

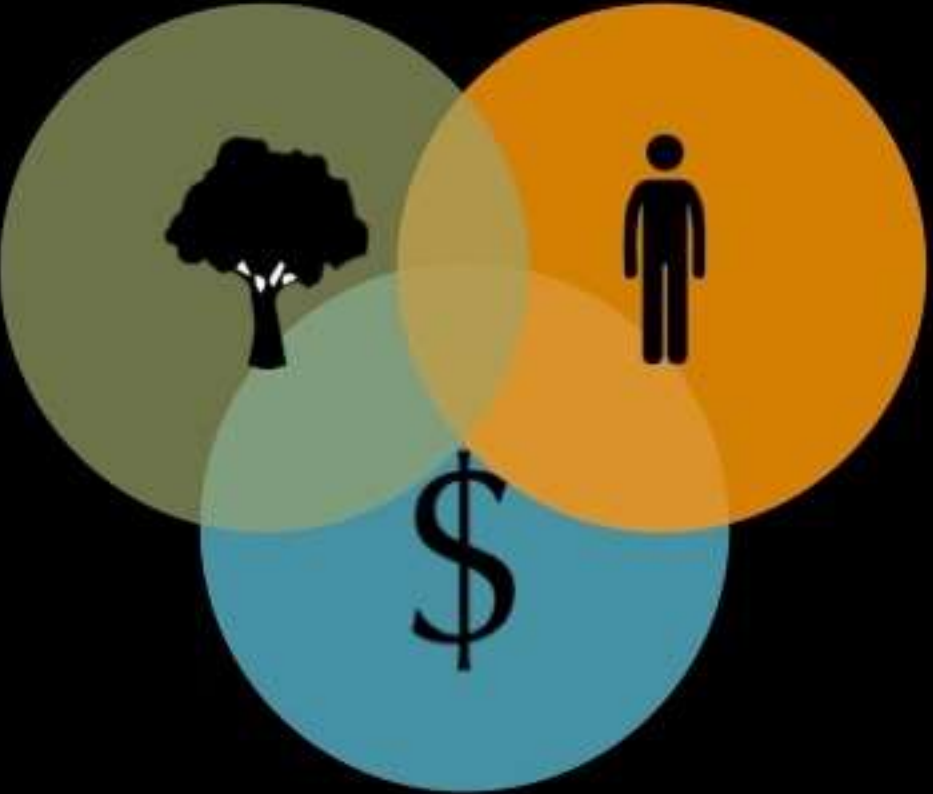


# LEVERAGING ECOSYSTEMS FOR LIVEABLE COMMUNITIES PRACTICAL APPLICATIONS OF SOCIAL-ECOLOGICAL URBANISM (ECOSYSTEM SERVICES) WITHIN A LIVEABLE CITY FRAMEWORK

LARS JOHANSSON, LOTTIE CARLSSON AND INGRID BOKLUND

# SCIENCE...

# A NEW PARADIGM FOR SUSTAINABILITY...

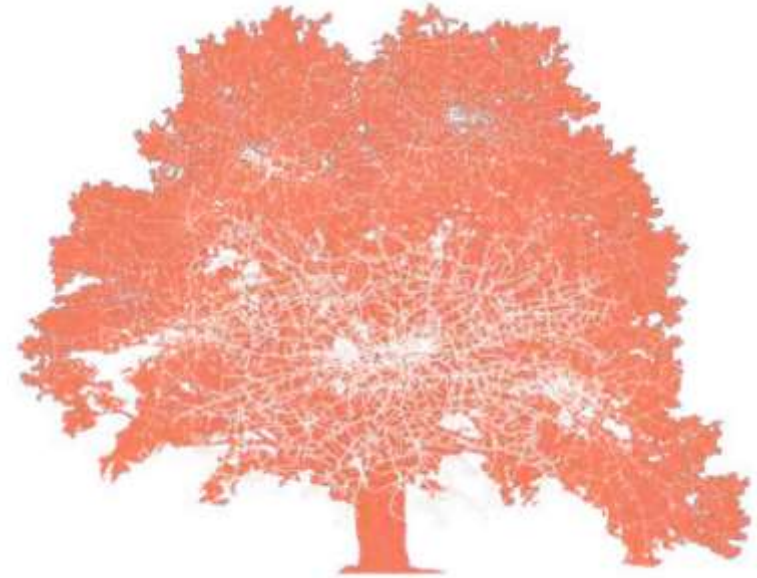
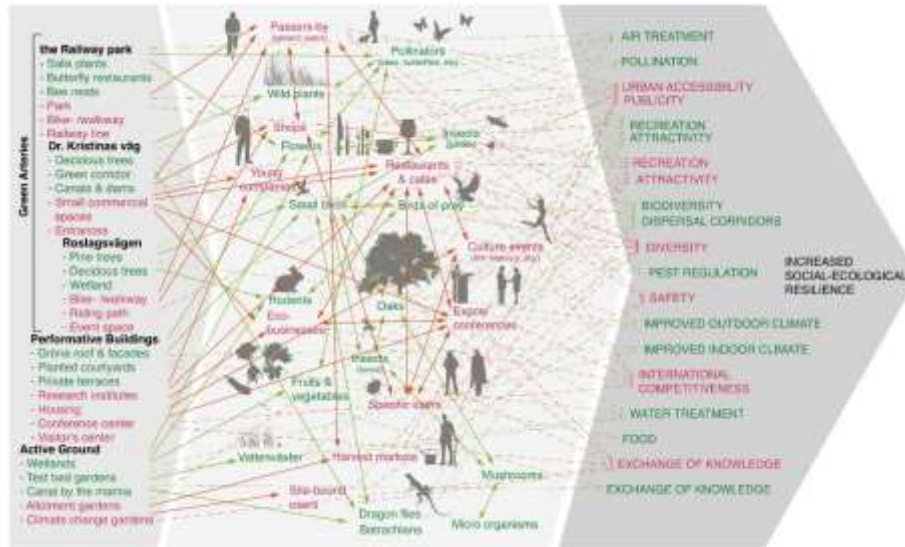


# ...PLANETARY BOUNDARIES AND HUMAN OPPORTUNITIES

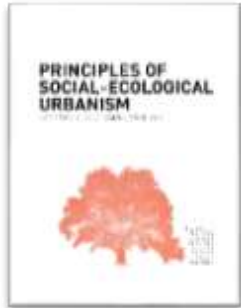
# LIVEABLE CITIES



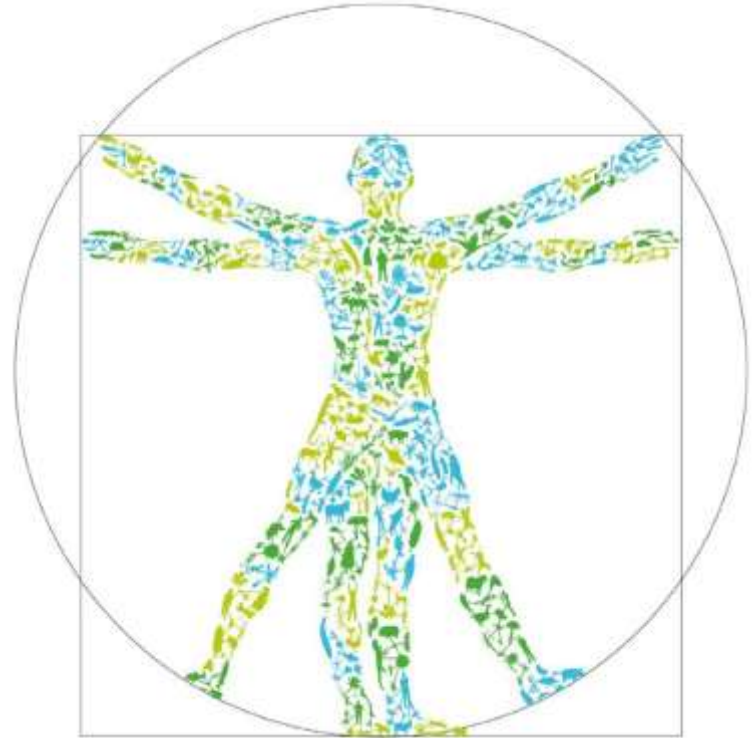
# SOCIAL-ECOLOGICAL URBANISM



# ECOSYSTEM SERVICES



## CICES





# Ecosystem Services

				Liveable Cities																						
				Social						Cultural				Physical												
Section	Group	Ecosystem services	Reference	Social services & Welfare	Diversity & Tolerance	Flexibel labor market & work conditions	Equity & Justice	Local/ regional economy	Diverse employment & industry sectors	Pro-active policy development & involvement	Safety & community	Education & Research	Health & Wellbeing	Individuality	Cultural identity	Inspiration & Art	Happiness & Satisfaction	Character of the city	Transport, mobility & connectivity	Energy	Buildings, housing, open space & infrastructure	Natural resources: water, air, soil	Local climate, soundscape & access to nature	Food systems		
Providing Services	Food	Cultivated crops	MA/T/C																						x	
		Reared animals and their outputs	MA/T/C																							x
		Wild plants, algae and their outputs	MA/T/C																							x
		Wild animals and their outputs	MA/T/C																							x
		Plants and algae from in-situ aquaculture	MA/T/C																							x
	Water	Animals from in-situ aquaculture	MA/T/C																							x
		Surface water for drinking	MA/T/C									x														x
		Groundwater for drinking	MA/T/C									x														x
		Water for non-drinking purposes	MA/T/C																							x
		Fibre, timber	MA/T/C																				x			x
Biotic Raw Materials	Genetic resources	MA/T/C																				x			x	
	Medicinal resources	MA/T									x		x									x			x	
	Ornamental resources	MA/T/C																							x	
	Biochemicals	MA/C																							x	
Bio-energy	Biomass based energy sources	MA/T/C																			x		x			
Regulating Services	Regulation of the physical environment	Nr quality regulation	MA/T/C									x													x	
		Global climate regulation	MA/T/C										x												x	
		Regional and local climate regulation	MA/T/C										x												x	
		Water purification & treatment	MA/T/C																						x	
		Regulation of water flows	MA/T/C		x																	x				x
		Flood protection	MA/T/C		x																					x
		Natural hazard regulation	MA/C		x																			x		x
		Erosion prevention	MA/T/C																							x
		Noise reduction	NA										x													x
		Disease regulation	MA/T/C																							x
	Pest regulation	MA/T/C																							x	
	Maintenance of biotic conditions	lifecycle maintenance, habitat and gene pool protection	T/C																							x
		Maintenance of nursery services	T/C																							x
		Pollination	MA/T/C																							x
		Seed dispersal	C																							x
Bio-remediation		MA/C																							x	
Cultural Services	Symbolic	Herbal, vegetation and storage	MA/T/C																						x	
		Cultural Heritage	MA/T/C		x								x												x	
		Natural Heritage	C										x												x	
		Sacred and/or religious values	MA/T/C		x			x					x												x	
		Sence of place	MA/T/C										x												x	
	Physical and experiential interactions	Educational values	MA/T/C		x																					x
		Scientific resources	T/C		x																					x
		Aesthetic values	MA/T/C																							x
		Recreation	MA/T																							x
		Tourism	MA/T/C																							x
		Outdoor life	T/C		x	x																				x
		Health	T/C		x																					x
		Social relations	MA		x	x	x																			x
		Accessibility	P		x	x?	x																			x
		Openness	P		x																					x
Urban	Recreational attractiveness	P																							x	
	Diversity	P		x	x?																				x	
	Security	P		x	x?	x																			x	
	Internationally competitive	P		x	x																				x	
	Knowledge sharing	MA/P		x	x																				x	
Supporting Services	Primary production	MA/T																							x	
	Photosynthesis	MA/T																							x	
	Soil formation and composition	MA/T/C																							x	
	Water cycling	MA/C																							x	
	Nutrient cycling	MA/C																							x	
	Biodiversity	R																							x	
	Maintenance of life cycles of migratory species	T/C																							x	
	Nursery service	F																							x	
	Habitats for species	T/C																							x	
	Renewable energy (wind, water, sun)	C		x																					x	
Biotic products and materials	T/C																							x		

## Liveable Cities Indicators



# ...TO PRACTICE





**Alingsås**

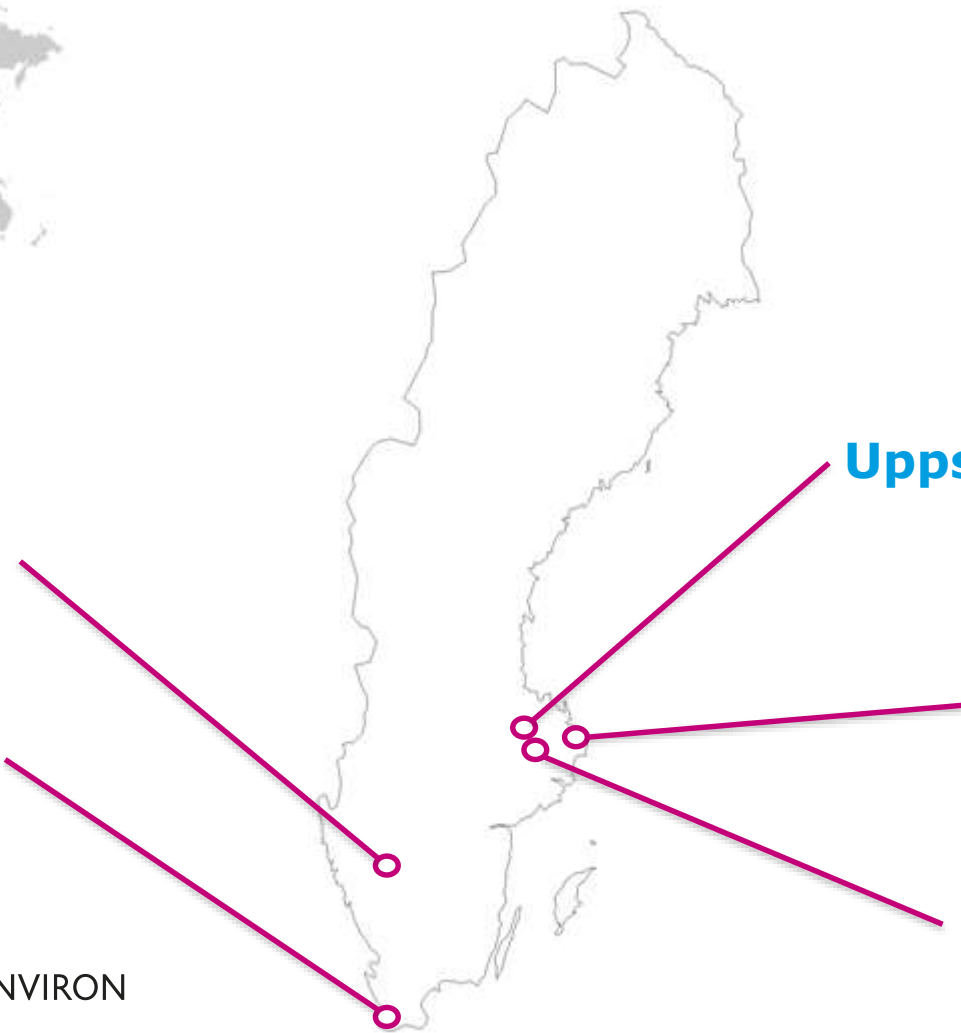
**Malmö**

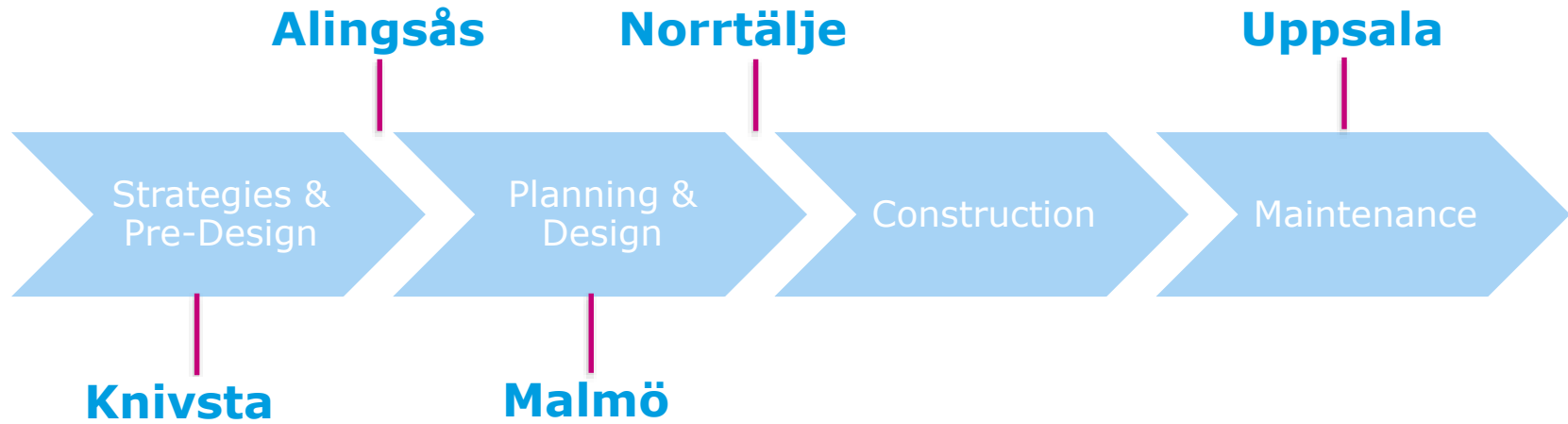
**Uppsala**

**Norrtälje**

**Knivsta**

**RAMBOLL** ENVIRON







Norrtälje Harbour © Norrtälje Kommun

# NORRTÄLJE HARBOR

## USING AN ECOSYSTEM SERVICES PERSPECTIVE AND BIOTOPE AREA FACTOR AS TOOLS FOR SUSTAINABLE URBAN DEVELOPMENT

2015-2016  
NORRTÄLJE MUNICIPALITY

**RAMBOLL** ENVIRON



**...FOR KIDS, BOATS AND SWIMMING!**



## 1. SITUATION ANALYSIS

Which ecosystem services are present on site / in and surrounding the area today?

## 2. PRIORITIZE

Which ecosystem services are important to the area and its stakeholders, now and in the future?

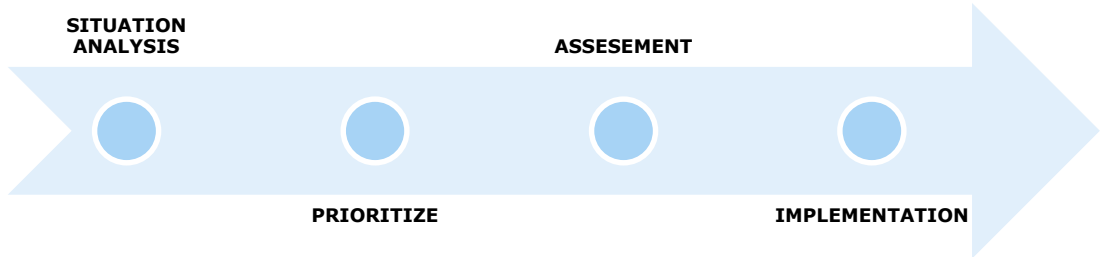
## 3. ASSESEMENT

Which ecosystem services need to be: **protected / strengthened / created** when the port area is developed?

## 4. IMPLEMENTATION

→ Input to target variables for **biotope area factor**.

→ Input to layout and design of the public space in Norrtälje Harbor.



# BIOTOPE AREA FACTOR

eco-efficient area

total area

## TILLÄGGSAKTOR REGLERANDE, UPPRÄTTHÅLLANDE OCH FÖRSÖRJANDE

FAKTOR

### Växternas nyttovärden för pollinering m.fl. nyttodjur

EST	Blommande, bär-såttande och/eller skyddande träd och buskar	Skyddande växter har ett lätt, snårigt växtsätt och gärna med tomor för skydd åt småflugor	0.3
		<b>Ange: AREA YTOR, ANTAL TRÄD</b>	
EST	Tidigblommande (april/början maj) växter	Arter som är särskilt gynnsamma med lättåtkomligt pollen eller nektar under tidig vår t ex gråvide, sölg, lönn, vintergäck, snödroppa, krokus, snökllocka, luktvial, violviva, m fl	0.5
		<b>Ange: AREA YTOR, ANTAL TRÄD</b>	
EST	Växter för fjärlis-/humleraball	Specifika ängs-, örtväxter och perenner som attraherar insekter. Ska bista med nektar, pollen under större delen av växtsäsongen. Ska ligga i ett varmt och vindskyddat läge för att attrahera insekterna	0.5
		<b>Ange: AREA</b>	

### Habitat och biologisk mångfald

EST	Ädelträdd och lokala träddarter	Ek, al, ask, lönn, fågelbär med de närbesläktade arterna lundalm, bergesk, naverlönn, vresalm, samt lokala arterna axel (bok och avenbok borttaget från ädelträddarterna då de ej finns naturligt lokalt. Lind är borttaget pga en redan hög närvaro i staden med risk för homogen sammansättning)	0.5
		<b>Ange: ANTAL</b>	
EST	Biotoppplanteringar/ biotopmiljöer	Ytor med avseende att imitera natur med höga värden, t ex brynmiljöer, ängsmiljöer, och där djurlivet berikas även med boplatser, t ex död ved, stenrisen, sandblottar. Lokala arter ska finnas representerade i planteringar	0.3
		<b>Ange: AREA</b>	

### Klimatpåverkande

EST	Växtskugga	Träd som placeras för att ge skugga i ett solutsatt läge, pergolor a dyl som skuggar soliga lägen och starkt solutsatta väggar mm	0.2
		<b>Ange: ANTAL</b>	
EST	Flerskiktade planteringar	Ska innehålla fällskikt, buskskikt och träskikt i samma yta. Endast den faktiskt flerskiktade delen av ytan beräknas	0.5
		<b>Ange: AREA</b>	
EST	Gröna tak och väggar	Avser en relativt tät grönska för isolerande/avkylande effekt	0.1
		<b>Ange: AREA</b>	







# **NOLTORP**

## **PROMOTING ECOSYSTEM SERVICES VIA SOCIAL-ECOLOGICAL URBAN DEVELOPMENT**

**2014**  
**ALINGSÅS MUNICIPALITY**





## CHALLENGE

- To **visualize** the value and ability of ecosystem services to deliver necessary social and ecological services in an urban context.
- To **describe** how social and ecological stakeholders, processes and networks must be mapped and analyzed in order to develop sustainable and resilient cities.
- To **translate** this into concrete solutions.

## STRATEGY

### 1. SITUATION ANALYSIS

- Mapping of biotopes and habitats
- Mapping / typology classification of land use

### 2. SOCIAL-ECOLOGICAL ANALYSIS

- Identify clusters of ESS for different types of land use
- Calculate and quantify the potential value of ESS

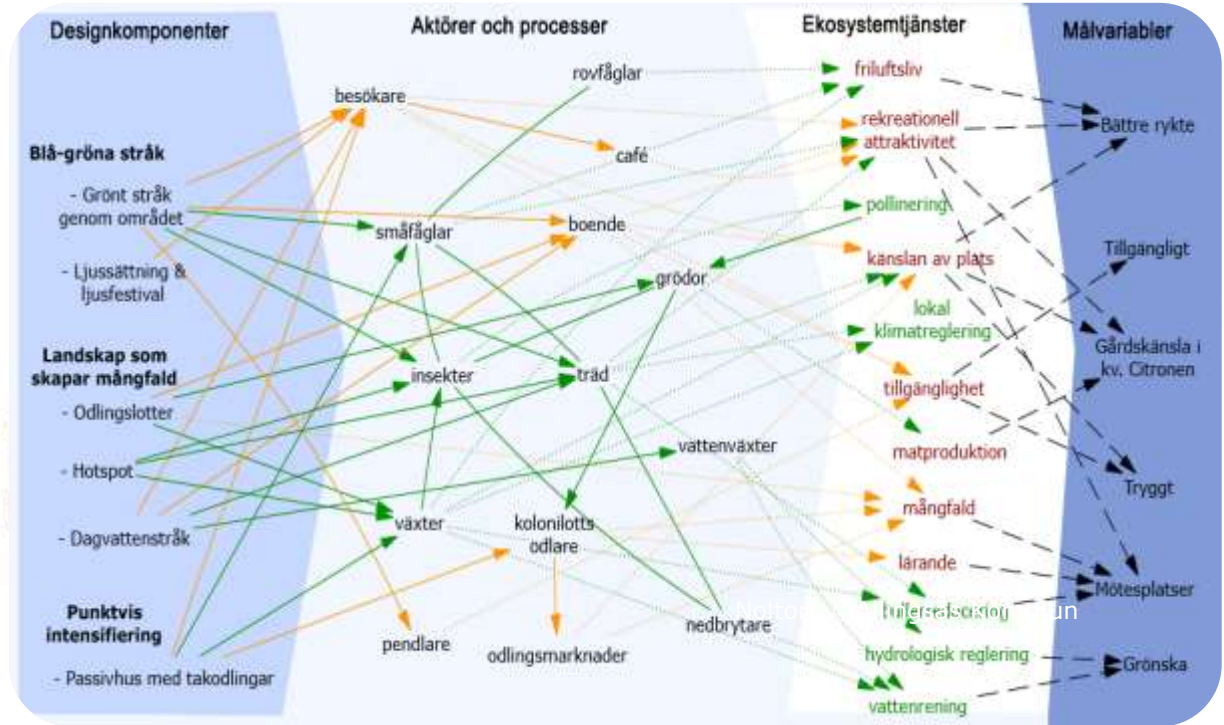
### 3. DESIGN

- Multifunctionality!

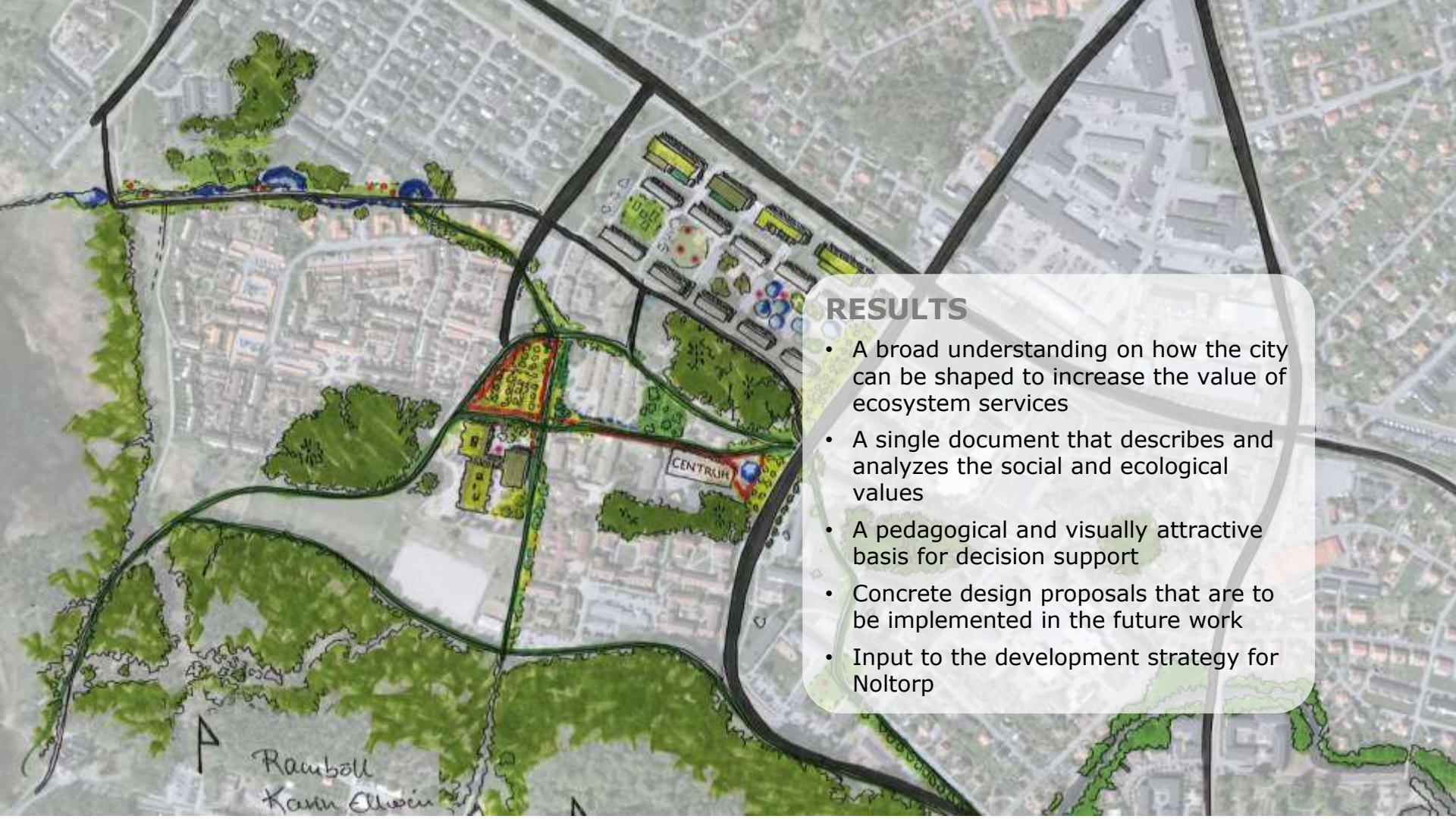
# VISUALIZATION

## NOLTORP: A SOCIO-ECOLOGICAL NETWORK

- Target variables based on goals and visions for the project
- Ecosystem services that contribute to achieving the objectives
- Stakeholders and processes that are supplying identified ecosystem services
- **Examples of design** components for facilitating the network of stakeholders and processes







## RESULTS

- A broad understanding on how the city can be shaped to increase the value of ecosystem services
- A single document that describes and analyzes the social and ecological values
- A pedagogical and visually attractive basis for decision support
- Concrete design proposals that are to be implemented in the future work
- Input to the development strategy for Noltorp



# KNIVSTA ECOSYSTEM SERVICES AND CHILDREN'S LOCAL NATURE

**2016**  
**KNIVSTA MUNICIPALITY**

**RAMBOLL** ENVIRON



# KNIVSTA MUNICIPALITY, SWEDEN

## Challenge

To map urban nature areas where children play on a weekly basis.

To analyze accessibility and barriers in the city from a children's perspective.

## Effect

Areas important for children and young people in the municipality of Knivsta are made visible in municipal planning.

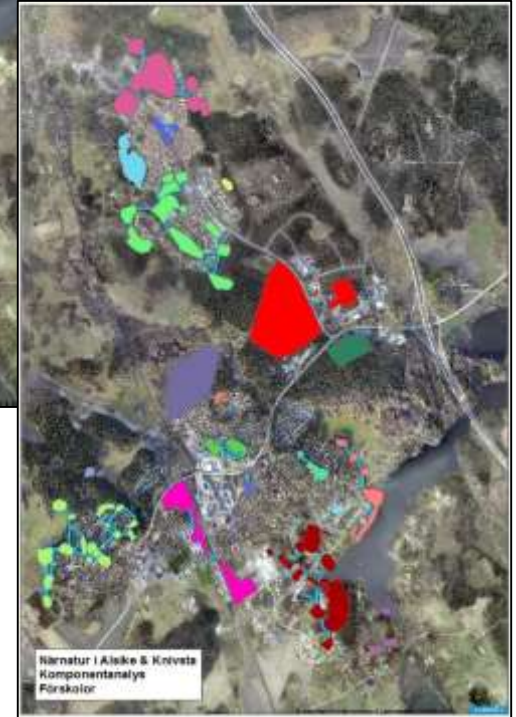
Areas linked to cultural and urban ecosystem services are made visible.

Understanding the values provided by the city near nature.



## Ecosystem Services provided by these areas:

- Educational values
- Recreation
- Health
- Social relations





ELINEGÅRD.SE

# ELINEGÅRD

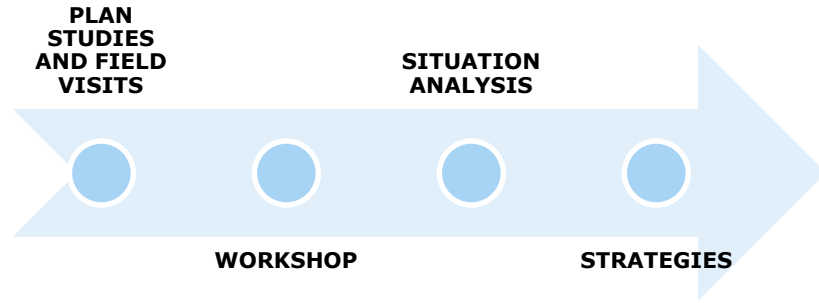
## INTEGRATION OF AN ECOSYSTEMS SERVICE PERSPECTIVE IN URBAN PLANNING

2016

IKANO BOSTAD (SISTER COMPANY TO IKEA), MALMÖ

**RAMBOLL** ENVIRON

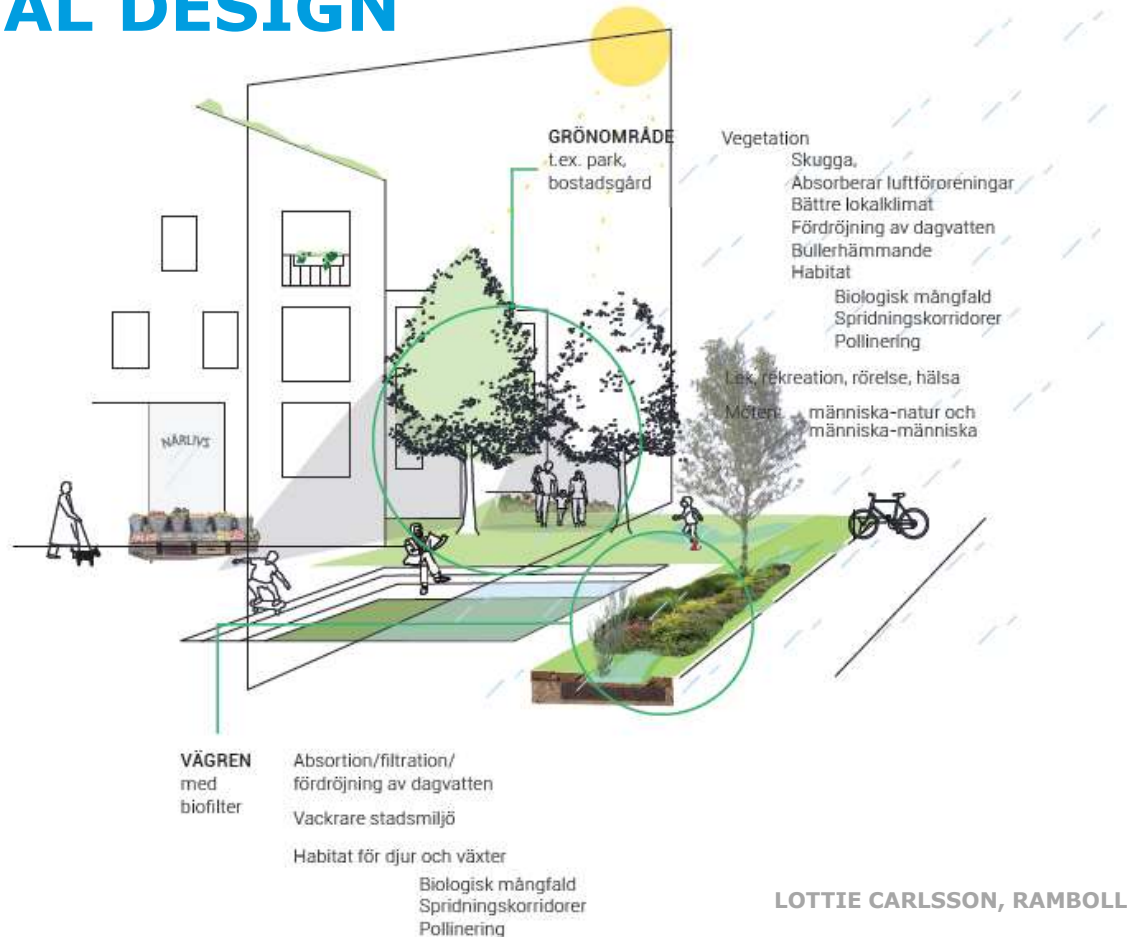
# WORKFLOW





# MULTIFUNCTIONAL DESIGN

Turnover of theory of ecosystem services to site-specific solutions that includes combined ecological, social and economic functions to create added value.





# UPPSALA

## USING ESS AS A TOOL FOR STAKEHOLDER COPPERATION AND JOINT MANAGEMENT

2016-2017

UPPSALAHEM, CITY OF UPPSALA, CHURCH OF SWEDEN, SWEDISH AGRICULTURAL UNIVERSITY

**RAMBOLL** ENVIRON

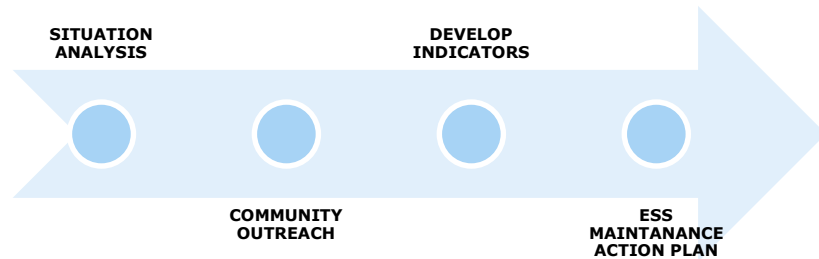




## **PARTNERS**

- City of Uppsala
- Uppsalahem (Public Housing Company)
- Church of Sweden
- Swedish Agricultural University
- Ramboll

# SCOPE OF PROJECT



- ✓ Maximise output of ESS
- ✓ Promote human well being
- ✓ Promote understanding of the socio-ecological system amongst stakeholders
- ✓ Strengthen the sense of community within and between children, residents and visitors
- ✓ **Increased value and benefits from each dollar invested in maintance of the green areas**

# CONCLUSIONS

- EVIDENCE-BASED PLANNING AND URBAN DESIGN
- COMMUNICATION TOOL FOR MULTIDISCIPLINARY WORK, STAKEHOLDER COOPERATION AND COMMUNITY OUTREACH
- HUMAN SCALE AND WELL BEING IN FOCUS
- HOLISTIC BY DEFAULT
- BOOSTING THE LEGITIMACY OF THE SUSTAINABILITY MANAGEMENT



# CONTACT

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