

Appendix 2.1: Protocol of the systematic review used for chapter 2 of the regional assessment for Europe and Central Asia (ECA)

We conducted a comprehensive review of the literature on the status and trends of nature’s contributions to people (NCP). The literature review will be based on published peer-reviewed scientific articles, but also will include assessment relying on indicators and material on indigenous and local knowledge (ILK). The synthesis of the data from the review will assist in evaluating the main trends in the different sub-regions. The review was also used to establish guidance for documenting the dominant characteristic NCP and help in finding appropriate case studies for the Chapter boxes. An integrated and standardised spreadsheet is being developed to structure the literature review and to help summarise the trends and to contribute to the attribution of confidence and uncertainty.

The systematic search approach consists of four main stages: (i) generation and agreement of searching strings, (ii) the systematic search to identify the number of papers per ECA sub-region, (iii) the systematic search to identify the relevant papers for ECA and (iv) extraction of the data for input into the spreadsheets.

The generation of searching strings comprises (1) elements of NCP status, trends and condition (Trend OR Inceas* OR Decreas* OR Stabl* OR Condit* OR Scenario* OR model* OR Impact* OR Future* OR Current OR Past), (2) geographical range –(a) Central Europe (Albania* OR Bosni* OR Herzegov* OR Bulgaria* OR Croatia* OR Cyprus OR Czech* OR Estonia* OR Hungar* OR Kosov* OR Latvia* OR Lithuania* OR Montenegr* OR Poland OR polish OR Romania* OR Serbia* OR Slovakia* OR Slovenia* OR Macedonia* OR Turkey OR turkish OR “Central Europe” OR Europe), (b) Western Europe (Andorra OR Austria* OR Belgium OR belgian OR Denmark OR danish* OR Finland OR finnish OR France OR french OR German* OR Greece OR greek OR Iceland* OR Ireland OR irish OR Israel* OR Italy OR italia* OR Liechtenstein OR Luxembourg OR Malta OR maltes* OR Monaco OR Netherlands OR dutch OR Norway OR norwegian OR Portug* OR “San Marino” OR Spain OR spanish* OR Sweden OR swedish OR Switzerland OR swiss OR ("United Kingdom" OR UK) OR brit* OR England* OR Scotland* OR Wales OR “Western Europe” OR Europe), (c) Eastern Europe (Armenia* OR Azerbaijan* OR Belarus OR Georgia* OR Moldova* OR Russia* OR Soviet* OR “U.S.S.R.” OR “USSR” OR Ukrain* OR “Eastern Europe” OR Europe) and (d) Central Asia (Kazakh* OR Kyrgyzstan OR kirghizia* OR kirgizstan OR Tajiki* OR Turkmeni* OR Uzbeki* OR “Central Asia”) and (3) the searching string of each NCP (**Table 2.1.1**)

Table 2.1.1: Searching strings used for the systematic review per each category of nature’s contribution to people (NCP).

	NCP	Searching string
1	Habitat creation and maintenance	nurser* OR habitat OR nesting OR mating OR resting OR reproduction OR life cycle OR migrat* OR overwintering OR feeding OR juvenile AND "ecosystem service*"
2	Pollination	Pollination is based on IPBES deliverable of pollinators

3	Regulation of air quality	(Service OR Benefit) AND (air quality OR atmospheric regulat* OR "air pollution" OR filtration OR fixation OR degradation OR removal OR particulate matter OR nitrogen OR ozone OR VOC) AND (Ecosystem service* OR natural service* OR natural benefit*)
4	Regulation of climate	(Service OR Benefit) AND (climate regulat* OR carbon storage OR carbon sequestration OR carbon loss OR carbon emissions OR temperature OR carbon fixation OR carbon capture OR DOC OR dissolved organic carbon) AND (Ecosystem service* OR natural service* OR natural benefit*)
5	Regulation of ocean acidification	"up-regulation of pH" AND (kelp* OR seagrass* OR vegetation OR macrophyte* OR seaweed* or alga*)
6	Regulation of freshwater quantity and location	<u>Freshwater provision:</u> freshwater or "fresh water" AND (quantity OR flow OR supply OR provision OR drink* OR use OR provision OR irrigat* OR non-drinking OR transport OR hydropower OR surface OR groundwater OR hydrological) <u>Freshwater regulation:</u> freshwater or "fresh water" AND (discharge OR flow OR regulation OR buffer* OR flood prevention OR drought prevention OR "hydrological cycle")
7	Regulation of freshwater and coastal water quality	(Service OR Benefit) AND Water quality AND (regulation OR self-purif*ication OR remov* OR retention OR retain*) AND (Ecosystem service* OR natural service* OR natural benefit*) AND (nutrient* OR nitrate OR nitrogen OR pollutant*)
8	Formation and protection of soils	1- ("ecosystem service" OR service OR benefit) soil* AND erosion OR "soil retention" OR "erosion control" OR erosivity OR erodibility OR erosion prevent* OR soil loss OR sediment loss OR coast* erosion OR prevent* OR beach loss OR beach erosion 2- ("ecosystem service" OR service OR benefit) AND soil* AND (fertility OR "nutrient cycling" OR "nutrient availability" OR decomposition OR biodegradation OR weathering) 3- ("ecosystem service" OR service OR benefit) AND soil* AND (filtration OR retention OR fixation OR degradation OR biodegradation OR attenuation OR dissipation OR storage OR remediation OR bioremediation OR decontamination) AND (pathogen* OR pollutant* OR contaminant* or "heavy metal" OR radionuclide* OR pesticide OR herbicide OR "excess nutrient" OR phosphorus OR nitrate)
9	Regulation of hazards and extreme events	(service* OR benefit*) AND (prevent OR reduc* OR protect* OR mitigat*) AND (flood OR landslide OR avalanche OR storm OR hurricane OR hinterland OR coastal squeeze OR fire)
10	Regulation of detrimental organisms and biological processes	<u>Removal of animal carcasses</u> (ecosystem service*) AND TOPIC: (scaveng* OR vulture* OR carcass* removal OR carrion removal OR cadaver removal OR corpse removal OR carcass* elimination OR carrion elimination OR cadaver elimination OR corpse elimination OR carcass* consumption OR carrion consumption OR cadaver consumption OR corpse consumption)

11	Food and feed	"Ecosystem service*" AND (food OR fodder OR feed OR livestock OR rear* OR meat OR fish* OR dair* OR game OR crop* OR mushroom* OR berries OR "wild fruit*" OR honey OR product* OR yield*)
12	Energy	<p><u>Woodfuel:</u> Ecosystem Service* AND wood fuel* OR fuel wood* OR forest energy resources OR forest fuel harvesting OR energy wood</p> <p><u>Biofuel:</u> Ecosystem Service OR Benefit AND Biofuel crop OR bioenergy crop OR biomass fuel OR biomass fuel resources OR biomass wastes OR energy plants</p>
13	Materials and assistance	Materials OR fibres OR wood OR timber OR ornament* OR decoration OR reed OR pulp OR resin OR wax OR dye OR pearl OR shell OR coral OR cotton OR decor* OR cellulose OR rubber OR flax OR sponge AND "ecosystem service*"
14	Medicinal, biochemical and genetic resources	<p>("biological diversity" OR biodivers* OR "living natural resource*" OR "living resource*" OR "natur* diversity" OR "diversity in nature" OR "*species diversity" OR "diversity of species" OR "habitat diversity" OR "diversity of habitat*" OR "int*-speci* diversity" OR "genetic diversity" OR "diversity of gene*" OR "landscape diversity" OR "diversity of landscape*" OR ecosystem* OR "ecological system*" OR "ecosystem service*" OR "landscape service*" OR "environmental service*" OR "ecological service*" OR "natur* capital*" OR "nature based solution*" OR "environmental capital*" OR "green infrastructure" OR greenspace* OR "green space*" OR "blue infrastructure" OR bluespace* OR "blue space*" OR flora* OR fauna* OR wildlife OR "natural habitat*" OR "ecological habitat" OR "wildlife habitat*" OR "invasive * species" OR biogeograph* OR "bio-geograph*" OR "natur* space*" OR "natur* environ*")) NOT (TS=("the nature of" OR "*power plant*" OR "*hydro plant" OR "*nuclear plant" OR "*electric plant" OR "*thermal plant" OR "*coal plant" OR "*fired plant") OR TI=(America* OR "US" OR Africa* OR Russia OR Australia* OR Oceania*)) AND ((TS=("biodiversity for medicine" OR "biodiversity for food and medicine" OR "biological diversity for medicine" OR "biological diversity for food and medicine" "biodiversity-based medicin*" OR "biodiversity-derived medicin*" OR bioprospecting OR "biodiversity-based prospecting" OR "biodiversity based prospecting" OR "prospecting from natur*" OR "medicine* from natur*" OR "medicine* derived from natur*" OR "medicinal species" OR "medicinal plant*" OR "medicinal and aromatic plant*" OR "medicinal animal*" OR "medicinal fung*") OR (TS(("animal model*" OR "biomedical model*" OR "ecologic* model*" OR "plant model*" OR "wildlife model*" OR "biomedical research" OR biomim*ic* OR "comparative anatom*" OR "comparative audiolog*" OR "comparative biochemistry" OR "comparative dolorolog*" OR "comparative immunolog*" OR "comparative endocrinolog*" OR "comparative neurolog*" OR "comparative oncolog*" OR "comparative ophthalmolog*" OR "comparative osteolog*" OR "comparative toxicolog*" OR "innate immunity" OR neurogen* OR "cell regeneration" OR "organ regeneration" OR "tissue regeneration" OR "regeneration research" OR "stem-cell research" OR "wildlife immun*" OR "evo-devo" OR "evo-eco-devo" OR "eco-evo-devo" OR "evolution and development" OR "evolution, ecology and development"))</p>

15	Learning, artistic, scientific and technological inspiration	<p><u>Formal learning:</u> ("teach*" OR "learn*" OR "inspir*" OR "biomim*" OR "art") AND ("ecosystem service*" OR "nature benefit*")</p> <p><u>ILK:</u> Database provided by TF-ILK</p>
16	Physical and experiential interactions with nature	<p><u>Recreation experiences:</u> (("Hunting" OR "game" OR "fishing" OR "angling" OR "bird watching" OR "whale watching" OR "gathering" OR "picking" OR "recreation" OR "nature tourism" OR "ecotourism") AND ("ecosystem service*" OR "nature benefit*"))</p> <p><u>Aesthetic experience</u> landscape AND (preferences OR valuation OR appreciat*) AND ("aesthetic*" OR "beaut*")</p>
17	Symbolic meaning, involving spiritual, religious, identity connections, social cohesion and cultural continuity	<p><u>Spiritual & Religious connections:</u> "ecosystem service*" OR nature AND religio* OR spiritual OR ritual OR rite* OR belief OR sacred OR holy</p> <p><u>Satisfaction derived from existence of species and habitats</u> (species OR ecosystem OR nature OR biodiversity) AND ("existence value" OR iconic OR charismatic OR emblematic OR symbolic OR flagship)</p>