

An aerial photograph of a rural landscape in Sweden. The scene is dominated by dense green forests and rolling hills. In the foreground, a large, calm lake reflects the sky. A dirt path winds through the forest towards the water. In the middle ground, there are several buildings, including a large industrial or commercial structure with a blue roof, and smaller residential houses. The background shows more green fields and a larger body of water under a clear sky.

# METHODS FOR VALUATION OF ECOSYSTEM SERVICES WHEN DESIGNING BLUE GREEN INFRASTRUCTURE CASE STUDY, SWEDEN

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**RAMBOLL**



# BACKGROUND



# LOMMARSTRANDEN – CITYLIFE CLOSE TO NATURE

“Planned exploitations should help to reinforce existing blue-green infrastructure”

- Master plan, Norrtälje Municipality



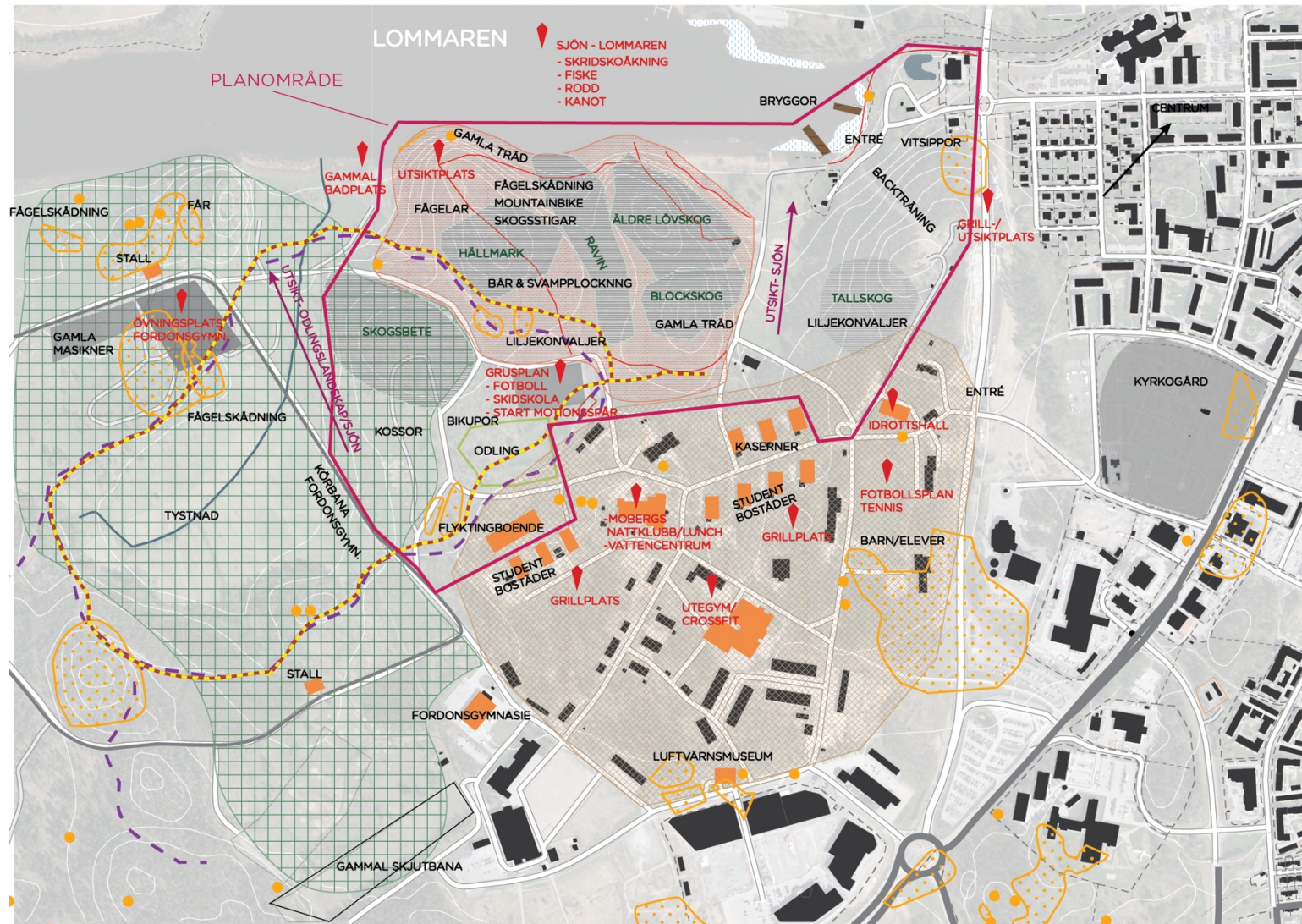
# LOMMARSTRANDEN – CITYLIFE CLOSE TO NATURE

- 1,200 new residences
- Different types of accommodation and housing sizes
- Construction start 2019



# BASELINE VALUATION

# MAPPING





# ZONING



# BASELINE VALUATION – METHODOLOGY

## QUANTITATIVE SCORE

### Storberget

Identifierade värden	Ekosystemtjänster
Fornlämning	Kulturarv, platskänsla
Naturvärdesklass 2	Biologisk mångfald, Habitat, Naturarv
Naturvärdesklass 3	Biologisk mångfald, Habitat, Naturarv
Naturvärde Skogsstyrelsen	Biologisk mångfald, Habitat, Naturarv
Fuktig, kalkpåverkad blandbarrskog	Biologisk mångfald, Habitat, Naturarv
Skog	Rekreation, Lärande, Ornamentala resurser, Luftrening, Kolbinding, Klimatreglering, Vattenrening, Bullerreducering, Erosionsskydd, Pollinering, Habitat
Äldre lövskog	Naturarv
Blockskog	Andlig upplevelse, Platskänsla, Rekreation
Lijekonvaljer	Ornamentala resurser, Estetiska värden
Bär- och svamplockning	Rekreation, Lärande, Livsmedel
Skogstigar	Friluftsliv, Rekreation, Hälsa
Mountainbike	Friluftsliv, Rekreation, Hälsa
Fågelskådning	Lärande, Rekreation, Resurs för forskning, Friluftsliv
Utsiktsplats	Estetiska värden, Platskänsla, Rekreation
Fåglar	Rekreation, Lärande, Biologisk mångfald
Orientering	Hälsa, Friluftsliv, Sociala relationer, Rekreation
Löpträning	Hälsa, Friluftsliv, Sociala relationer, Rekreation

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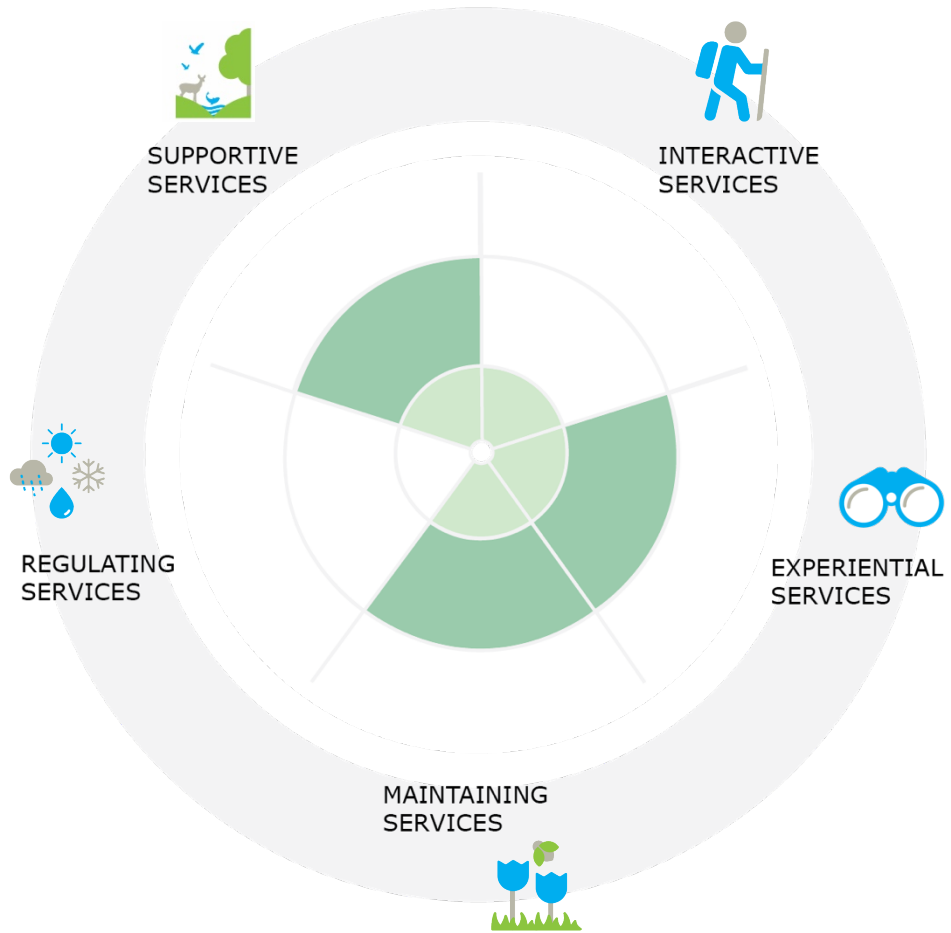
## QUALITATIVE ASSESSMENT

For each area, the qualitatively identified ecological and social values were translated into quantified ecosystem services.

The number of services for each area was scored by the following:

1–2 services	1 point	Small amount of services
3–4 services	2 points	Moderate amount of services
5+ services	3 points	Large amount of services

# MÄSSFÄLTET



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# LOMMARSKOGEN



# IMPACT ASSESSMENT

# IMPACT ASSESSMENT – METHODOLOGY

## DEVELOPMENT SCENARIO

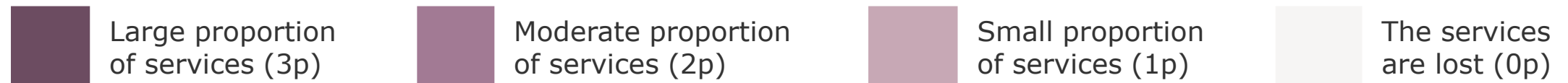
- Can the structures that generate ecosystem services be moved within the area?
- Can the structures be expanded?
- Can the structures be replaced?

Great positive impact	Great conditions for the services to arise or reinforce during exploitation
Small positive impact	Certain conditions for the services to arise or reinforce during exploitation
No/Negligible impact	Services are deemed not affected negatively or positively
Small negative impact	Some of the conditions of the services are destroyed or claimed. Services are judged to some extent be generated despite exploitation
Great negative impact	Large portions of the service's premises are destroyed or claimed. The services are not expected to be generated during exploitation

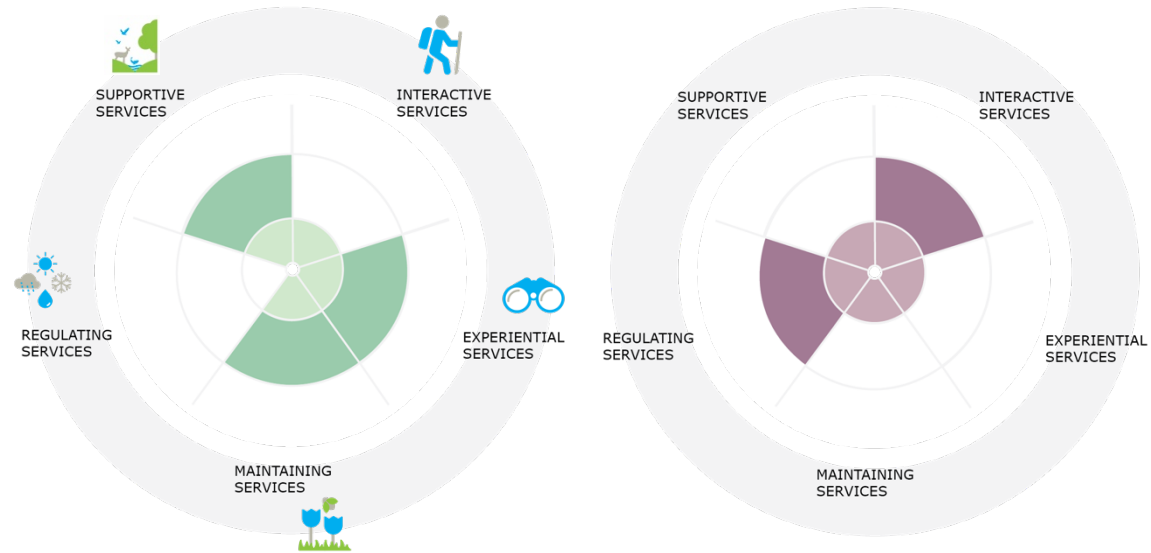
# IMPACT ASSESSMENT – METHODOLOGY

	Small proportion of services (1p)	Moderate proportion of services (2p)	Large proportion of services (3p)
Great positive impact	Large proportion of services (3p)	Large proportion of services (3p)	Large proportion of services (3p)
Small positive impact	Moderate proportion of services (2p)	Large proportion of services (3p)	Large proportion of services (3p)
No/Negligible impact	Small proportion of services (1p)	Moderate proportion of services (2p)	Large proportion of services (3p)
Small negative impact	The services are lost (0p)	Small proportion of services (1p)	Moderate proportion of services (2p)
Great negative impact	The services are lost (0p)	The services are lost (0p)	The services are lost (0p)

Estimate of ecosystem services after exploitation



# MÄSSFÄLTET

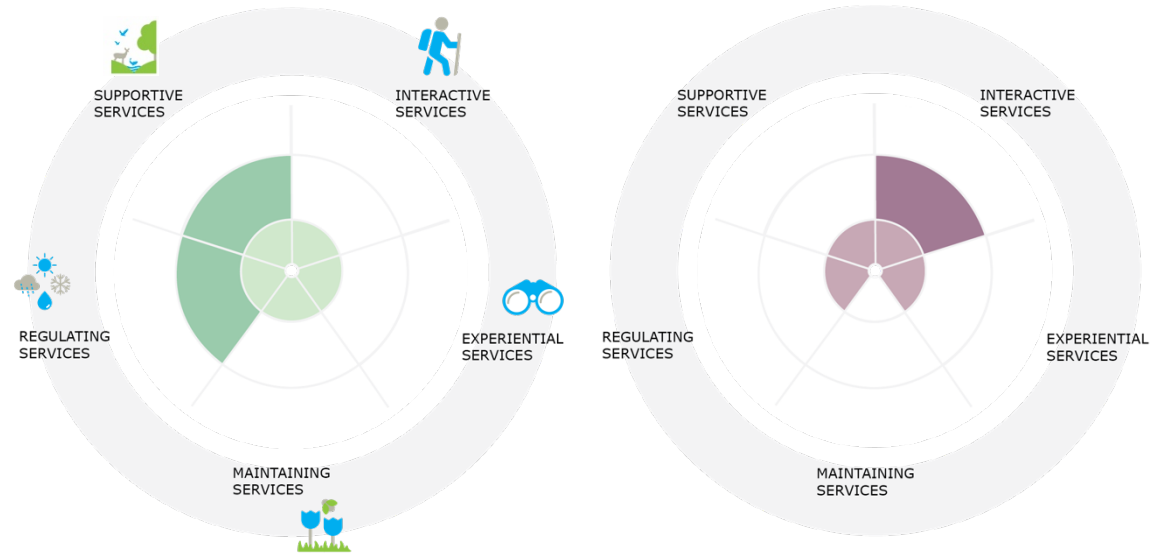


Mässfältet	Small proportion of services (1)	Moderate proportion of services (2)	Large proportion of services (3)	
Great positive impact				Large proportion of services (3)
Small positive impact	Interactive services Regulating services			Moderate proportion of services (2)
No/Negligible impact				Small proportion of services (1)
Small negative impact		Experiential services Maintaining services Supportive services		The services are lost (0)
Great negative impact				





# LOMMARSKOGEN



Lommarskogen	Small proportion of services (1)	Moderate proportion of services (2)	Large proportion of services (3)	
Great positive impact				Large proportion of services (3)
Small positive impact	Interactive services			Moderate proportion of services (2)
No/Negligible impact	Experiential services			Small proportion of services (1)
Small negative impact	Maintaining services	Regulating services Supportive services		
Great negative impact				The services are lost (0)



# GUIDELINES

# GUIDELINES MÄSSFÄLTET

## INTERACTIVE SERVICES

Make the area accessible by extending paths and illuminated tracks into Mässfältet

Create space and conditions for nature play, outdoor gym and meeting places



## EXPERIENTIAL SERVICES

The connection to the old regiment area should be enhanced to create identity and sense of place

## SUPPORTING SERVICES

Plants present on Mässfältet today should be replanted in public spaces to attract species linked to the open landscape



## REGULATING SERVICES

The natural surfaces' function for water management should be preserved/recreated through blue-green solutions

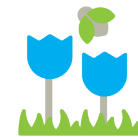
Vegetation like bushes and trees should be planted in the area



## MAINTAINING SERVICES

The area should be managed traditionally

Species linked to the open landscape should be reinstated to benefit the existing ecosystem



# GUIDELINES

## LOMMARSKOGEN

### INTERACTIVE SERVICES

Trails can be brought into the area to connect to the movements patterns in Lommarstranden

Create opportunities for physical activity by providing space for natural play, outdoor gym and meeting places



### EXPERIENTIAL SERVICES

Create sight lines towards Lake Lommaren

Preserve the opportunity to enjoy seasonal flowers like whitewashes and lilies

### SUPPORTING SERVICES

Forest habitats should be preserved as far as possible

Preserve/recreate the area's function as part of the ecological forest network



### REGULATING SERVICES

Preserve vegetation where possible, due to tree's regulatory functions

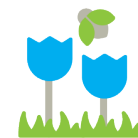
Create blue-green solutions and multifunctional surfaces for stormwater handling and noise reduction



### MAINTAINING SERVICES

Preserve and reintroduce the forest-led vegetation as far as possible to benefit pollinators and seed dispersal linked to the forest environment

Create opportunities for gardening



# THE NEXT STEPS...

# PLATFORM FOR FUTURE SUSTAINABILITY WORK

- The result has been implemented within a zoning plan and a sustainability program
- The result has helped the municipality communicate how the values of Lommarstranden will be preserved and strengthened



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