Appendix 1

Urban ecosystem services resilience assessment matrix. Criteria for assessing expressions of ES resilience thinking in policies regarding GBI in urban context (authors adaptation, based on Borgström et al 2015, and Nykvist et al 2017, Biggs et. a, 2012)

ES resilience aspects	Specification/Guiding questions for the assessment	Qualitative evaluation criteria	Relation to Biggs Resilience principle
Diversity consideration	*Biological diversity:* How are genetic, species and landscape level diversity addressed? How are interactions between species and/or ecological succession addressed? How is complementarity in the landscape addressed? *Social diversity:* How are the different socio-economic components of the urban areas analyzed? How are cultural and historical values considered? *Structural diversity:* How is urban structure (in terms of neighbourhoods' differences and components) considered? Spatial/temporal scale is considered?	High: All the components are addressed in detail. Biodiversity is addressed at genetic and species level; different relations in the system (e.g., food webs) are described as well as essential processes (e.g., nutrient cycling, hydrology); well consideration of different social groups, their current or potential employment rates, housing characteristics, growing population, and increasing immigration is taken into account in spatial and temporal scales; considered differences of neighbourhood/district characteristics Medium: several components of biodiversity in terms of species are addressed; no detailed reference to the different relation in the system. growing population and increasing immigration is mentioned without spatial or temporal scales, some information about different social groups and their employment rates are mentioned. No clear division in districts' characteristics Low: no components of biodiversity in terms of species are addressed; no reference to the different relations in the system. rowing population and increasing immigration not addressed or very vague. no reference to the spatial component of the socio economic and demographic characteristics	P1,P 4
Use of different knowledge spheres	What kind of knowledge is used? How is involvement of different stakeholders in planning, design, management, monitoring etc. addressed? Spatial/temporal scale is considered?	High: Different kind of knowledge have been used (i.e reference to scientific framework or existing studies, informal knowledge, previously acquired knowledge); detailed explanation and presentation of the stakeholders to be included in the different steps, collaboration pathways and different role clearly explained. Medium: Knowledge-base is not completely clear; some references to previous study but not	P1, P5, P6

| | | comprehensive assessment of the knowledge sphere included. Stakeholders presented in different details, collaboration mentioned, but not clear roles and methods | |
| | | Low: Knowledge base is fuzzy and not references. Not clear reference to stakeholders either to roles and methods of collaboration | |

Physical connectivity	How is green and blue infrastructure (structures, nodes, networks, species migration etc.) addressed? How is mobility and physical accessibility addressed? How is information flow addressed? Spatial/temporal scale is considered?	High: Map of the existing blue and green infrastructure presented, evaluated and used as a base for further discussion on the topics; existing nodes, networks, and possibilities for species migration have been addressed. Concrete actions agreed and well presented to improve current infrastructures connectivity. Accessibility to the green and blue infrastructure is assessed and well considered. Physical nodes and mobility and transport scheme have been previously assessed and the results are integrated in the policy. Actions on how to improve it are considered.	P2
		Medium: reference to the overall green infrastructure present but not clear the level of detail; existing nodes, networks and species migration mentioned; mention to future development of the structures, but no concrete actions mentioned. Accessibility to the spaces is considered but not detailed explained neither in present or future actions	
		Low: reference to the overall green infrastructure present but not clear the level of detail; existing nodes, networks and species migration not mentioned; no mentions of future development of the structures. accessibility and connectivity are not consider neither as an assessment neither for future development	
Disturbance regimes	What disturbances are recognized? What responses are addressed (coping, adapting, transforming)?	High: disturbances have been identified and assessed with clear reference to spatial and temporal frame. Responses to disturbances have been clearly identified (i.e. action plans, strategy, etc.)– specify which disturbances and responses have been considered	P3, P4
		Medium: main disturbances have been identified, but there's no clear spatial and temporal frame. Responses to disturbances have also been considered, but not clear actions planned - specify which disturbances and responses have been considered	
		Low: disturbances have not been identified, neither clear responses to possible events	

Assessment of forecast, possible changes and uncertainty	What changes are recognised, e.g. climate, demographical, economic, political, technological innovation, human preferences and lifestyle (CES), tourism, housing, land use planning? Are changes in relation with future capacity and demand of ES considered and addressed? How are monitoring, evaluation and revision addressed? Spatial/temporal scale is considered?	High: main possible changes trend and scenario relevant for the city development and planning have been considered, they have been integrated and overlapped among them; monitoring, evaluation and revision methods and actions have been addressed. Possible changes in ES capacity and demand have been addressed, even if not explicitly mentioned as such. Medium: main possible changes, trend and scenario have been considered, with low level of detail and no integration among them; monitoring, evaluation and revision are mentioned but not explained in detail. Possible changes in ES capacity and demand are not clearly addressed, even if not explicitly mentioned as such. Low: main possible changes trend and scenario have not been considered, maybe mentioned but not assessed; no reference to monitoring evaluation and revision. Possible changes in ES capacity and demand are not addressed, neither implicitly.	P3, P4
System knowledge approach	How are the management steps of monitoring, evaluating, revising and adapting addressed? How are emergent signals captured? How are responses to changes addressed?	High: management steps of monitoring, evaluating, revising and adapting are well addressed. Responses to changes as well as emergent signals are well defined and integrated. Medium: management steps of monitoring, evaluating, revising and adapting are mentioned, but not clearly addressed as well as emergent signals. Responses to changes are not clearly defined and integrated. Low: no specific management steps of monitoring, evaluating, revising and adapting are mentioned neither emergent signals are addressed. Responses to changes are not defined and integrated.	P3, P4, P5
Institutional flexibility	In what ways is the approaches to GBI reactive or proactive? How are alternative approaches recognized? What kind of formulations are used, e.g. shall, should, recommend?	High: alternative approaches are considered and clear criteria for decision support are recognized. High degree of flexibility of the policy is recognized and structured. Medium: alternative approaches are recognized, bit not clear criteria to support decision are recognized. Flexibility and adaptation of the policy are considered but not addressed. Low: alternative approaches are not recognized; possible flexibility of the policy has not been considered	P3, P4, P5
Poly centric governance	How is governance organised (centralised/decentralised, single	High: multi-stakeholders and participatory process have been set up from the policy development and have	P1,P2, P6,P7

actor/multiple actors, sector divided, strong/weak linkages across levels, sectors and actors)?

How is collaboration between actors addressed?

How is responsibility organised?

been integrated in the strategy/action plans for future collaboration. Governance models are clearly defined and flexible. Responsibility and roles are also well explained. Collaboration among stakeholders is well defined; dedicated tools instruments and methods have been developed.

Medium: multi-stakeholders and participatory process have been set up but not clearly integrated and explained in the overall process. Governance models are defined but with low level of details. Roles, responsibilities and competences are implicitly considered but not clearly defined in the text. Collaboration among stakeholders is mentioned but dedicated tools instruments and methods are not clearly defined.

Low: multi-stakeholders and participatory process are not integrated and explained in the overall process. Governance models, responsibility and roles are fuzzy and not clearly identified. Not clear how stakeholders will cooperate