

# EGCA 2018, Umeå, Sweden

## 4. Nature and biodiversity

With high-quality nature management and urban planning considering biodiversity and ecosystem services, Umeå Municipality is working according to EU 2020 Biodiversity Strategy in order to enhance biodiversity and make the nature accessible to citizens and visitors. The broad regional ecological expertise collaborates, plans and conducts biodiversity and nature projects: Umeå Municipality, Västerbotten County, Umeå University, Swedish University of Agricultural Sciences and local stakeholders.

### 4A Present situation

INDICATOR	NUMBER	TOTAL AREA (ha)	YEAR OF DATA
Number and total area of Natura 2000 sites in Umeå municipality	SPA: 4 SCI: 19 Total: 23	SPA: 28897 ha SCI: 41881 ha Total area of Natura 2000 sites (no overlap of SCI or SPA): 43380 ha	2015
Number and total area of designated sites of national biodiversity importance	National areas of interest for nature (Riksintressen): 19 Nature reserves: 25 Biotope protection: 47 Nature conservation agreements: 4	National areas of interest for nature (Riksintressen): 45998 ha Nature reserves: 64859 ha Biotope protection: 143 ha Nature conservation agreements: 49 ha	2015
Number and total area of designated sites of local biodiversity importance within the city, that is: Local nature reserves and areas designated for natural conservation	Local nature reserves: 2  Designated areas for nature conservation: 134	Local nature reserves: 733 ha  Designated areas for nature conservation: 18297 ha	2015
Date and time horizon of your city's Biodiversity Action Plan	Umeå has adopted local objectives and guidelines in order to maintain and increase biodiversity. These are governing current activities. Future activities will be part of a new local action program for Umeå's green structure with a horizon of five years.		

*Table 4A1: Protected and designated areas for nature conservation in Umeå municipality, Biodiversity Action Plan*

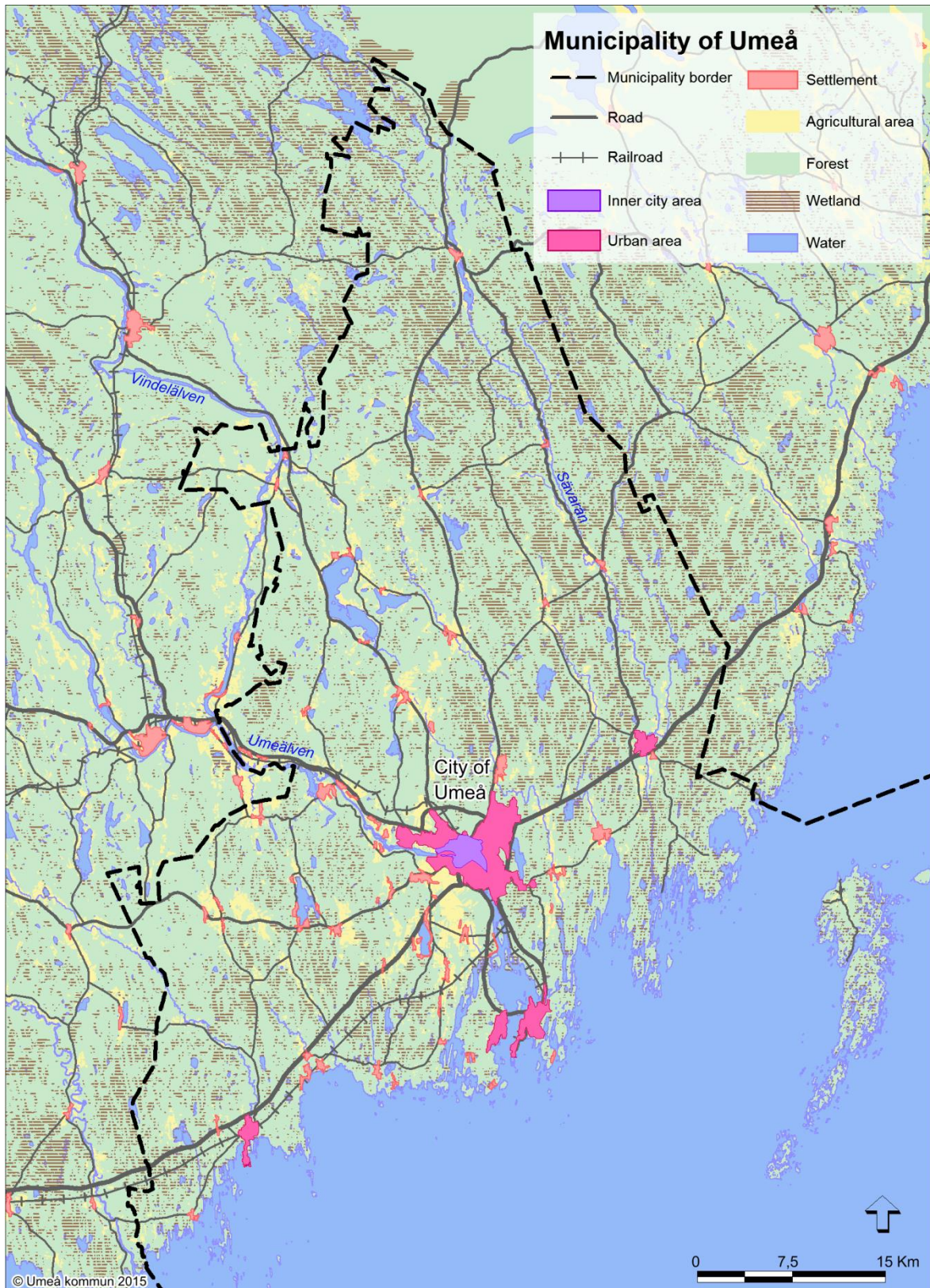


Figure 4A1: Map of main habitats in the municipality of Umeå

Umeå is with 120.000 inhabitants the largest city in northern Sweden in an otherwise sparsely populated region. A fundamental characteristic is its proximity to northern nature and wildlife; within the vicinity of the city boundary it's possible to see brown bear, lynx, wolverines or migrating wolves. 13.1 % of the municipal's area (land and water) is protected either by Nature 2000, nature reserves, biotope protection or nature conservation agreements.

The 2331 km<sup>2</sup> land area is dominated by coniferous boreal forests (1500 km<sup>2</sup>). Important areas for biodiversity are 350 km of land-upheaval coastline, wetlands, boreal streams and rivers. The land upheaval since the last glaciation (about nine mm/year) is constantly creating pristine natural habitats undergoing primary succession. These forests of primary succession stages are a priority Natura 2000 habitat type.

Through Umeå runs the Umeälven (River Ume) and its chief tributary is Vindelälven (River Vindel) – one of only four natural unexploited national rivers (Nature 2000 site).



*Figure 4A2: View over the city of Umeå from the east with the Umeälven in the centre, the Nature 2000 site 'Umedelta and plains' with its agricultural areas to the left and boreal forests in the background*

All Nature 2000 sites have good conservation status and the different habitat types are mapped and followed up by a national monitoring scheme. A suburban important Nature 2000 area is the Umeälven delta and its plains (Figure 4A2, 4A3, 4A5). The 1150 ha of agricultural land (the largest continuous farming area in northern Sweden) is extremely important for arctic migrating and breeding birds like whooper swan, bean goose and crane and supports 62 threatened bird species. Because of the proximity to the city and its attraction for housing areas, maintaining favourable conservation status of this site (continuous farm management) presents a challenge.



*Figure 4A3: View over the Nature 2000 site Umedelta with the plains in the background*

In Sweden the Right of Public Access gives everybody freedom to roam the countryside. This gives great opportunities for nature and outdoors life associations to explore the Umeå nature, contributing to raise the expertise and awareness for biodiversity. The local ornithological association is running two bird observatories, Fjäderägg since 1984, Umedeltat since 2010, giving long-term data on population fluctuations of migrating birds. The botanical association is currently mapping the distribution of all vascular plants in the county. Many associations traditionally arrange public activities to raise awareness for biodiversity and conservation issues, both during summer and winter.

Farmlands are small-scale and farming is due to climate reasons substantially non-pesticide. Arable and grazing farmland in Umeå countryside has a long history of providing habitats for a broad range of species, e.g. Eurasian Curlew, Lapwing, Ortolan Bunting.

Riparian forests along the Umeälven are one of the region's most species-rich habitats. The Lesser Spotted Woodpecker is a typical umbrella species for this environment and Umeå has a special program monitoring the species giving good information on the conservation status of the riparian forests (see 4B).

Actions on invasive species in the region are e.g. performed on racoon dog and mink. Methods for an effective eradication of the racoon dog were successfully devolved by a LIFE project (LIFE 09 NAT/SE/00034).

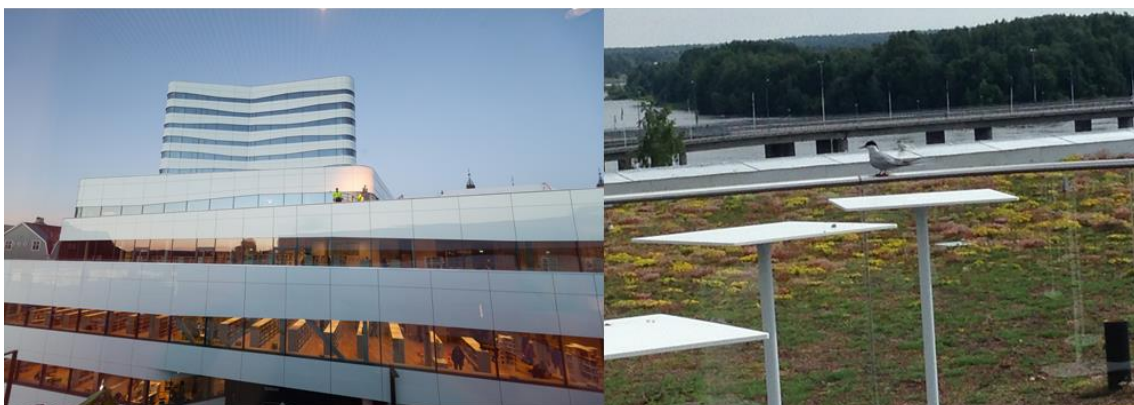
Table over all Nature 2000 sites in the municipality, many of these sites are also protected as nature reserves. Sites of local biodiversity importance are not described here due to the large number of sites; the local sites near the city can be viewed in Figure 4B6.				
NAME	AREA (HA)	PROTECTION	MAIN HABITATS	DATE*
Bonden SE0810002	396	SPA/SCI Nature reserve	Rocky island, nesting place for seabirds	2012
Brattby SE0810445	26	SCI	Northern boreal alluvial meadow	2012
Ersmarksberget SE0810429	20	SCI Nature Reserve	Transition mire and fennoscandian herb rich forest	2012
Holmöarna SE0810010	24209	SPA/SCI Nature reserve	Large archipelago with extraordinary conservation values related to land upheaval habitat development from sea bottom to taiga forest  Important bird habitat	2012
Hålvattsmyrorna SE0810447	172	SCI Nature reserve	Taiga forest and Aapa mire	2012
Isklinten SE0810500	233	SCI Nature reserve	Taiga forest with transition mires and bog woodland	2010
Ostnäs SE0810365	857	SCI Nature reserve	Taiga forest with primary succession stages of land upheaval coast and large shallow inlets and bays	2012
Rismyrbrånet	15	SCI Nature reserve	Taiga forest	2012

SE0810477				
Skeppsviksskärgården SE0810011	791	SCI Nature reserve	Boreal Baltic islets and small islands with estuaries and reefs	2012
Snöanskärgården SE0810003	5654	SCI Nature reserve	Boreal Baltic islets and small islands with estuaries and reefs and primary succession stages of land upheaval coast	2012
Strömbäck-Kont SE0810009	477	SCI Local nature reserve	Taiga forest with primary succession stages of land upheaval coast, coastal lagoons and natural eutrophic lakes	2012
Sydostbrotten SE0810519	4337	SCI	Boreal reefs with representative flora and benthic fauna	2013
Sävarån SE0810436	2028 (within Umeå)	SCI	Natural river with dystrophic lakes and ponds, alluvial meadows and alluvial forests	2012
Sävaråns utlopp SE0810506	819	SPA Nature reserve	Important bird habitat	2012
Sörforsdammen SE0810483	21	SCI	Lake with the predaceous beetle <i>Dytiscus latissimus</i>	2012
Tavlefjärden SE0810029	126	SCI Nature reserve	Forest with primary succession stages of land upheaval coast and transition mires.	2009
Törelbrännan SE0810029	46	SCI Nature reserve	Taiga forest and aapa mires	2012
Umeälvens delta och slätter SE0810475	3506	SPA	Very important species rich habitat for migrating and nesting birds.  Ramsar site according to the Convention on Wetlands  IBA by BirdLife International	2012
Umeälvens delta SE0810491	2006	SCI Nature reserve	Estuaries with humid meadows, forests of primary succession stages of land upheaval coast and alluvial forests.	2012

Vindelälven SE0810435	194 (within Umeå)	SCI	Natural large river	2012
Västermark SE0810388	304	SCI Nature reserve	Taiga forest with transition mires and bog woodland	2012
Öreälven SE0810403	3 (within Umeå)	SCI	Natural river	2012

*Table 4A2: List over all Nature 2000 sites within Umeå municipality, \*refers to date of management plan.*

In a growing and denser city as Umeå, there are potential negative impacts on biodiversity and nature. It's therefore important to find innovative solutions mitigating biodiversity losses in urban environments, like the sedum roof of the newly built cultural centre Väven. Within one year this became an attractive breeding site for arctic terns (Annex I, the Birds Directive) fishing in the nearby Umeälven (figure 4A4).



*Figure 4A4: The new culture centre Väven in the inner city with breeding Arctic terns on its sedum roofs, the river Umeälven in the background.*

## 4B Past performance

### 4B.1: Managing, conservations actions and monitoring of Natura 2000 sites<sup>1</sup>

Natura 2000 sites within the municipality are administrated by the County Administrative Board of Västerbotten. Below there are examples of actions concerning sites where Umeå municipality participated in actions raising a favourable conservation status.

#### a. The Umedelta and plains (SE0810475):

One of the first and largest European biodiversity offsetting schemes (figure 4B5) was conducted here with very good progress in relation to its biodiversity objectives (table 4B3). The biodiversity offsetting scheme was part of the mitigation measures for the new Bothnian railway through the Umedelta Nature 2000 area.

A Nature Conservation Foundation (Stiftelsen Naturvård vid nedre Umeälven) was founded 2008 for the long-term management of the compensation measures, as part of the offsetting scheme. Different stakeholders sit on the board: County administration, Umeå Municipality, Swedish Transport Administration, Umeå's two universities, NGO's, landowners and farmers. The foundation was funded with €2.3 million by the Swedish Transport Administration for long-term management of 550 ha of newly established sites. This management includes:

- Conservation management of deciduous forests
- Maintenance of wetlands, flood areas and shoreline meadows for migratory birds
- Cultivation of grain as feed for geese, swans, ducks and cranes
- Monitoring of the compensation targets and conservation status of the designated habitats and species
- Communication activities like guided bird-watching tours for the public

The offsetting scheme and measure management have produced valuable experience on several of the challenges related to an efficient application of biodiversity offsetting. Some of the experiences have international relevance and the scheme has proven to be a test-bed for different offsetting solutions; ecological engineering, long-term organizational and financial management as well as stakeholder participation, public awareness and collaboration with landowners and farmers. The corporate competence in Umeå due to this offsetting scheme has inspired policy development and offsetting schemes nationally and internationally.

---

<sup>1</sup> Local biodiversity sites are not described here due to the large number.



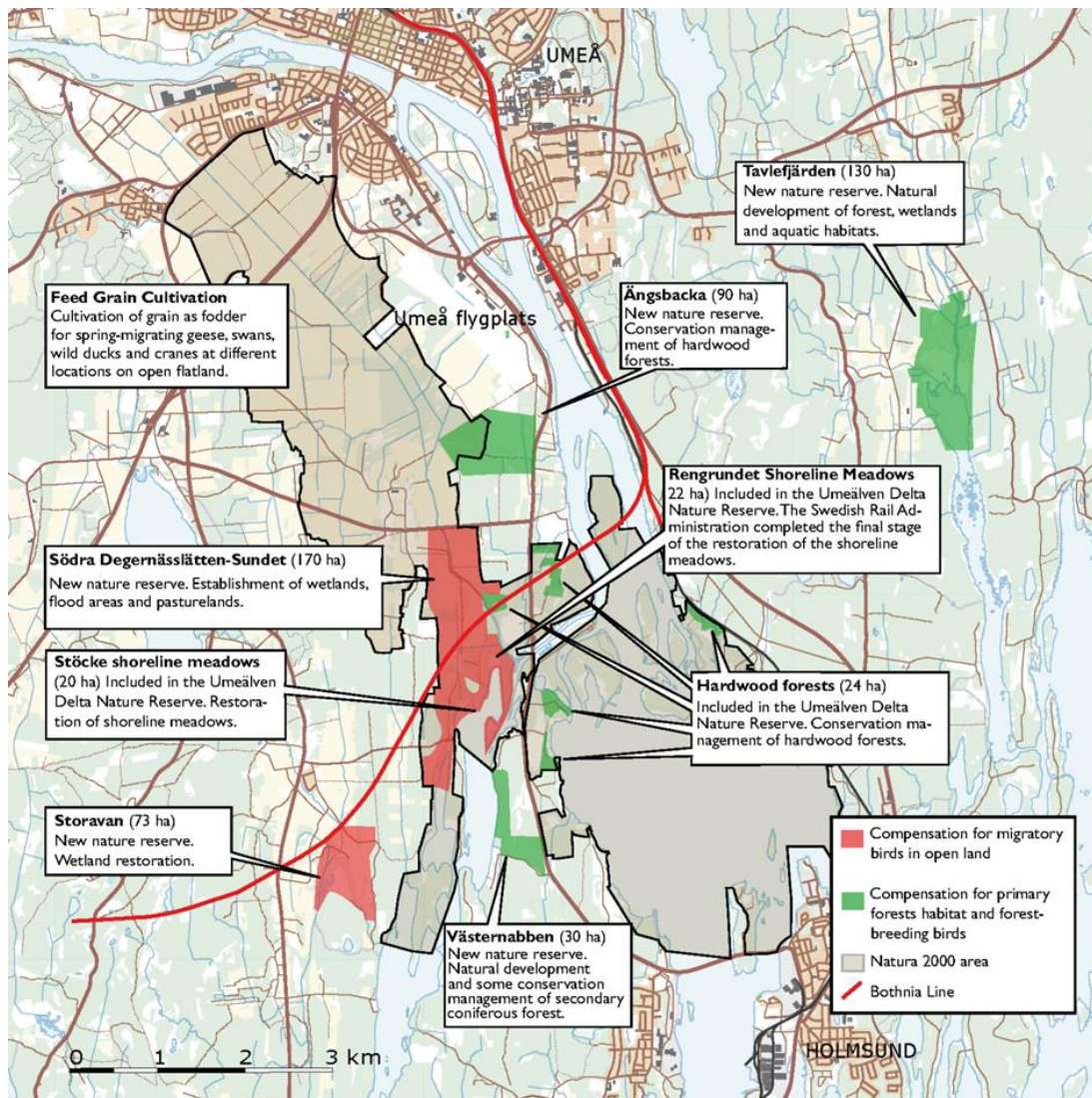


Figure 4B5: Map of compensation measures for the Umedelta and plains Natura 2000 site with a view on the new established wetlands Södra Degernässlätten-Sundet

Conservation targets for migrating birds in the Umedelta and plains SPA				
SPECIES	TARGET*	MONITORED 2011	MONITORED 2012	MONITORED 2013
Bean goose	2300 or more	1000	3628	1104
Crane	700 or more	80	768	170
Whooper swan	2200 or more	659	2532	950
*Peak spring count in at least one year in every three years				
Bird numbers fluctuated profoundly between years because of weather conditions.				

*Table 4B3: Conservation targets*

b. Restorations of Nature 2000 sites

Most of the streams and rivers in the region are affected by timber floating activities during the past century and are in need of restauration. Umeå Municipality is mainly involved in two projects restoring river stream habitats and riparian areas in order to strengthen the abundance and distribution of key species (salmon, otter, freshwater pearl mussel):

1. Sävarån (SE0810436):

Umeå Municipality leads this project, coordinating all practical work, legislation and information. The project is funded by the Swedish EPA and Holmen Skog AB. The aim is to restore the river's stream habitats and riparian areas to a natural state (time range 2011-2015, budget €250.000). Parallel to this, local stakeholders established fishing grounds and raised accessibility to the river by walking paths and information signs (Leader project, budget €60.000).

2. Vindelälven SE (0810435):

In the basin for the Vindelälven, there have been two major projects for improving fish migration and spawning:

- Improving fish and smolt migration passing Stornorrfors hydroelectric power station on their passage from the sea to the upstream unregulated Vindelälven. Umeå Municipality contributed €2 million for a new fish ladder plus €4.5 million for riverbed restoration 2012-2014 – total costs €10 million 2008-2014.
- Within the Vindelälven LIFE-project (LIFE08 NAT/S/000266) 25 tributaries have been restored along a total river stretch of 44 km. The LIFE project is a collaboration project between Umeå University, municipalities and local fishing associations. Umeå Municipality contributed €37 000 to the total costs of €2.8 million 2010-2014.

**4B.2: Maintaining biodiversity and ecosystem services in the city by protecting and managing large nature areas and a functional green infrastructure**

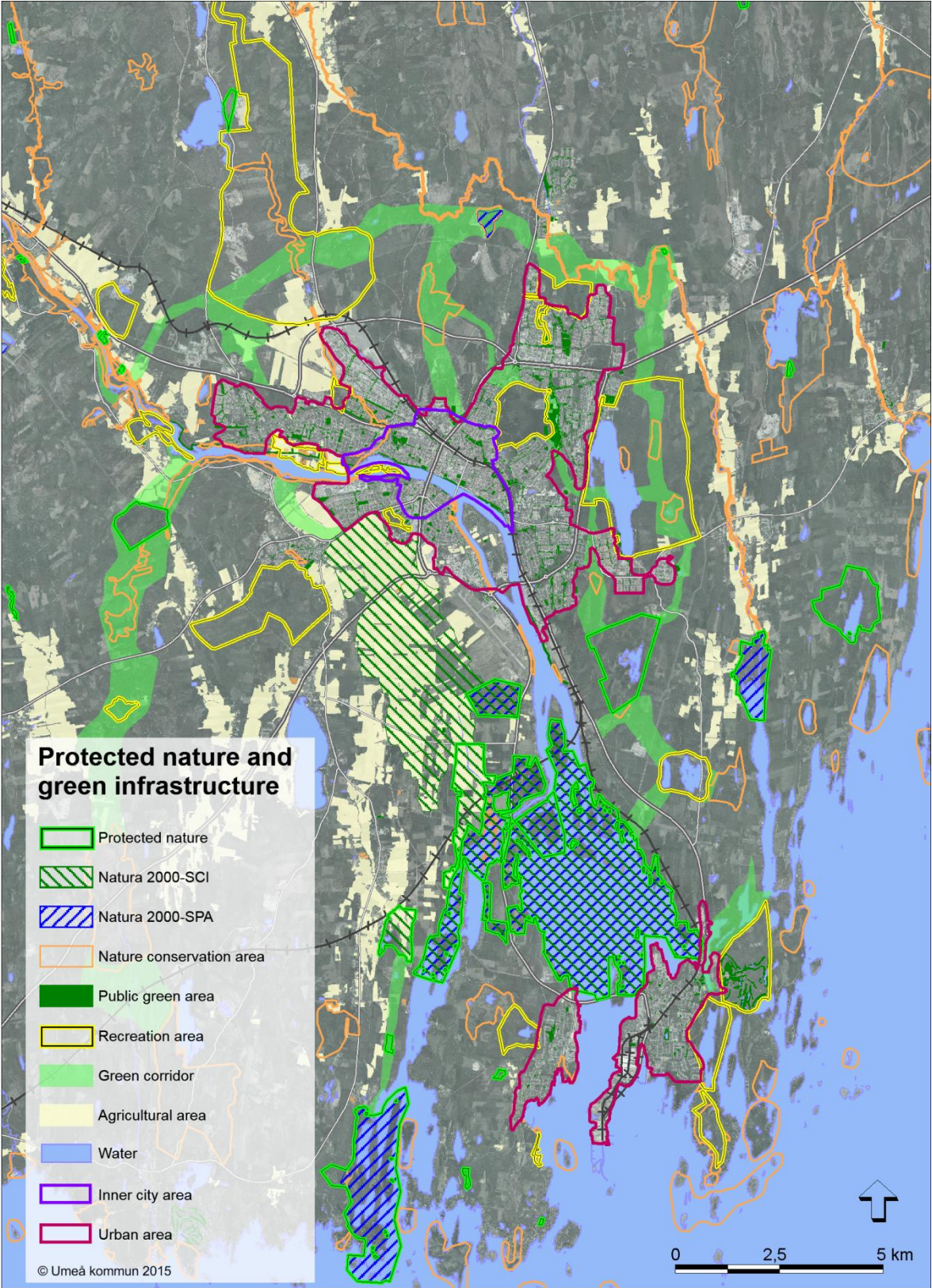


Figure 4B6: Map over protected nature areas, designated areas for nature conservation and green infrastructure corridors around Umeå’s city boundary

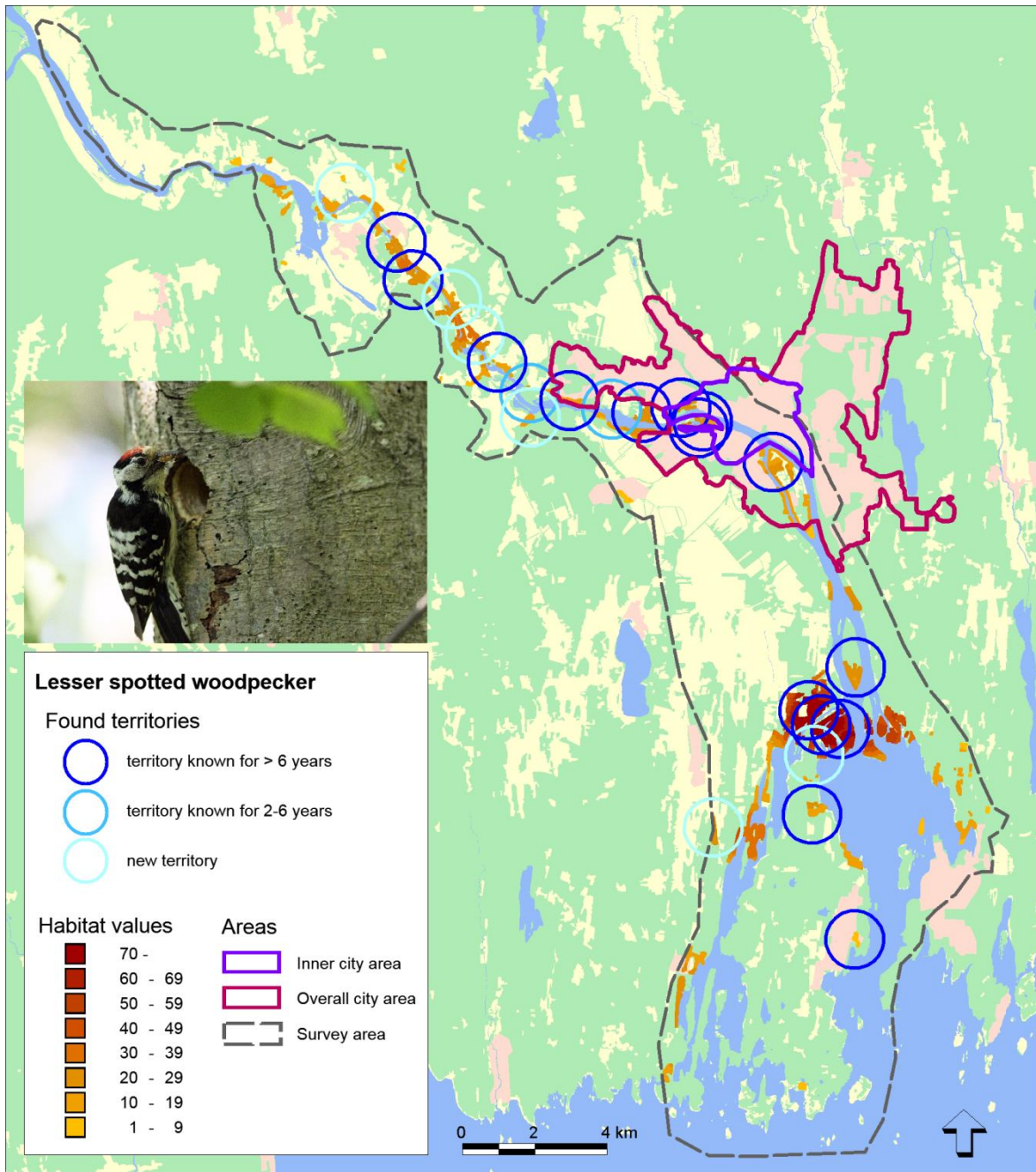
A main strategy for sustainable urban development is to densify the city. This entails potential exploitation risks of green urban areas important for biodiversity. To avoid these potential negative impacts Umeå Municipality has, guided by national environmental objectives, adopted local objectives and guidelines for biodiversity in the comprehensive plan and related documents (Table 4C4).

Umeå Municipality is actively carrying out surveys, follows up and identifies areas with high biodiversity status, continually updating a GIS database containing information important biodiversity areas. Based on these data Umeå Municipality has designated areas for nature conservation and important green corridors in its strategic planning documents and comprehensive plan (Figure 4B6).

Umeå is, in general, very restrictive of exploiting valuable nature areas. All development and planning projects are assessed by biologists. Besides well-established procedures for impact assessments on biodiversity, Umeå municipality is currently working out routines for integrating assessment of ecosystem services into planning projects (see 4C).

The riparian forests along the Umeälven are one of the region's most species-rich habitats. The moist environment with deciduous trees and a high amount of deadwood creates natural habitats for many species, like tree living fungi, insects, bird and bats. But the riparian forests close to the city are under threat as pressure for attractive housing areas along the riverside increases.

The Lesser Spotted Woodpecker has been shown to be a good indicator for the ecological status of these forests, as it's a highly specialized feeder on insect larvae in dead wood and requires a certain area and quality of deciduous-rich environments within its home range. Umeå Municipality conducted a study on habitat values of the riverine forests and the abundance of Lesser Spotted Woodpecker along the riverine landscape (Figure 4B7). Instead of protecting certain forests areas and risking fragmentation and species loss at a landscape level, Umeå Municipality adopted a target on the abundance of Lesser Spotted Woodpecker, which will be followed up every 5<sup>th</sup> year (Figure 4B7).



Surveys\* on breeding pairs of Lesser Spotted Woodpecker:

Target	2007	2012
15 – 18 pairs	22 pairs	23 pairs

\*Surveys will be conducted every 5<sup>th</sup> year.

Figure 4B7: Territories of Lesser Spotted Woodpecker (circles), habitat values of riparian forest areas and surveys in the riparian landscape along Umeälven

#### **4B.3: Raising public and political awareness for biodiversity and ecosystem services for a better understanding of the importance of green areas for sustainable cities**

Umeå is actively raising awareness on biodiversity by public consultation meetings discussing local development plans, management plans for public parks etc. New recruitments for leading positions in the municipal administration undergo an introduction about sustainable development in Umeå, including information on the importance of biodiversity for human's health and welfare.

The Nature School in Umeå supports outdoor education within the municipal pre-schools and primary schools. The Nature School's mission is to found good knowledge and understanding of nature, ecosystem services and biodiversity. Umeå's Nature School is considered a national frontrunner in this area. During the last 10 years projects have been accomplished to catalyse and create better conditions for outdoor education and raising the awareness for teachers, pupils, parents and immigrants.

#### **4B.4: Integration of economic, health and job benefits of biodiversity protection into strategic and finance planning**

Umeå Municipality supports the initiative to establish a MAB biosphere reserve for the riverine landscape along the Vindelälven; from the mountains via the lower Umeälven to Umedelta including its plains. In collaboration with local residents, stakeholders, Sami community and other municipalities, Umeå Municipality is working to enhance people's livelihoods and to preserve biodiversity by sustainable exploitation of the rich natural resources. After three-year candidate phase 2015-2017, the intense work will hopefully lead to a new MAB biosphere reserve in 2018. As part of this project Umeå Municipality plans a visitor centre at Umedeltat as an attractive destination for visitors and providing information about the species and habitat types in the area.

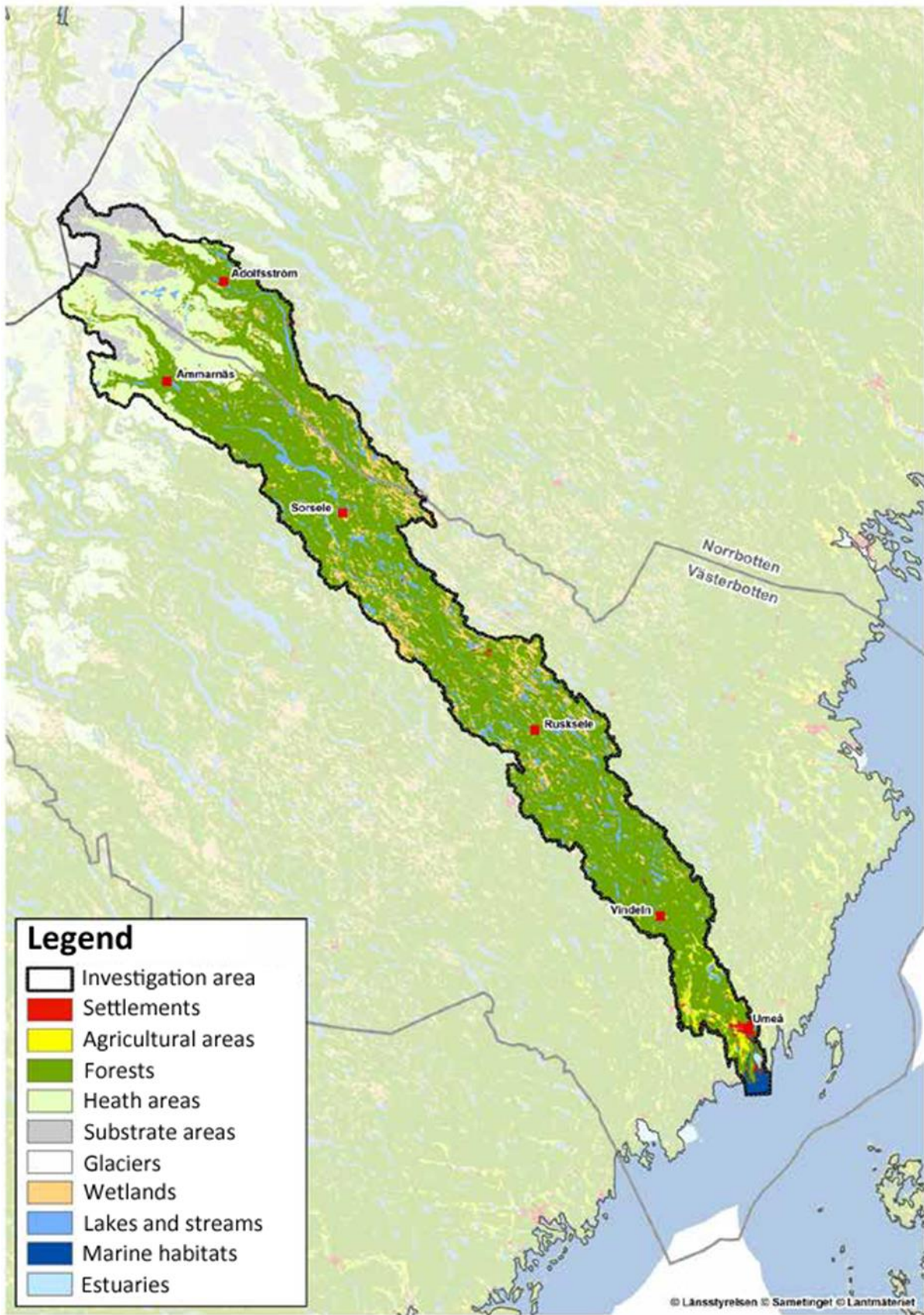



Figure 4B8: Map of the investigation area of the feasibility study for the Vindelälven biosphere reserve



#### 4C Future plans:


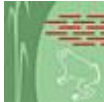
In a growing and denser city as Umeå, there are potential negative impacts on biodiversity and nature. It is therefore important to find innovative solutions for mitigation of biodiversity losses. To reduce these impacts Umeå Municipality needs to cooperate with different stakeholders and find holistic solutions to the main challenges:


- Maintaining biodiversity and ecosystem services in the city by protecting and managing large nature areas and a functional green infrastructure.
- Raising both public and political awareness for biodiversity and ecosystem services for a better understanding of the importance of green areas for sustainable cities.

Guided by European directives and national environmental objectives for biodiversity Umeå has decided local environmental objectives, guidelines and actions		
OBJECTIVES	GUIDELINES	ACTIONS
 <p><b><i>A rich diversity of plant and animal life</i></b></p> <p>The loss of biodiversity is halted by 2010 and no more species disappear from Umeå's fauna and flora.</p>	<p>The comprehensive plan contains guidelines for the conservation of nature habitats and biodiversity. It also includes a strategy and proposals for future actions to protect and enhance biodiversity.</p> <p>Guidelines for biodiversity in management plans for urban park areas.</p>	<p>A new program for Umeå's green structure with a list of actions and budget requirements for the next five years.</p> <p>Implementation of national action plans for threatened species into the program for green structure.</p> <p>Surveys and monitoring of threatened species e.g. bat surveys, nesting birds in riparian forests, botanical inventories etc.</p> <p>Implementing analyses of ecosystem services in planning projects.</p> <p>Impact assessments and surveys for biodiversity of plan and building projects.</p> <p>Monitoring the effectiveness of decided guidelines.</p>



 <p><b>Sustainable forests</b></p> <p>By 2012 are all urban forests of interest for recreation managed to favour recreation and biodiversity.</p>	<p>All valuable and important forest areas for biodiversity are designated in the comprehensive plan.</p> <p>Proposal for a new nature reserve of a deciduous riparian forest area.</p> <p>Forestry has to be certified by PEFC or FSC.</p>	<p>New management plans for forestry favouring biodiversity and recreation for the forest owned by the municipality.</p> <p>Biodiversity surveys in park forest and a new management plan considering nature conservation and better public accessibility.</p> <p>Protection of valuable forests by biotope protection and nature conservation agreements.</p> <p>Monitoring program for riparian forests.</p>
 <p><b>Flourishing lakes and streams</b></p> <p>Barriers for fish migration are removed.</p> <p>All watercourses affected by timber floating are restored to their natural conditions.</p> <p>Good water quality for all waterbodies.</p>	<p>Guidelines on good water quality in the comprehensive plan.</p> <p>Strategy for removing artificial barriers for fish migration.</p> <p>Guidelines for a good water quality according to the EU Water Framework Directive.</p>	<p>Restoring tributaries of Vindelälven and Umeälven improving fish migration (Proposal for new Life project).</p> <p>Continued monitoring of water quality in certain lakes and streams.</p> <p>Source analyses for water bodies risking eutrophication e.g. Nydalasjön, Tavleån.</p> <p>Umeå participates actively in five water boards, a cooperation between different stakeholders to improve water quality of drainage basins.</p> <p>Projects on an improved administration and better information of public fishing grounds in rivers and streams.</p>

 <p><b><i>A balanced marine environment, flourishing coastal areas and archipelagos</i></b></p> <p>No further limitation of public accessibility to coastal shorelines.</p>	<p>Coastal comprehensive plan with guidelines concerning the protection of natural coastal habitats and designated areas for nature conservation, culture and recreation. Protection of land-upheaval environments, proposal for two new nature reserves.</p> <p>Restrictions for better shoreline protection preventing utilization of natural shorelines for housing.</p>	<p>Proposed projects for restorations of disturbed coastlines due to dredging and exploitation.</p> <p>Restrictions for new buildings within 100 m to the shoreline.</p> <p>Critical assessments of new proposals on dredging and bridges for boat live.</p> <p>Surveys on habitat quality of shallow bays along the coast.</p> <p>Inventory of private and public sewages along the coast and oncoming municipal strategy.</p> <p>Decontamination of coastal areas polluted by former timber and sawing industry e.g. projects for Norrbyskär and Fabriksviken.</p>
 <p><b><i>Thriving wetlands</i></b></p> <p>Most valuable wetlands (Class 1 of 4) are protected.</p> <p>Increased public accessibility of wetlands close to the urban area.</p>	<p>All highly valuable wetlands are pointed out in the comprehensive plan with guidelines protecting them from negative impacts.</p>	<p>Proposed projects for restoration of periurban wetlands e.g. in Stadsliden and Nydala.</p> <p>Critical assessments of planning projects on impacts for nearby wetlands.</p> <p>Planning of Nature trails in wetlands.</p>

 <p><b>A varied agricultural landscape</b></p> <p>No further decrease of managed farmland areas.</p> <p>Increased cultivation of pastures to increase biodiversity.</p>	<p>Agricultural areas are pointed out and protected by guidelines in the comprehensive plan.</p>	<p>Every planning project is critically assessed on its consequences for agriculture and biodiversity.</p> <p>New comprehensive plan for Röbbäck enabling sustainable farming close to the city, important for a good conservation status of the Nature 2000 site 'Umedelta and its plains'.</p> <p>Survey and monitoring of all agricultural areas and pastures within the municipality every 12 - 15<sup>th</sup> year.</p>
--	--	---

*Table 4C4: Long term objectives, guidelines and actions for Umeå Municipality*

For the next years Umeå is planning many different kinds of actions improving biodiversity, below the most important actions meeting the challenges mentioned above:

### **A new program for Umeå's green structure**

Guided by the strategic long-term environmental objectives, guidelines and already decided actions (Table 4C4) Umeå municipality is working on a new program for green structure (time range 2015-2017, budget €75.000). The main part of the program will be a priority list of actions including budget requirements in order to improve ecological, economic and social development of Umeå's green structure including both land and water. The program will evaluate current conditions for biodiversity and ecosystem services and include actions raising awareness for biodiversity e.g. good accessibility for the residents to different kinds of nearby natural areas (Figure 4C9). Another part of the program will be a profound monitoring program on how decided strategic objectives concerning natural habitats and biodiversity are being achieved.

**Green areas in close vicinity to housings offer a diversity of activities**

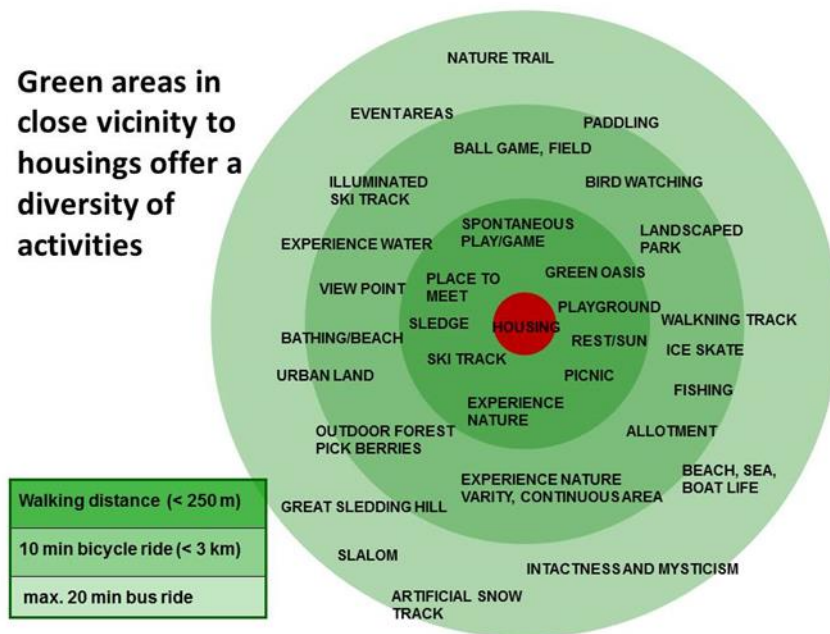


Figure 4C9: The green target is an objective and used as a guideline for accessibility of different kinds of natural outdoor activities from the residential areas. The green target is adopted in the comprehensive plan.

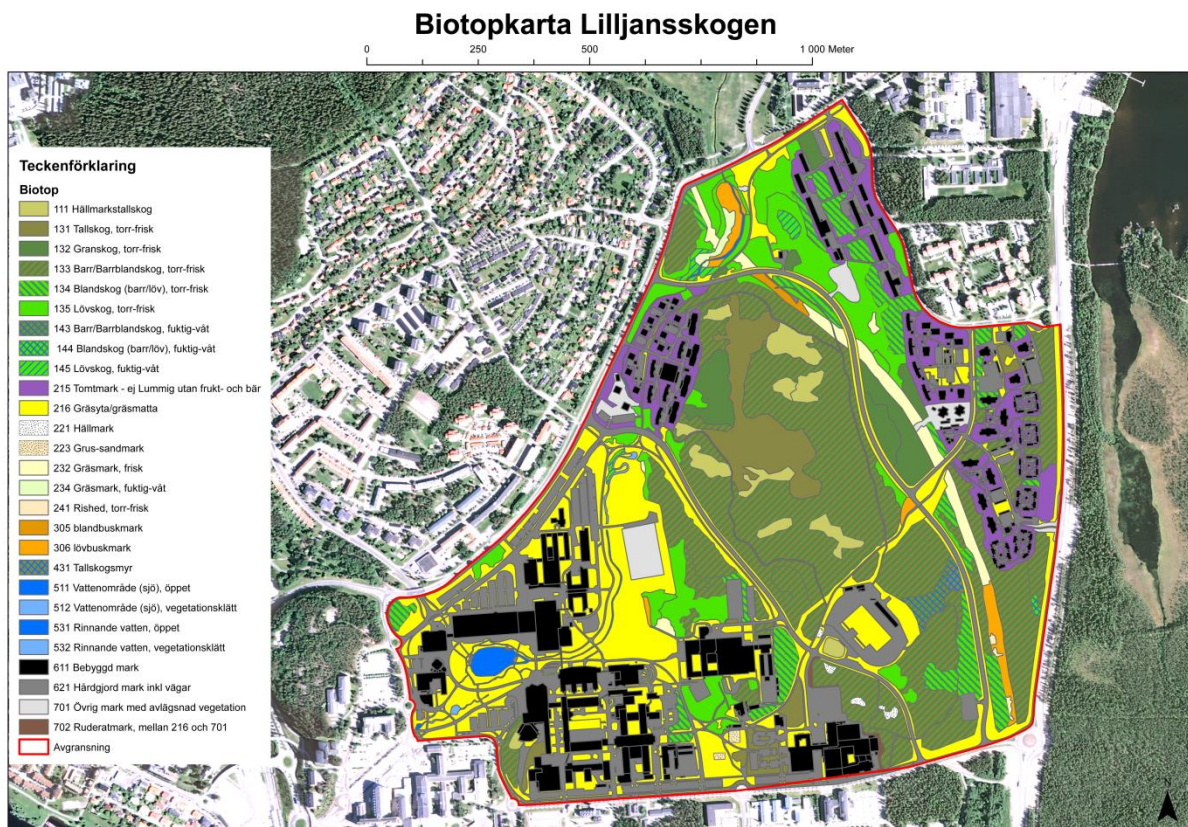
**Biotope mapping and the development of critical guidelines for green structure in planning projects**

During 2014, a biotope mapping project started to improve future planning and monitoring the sustainable urban development of Umeå. The project is a cooperation between Umeå Municipality, University of Agricultural Science (SLU) and Stockholm University continuing until 2017. The project aims to develop a definition scheme for biotope classes useful for analyses of ecosystem services, sustainable urban planning and nature conservation. The biotope map is an important base for a simulation program on ecological landscape planning of urban areas within the Heureka system developed by SLU.

By using satellite data from the European ESA, the University of Stockholm and SLU are currently working on a method enabling a more automatically mapping of main biotope classes on the base of high resolution CadasterEnv satellite data. This is done in collaboration between Umeå Municipality and the cities in the Stockholm region, giving better comparative and reliable data, easing future updates.

The biotope database will also be a substantial base for developing crucial planning guidelines e.g. a system of green area factors for the dense inner city area of Umeå.

The total cost of the project will be €80 000-100 000. Umeå Municipality contributes with €30 000, the rest is financed by national nature conservation and research funding.



*Figure 4C10: Excerpt of a biotope map over Lilljansskogen used for the pilot project testing methods on integrating ecosystem services into planning documents.*

### Implementing analyses of ecosystem services in planning projects

Today we know ecosystem services are important for human well-being and for reducing the effects of climate change, but it's still difficult to integrate them into urban planning processes.

Umeå Municipality is currently carrying out a pilot project testing methods on integrating ecosystem service into a new detailed plan for housing areas at Lilljansskogen close to the University campus (figure 4C10). The aim of the project is to develop methods and routines to make both quantitative as well as qualitative biodiversity values visible in future planning processes (time range 2015, budget €10 000).

Surveys on ecosystem services in this area focus on values of the green environment for delaying surface water, protection of erosion, recreation and human health and the regulative services by maintaining species biodiversity.

### **Urban forests: New management plan for municipal owned forests**

Forestry is an important industry in northern Sweden and 42 % of the endangered species are associated to forests. Umeå Municipality owns about 9000 ha forest mainly used as land back-up for future exploitation areas and forestry. 10% of the forestry area is promoted for nature conservation. Additionally, about 1000 ha forest parks close to urban areas are designated for recreation and nature conservation (Figure 4C11).

For the municipal forests, a multi-management plan is prepared considering forestry, biodiversity, recreation and land back-ups for future exploitation, all according to target 3, EU Biodiversity Strategy (time range 2015-2016, budget €92.000).

For the forest parks, a new management plan will be set up in order increase biodiversity and raising public awareness for biodiversity, e.g. information signs and natural paths. This management plan includes a survey on habitats important for biodiversity (time range 2015-2017, budget €100.000).

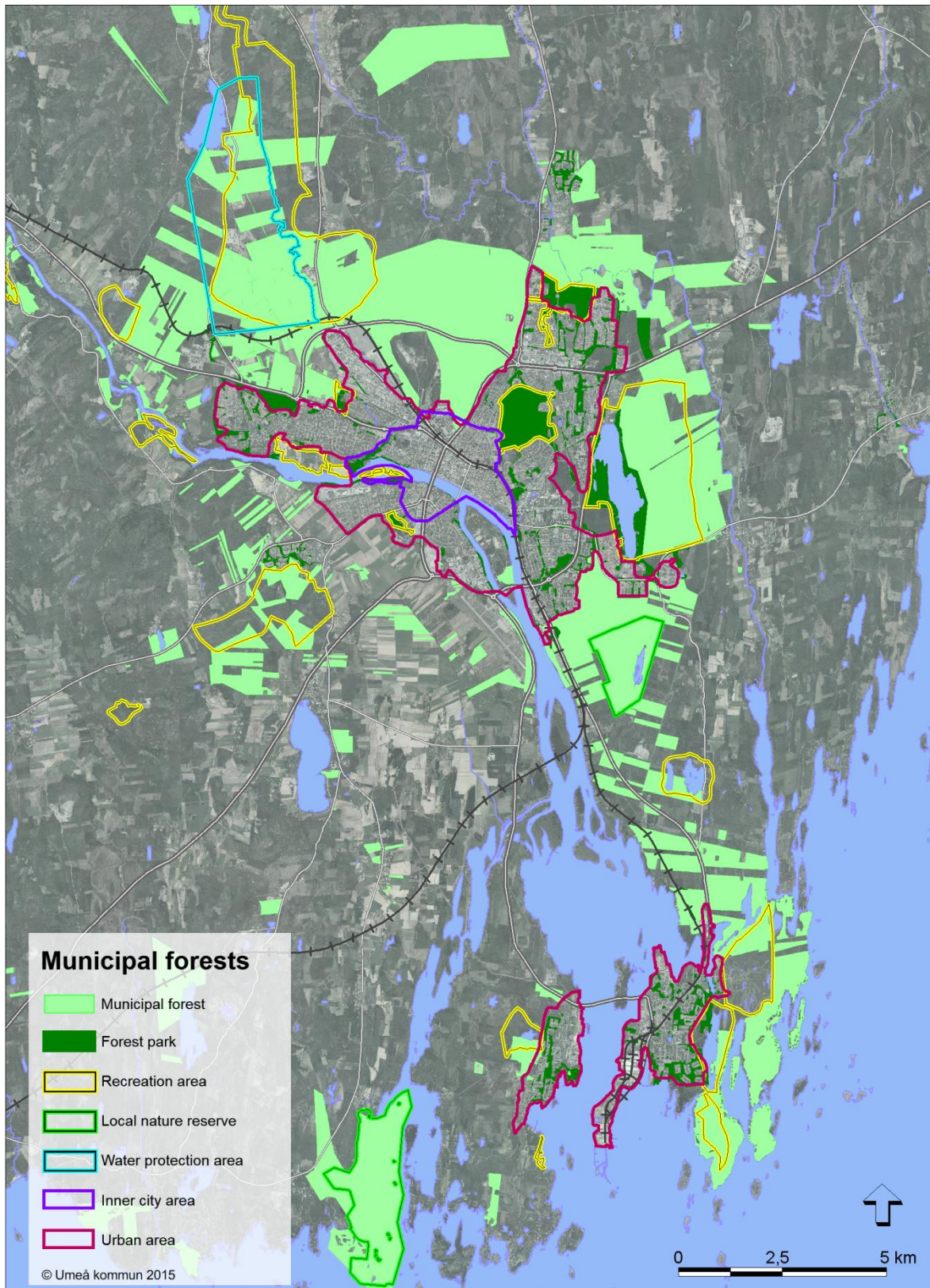


Figure 4C11: Forests around the city boundary of Umeå owned and managed by Umeå Municipality.

## 4D References

Red listed species in Scandinavian forests:

Tillståndet i skogen – rödlistade arter i ett nordiskt perspektiv, Artdatabanken rapportera 9, SLU, 2011

<http://www.slu.se/Global/externwebben/centrumbildningar-projekt/artdatabanken/Dokument/Publikationer/Tillst%3%a5ndet%20i%20skogen.pdf>

Conservation plans (Bevarandeplaner) for areas protected by the Nature 2000 network:

[http://www.lansstyrelsen.se/vasterbotten/Sv/djur-och-natur/skyddad-natur/natura\\_2000/Pages/alla-bevarandeplaner.aspx](http://www.lansstyrelsen.se/vasterbotten/Sv/djur-och-natur/skyddad-natur/natura_2000/Pages/alla-bevarandeplaner.aspx)

Comprehensive plan for Umeå:

Översiktsplan Umeå Kommun

<http://umea.se/umeakommun/kommunochpolitik/planerochstyrdokument/utvecklingochplanering/stadsplaneringochbyggande/oversiktsplan/umeasframtidatillvaxtomrade.4.6d96946b127b1c6010c80002109.html>

Comprehensive plan for Umeå's coast: Översiktsplan för kusten

<http://www.umea.se/umeakommun/kommunochpolitik/planerochstyrdokument/utvecklingochplanering/stadsplaneringochbyggande/oversiktsplan/kusten.4.76244a6d126e919ed6f800011786.html>

The Lower Umeälven Nature Conservation Foundation:

Stiftelsen Naturvård vid nedre Umeälven

<http://www.lansstyrelsen.se/vasterbotten/sv/naringsliv-och-foreningar/stiftelser/stiftelsen-naturvard-vid-nedre-umealven/Pages/default.aspx?keyword=Naturv%3%a5rdsstiftelse>

Restoring Sävarån:

<http://www.umea.se/download/18.132ee0e113ac21ad5032b77/1361886745272/Bildspel+S%C3%A4var%C3%A5n+%28Svartiduforsen%29+f%C3%B6refterbilder2012.pdf>

Vindelälven Life project:

<http://vindelriverlife.se/>

Stornorrfors fish ladder:

<http://fiskevatten.vattenfall.se/fiskvandring-i-stornorrfors>

Nature school Umeå:

Naturskolan

<http://umea.se/umeakommun/utbildningochbarnomsorg/kvalitetochutveckling/naturskolanochlarandeforhallbarutveckling/naturskolan.4.3343915a13c39d42119341e.html>

Umeå's health and environmental barometer:

Livsmiljöbarometer

<http://livsmiljo.umea.se/>



Local environmental objectives for Umeå:

Miljömål

[http://www.umea.se/umeakommun/kommunochpolitik/planerochstyrdokument/utveckling\\_ochplanering/hallbarutveckling/strategisktmiljoarbete/miljomal.4.1821d6e811c67c7e795800018196.html](http://www.umea.se/umeakommun/kommunochpolitik/planerochstyrdokument/utveckling_ochplanering/hallbarutveckling/strategisktmiljoarbete/miljomal.4.1821d6e811c67c7e795800018196.html)

Vindelälven MAB biosphere reserve – feasibility study:

<http://www.lansstyrelsen.se/vasterbotten/Sv/lantbruk-och-landsbygd/landsbygdsutveckling/forstudie-biosfaromrade-vindelalvsdalen/Pages/default.aspx>

GIS-landscape analyses of the riparian landscape along Umeälven:

GIS-baserad landskapsanalys över Umeälvslandskapet

[http://www.umea.se/download/18.7cd3993d12914ea61e58000929/1361888122565/GIS-baserad+landskapsanalys\\_Ume%C3%A4lvslandskapet.pdf](http://www.umea.se/download/18.7cd3993d12914ea61e58000929/1361888122565/GIS-baserad+landskapsanalys_Ume%C3%A4lvslandskapet.pdf)

Umeå's strategy for a poison-free environment:

Kemikaliestrategi

<http://www.umea.se/download/18.1a5fea8a1437b3e6e5217938/1392983674979/Kemikaliestrategi+feb14.pdf>

The biotope database project for Umeå municipality:

[http://www.umea.se/umeakommun/kommunochpolitik/planerochstyrdokument/utveckling\\_ochplanering/projekt/pagaendeprojekt/byggaboochmiljo/biotopdatabas.4.7e0bd80714caac19053bfad.html](http://www.umea.se/umeakommun/kommunochpolitik/planerochstyrdokument/utveckling_ochplanering/projekt/pagaendeprojekt/byggaboochmiljo/biotopdatabas.4.7e0bd80714caac19053bfad.html)