Seoul City : Direction of Urban Biodiversity Strategy

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University of Seoul

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Contents
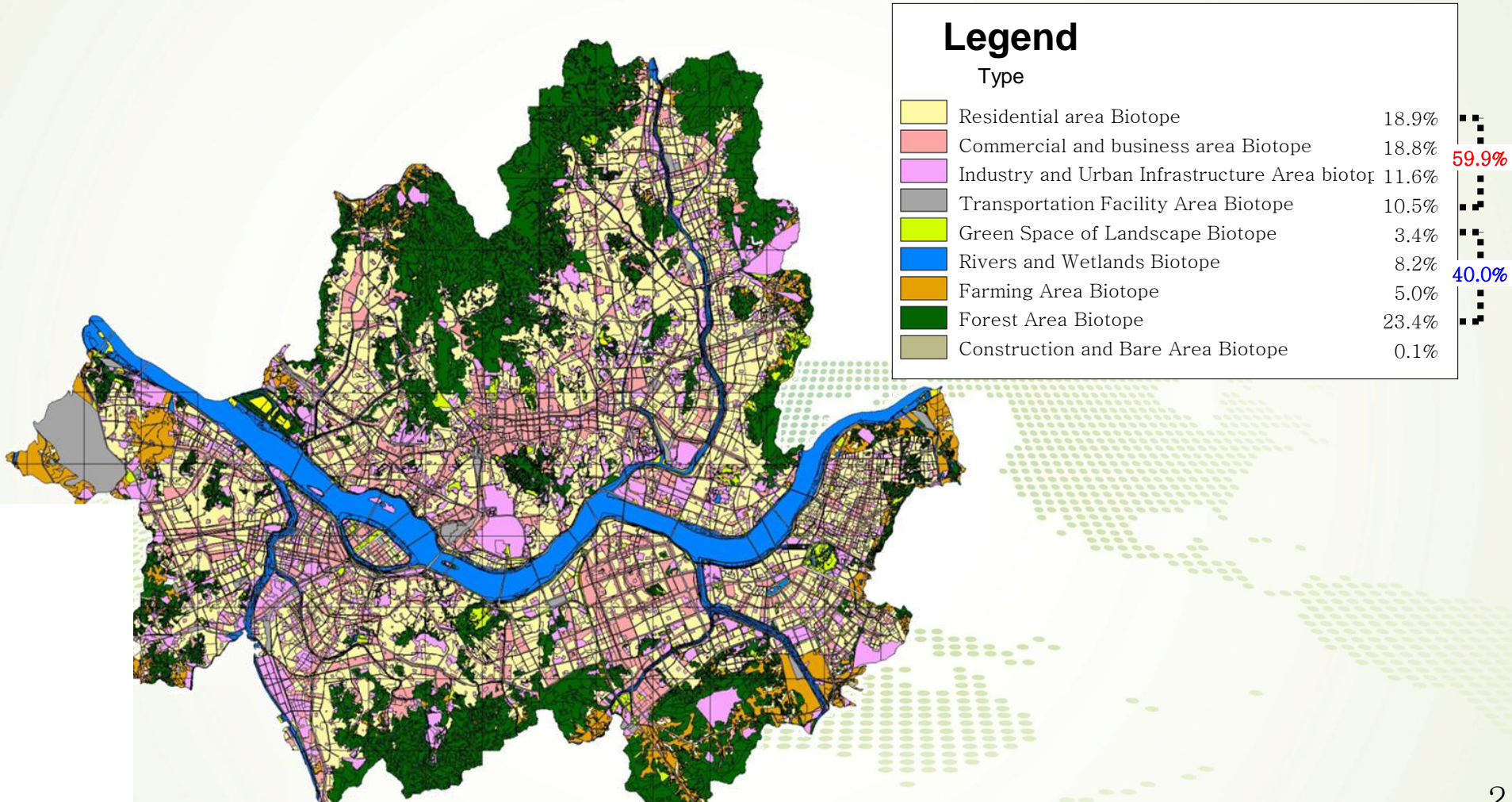
Management Policy Status and Assessment of Seoul Biodiversity
(서울시 생물다양성 관리 정책 및 평가**)**

Establishment Condition of Seoul Biodiversity Management Strategy
(서울시 생물다양성 관리 전략 수립 여건**)**

Assessment and Strategy Direction of Seoul Urban Biodiversity
(서울시 도시생물다양성 평가 및 전략 방향**)**

Biotope Map Creation
and Operation
(도시생태 현황지도 작성 및 운영)

Legend

Type

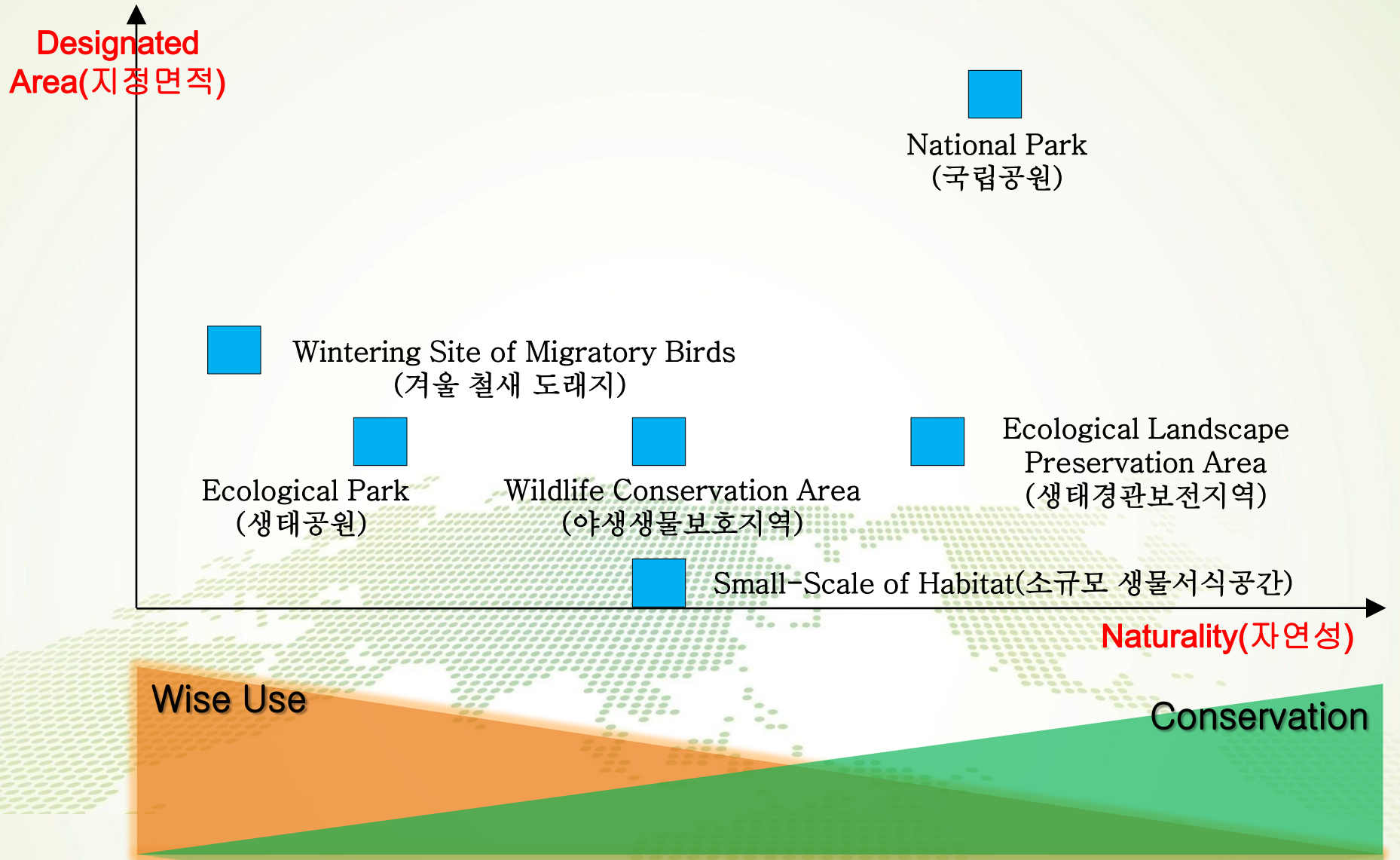|		
	Residential area Biotope	18.9%
	Commercial and business area Biotope	18.8%
	Industry and Urban Infrastructure Area biotope	11.6%
	Transportation Facility Area Biotope	10.5%
	Green Space of Landscape Biotope	3.4%
	Rivers and Wetlands Biotope	8.2%
	Farming Area Biotope	5.0%
	Forest Area Biotope	23.4%
	Construction and Bare Area Biotope	0.1%

59.9%

40.0%

■ Seoul Biotope Map(서울시 도시생태현황지도)

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Designation and Management of Protected Areas
(보호지역 지정 및 관리)

❖ Designation System of Protected Areas(보호지역 지정 관리 체계)

Ministry of Environment (환경부)		Seoul City (서울시)
Natural Environment Conservation Act (Natural Environment Conservation Act Article 13) (자연환경보전법)	Delegation(위임) →	**Seoul City Natural Environment Conservation Municipal Ordinance** (서울시 자연환경 보전조례)
Ecological Landscape Preservation Area (생태경관보전지역)		**Ecological Landscape Preservation Area** (Natural Environment Conservation Municipal Ordinance Article 7, 2 Site Designation) (생태경관보전지역)

- -

Wild Animal and Plant Conservation Act
(Wild Animal and Plant Conservation Act
Wild Animal and Plant Conservation Act Article 13)
(야생동식물보호법)

Protection Wild Animal and Plant
(Natural Environment Conservation Municipal Ordinance
Article 15)
(자연환경보전조례)

The Extinction Crisis of Wild Animal and Plant (멸종위기 야생동식물)	Special Protected Area of Wild Animal and Plant (야생동식물 특별보호구역)	Protected Area of Wild Animal and Plant (야생동식물보호구역)	Migratory Bird Protected Area and Wild Animal and Plant Habitat (철새보호구역 및 야생동식물 서식지역)

■ System related to Seoul City Protection Area(서울시 보호지역 관련 제도)

❖ Seoul Protected Area Status(서울시 보호지역 위상)

Designated Area(지정면적)

National Park
(국립공원)

Wintering Site of Migratory Birds
(겨울 철새 도래지)

Ecological Landscape
Preservation Area
(생태경관보전지역)

Ecological Park
(생태공원)

Wildlife Conservation Area
(야생생물보호지역)

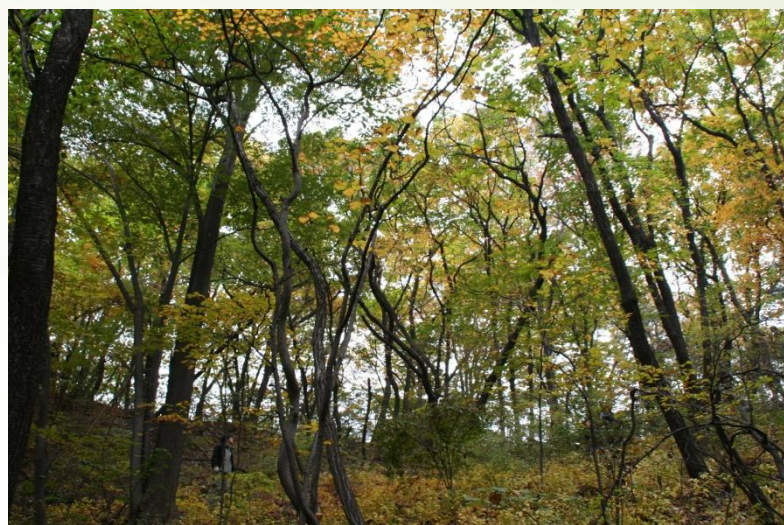Small-Scale of Habitat(소규모 생물서식공간)

Naturality(자연성)

Wise Use

Conservation

❖ Protected Area and Protected Species Designation Status (보호지역 및 보호종 지정 현황)

Type (유형)	Concept(개념)	Target (대상)	Site (개소)	Area (면적)	Area Ratio (Compared by Seoul)(서울시 면적대비 비율)
National Park	▪ Representative areas of ecosystem and cultural landscape in Korea	Bukhansan(Mt.)	1	39.46㎢ (Of Total 49.4%)	6.52%
Ecological Landscape Preservation area	▪ Areas showing off rich biodiversity and magnificent landscapes with protection values	Bamseom (Islet) of Hangang (River), Dunchon-dong	17	4.8㎢	0.80%
Wildlife Conser-vation Area	▪ Areas needed for special protection of endangered species in Seoul metropolitan city	Umyeonsan(Mt.) Asian Toad Habitat, Suraksan(Mt.) Hastatus Natural Habitat	4	About 31,000 ㎡	0.004%
Migratory Bird Protected Area	▪ Stop-over site of migratory birds needed for special protection in Seoul metropolitan city	Jungnangcheon CheonggyecheonAnyangcheon (River Downstream)	3	1,271,523㎡	0.21%
Ecological Park	▪ Park set for the improvement of biodiversity, rest of citizen and ecological study	Seoul Iris Garden	1	51,486㎡	0.008%
Seoul City Protected Wild Animal and Plant	▪ Endangered species or species whose population decreases ▪ Species inhabiting in specific areas of forests, rivers, wetlands and highlands, showing protection values ▪ Species having academic and economic value ▪ Species that the city major believes to have high value for protection (Seoul City Natural Environment Conservation Municipal Ordinance, Article 15)	Seoul City Protected Wild Animal and Plant	Mammalia 5 Species Bird 11 Species Amphibian and Reptile 7 Species Fish 4 Species Insect 12 Species Plant 10 Species		

- Dunchon-dong ecological landscape preservation area (2006. 8)(둔촌동 생태경관보전지역)

- Namsan ecological landscape preservation area(2006. 10)(남산 생태경관보전지역)

- *Epimedium koreanum* in valley part of Cheonggyesan(청계산 계곡부)

- *Oriolus chinensis*(꾀꼬리)

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Small-scale of habitat(소규모 생물서식공간 조성)

- Small-scale of habitat of Namsan Urban nature park(남산도시자연공원)

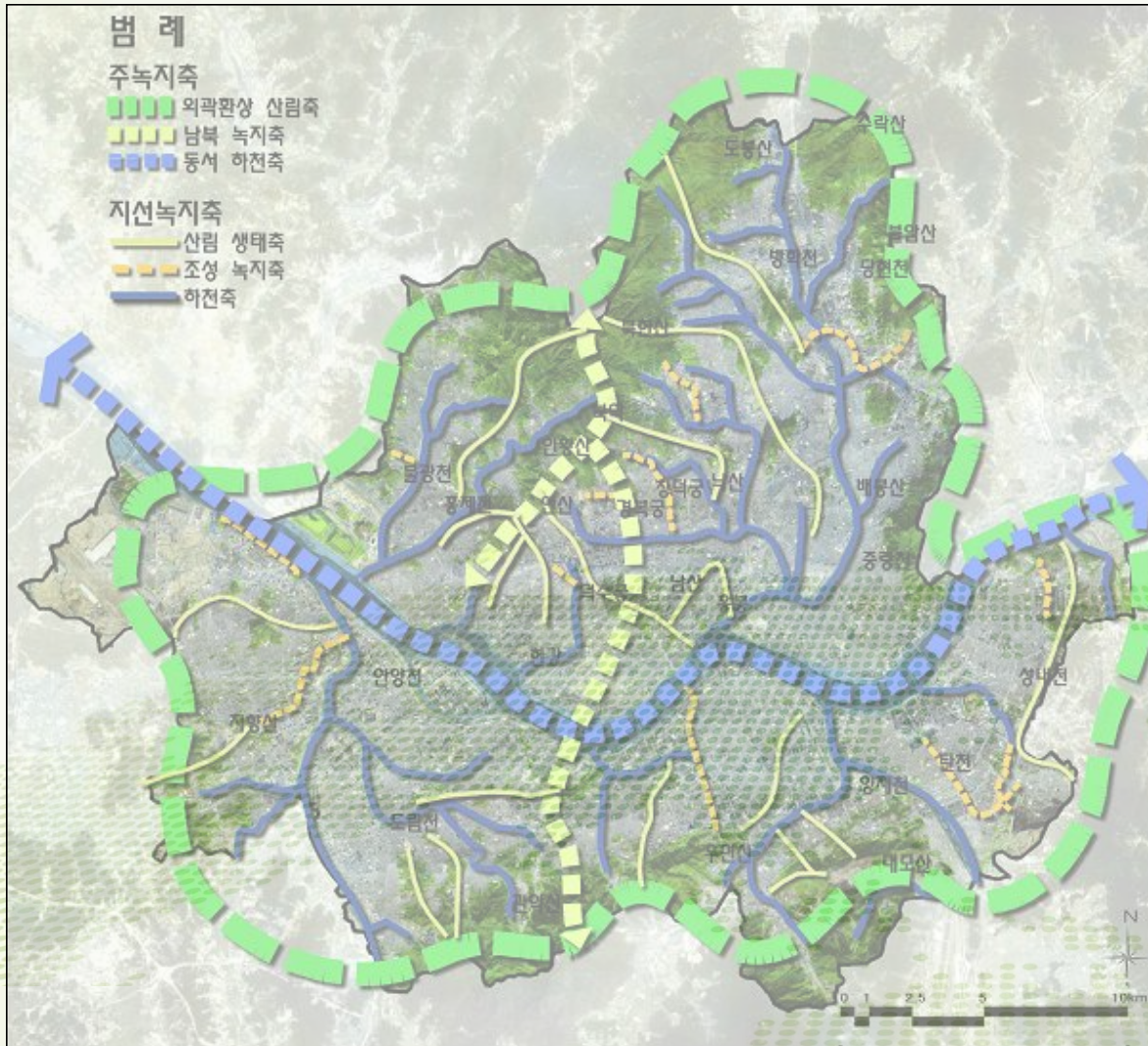- Small-scale of habitat of Yongsan family park(용산가족공원)

- Small-scale of habitat of Gil-dong ecological park(길동생태공원)

- Small-scale of habitat of Boramae park (보라매공원)

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Setting and Connecting Urban Eco-axis(도시생태축 설정 및 연결)

■ Ecological corridor of Noryangjin neighborhood park , Donjak-gu
(동작구 노량진 근린공원 생물이동통로)

■ Ecological Network plan , Seoul(서울시 녹지축 설정도)

Restoration and Biodiversity Management of Damaged Ecosystem of Urban Forest(도시림 생태계 훼손지 복원 및 생물다양성 관리)

Assessment of Seoul Biodiversity Management Policy
(서울시 생물다양성 관리 정책 평가)

Biotope Mapping and Management (도시생태현황지도 작성 및 운영)

- Continuous updating and utilization(ordinance Established)
- Database for PA designation and the protection of ecologically-valuable areas
- Lack of a comprehensive (ecological) management plan

Designation of Ecological Landscape Preservation area (생태경관보전지역 지정)

- Development of 17 individual management plans: gap between management plans and on-field researches
- Low rate of implementing plans (0~75%, Average 30%)

Designation and Management of Protected Species (보호생물 지정관리)

- Designation of Seoul city protected species by ordinance
- Detailed plans for conservation and management

Establishment and Connection of Urban Eco-axis (도시생태축 설정 및 연결)	▦ Continuous connection of fragmented areas ▦ Limits from the simple connection of fragmented areas, rather than ecological connection
Forest Management (산림 관리)	▦ Lack of consideration on the ecological structure in case of forest ecosystem restoration ▦ Management of biodiversity loss (brush cutting)
Promoting Citizen Awareness (시민인식 증진)	▦ Lack of long term target

Promotion of Individual business
(개별사업 단위별 추진)

Lack of consideration for the changing Urban Environment(변화하는 도시환경에 대한 고려 미흡)

Absence of comprehensive biodiversity management master plan
(종합적인 생물다양성 관리 마스터플랜 부재)

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Convention on Biological Diversity Article 6
(생물다양성협약 제6조)

❖ Each parties taking the following actions according to their particular circumstances and abilities

- Development of national strategies, plans or program

for the conservation and sustainable use of biodiversity

- Appropriate integration of conservation and sustainable use of biodiversity

into the associated plan, program and policy

Enactment of Law on Conservation and Use of Biodiversity
(생물다양성 보전 및 이용에 관한 법률 제정)

❖ Establishment and implementation of national biodiversity strategies every five year

Recommendation of Establishing Local Biodiversity Strategies
(지방생물다양성전략 수립 권고)

Local Biodiversity Strategy and Action Plan

GUIDELINES

An aid to municipal planning and biodiversity conservation

Promoting National Land-Environment Planning Linkage System
(국토-환경계획 연동제 추진)

Land planning(국토계획)

Environment planning (환경계획)

(수직적 평가)

(수평적 평가)

Assessment of land planning (국토계획평가)

인·허가의 기준

National Land Master plan (국토종합계획)

National Environmental planning(국가환경종합계획)

City and province comprehensive plan (광역시/도 종합계획)

Strategic Environmental Assessment (전략환경영향평가)

City and province comprehensive plan for environment (광역시/도 환경종합계획)

City master plan (도시기본계획)

City/county/town master plan for environment (시/군/구 환경종합 기본계획)

인·허가의 대상

City management plan (도시관리계획)

City and province master plan for environment (시/군/구 환경종합 시행계획)

용도 지역·지구	용도 구역	지구단 위계획	도시개 발,정 비사업	기반시 설계획

Strategic Environmental Assessment (전략환경영향평가/ Environmental Impact Assessment (환경영향평가)

Development project (환경생태계획)

Ecological planning (환경생태계획)

Overall Condition(여건 종합)

Establishment of Biodiversity Strategy at Home and Abroad **(국내외적 생물다양성 전략수립 필요)**	▪ To establish local biodiversity strategy in line with national biodiversity strategy ▪ To ensure the linkages with relevant plans (urban plans)
Guideline of Local Biodiversity Strategy **(지방생물다양성 전략 가이드라인)**	▪ To diagnose the status through Local CBI (City biodiversity index) ▪ To establish the strategic plans suitable to the characteristics of each area
National Land-Environment Planning Linkage System **(국토-환경계획 연동제)**	▪ To develop biodiversity strategies compatible to urban planning

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❖ Aspect of Urban Heat Island and Energy(도시열섬 및 에너지 측면)

Legend

Type

시가화지역	Residential area (18.9%)	
	Mixed use(13.0%)	
	Commercial area (5.9%)	
	Industrial area	55.7%
	Public use	
	Transportation facilities	
	Social service facilities	
기타	Bare ground	
	Special area	
녹지 및 오픈 스페이스	Green/open spaces(29.3%)	
	Cultural heritage sites	31.9%
	Urban parks (2.5%)	
하천	streams (8.1%)	
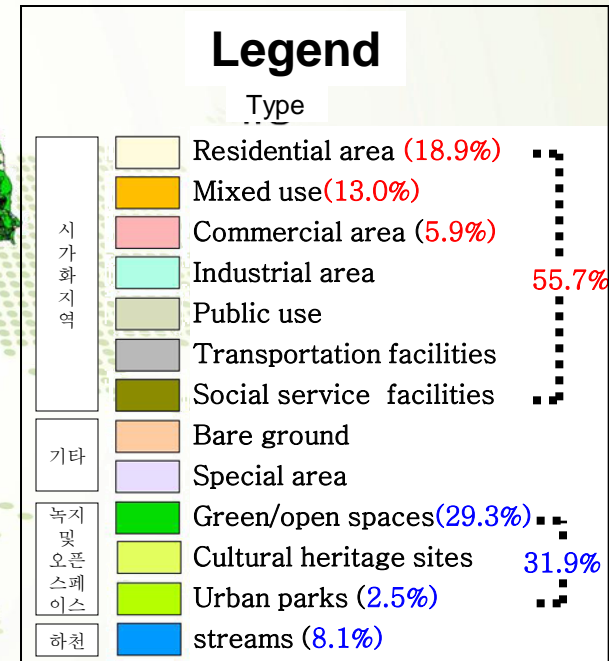
■ Seoul Land use map(서울시 토지이용현황도)

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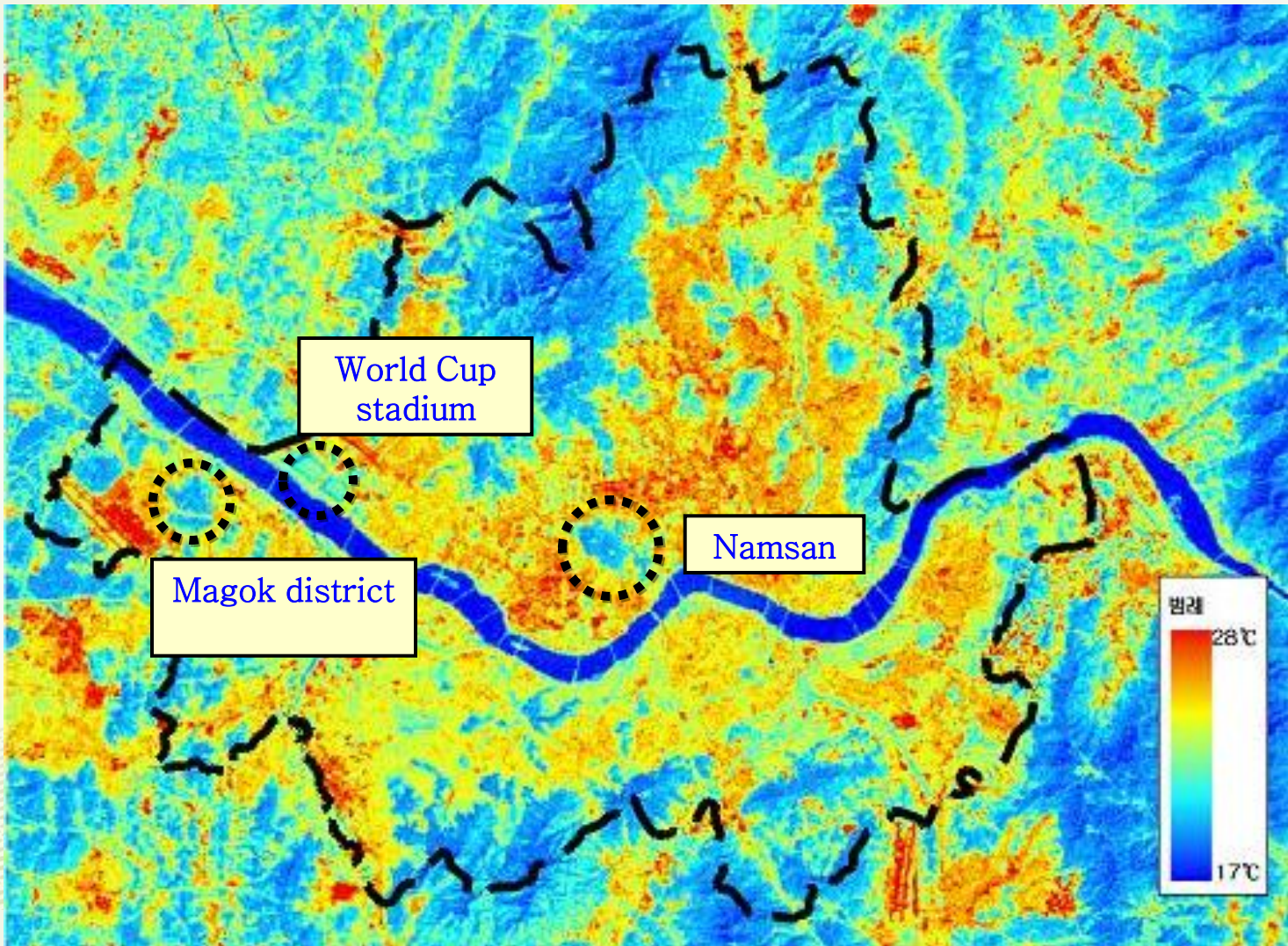
- Namsan
- World Cup stadium
- Maguk district

■ Seoul land surface temperature analysis using Landsat ETM+
  (September, 10, 2002)(서울시 지표면 온도 분석도)

❖ Aspect of Water Circulation(물순환기반 측면)

Legend

Type

▢	10% below	44.5%
▢	10~30% below	1.8%
▢	30~50% below	3.1%
▢	50~70% below	2.5%
▢	70~90% below	10.3%
▢	90% above	37.9%

■ Seoul Land coverage map(서울시 토지피복현황도)

Urban development and management(도시개발 및 관리 측면)

| Urban management Policies(도시관리정책)	Eco City planning elements (생태도시계획요소)	Effects on urban ecosystems (도시생태계 영향내용)
Urban regeneration Project (도시재정비사업)	Entropy side	▪ Due to skyscraper, temperature rise: increase of urban heat island
	Water circulation side	▪ **Loss of rainfall infiltration functions caused by excessive underground water development**
Urban newtown project Urban redevelopment of mixed building in subway area (도심뉴타운 조성/역세권 개발)	Biodiversity side	▪ **Forest drying, driven by the excessive development of forest periphery areas**
Urban development of farmland outside the city (도시외곽 경작지 도시개발)	Entropy side	▪ Decrease of cool island in the city due to paddy field developed
	Water circulation side	▪ Decrease of natural ground and detention pond
Magok district Development (마곡지구개발)	Biodiversity side	▪ Loss of wintering bird site and amphibian's spawning site
River restoration (하천복원)	Entropy side	▪ Effect of reducing urban temperature by water
	Water circulation side	▪ Improvement of water detention
Artificial covered river Restoration, Creating Eco river (복개하천 개방/생태하천 조성)	Biodiversity side	▪ Creation of water ecology

CBI Assessment based on Biotope map
## (도시생태현황지도를 바탕으로 한 CBI 평가)

Indicator(지표)	Calculation of Indicator(변수 계산)
I1. Proportion of natural area in city (도시내 자연지역의 비율)	(Total area of natural areas, restored and naturalised areas) ÷ (Total area of city) × 100%=0~100/1(㎡) : forests, freshwater swamps, natural grasslands, streams, lakes except for Parks, golf courses, roadside plantings
I2. Connectivity measures or ecological networks to counter fragmentation (파편화에 대응하기 위한 연결성 측정 또는 생태적 네트워크)	▪ Total number of connected natural areas ÷ Total area of natural areas : In general, patches are considered as connected , if they are less than 100m apart : Cities can decide the distance of connection depend on the each situation (e.g. Green Axis, Ecological corridor, Crown of tree for small sized mammal's habitat ▪ Areas of network ÷ Total areas of city = 0~1/1(㎡)
I** Value of biotope(비오톱 가치)	▪ Total score = (Area of grade 1~5 of Biotope assessment X each weight) / Total city areas weight : grade 1=10, grade 2=7, grade 3=5, grade 4=3, grade 5=1 ▪ Total score ÷ Total city areas = 1~10/1㎡
I9. Proportion of protected areas (보호지역의 비율)	▪ Area of protected or secured natural area ÷ Total area of the city×100% : Nature park, Ecological landscape preservation area, Wild life reservation, protected areas of the forest genetic resources, Natural monument and reserve : Standard of CBD 17% (Inland)
I11. Regulation of quantity of water (수량 규제)	▪ Total permeable pavement area ÷ Total inland area of the city×100% : Standard of lowest score city 50%
I12. Climate regulation: Carbon storage and cooling effect of vegetation (기후규제: 식생의 탄소저장 및 온도저감 효과)	▪ Tree canopy cover÷ Total inland area of the city×100% : Standard of lowest score city 20%

▪ CBD secretariat(2011) User's manual for the city biodiversity index). Reconstruction of contents
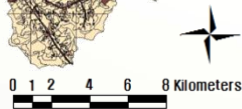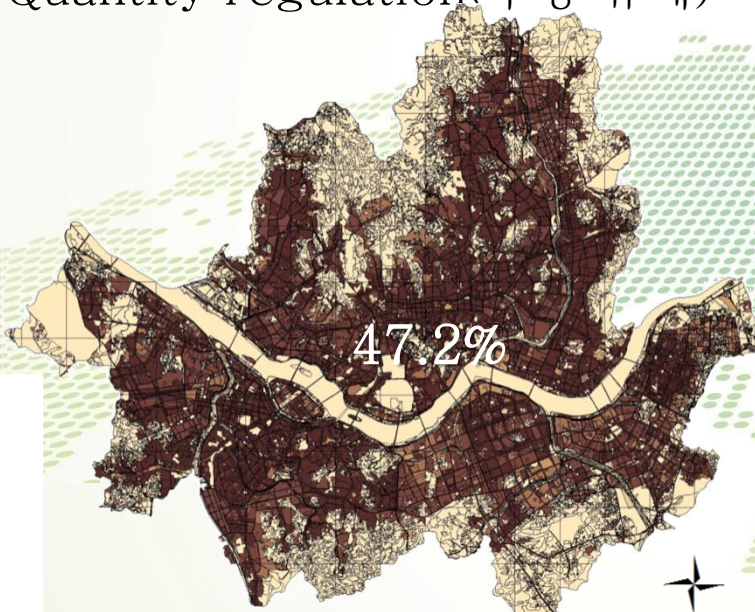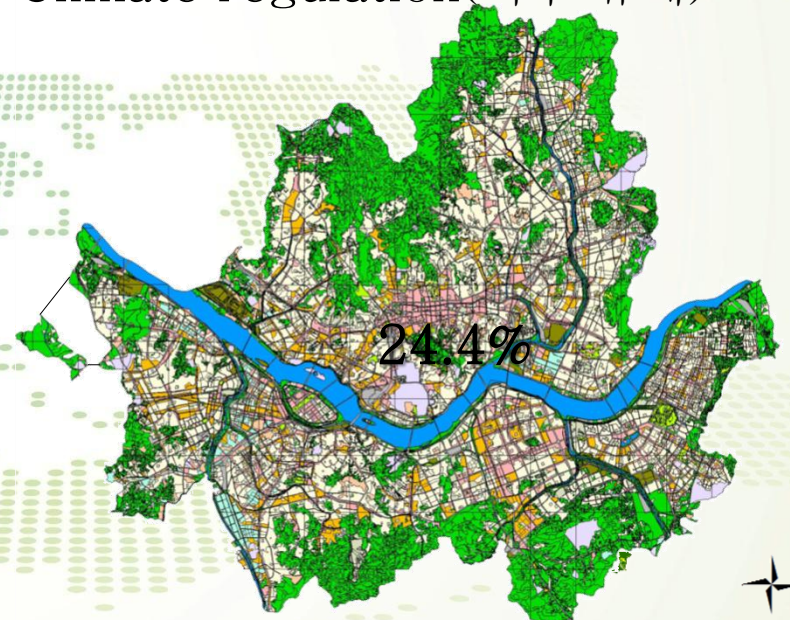
❖ Ecological network proportion
　(생태네트워크율)

0.25/㎡
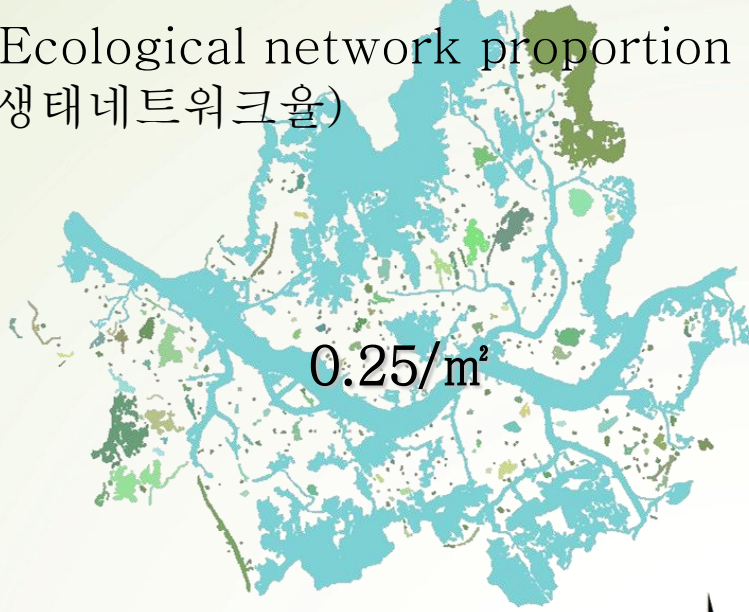
❖ Ecological value assessment
　(생태적 가치 평가)

4.3/㎡
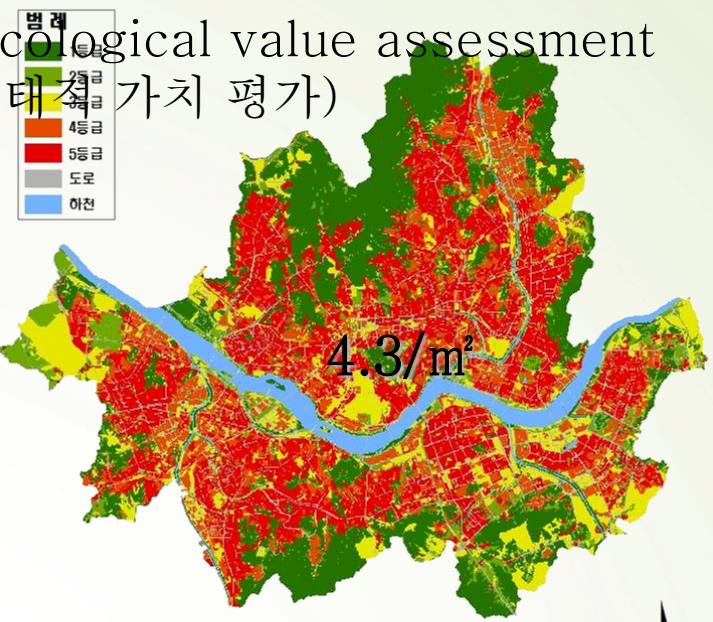
❖ Quantity regulation(수량 규제)

47.2%

❖ Climate regulation(기후 규제)

24.4%

❖ Comparison with other cities(타 도시와의 비교)

City (도시명)	Proportion of natural areas in city (%) (도시내 자연지역 비율)	Proportion of ecological network (생태네트워크율)	Biotope value/ Urban area (㎡) (비오톱가치/도시면적)	Proportion of protected area(%) (보호지역 비율)	Quantity control(%) (수량 규제)	Climate control (%) (기후규제)
Seoul	31.4	0.25	4.3	8.9	47.2	24.4
Incheon	36.3	0.08	5.1	2.1	75.1	26.4
Tokyo	0.0	–	–	0.14	24.0	22.8

Overall Assessment of Seoul Urban Biodiversity
(서울시 도시생물다양성평가 종합)

Biodiversity Condition (생물다양성 기반)	▪ Highly-dense land use and climate change → Temperature rise (increased Entropy) ▪ Lack of wildlife habitat foundation in urban area
Urban Development and Management (도시개발 및 관리)	▪ Development of suburban areas → Habitats reduction ▪ Restoration of stream ecosystem → Increase of biodiversity
CBI Assessment (CBI 평가)	▪ Low network proportion, quantity regulation, climate regulation, compared to the ratio of natural areas

Strategy Direction of
Seoul Biodiversity
(서울시 생물다양성 전략 방향)

Strategy Direction of Seoul Urban Biodiversity
서울시 도시생물다양성 전략 방향)

Citizen
Participation
(시민참여)

Ecological
Planning
(환경생태계획)

Strategy Establishment of
Seoul Urban Biodiversity
(서울시 도시생물다양성 전략 수립)

Organizing

World Forum on

Urban Biodiversity

(세계 도시생물다양성

포럼 구성)

Establishment of Detailed Strategy of
25 borough in Seoul
(서울시 25개 구 세부 실천전략 수립)

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Strategy Purpose and Process(전략 목표 및 수립 절차)

Strategy Purpose of Biodiversity (생물다양성 전략 목표)

- Establishment of biodiversity strategy reflecting the Seoul city's condition and characteristic

- Creation of city with high ecological carrying capacity

- Establishment of citizens-participatory strategies on biodiversity

Establishment Process of Biodiversity Strategy (생물다양성 전략 수립 절차)

- Organization of biodiversity forum composed of Seoul citizens and experts

- Round table for collecting the opinions of Seoul citizens

- Establishment of spatial planning through environmental/ecological plan
- Diagnostic through CBI evaluation and establishment of target indicators

Spread of Biodiversity Strategy (생물다양성 전략 확대)

- Creation of action plan for each 25 *Gus* (borough), Seoul

- Organization of World Urban Biodiversity Forum

Detailed Gaal and Direction(세부 목표 및 방향)

Detailed goal (세부목표)	Direction(방향)
Establishment of Biodiversity Region **(생물다양성 권역 설정)**	⊞ Establishment of biodiversity region under the consideration of each local area and government ⊞ Decision of strategy goals and direction by each biodiversity region
Improvement of Ecological Habitat Base **(생물서식기반 향상)**	⊞ Plan to improve habitats corresponding to the urban planning ⊞ Plan to manage habitats corresponding to the urban environment (plan of climate change, urban heat island, air pollution) ⊞ Plan to foster habitats and to restore damaged areas
Species Increase & Habitat Enlargement **(생물종 및 서식공 간 확대)**	⊞ Extension of PA designation (Maximum goal 17%, inland) ⊞ Habitat connection (Habitat network) : Creation of biodiversity-promoting areas between PAs and completion of management plans ⊞ Protected areas and species: management system, management goal, and citizens' participation

Detailed goal (세부목표)	Direction(방향)
Genetic Diversity **(유전자 다양성 확** **보)**	▪ Conservation of native species' population and enlargement of their habitats ▪ Management of alien species and naturalized species ▪ Establishment of ecological management planning of urban forest
Diversity of **Urban** **Green** **(도시녹지 다양성** **확보)**	▪ Improvement of naturalness of urban green : development of urban wilderness ▪ Improvement of diversity of public green and private green spaces ▪ Improvement of diversity of roadside: Security of ecological corridor
Enhancement of Citizen participation (시민참여 확대)	▪ Enlargement of CEPA Program ▪ Improvement of citizen participation for monitoring and management of biodiversity ▪ Implementation of biodiversity policy made by citizen ▪ Fundraising from company for management of biodiversity

Thank You !!!