255	name of street	Retrieved from the Swedish Transport Administration's product *Road type.*
vardvagnummer	Text	255	complete road number for the main road	Combination of main number, sub-number, and European road. Used for printing in map products. The information is based on data from the Swedish Transport Administration's product *Road type.* Examples: E4, E20.8, 859, 891.1

Attribute	Type	Length	Definition	Description
gastvag1nummer	Text	255	complete road number for guest road 1	Combination of main number, sub-number, and European road. Used for printing in map products. The information is based on data from the Swedish Transport Administration's product *Road type.*
gastvag2nummer	Text	255	complete road number for guest road 2	Combination of main number, sub-number, and European road. Used for printing in map products. The information is based on data from the Swedish Transport Administration's product *Road type*
referenslanksid	Text	255	identity for a reference links that represents a road section that has been opened for traffic at the same moment	Retrieved from the Swedish Transport Administration's product *Road type.*
startavstand	Floating point	6.2	distance as a percentage from the start point of the reference link to the starting point of *Road line*.	Together with the reference link ID (referenslanksid) and end distance, it indicates the location of *Road line* on the road network. Retrieved from the Swedish Transport Administration's product *Road type.*
slutavstand	Floating point	6.2	distance as a percentage from the start point of the reference link to the	Together with the reference link ID (referenslanksid) and start distance, it indicates the location of the *Road line* on the road network.

Attribute	Type	Length	Definition	Description
			endpoint of *Road line.*	Retrieved from the Swedish Transport Administration's product *Road type.*

Table 62 Value set Coherent road type.

Value	Definition
Motorväg *(Motorway)*	road that corresponds to the traffic rules for a motorway
Motortrafikled *(Two-lane expressway)*	road that corresponds to the traffic rules for two lane expressways
Mötesfri väg *(Divided road)*	road where oncoming traffic is separated by a median barrier
Landsväg *(Country road)*	main road with one lane in each direction, separated by a centre line
Landsväg liten *(Country road, small)*	state road with road number >499

Table 63 Value set Level.

Value	Definition
överfart *(overpass)*	road or rail traffic that passes over another object
underfart *(underpass)*	road or rail traffic that passing under another object
tunnel *(tunnel)*	underground road or rail traffic
överfart och underfart *(overpass and underpass)*	road or rail traffic that passes over or under another object
Ingen information	no information.

5.5.5 ROAD POINT

Table 64 Contents in Road point (Layer name: vagpunkt)

Object type	Object type number	Definition	Description	Comment
Locked gate or boom gate	2203	permanent physical obstacle in the form of a locked gate or barrier with the purpose of prevent unauthorised traffic	Only the value locked gate or boom gate is available in the product. The rotation points for road barriers follow geographical rotation and not arithmetic.	Selection according to the Swedish Transport Administration's product *Roadblock.*
Turnaround	2205	road area at the end or along a road that is designed to provide longer vehicles the opportunity to turn around	Can consist of cul-de-sacs (flat surface), turning pockets (short road) or reversal loops where it is possible to turn with a truck with a trailer. Used within the forest road network.	Selection according to the Swedish Transport Administration's product *Turnarounds.*
Rest area	2207	facility alongside a road for travellers need to rest, use toilets, recreate or similar.		Selection according to the Swedish Transport Administration's product *Service area*.
Interchange	2209	plane separated junction where entrance and exit can be accessed	Centre point for interchanges is mapped.	Based on the Swedish Transport Administration's product *Junction.*
Roundabout	2210	circular road junction in one level where entrance and exit can be accessed	Centre points for roundabouts is mapped.	Based on the Swedish Transport Administration's product *Junction.*

Table 65 Attribute set for Road point.

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. Retrieved from *Junction*, *Service area*, *Turnaround* or *Roadblock* attribute property_oid.
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000. Retrieved from *Junction*, *Service area*, *Turnaround* or *Roadblock*, attribute valid_from.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of road point	Retrieved from *Junction*, *Service area*, *Turnaround* or *Roadblock*, attribute typ.

Attribute	Type	Length	Definition	Description
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anti-clockwise rotation. Orientation is given in degrees (360 degrees in a circle).
vandmojlighetstyp	Text	255	type of turning possibility	Mandatory value for *Turnaround*. See value range *turnaround type*. Retrieved from *Turnaround* attribute typ_av_vändmöjlighet.
trafikplatsnummer	Integer	4	The Swedish Transport Administration's number for interchanges	Retrieved from *Junction* attribute trafikplatsnummer.
trv_namn	Text	255	The Swedish Transport Administration's name of interchange, roundabout or rest areas	Refers to the name of the interchange, roundabout or junction. The name of interchanges should always be preceded by the abbreviation Tpl and for roundabouts by the abbreviation Cpl. If the name contains North, West, South or East. these should be abbreviated as N, W, S or E. Rest area is described with the abbreviation Rpl in the name. Examples: Tpl Kalmar N, Cpl Eskilstuna S Retrieved from *Junction* or

Attribute	Type	Length	Definition	Description
				Service area attribute name.

Table 66 Value set Turnaround type.

Value	Definition
vändficka *(turning pocket)*	
vändslinga *(turning loop)*	
Vändplan *(turning area)*	
okänt *(unknown)*	missing information

5.5.6 FERRY ROUTE

Table 67 Contents in Ferry route (Layer name: farjeled)

Object type	Object type number	Definition	Description	Comment
Ferry route	1891	route for ferry traffic	Ferry route with car ferries in regular traffic.	Within the country the following is mapped: - Ferry routes operated by the Swedish Transport Administration's ferry company. - Other ferry routes that connect the state road network. - Other ferry routes with year-round traffic and a

Object type	Object type number	Definition	Description	Comment
				fixed timetable. International ferry routes are also included.

Table 68 Attribute set for Ferry route.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosakerhetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.

Attribute	Type	Length	Definition	Description
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	

Attribute	Type	Length	Definition	Description
objekttyp	Text	255	indicates the type of *Ferry route*.	The object type is always *Ferry route* for this object.
destination	Text	50	destination for the *Ferry route*	Examples: Nynäshamn-Visby, Kvarsebo-Skenäs, International examples: Riga(LV), Turku(FI).
vagnummer_internationell	Text	20	road number for ferry routes to international destinations	
vagnummer_nationell	Text	20	road number for domestic ferry routes	

5.5.7 OTHER ROADS

Table 69 Contents in Other roads (Layer name: ovrig_vag)

Object type	Object type number	Definition	Description	Comment
Park road	1842	pedestrian road within a landscaped park		A shared pedestrian and cycle paths within landscaped parks are mapped as *Cycle path.*
Cycle path	1623	road where only bicycles and class II mopeds are allowed		Completely mapped if it connects different built-up areas or leads to specific locations. Not included if it is part of another road.
Footpath	1624	well-trodden path		Mapped when: -Leads to built-up areas (minimum

Object type	Object type number	Definition	Description	Comment
				length 100 metres). -Leads to a specific destination (minimum length 250 metres). For example: Lakes, viewpoints, wetlands, or sites of cultural heritage. -Connects roads. -Runs along a beach. Within trail-dense areas, some editing may be required to present the areas characteristics. Within the coverage area for Lantmäteriet's mountain range information (see appendix 1) clear roads created by quadbikes are also mapped as *Footpath.*
Illuminated track	1625	illuminated tracks with prepared and maintained trail or track		Mapped completely.
Tractor path	1628	road that normally lacks a road body but has a prepared roadway of a permanent nature intended for tractors	The road is in generally accessible for farming tractors with trailers and off-road vehicles (vehicles with high ground clearance, larger wheels, and four-wheel drive).	Mapped when: -Has a length exceeding 500 meters - Leads to built-up areas (minimum length 100 metres). -Leading to other specific

Object type	Object type number	Definition	Description	Comment
				destination (minimum length 250 metres). -Connects roads. -Follows a beach. - Is constructed as a trotting training track. Not included: -Timber-hauling Road (temporary road used to transport timber) - Winter road (old road that crosses wetland areas).
Hiking trail	1846	marked trail along a path or road intended for hiking	Example of trails are *Sörmlandsleden*, *Kungsleden* and various Pilgrim trails.	Mapped if it is at least 10 kilometres long, except within the coverage area of Lantmäteriet's mountain range information, where it is mapped regardless of length. Additionally, it should be named and clearly marked, normally with painted orange rings on trees or poles. On alpine tundra painted cairns or low poles are used.
Hiking and winter trail	1847	marked trail along a path or road intended for hiking, skiing, or snowmobiles.	Marked with red crosses on poles. Restrictions or snowmobiles may apply.	Well-marked and maintained trails are included. Mapped within the coverage area for Lantmäteriet’s mountain range

Object type	Object type number	Definition	Description	Comment
				information (see appendix 1).

Table 70 Attribute set for Other roads.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosakerhetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosakerhethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.

Attribute	Type	Length	Definition	Description
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	specifies the type of *Other roads*	Range of values for valid values.

Attribute	Type	Length	Definition	Description
vagutforande	Text	255	specifies the road's relationship to other roads or terrain	See value range *Road construction.*
skoterkorning_tillaten	Text	255	specifies if snowmobiles are allowed	Mandatory for the object *Hiking and winter trail.* See value range *Snowmobiles allowed.*

Table 71 Value set Road construction.

Value	Definition	Comment
Bro *(Bridge)*	construction meant to carry traffic over an obstacle	
Normal *(Normal)*	road on the ground	
Sommarbro *(Summer bridge)*	bridge that is removed during the winter season to avoid damage caused by snow melt	Only valid for the object type *Hiking trail.*
Tunnel *(Tunnel)*	underground road	
Underfart *(Underpass)*	road or trail that goes underneath another object	
Ingen information *(No information)*		

Table 72 Value set Snowmobile driving.

Value	Definition
Ja *(Yes)*	snowmobiles are allowed on the trail
Nej *(No)*	snowmobiles are not allowed on the trail
Påbjuden	snowmobiles are mandatory on the trail within a restricted area

Value	Definition
(Mandatory)	
Ingen information *(No information)*	.

5.5.8 MOUNTAIN TRANSPORT TRAIL

Table 73 Contents in Mountain Transport Trail (Layer name: transportled_fjall).

Object type	Object type number	Definition	Description	Comment
Reindeer herding trail	1823	trail for the reindeer husbandry	Used for *reindeer moving trail* and *reindeer husbandry trail.*	
Capture line across trail	1824	marking across a trail's direction of travel to facilitate orientation in bad weather		Mapped within the coverage area for Lantmäteriet's mountain range information (see appendix 1).
Rowing trail	1825	trail with accessible boats	Used to enable crossings of larger water courses or lakes during hiking.	Included along the *Kungsleden* trail in Norrbotten county.
Boat portage	1827	permanent facility to move boats between lakes	Example: *Boat portage* at *Hävlingen*.	Minimum length 200 metres.
Trafficated boat route	1828	route for boat traffic that connects trails		Mapped completely within the coverage area for Lantmäteriet's mountain range information (see appendix 1).

Table 74 Attribute set for Transport trail mountain.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the

Attribute	Type	Length	Definition	Description
				system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1,

Attribute	Type	Length	Definition	Description
				subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of transport trail in the mountains	Range of values for valid values.
rennarings-ledstyp	Text	255	indicates the type of reindeer husbandry route	Value is only specified for the object type *Reindeer husbandry route* and is mandatory. See value range *Type of reindeer husbandry route*.

Table 75 Value set Type of reindeer husbandry trail

Value	Definition
Renflyttningsled *(Reindeer moving trail)*	trail used for moving reindeer herds between different grazing lands
Renskötarled *(Reindeer husbandry trail)*	trails used by reindeer herders

5.5.9 MOUNTAIN POINT OF INTEREST

Table 76 Contents in Mountain point of interest (Layer name: ledintressepunkt_fjall).

Object type	Object type number	Definition	Description	Comment
Ford	1832	suitable crossing for hikers over larger water courses lacking bridges	Fords are mapped along the most frequently used trails in the mountains. Some fords outside the trails are also mapped, but these are well-known and have been used by the Sami people and hikers for a long time.	Which fords that are mapped are always decided in collaboration with nature conversationalists, tour guides and Sami people. Mapped fords do not mean that crossing the water courses is always possible. Water levels can change very quickly in high mountain areas during heavy rainfall. Large variations in snow melt can also occur within a day. Mapped within the coverage area for Lantmäteriet's mountain range information (see appendix 1).
Emergency phone	1833	landline telephone available for emergency calls and short messages, which is		The emergency phone cannot be used for private calls because it is directly connected to the

Object type	Object type number	Definition	Description	Comment
		always accessible		police's/mountain rescue's emergency centre. Mapped completely within the coverage area for Lantmäteriet's mountain range information (see appendix 1).
Parking	1834	artificial area in mountain regions intended for car parking	The parking is a suitable starting point for continue foot/skis/snowmobile on a trail or in some cases by boat. Often there is information boards with tourist information.	Larger maintained car parks are mapped.
Storm bell	1835	device that, with a bell, facilitates navigation to the location.	The bell rings when the wind blows hard enough and helps the hikers finding the shelter in poor visibility.	The storm bell at Endalen's shelter is the only one in Sweden. It was erected in 1930 by a group of Norwegians as a thank you for being rescued in the easter snowstorm of 1927.
Flashing beacon	1837	device that, facilitates navigation to the location with regularly occurring flashing signals		The flashing beacon at Blåhammaren's mountain station is the only land lighthouse in Sweden.

Table 77 Attribute set for Trail point of interest mountain.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the

Attribute	Type	Length	Definition	Description
				system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1,

Attribute	Type	Length	Definition	Description
				subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	unique integer for the object type	
objekttyp	Text	255	indicates the type of trail point of interest in the mountains	Range of values for valid values.
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anticlockwise rotation. Orientation is given in degrees (360 degrees in a circle).

5.5.10 RAIL TRAFFIC

Table 78 Contents in Rail traffic (Layer name: ralstrafik).

Object type	Object type number	Definition	Description	Comment
Railway	1861	rail traffic that is part of the national railway network as well as industrial tracks		
Heritage railway	1862	rail traffic with museum activities	A heritage railway can either be built for this purpose have been used in regular train traffic before being shut down and converted to a heritage railway.	
Tramway	1863	rail traffic with trams for public transport in an urban environment	Tram traffic can run on streets and roads together with other vehicles or on its own railway embankment, which mainly occurs in suburbs that are planned at the same time as the tramway. For example, the local tram network in Norrköping and *Tvärbanan*.	
Subway	1864	mainly underground rail traffic system that is level-separated from other traffic	Only occurs in Stockholm.	

Table 79 Attribute set for Rail traffic.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not

Attribute	Type	Length	Definition	Description
				changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions

Attribute	Type	Length	Definition	Description
				are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of rail traffic	Range of values for valid values.
status	Text	255	status of the track	See value range *Rail traffic status.*
flerspar	Text	255	indicates the direction of travel	See value range *Track direction.*
sparvidd	Text	255	distance between the rails	See value range *Track width.*
bro_och_tunnel	Text	255	indicates the stretch through a tunnel or the level for roads or railways in relation to another road or railway	See value range *Level.*

Attribute	Type	Length	Definition	Description
under_bygg-nad	Text	255	indicates if the rail traffic goes under a building or not	Value range: Ja/Nej/Ingen information (Yes/No/No information)
straknamn	Text	50	name of railway route	
elektrifiering	Text	255	indicates if the railway is electrified or not	Value range: Ja/Nej/Ingen information (Yes/No/No information)
huvud_sido-spar	Text	255	indicates if the track is a main track or not	See value range *Main_side track.*

Table 80 Value set Track width.

Value	Definition
Normalspår *(Normal track)*	standard gauge railway tracks with the track gauge of 1435 millimetres
Bredspår *(Wide track)*	broad gauge railway tracks with a track width gauge greater than 1435 millimetres
Smalspår *(Narrow track)*	narrow gauge railway track with a track gauge less than 1435 mm
Ingen information *(No information)*	

Table 81 Value set Track direction.

Value	Definition
Enkelspår *(Single track)*	stretch with only one main track on the line
Nedspår *(Down track)*	the left track in the direction in which trains with odd numbers travel, in the case of double tracks

Value	Definition
Uppspår *(Up track)*	the left track in the direction in which trains with even numbers of travels, in the case of double tracks
Ingen information *(No information)*	

Table 82 Value set Main_side track.

Value	Definition
Avvikande huvudspår *(Deviant main track)*	main track in an operating site other than the normal main track
Normalhuvudspår *(Normal main track)*	main track in an operating site that runs through switches in default mode
Sidospår *(Side track)*	any track other than main track
Tågspår ej TrV *(Train track not Swedish Transport Administration)*	track not owned by the Swedish Transport Administration.
Ingen information *(No information)*	

Table 83 Value set Rail traffic status.

Value	Definition
Avstängd *(Closed)*	temporarily closed for at least a year
Ej underhållen *(Not maintained)*	
Nedlagd *(Decommissioned)*	discontinued
Planerad *(Planned)*	
Rivet	

Value	Definition
(Torn)	
Öppen *(Open)*	open for traffic
Ingen information *(No information)*	

Table 84 Value set Level.

Value	Definition
Överfart *(Overpass)*	road or rail traffic that passes over another object
Underfart *(Underpass)*	road or rail traffic that passing under another object
Tunnel *(Tunnel)*	underground road or rail traffic
Överfart och underfart *(Overpass and underpass)*	road or rail traffic that passing over or under another object
Ingen information *(No information)*	

5.5.11 RAIL TRAFFIC STATION

Table 85 Contents in Rail traffic station (Layer name: ralstrafikstation).

Object type	Object type number	Definition	Description	Comment
Railway station	1871	location along a railway line intended for trains to make a stop	Mapped for railways that dispatches passengers or freight traffic. It does not need to have an associated station building.	Mapped according to information from the Swedish Transport Administration or available timetables.
Subway station	1872	location along a subway line intended for		Mapped according to available timetables.

Object type	Object type number	Definition	Description	Comment
		subway trains to make a stop		
Tram stop	1873	location along a tramway intended for trams to make a stop		Mapped according to available timetables.

Table 86 Attribute set for Rail traffic station.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000

Attribute	Type	Length	Definition	Description
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.

Attribute	Type	Length	Definition	Description
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of rail traffic station	Range of values for valid values.
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anti-clockwise rotation. Orientation is given in degrees (360 degrees in a circle).
status	Text	255	status of the station	See value range *Rail traffic status*.
under_mark	Text	255	indicates if the station is located underground	Value range: Ja/Nej/Ingen information (Yes/No/No information)
resandeutbyte	Text	255	indicates if embarking and disembarking is possible for passengers at the station	Value range: Ja/Nej/Ingen information (Yes/No/No information)

Table 87 Value set Rail traffic status.

Value	Definition
Avstängd *(Closed)*	temporarily closed for at least a year
Ej underhållen *(Not maintained)*	
Nedlagd *(Decommissioned)*	discontinued
Planerad *(Planned)*	
Rivet	

Value	Definition
(Torn)	
Öppen *(Open)*	open for traffic
Ingen information *(No information)*	

5.6 Transmissions

Table 88 Included layers in the Transmissions theme.

Cables	Layer name
Electric transmission line	ledningslinje
Electrical substation area	transformatoromrade

5.6.1 DATA CAPTURE

LINEAGE

The updating of electricity transmission lines is done in collaboration with the electricity companies in Sweden. Lantmäteriet has signed agreements with several companies. Some companies deliver electricity transmission lines on a voluntary basis. Lantmäteriet update electricity transmission lines using the materials provided by the electricity companies. The electricity transmission lines that are not updated through electricity companies as they were from the original collection and have not been updated since.

5.6.2 MAINTENANCE FREQUENCY

Every other year, the electricity companies provide electricity transmission lines to Lantmäteriet, which uses it as a basis for updating the maps with the help of orthophotos.

Electrical substations and pipelines are corrected periodically corrected using aerial photograph interpretation by Lantmäteriet.

5.6.3 DATA QUALITY

COMPLETENESS

The completeness of the national transmission lines is high and there is good control that they are included.

For regional and distribution transmission lines, the completeness is not as high as for the national transmission lines. Just over half of Sweden’s area is delivered to Lantmäteriet according to agreements with large electricity companies and a third is delivered according to verbal agreements with

smaller companies. Agreements for the remaining companies are in progress. A few of the transmission lines are underground and are not presented in Topography 10 Download, vector.

When it comes to electricity transmission clearings in forests, it is more difficult to distinguish if the transmission line is still present or not. In these situations, it is especially important to receive topical statuses of the electricity transmission lines from the electricity companies.

LOGICAL CONSISTENCY

Due to generalizations etc., no requirements can be placed on logical consistency and controls for this for electricity transmission lines The main transmission lines form their own network.

THEMATIC ACCURACY

The thematic accuracy is high because the electricity companies classify and deliver the information themselves.

POSITIONAL UNCERTAINTY

The positional uncertainty for transmission lines varies, depending on whether they are in the forest or in open areas. With the help of high-resolution aerial photographs, it is easy to control, in open areas, if transmission lines are still present or not. The quality and origin of deliveries vary from company to company. The positional uncertainty for telephone lines is higher than other transmission lines.

Table 89 Positional uncertainty for Transmission lines.

Object type	**Requirement for planar positional uncertainty (m)**
Electricity transmission line, national	5
Electricity transmission line, region	5
Electricity transmission line, distribution	5
Pipeline	5
Telephone line	50
Electrical substation area	5

5.6.4 TRANSMISSION LINE

Table 90 Contents in Transmission line (Layer name: ledningslinje)

Object type	Object type number	Definition	Description	Comment
Electricity transmission line, national	1702	transmission line for electricity distribution, usually with a voltage higher than 200 kV		Fully mapped for aerial transmission line.
Electricity transmission line, region	1703	transmission line for electricity distribution, usually with a voltage between 25 and 200 kV.		Fully mapped for aerial transmission line. Some older regional transmission line can be 20 and 24 kV.
Electricity transmission line, distribution	1704	transmission line for electricity distribution, usually with a voltage between 6 and 24 kV		Fully mapped for aerial transmission line.
Pipeline	1706	a long and narrow, usually cylindrical, pipe structure used for transporting liquid or gas		Fully mapped. Generalisation may occur within industry and harbour areas.
Telephone line	1707	transmission line meant for telephone traffic		Mapped to remotely located farms and only within the coverage area for Lantmäteriet's mountain range information (see Appendix 1). Telephone lines that run along roads are not included.

Table 91 Attribute set for Transmission line.

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created

Attribute	Type	Length	Definition	Description
				in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of transmission line	Range of values for valid values.

5.6.5 ELECTRICAL SUBSTATION AREA

Table 92 Contents in Electrical substation area (Layer name: transformatoromrade).

Object type	Object type number	Definition	Description	Comment
Electrical substation area	1741	area on the ground on which facilities for switching or transforming electricity are located	The area is usually fenced in.	Mapped completely.

Table 93 Attribute set for Electrical substation area.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000

Attribute	Type	Length	Definition	Description
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.

Attribute	Type	Length	Definition	Description
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates that the type is electrical substation area	The object type is *Electrical substation area.*

5.7 Nature conservation

Table 94 Included layers in the Nature conservation theme.

Nature conservation	Layer name
Protected nature	skyddadnatur
Nature conservation point	naturvardspunkt
Restricted area	restriktionsomrade

5.7.1 DATA CAPTURE

LINEAGE

Information about nature conservation areas is obtained through collaboration with the Swedish Environmental Protection Agency. The Swedish Environmental Protection Agency receives their information from each county administrative boards. The areas have been digitized by the county administrative boards based on property boundaries and aerial photographs. New nature conservation areas are measured in the field with GPS, but some of the older areas have also been measured with GPS or other measurement methods with high accuracy.

5.7.2 MAINTENANCE FREQUENCY

The information is updated each month with changes. The date of change (*versongiltigfran*) is the date that shows when the information was added to Lantmäteriet's database. The decision date is available from the Swedish Environmental Protection Agency, skyddad natur (protected nature).

5.7.3 DATA QUALITY

COMPLETNESS

The areas have very high completeness and are mapped according to decisions made by County Administrative Board.

LOGICAL CONSISTENCY

Nature reserves do not overlap with national parks or other nature conservation areas.

THEMATIC ACCURACY

Fully mapped according to decisions made by the County Administrative Board.

POSITIONAL UNCERTAINTY

Older areas have the same positional uncertainty as property boundaries. Where newer measurements have been made with GPS, the planar positional uncertainty is at least 5 metres.

Object type	Requirement for planar positional uncertainty (m)
National Park	5
Nature reserve	5
Nature conservation area	5
Nature monument area	5
Animal protection area	5
Culture reserve	5
Nature monument	5
Other nature conservation object	5
Fire ban	50
Tent and fire ban	50
Prohibited area for off-road vehicles	15-20
Prohibited area for off-road vehicles, time-limited	50

5.7.4 PROTECTED NATURE

Table 95 Contents in Protected nature (Layer name: skyddadnatur)

Object type	Object type number	Definition	Description	Comment
National Park	5603	protected nature according to *Miljöbalken*		National Parks are always presented with name,

Object type	Object type number	Definition	Description	Comment
		(SFS 1998:808) 7 Ch 2 § or corresponding older law.		such as Abisko national park. In cases where the established name format from the government does not match Lantmäteriet's standardized name format, only the information text "National Park" is presented. Presented completely.
Nature reserve	5604	protected nature according to *Miljöbalken* (SFS 1998:808) 7 Ch. 4-6 §§ or corresponding older law		Nature reserve is always presented with name, such as Agnäs nature reserve. In cases where the established name format from the County Administrative Board does not match Lantmäteriet's standardized name format, only the information text "Nature Reserve" is presented. Presented completely.
Nature conservation area	5608	protected nature according to the *nature conservation law*	The decision to establish nature conservation areas was made by the County Administrative Board or municipalities. The possibility to establish nature conservation areas ceased when	No data has been collected yet.

Object type	Object type number	Definition	Description	Comment
			Miljöbalken came into act in 1998.	
Nature monument area	5605	protected nature according to *Miljöbalken* (SFS 1998:808) 7 Ch. 10 § or corresponding older law	Area with one or more biological and/or geological natural monuments.	
Animal protection area	5606	protected nature according to *Miljöbalken* (SFS 1998:808) 7 Ch. 12 § or corresponding older law	*Animal protection area* is divided into *bird protection area*, *seal protection area* or *animal protection area*.	
Culture reserve	5607	protected nature according to *Miljöbalken* (SFS 1998:808) 7 Ch. 9 §		Decided by the County Administrative Board Presented completely.

Table 96 Attribute set for Protected nature.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a

Attribute	Type	Length	Definition	Description
				property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organisat-ion	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never

Attribute	Type	Length	Definition	Description
				have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of protected nature	Range of values for valid values.
nvid	Text	10	number indicating county and type of area	Made up of "County Type Serial number". The serial number consists of three characters and can be blank. Type 01=national park 02=nature reserve 04=forbidden 06=other reserve 09= animal protection area 11=nature conservation area 13=cultural reserve Not linked to the current identity of the Swedish Environmental Protection Agency.
nvr-beskrivning	Text	100	the Swedish Environmental Protection	

Attribute	Type	Length	Definition	Description
			Agency's name or description of the area	
extern_registerenhet	Text	50	unique identity at another organisation where the information is stored	Refers to the registry of Swedish Environmental Protection Agency.
djurskyddstyp	Text	255	type of animal protection area	Valid only for the object type *Animal protection area*, is mandatory. See value range *Animal protection type*.

Table 97 Value range Animal protection type.

Value	Definition
Säl- och fågelskyddsområde	animal protection area for seals and birds
Djurskyddsområde	animal protection area for animals other than seals and birds
Fågelskyddsområde	animal protection area for birds
Sälskyddsområde	animal protection area for seals
Ingen information	no information

5.7.5 NATURE CONSERVATION POINT

Table 98 Contents in Nature conservation point (Layer name: naturvardspunkt).

Object type	Object type number	Definition	Description	Comment
Nature monument	5804	nature object protected according to *Miljöbalken* (SFS 1998:808) 7 Ch. 10 § or		Decided by the County Administrative Board. Presented completely.

Object type	Object type number	Definition	Description	Comment
		corresponding older law		
Other nature object	5803	distinctive nature object, not protected by law, but of general interest	Cave, spring, or area with standing stones are mapped.	

Table 99 Attribute set for Nature conservation point.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000

Attribute	Type	Length	Definition	Description
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.

Attribute	Type	Length	Definition	Description
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of Nature conservation point	Range of values for valid values.
nvid	Text	10	number indicating county and type of area	Made up of "County Type Serial number". The serial number consists of three characters and can be blank. Type 01=national park 02=nature reserve 04=forbidden 06=other reserve 09= animal protection area 11=nature conservation area 13=cultural reserve Not linked to the current identity of the Swedish Environmental Protection Agency.
nvr-beskrivning	Text	100	the Swedish Environmental Protection Agency's name or description of the area	
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anticlockwise rotation. Orientation is given in degrees (360 degrees in a circle).
ovrigt_naturobjektstyp	Text	255	distinctive nature object	The value only applies for the object type *Other nature object.*

Attribute	Type	Length	Definition	Description
				See value range *Type of other nature object.*

Table 100 Value set Type of other nature object.

Object type	Definition	Description
Grotta *Cave*	natural cavity large enough for a human to enter	Caves are usually horizontal, possibly with vertical elements. Caves in mountains are the most common.
Källa *Spring*	groundwater collection flowing out of the ground, which due to constant inflow and outflow is not stagnant	Well-known and commonly named springs are mapped.
Raukområde *Rauk area*	area with several closely spaced standing stones	
Ingen information *No information*		

5.7.6 RESTRICTION AREA

Table 101 Contents in Restriction area (Layer name: restriktionsomrade).

Object type	Object type number	Definition	Description	Comment
Fire ban	5610	area with a ban on open fires	Information is obtained from the County Administrative Board.	Mapped within the coverage area Lantmäteriet's mountain range information (see appendix 1).
Tent and fire ban	5609	area with a ban on camping and open fires	Information is obtained from the County Administrative Board.	Mapped within the coverage area Lantmäteriet's mountain range information (see appendix 1).
Prohibited area with	5602	area where off-road vehicles is prohibited	Off-road vehicle traffic is prohibited according to a decision by the	Mapped within the coverage area Lantmäteriet's

Object type	Object type number	Definition	Description	Comment
off-road vehicles		according to the Off-road Traffic Ordinance (SFS 1978:594)	County Administrative Board or municipality.	mountain range information (see appendix 1).
Prohibited area for terrain vehicles, time-limited	5611	area with a time-limited ban on off-road vehicle traffic according to the Off-road Traffic Ordinance (SFS 1978:594)	Off-road vehicle traffic is prohibited during a certain time of the year out of consideration for reindeer herding, according to a decision by the County Administrative Board or municipality.	Mapped within the coverage area Lantmäteriet's mountain range information (see appendix 1).

Table 102 Attribute set for Restriction area.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltigfran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of	Date/time of latest change. Specified in the format:

Attribute	Type	Length	Definition	Description
			versions (does not refer to the validity of information or decision dates)	2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the

Attribute	Type	Length	Definition	Description
				version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of restriction area	Range of values for valid values.
informativ_text	Text	200	description of exceptions from, or information about, restricted area	Example: Snowmobile driving on the ice of lake *Bredåssjön* is allowed.
tidsbegränsning	Text	100	date when the prohibition applies	Only specified for the object type *Prohibited area for off-road vehicles time-limited*, for which it is mandatory. Example: April 20 - January 10.

5.8 Military area

Table 103 Included layers in the theme Military area.

Military area	Layer name
Military area	militart_omrade

5.8.1 DATA CAPTURE

LINEAGE

Older decision about boundary lines for military areas have been digitalized from paper maps. Some updates have been made with data from, among others, the Swedish Fortifications Agency. From 2011 to 2017, an accurate determination of the boundary lines for the military areas still used by the Swedish Armed Forces was performed.

5.8.2 MAINTENANCE FREQUENCY

Continuous updating in case of changes. Changes are provided by the Swedish Armed Forces.

Lantmäteriet's change date (*versiongiltigfran*) is the date that indicates when the information was last updated. The decision/creation date is available from the Swedish Armed Forces.

5.8.3 DATA QUALITY

COMPLETENESS

The areas have a very high level of completeness.

LOGICAL CONSISTENCY

Military areas are independent objects not connected to any other objects.

THEMATIC ACCURACY

Presented completely.

POSITIONAL UNCERTAINTY

Older boundary lines have approximately the same positional uncertainty as the property boundaries they follow. Where more recent measurements have been done with GPS, the positional uncertainty is usually better than 5 metres and is the measurement is performed using network RTK, the positional uncertainty is normally better than 1 decimetre.

The boundary lines on the map show an approximate location of where the terrain the boundary for a firing range or exercise field is in the terrain. It is always the Swedish Armed Forces' signs in the terrain that determine where the actual boundary location.

The boundary line usually follows the property division's boundaries. In some cases, there may be some deviation between the boundaries. This is usually since the collection of boundary lines for the military area did not occur simultaneously as the collection of property boundaries. The collection of the boundaries may also have been done using methods that have differing positional uncertainties.

Object type	**Requirement of planar positional uncertainty (m)**
Military firing range	5
Military training area	20
Barracks area	5

5.8.4 MILITARY AREA

Table 104 Contents in Military area (Layer name: militart_omrade).

Object type	Object type number	Definition	Description	Comment
Military training area	5501	military area primarily used for grouping, firing practice, and other types of exercises that do not do not involve live ammunition	Detonation of single charges or firing at a low-risk height can be carried out, see local instructions.	Presented completely. Carefully pay attention to any current barriers. The public are prohibited from access when activities are ongoing.
Military firing range	5503	military area where dangerous activities such as firing with live ammunition and detonations are regularly conducted	Military firing ranges can be owned or used by the state and are available mainly for the Swedish Armed Forces Defence Materiel Administration or the National Defence Radio Establishment. An area with potential risk is cordoned off, which normally constitutes a restricted area for aviation (R-area). Firing ranges over adjacent water are not part of the firing range but are delimited in the same way as firing ranges.	Presented completely. Carefully pay attention to topical barriers. The public are prohibited when activities are ongoing.
Barracks area	5504	military area, usually fenced, with barracks, chancellery, mess halls, storage facilities, etc.		

Table 105 Attribute set for Military area.

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created

Attribute	Type	Length	Definition	Description
				in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of military area	Range of values for valid values.
mo_id	Text	6	identifier for military area	An ID for the military area that comes from the Swedish Armed Forces and is used for linking our information with theirs. Structured in the

Attribute	Type	Length	Definition	Description
				form MOXXXX where MO is a prefix and XXXX is a serial number.
skjutfaltstyp	Text	255	type of firing range	Is mandatory for the object type *military firing range.* See value range *Firing range type*.
riskomrade	Text	100	militarily monitored area where firing may occur	It is only specified for *Military firing range* and is not mandatory. Example: *Riskområde 4*

Table 106 Value set Firing range type.

Value	Definition
Skjutfält *(Firing range)*	Firing range on land.
Skjutområde *(Firing area)*	Firing range on water.

5.9 Northern Artic Circle

Table 107 Included layers in the theme Northern Artic Circle.

Northern Artic Circle	Layer name
Northern Artic Circle	polcirkeln

5.9.1 DATA CAPTURE

LINEAGE

The Artic Circle is a line that represents the Northern Artic Circle, which marks the southern limit of areas where the sun is above the horizon more than 24 hours in a row. The Artic Circle approximately 0.47” (arcseconds) per year, which represents approximately 15 metres on the ground. The line is mathematically generated.

5.9.2 MAINTENANCE FREQUENCY

The Artic Circle is updated approximately every five years and is mathematically calculated.

5.9.3 DATA QUAILTY

COMPLETENESS

The Artic Circle has a high completeness.

LOGICAL CONSISTENCY

The Artic Circle is a stand-alone object.

THEMATIC ACCURACY

The thematic accuracy is high.

POSITIONAL UNCERTAINTY

The Artic Circle is mathematically calculated.

Object type	Requirement for planar positional uncertainty (m)
Northern Artic Circle	Approx. 15 m/year

5.9.4 NORTHERN ARTIC CIRCLE

Table 108 Contents in Northern Artic Circle (Layer name: polcirkeln).

Object type	Object type number	Definition	Description	Comment
Northern Artic circle	1881	southern boundary north of the equator for the area where the sun, at some point, is above the horizon for more than 24 hours in a row	The Artic Circle is presented with its mean circle for a certain year. The Artic Circle moves by approximately 0.47” (arcseconds) per year, which represents approximately 15 metres on the ground.	Presented completely.

Table 109 Attribute set for the Northern Artic Circle.

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created

Attribute	Type	Length	Definition	Description
				in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	Only indicates the object type *Northern Artic circle.*	Range of values for valid values.

5.10 Height

Table 110 Included layers in the theme Height.

Height	Layer name
Contour line	hojdlinje

Height	Layer name
Elevation point	hojdpunkt
Contour line text	hojdkurvstext

5.10.1 DATA CAPTURE

LINEAGE

The contour lines are generated from the National Elevation Database.

5.10.2 MAINTENANCE FREQUENCY

The contour lines are updated continuously.

5.10.3 DATA QUALITY

COMPLETENESS

The equidistance is 5 metres in the entire nation.

LOGICAL CONSISTENCY

There is no logical structure. The contour lines are for visual use only. The contour lines have attributes that indicate elevation values.

THEMATIC ACCURACY

Thematic accuracy is not relevant for contour lines.

POSITIONAL UNCERTAINTY

The contour lines show a visual height position, positional uncertainty is not relevant.

5.10.4 CONTOUR LINE

Table 111 Contents in Contour line (Layer name: hojdlinje).

Object type	Object type number	Definition	Description	Comment
Contour line	2401	contour line representing a certain elevation in the terrain	Adjacent contour lines together illustrate differences in elevation in the terrain.	The equidistance is 5 metres.
Depression contour	2402	contour line representing a certain depth in a depression	Adjacent depression contour lines together illustrate differences in elevation in the terrain.	The equidistance is 5 metres.

Table 112 Attribute set for Contour line.

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest

Attribute	Type	Length	Definition	Description
				integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of contour line	Range of values for valid values.
hojdvarde	Text	4	height above the sea in metres	
stodkurva	Text	255	contour lines that represent a certain elevation in the terrain	Every fifth elevation contour line is presented more prominently. Value range: Ja/Nej (Yes/No)
i_glaciar	Text	255	indicates if the contour line is on a glacier	Value range: Ja/Nej (Yes/No)

5.10.5 ELEVATION POINT

Table 113 Contents in Elevation point (Layer name: hojdpunkt).

Object type	Object type number	Definition	Description	Comment
Triangulation station	2412	geodetic elevation point that is part of the in national triangulation network	Elevation point that is geodetically accurately positioned in plan that is part of the in national triangulation network. Presented in whole metres.	Primary points (class 1 and 2) from the third nation triangulation are presented according to a certain selection.
Height fixed point	2413	geodetic elevation point that is part of the national height network	Levelled point included in the national levelling project or precision levelling project. Presented in whole metres.	The selection is done so that the distance between the points is 1 to 2 kilometres.
Spot elevation	2411	unmarked elevation point	Elevation point that does not need to be marked, ex. at a junction, on a summit or similar. Presented in whole metres.	Some older ground heights in southern mountain regions have lower quality because they are measured with barometers.

Table 114 Attribute set for Elevation point.

Attribute	Type	Length	Definition	Description
objektidentitet	Text	36	a globally unique identity for exchange objects	UUID is set when a new object is created in the system and is not changed thereafter. UUID consists of a character combination of 36 characters generated according to standardised procedures and follows an object, such as a property, throughout its lifetime.

Attribute	Type	Length	Definition	Description
				It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain
versiongiltig-fran	DateTime	23	indicates that a certain version becomes valid and is only used to keep track of versions (does not refer to the validity of information or decision dates)	Date/time of latest change. Specified in the format: 2019-04-26T11:28:03.000
lagesosaker-hetplan	Floating point	6.3	average deviation from the "true" value in plane	The value is described in the unit metre.
lagesosaker-hethojd	Floating point	6.3	average deviation from the "true" value in height	The value is described in the unit metre.
ursprung-lig_organi-sation	Text	255	indicates which process or collaboration form that is responsible for the change	Refer to table in chapter 5.
objektversion	Integer	10	indicates the version of the object	When registering a new object, a first version must always be created in the system where the object is created. The first version is version 1, subsequent versions are incremented by the nearest integer of the sending party when the exchange object is ready to be sent in a change request. The modified object must never have a version number that is less or equal to

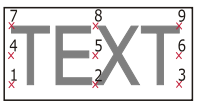
Attribute	Type	Length	Definition	Description
				the version number in the receiving system. When deleting, the version number in the change request must be the same as the version number in the receiving system. If the version number do not match the above description, the request will not be stored.
objekttypnr	Integer	4	a unique integer for the object type	
objekttyp	Text	255	indicates the type of elevation point	Range of values for valid values.
hojdvarde	Integer	4	height above the sea in metres	
rotation	Floating point	6.2	indicates orientation for a symbol	Orientation based on horizontal position with anti-clockwise rotation. Orientation is given in degrees (360 degrees in a circle).

5.10.6 CONTOUR LINE VALUE

Table 115 Contents in Contour line value (Layer name: hojdkurvstext).

Object type	Object type number	Definition	Description	Comment
Contour line value	2403	elevation value for a contour line	Elevation values are set for a selection of contour lines.	Cartographic selection.

Table 116 Attribute set for Contour line value.

Attribute	Type	Length	Definition	Description
objektidenti-tet	Text	36	a globally unique identity for ex-change objects	UUID is set when a new object is created in the system and is not changed thereaf-ter. UUID consists of a character combina-tion of 36 characters generated according to standardised pro-cedures and follows an object, such as a property, throughout its lifetime. It is ensured that a UUID is unique within the object type, i.e., it is checked within the domain.
skapad	DateTime	23	indicates the change in the object during migration	Specified in the for-mat: 1998-01-16T11:03:00.000
textkategori	Text	255	grouping is used to control the printing of text	The text category is used to control font style (nor-mal/italic/bold/light) and colour (black/blue/green/...).
textstorleks-klass	Text	255	specifies which font size to use depend-ing on the scale	In combination with text category, scale, and possibly text type, the printing of text is controlled.
textlage	Integer	3	insertion point for text	The insertion point of the text is speci-fied by a number be-tween 1-9. *Figure 6 Image that shows the insertion point of the text.* 

Attribute	Type	Length	Definition	Description
texttyp	Text	255	indicates type of text	Contour values are always of type U (information text)
karttext	Text	4	cartographic text	
textriktning	Floating point	6.2	rotation for text	Text rotation is specified in degrees (0.00 – 360.00, increasing anti-clockwise). 0.00=Unoriented text.

5.11 Text

Table 117 Included layers in the theme Text.

Text	Layer name
Text layer with place names and informational text.	textobjekt

5.11.1 DATA CAPTURE

LINEAGE

Place names

The collection of Place names started during the development of the Economic map in the 1930's. Place names established by Lantmäteriet have also been collected during field work by taking records, where the local population gave the information. The names are then reviewed by place name experts and have been compared with records in place name archives in Uppsala, Gothenburg, and Lund.

Since the field work was completed in 2004, collaboration between different authorities and municipalities have become a large part of the current collection of place names for Lantmäteriet's basic data.

Place names established by the government, county administrative board or municipality are provided as attributes to objects via collaboration agreements. These place names are reviewed by Lantmäteriet's place name section before publishing.

Informational text

Presented based on a list of informational text that has been changed over time. The purpose of the informational text is to provide the user of data or map with additional information about phenomena of general interest.

5.11.2 MAINTENANCE FREQUENCY

PLACE NAMES AND INFORMATIONAL TEXT

Place names and informational texts are updated continuously. Place names through name decisions and informational text through ongoing updates of topographical objects.

Text received through cooperation are updated at the point of delivery for the respective objects.

5.11.3 DATA QUALITY

COMPLETENESS

Place names and informational text

Place names have a high completeness and are nationwide. In minority areas, place names are also presented in Finnish, Meänkieli and Sami.

Informational text has high completeness and is nationwide.

LOGICAL CONSISTENCY

Place names and informational text

Place names and informational text set as cartographic texts have no connection to the objects to which the text refers.

Informational text

Informational texts are independent texts that cannot be connected to any object.

There are various categories of informational texts, for example NATUTX and MILUTX. The categories are used based on the theme the informational text describes, see chapter 5.11.4 Text layers with place names and informational text.

THEMATIC ACCURACY

Place names

Place names are presented completely and checks against Lantmäteriet's place name register are continuously performed.

Informational text

Informational text is presented according to the valid list.

POSITIONAL UNCERTIANTY

Place names and informational text

Place names and informational text are presented as cartographic texts, the positional uncertainty is not relevant.

5.11.4 TEXT LAYER WITH PLACE NAMES AND INFORMATIONAL TEXT

Contains cartographically placed text. The recommended font is Arial.

Table 118 Contents in Text layer with place names and informational text (Layer name: textobjekt).

Detail type	Name	Description	Comment
ANLTX	Facility name	Name of facility or facility area. A facility can be a building, a collection of buildings, or another type of constructed area meant for production, service, or recreation.	Names reviewed and established by Lantmäteriet's place name section. Examples, name of airports, lighthouses, power plants, hiking trails, national boundary markers, town squares, sports facility. Names of airports are presented according to records from AIP (Swedish Transport Agency's list of airports). Airports that are presented with names have facilities and operate according to timetables. Names of lighthouses are always written in letter form when a number is present in the name.
ANLUTX	Information text, facility	information text for facility and buildings	Presented according to established list of information text.
BEBTX	Building name	Names of buildings, or a collection of buildings meant primarily intended for residential or office purposes. Examples are name of villages, farmyards, crofts as well as individual buildings.	Names reviewed and established by Lantmäteriet's place name section.
BEBTÄTTX	Place name of urban areas	Names of localities.	Names reviewed and established by Lantmäteriet's

Detail type	Name	Description	Comment
			place name section. The naming must be the asserted place name, for example Gävle, Andersberg, Huskvarna, Norrhult, Klavreström or Svansjö sommarby. To get an understanding of the extent of an urban area Statistics Sweden's definition of urban areas is used as a base. A statistical urban area is delimited according to SCB's definition of a coherent settlement with at least 200 inhabitants and no more than 200 metres between buildings. For example, Sundbyberg is part of the statistic urban area of Stockholm. But the name Sundbyberg is presented with the detail type BEBTÄTTX because it has more than 200 inhabitants.
KYRKATX	Name of church	Name of a larger church building, parish church, former parish churches and civil parish churches belonging to the Church of Sweden. Church also includes chapels (not burial chapels) and abandoned churches.	Names reviewed and established by Lantmäteriet's place name section. The suffix "kyrka" (church) is always written after the name, for example Ovanåkers kyrka. The name of the church consists of

Detail type	Name	Description	Comment
			the parish name in genitive form along with the noun “kyrka” (church), for example Vendels kyrka.
GLACIÄRTX	Name of glacier	Name of glacier.	Reviewed and established by Lantmäteriet’s place name section.
SANKTX	Name of wetland	Name of wetland.	Reviewed and established by Lantmäteriet’s place name section.
VATTDELTX	Name of a part of water (lakes and larger watercourses)	Name of a part of water. For example, part of a sea, lake, sound, or bay.	Reviewed and established by Lantmäteriet’s place name section.
VATTDRTX	Watercourse, name	Name of a water course, rapids, or waterfall.	Reviewed and established by Lantmäteriet’s place name section.
VATTTX	Name of lake	Name of sea and lake.	Reviewed and established by Lantmäteriet’s place name section.
MILUTX	Information text, military area	Informational text for military area.	Presented according to established list of information text.
NATTX	Name of area protected by NVL	Name of nature and culture reserve as well as nature conservation areas that are legally protected.	Names established by the government and County Administrative Board for national parks, nature reserves, domain reserves, culture reserves and seal

Detail type	Name	Description	Comment
			protection areas. In cases where the name does not match with Lantmäteriet's established name, the place name section is to make an assessment on whether the name should be presented with a name or only with an information text.
NATUTX	Information text, nature conservation	Informational text for nature and culture reserves as well as nature conservation areas that are legally protected.	Presented according to established list of information text.
TERRTX	Terrain name	Name of nature and terrain features.	Reviewed and established by Lantmäteriet's place name section.
TERRUTX	Information text, nature, and terrain features	Informational text for nature and terrain feature.	Presented according to established list of information text.

Table 119 Attribute set for Text layer with place names and informational text.

Attribute	Type	Length	Description
text	Text	64	Text string.
detaljtyp	Text	10	Detail type code.
tdelidx	Integer	2	Hyphenation 0 = not hyphenated, otherwise 1-9 for each sub string.
regtext	Text	100	Registry text from the place name register. Information text has no registry text.
trikt	Floating point	6.2	Text orientation. Given in unit of degrees (0.00 – 360.00,

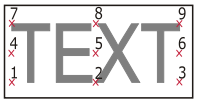
Attribute	Type	Length	Description
			increases anti-clockwise). 0.00=Unoriented text.
tjust	Integer	3	Text insertion point (1-9). *Figure 7 Image shows the text insertion point.* 
thojd	Integer	7	Text height in the form of code. The following font sizes are used when the text is adjusted for presentation at a scale of 1:10000: See the table below for point size.
adat	DateTime	23	Date/time for the latest change. Note that may not be the latest update. Given in the format: 1998-01-16T11:03:00.000

Table 120 Point size.

THOJD	Size
6	6 point (1,59 mm)
8	8 point (2,12 mm)
10	10 point (2,65 mm)
12	12 point (3,18 mm)
14	14 point (3,71 mm)
16	16 point (4,24 mm)
20	20 point (5,30 mm)
30	30 point (7,95 mm)

6 List of changes

Table 121. Table for list of changes.

Version	Date	Reason and change from previous version
1.14	2024-02-28	Chapter 2 Reference to the “Termdatabasen Ekvator” has been removed as it has ceased to exist. Chapter 5.3.7 Church has received a new definition, description, and comment. Chapter 5.4.6 Definition and description changed for airport status. Chapter 5.8.3 The values for Requirement of planar positional uncertainty had been reversed and are now changed to 5 m for Military Firing Range and 20 m for Military Training Area. List of change added.
1.13	2023-12-20	Chapter 5.1.5 Description updated and moved to the comment for Glacier Boundary, Built-up area boundary, Industry and retail area boundary, Arable land boundary, Open land boundary and Forest land boundary. Chapter 5.4.4 Description and comment added for School Area. The phrase "No data has been collected yet" has been removed. Description added, and examples modified in comment for Activity park.
1.12	2023-10-23	Improved English translation. Chapter 3.1 Text about styling moved to Chapter 4.2. Chapter 5.3.4 Description for the attributes *byggnadsnamn1*, *byggnadsnamn2* and *byggnadsnamn3* has been changed. Chapter 5.3.7 Comment changed for Sami cot. Chapter 5.5.1 Text about abandoned railways has been updated.

Version	Date	Reason and change from previous version
		Chapter 5.4.4 Description and comment added for Hospital Area. Definition and description have been changed for Allotment area. Chapter 5.4.8 Description and comment have been added for Helicopter pad. Chapter 5.5.11 The comment for Railway Station has been changed.
1.11	2023-06-21	First version in English

Appendix 1 Lantmäteriet's coverage area for mountain range information

Within Lantmäteriet's coverage area for mountain range information there is a slightly different object selection. Partly objects that are only presented within this area for example Sami cot, and partly objects that are presented in the whole of Sweden but have another selection in this area, for example watercourses.

For information in more detail, see the selection for the respective objects in chapter 5.

Figure 7 Lantmäteriet's coverage area for mountain range information.