SUPPORTING INFORMATION

Table S1: Details on the literature search queries

Search details
Search Date: 17/10/2016
Platform: SCOPUS
Search: Title + Abstract + Keywords
Period: since 1996

Search terms
(multi-criteria decision analysis) OR (multicriteria decision analysis) OR (multi criteria decision analysis) OR (mcda) OR (multi-criteria analysis) OR (multicriteria analysis) OR (multi criteria analysis) OR (mca) OR (multi criteria evaluation) OR (multi-criteria evaluation) OR (multicriteria evaluation) OR (mce) AND (biodivers*) OR (nature) OR (biodiversity conserv*)

Table S2 Reference of the eighty-six studies in which the MCDA was applied to issues relating to biodiversity and conservation.

| N.	REFERENCE
1	Ferretti, V. & Pomarico, S. (2013b). Ecological land suitability analysis through spatial indicators: An application of the Analytic Network Process technique and Ordered Weighted Average approach. *Ecological Indicators*, **34**, 507–519.
2	Ferretti, V. & Pomarico, S. (2013a). An integrated approach for studying the land suitability for ecological corridors through spatial multicriteria evaluations. *Environment, Development and Sustainability*, **15**, 859–885.
3	Bottero, M., Comino, E., Duriavig, M., Ferretti, V. & Pomarico, S. (2013). The application of a Multicriteria Spatial Decision Support System (MCSDSS) for the assessment of biodiversity conservation in the Province of Varese (Italy). *Land Use Policy*, **30**, 730–738.
4	Newton, A.C., Hodder, K., Cantarello, E., Perrella, L., Birch, J.C., Robins, J., Douglas, S., Moody, C. & Cordingley, J. (2012). Cost-benefit analysis of ecological networks assessed through spatial analysis of ecosystem services. *Journal of Applied Ecology*, **49**, 571–580.
5	Vimal, R., Pluvinet, P., Sacca, C., Mazagol, P.O., Etlicher, B. & Thompson, J.D. (2012). Exploring spatial patterns of vulnerability for diverse biodiversity descriptors in regional conservation planning. *Journal of Environmental Management*, **95**, 9–16.
6	Wu, J., Wu, J., Wang, X. & Zhong, M. (2012). Securing water for wetland conservation: A comparative analysis of policy options to protect a national nature reserve in China. *Journal of Environmental Management*, **94**, 102–111.
7	Toledo-Aceves, T., Meave, J.A., González-Espinosa, M. & Ramírez-Marcial, N. (2011). Tropical montane cloud forests: Current threats and opportunities for their conservation and sustainable management in Mexico. *Journal of Environmental Management*, **92**, 974–981.
8	Fuller, D.O., Meijaard, E.M., Christy, L. & Jessup, T.C. (2010). Spatial assessment of threats to biodiversity within East Kalimantan, Indonesia. *Applied Geography*, **30**, 416–425.
9	Gorokhovich, Y. & Voustianiouk, A. (2010). Prioritization of coastal properties for conservation in New York State. *Journal of Coastal Conservation*, **14**, 41–51.
10	Valente, R. de O.A. & Vettorazzi, C.A. (2008). Definition of priority areas for forest conservation through the ordered weighted averaging method. *Forest Ecology and Management*, **256**, 1408–1417.
11	Hajkowicz, S., Higgins, A., Miller, C. & Marinoni, O. (2008). Targeting conservation payments to achieve multiple outcomes. *Biological Conservation*, **141**, 2368–2375.
12	Martínez-Harms, M.J. & Gajardo, R. (2008). Ecosystem value in the Western Patagonia protected areas. *Journal for Nature Conservation*, **16**, 72–87.
13	Dhar, A., Ruprecht, H. & Vacik, H. (2008). Population viability risk management (PVRM) for in situ management of endangered tree species-A case study on a Taxus baccata L. population. *Forest Ecology and Management*, **255**, 2835–2845.
14	Regan, H.M., Davis, F.W., Andelman, S.J., Widyanata, A. & Freese, M. (2007). Comprehensive criteria for biodiversity evaluation in conservation planning. *Biodiversity and Conservation*, **16**, 2715–2728.
15	Geneletti, D. (2007). An approach based on spatial multicriteria analysis to map the nature conservation value of agricultural land. *Journal of Environmental Management*, **83**, 228–235.
16	Ausseil, A.G.E., Dymond, J.R. & Shepherd, J.D. (2007). Rapid mapping and prioritisation of wetland sites in the Manawatu-Wanganui region, New Zealand. *Environmental Management*, **39**, 316–325.
17	Strager, M.P. & Rosenberger, R.S. (2006). Incorporating stakeholder preferences for land conservation: Weights and measures in spatial MCA. *Ecological Economics*, **58**, 79–92.
18	Moffett, A., Dyer, J.S. & Sarkar, S. (2006). Integrating biodiversity representation with multiple criteria in North-Central Namibia using non-dominated alternatives and a modified analytic hierarchy process. *Biological Conservation*, **129**, 181–191.
19	Geneletti, D. (2004). A GIS-based decision support system to identify nature conservation priorities in an alpine valley. *Land Use Policy*, **21**, 149–160.
20	Noss, R.F., Carroll, C., Vance-borland, K., Wuerthner, G. & Vance-borland, K.E.N. (2002). A Multicriteria Assessment of in Irreplaceability Greater of Sites Vulnerability Yellowstone Ecosystem. *Conservation Biology*, **16**, 895–908.
21	Sierra, R., Campos, F. & Chamberlin, J. (2002). Assessing biodiversity conservation priorities: Ecosystem risk and representativeness in continental Ecuador. *Landscape and Urban Planning*, **59**, 95–110.

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22	Farashi, A., Naderi, M. & Parvian, N. (2016). Identifying a preservation zone using multi – criteria decision analysis. *Animal Biodiversity and Conservation*, **39**, 29–36.
23	Habtemariam, B.T. & Fang, Q. (2016). Zoning for a multiple-use marine protected area using spatial multi-criteria analysis: The case of the Sheik Seid Marine National Park in Eritrea. *Marine Policy*, **63**, 135–143.
24	Etxano, I., Garmendia, E., Pascual, U., Hoyos, D., Diez, M.-A., Cadinanos, J.A. & Lozano, P.J. (2015). A participatory integrated assessment approach for Natura 2000 network sites. *Environment and Planning C-Government and Policy*, **33**, 1207–1232.
25	Bali, A., Masoud Monavari, S., Riazi, B., Khorasani, N. & Masoud Kheirkhah Zarkesh, M. (2015). a Spatial Decision Support System for Ecotourism Development in Caspian Hyrcanian Mixed Forests Ecoregion. **21**, 340–353.
26	Cortina, C. & Boggia, A. (2014). Development of policies for Natura 2000 sites: A multi-criteria approach to support decision makers. *Journal of Environmental Management*, **141**, 138–145.
27	Grazhdani, D. (2014). Integrating ecosystem services into assessment of different management options in a protected area: a deliberate multi-criteria decision analysis approach. *Bulgarian Journal of Agricultural Science*, **20**, 1311–1319.
28	García-Marmolejo, G., Escalona-Segura, G. & Van Der Wal, H. (2008). Multicriteria evaluation of wildlife management units in Campeche, Mexico. *Journal of Wildlife Management*, **72**, 1194–1202.
29	Lu, S.Y., Shen, C.H. & Chiau, W.Y. (2014). Zoning strategies for marine protected areas in Taiwan: Case study of Gueishan Island in Yilan County, Taiwan. *Marine Policy*, **48**, 21–29.
30	Zhang, Z., Sherman, R., Yang, Z., Wu, R., Wang, W., Yin, M., Yang, G. & Ou, X. (2013). Integrating a participatory process with a GIS-based multi-criteria decision analysis for protected area zoning in China. *Journal for Nature Conservation*, **21**, 225–240.
31	Hajehforooshnia, S., Soffianian, A., Mahiny, A.S. & Fakheran, S. (2011). Multi objective land allocation (MOLA) for zoning Ghamishloo Wildlife Sanctuary in Iran. *Journal for Nature Conservation*, **19**, 254–262.
32	Oikonomou, V., Dimitrakopoulos, P.G. & Troumbis, A.Y. (2011). Incorporating ecosystem function concept in environmental planning and decision making by means of multi-criteria evaluation: The case-study of Kalloni, Lesbos, Greece. *Environmental Management*, **47**, 77–92.
33	Zia, A., Hirsch, P., Songorwa, A., Mutekanga, D.R., O'Connor, S., McShane, T., Brosius, P. & Norton, B. (2011). Cross-scale value trade-offs in managing social-ecological systems: The politics of scale in Ruaha National Park, Tanzania. *Ecology and Society*, **16**.
34	Khoi, D.D. & Murayama, Y. (2010). Delineation of suitable cropland areas using a GIS based multi-criteria evaluation approach in the tam Dao national park region, Vietnam. *Sustainability*, **2**, 2024–2043.
35	Graziano, R., Gilberto, P. & Ferrarini, A. (2009). A rapid and cost-effective tool for managing habitats of the European Natura 2000 network: A case study in the Italian Alps. *Biodiversity and Conservation*, **18**, 1375–1388.
36	Gurung, D.B. & Scholz, R.W. (2008). Community-based ecotourism in Bhutan: Expert evaluation of stakeholder-based scenarios. *International Journal of Sustainable Development & World Ecology*, **15**, 397–411.
37	Geneletti, D. & van Duren, I. (2008). Protected area zoning for conservation and use: A combination of spatial multicriteria and multiobjective evaluation. *Landscape and Urban Planning*, **85**, 97–110.
38	Wood, L.J. & Dragicevic, S. (2007). GIS-based multicriteria evaluation and fuzzy sets to identify priority sites for marine protection. *Biodiversity and Conservation*, **16**, 2539–2558.
39	Boteva, D., Griffiths, G. & Dimopoulos, P. (2004). Evaluation and mapping of the conservation significance of habitats using GIS: An example from Crete, Greece. *Journal for Nature Conservation*, **12**, 237–250.
40	Grošelj, P., Hodges, D.G. & Zadnik Stirn, L. (2015). Participatory and multi-criteria analysis for forest (ecosystem) management: A case study of Pohorje, Slovenia. *Forest Policy and Economics*, **71**, 80–86.
41	Fernández, I.C. & Morales, N.S. (2016). A spatial multicriteria decision analysis for selecting priority sites for plant species restoration: a case study from the Chilean biodiversity hotspot. *Restoration Ecology*, **24**, 599–608.
42	Suryabhagavan, K. V, Alemu, M. & Balakrishnan, M. (2016). GIS-based multi-criteria decision analysis for forest fire susceptibility mapping: a case study in Harenna forest, southwestern Ethiopia. *Tropical Ecology*, **57**, 33–43.
43	Derak, M. & Cortina, J. (2014). Multi-criteria participative evaluation of Pinus halepensis plantations in a semiarid area of southeast Spain. *Ecological Indicators*, **43**, 56–68.
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45	Uribe, D., Geneletti, D., del Castillo, R.F. & Orsi, F. (2014). Integrating stakeholder preferences and GIS-based multicriteria analysis to identify forest landscape restoration priorities. *Sustainability (Switzerland)*, **6**, 935–951.
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47	Rantala, M., Hujala, T. & Kurttila, M. (2012). Measuring and monitoring socio- cultural sustainability in the action of forest biodiversity cooperation networks. *Silva Fennica*, **46**, 441–459.
48	Jalilova, G., Khadka, C. & Vacik, H. (2012). Developing criteria and indicators for evaluating sustainable forest management: A case study in Kyrgyzstan. *Forest Policy and Economics*, **21**, 32–43.
49	Schwenk, W.S., Donovan, T.M., Keeton, W.S. & Nunery, J.S. (2012). Carbon storage, timber production, and biodiversity: Comparing ecosystem services with multi-criteria decision analysis. *Ecological Applications*, **22**, 1612–1627.
50	Nordström, E.-M., Eriksson, L.O. & Karin, Ö. (2011). Multiple criteria decision analysis with consideration to place-specific values in participatory forest planning. *Silva fennica*, **45**, 253–265.
51	Pasqualini, V., Oberti, P., Vigetta, S., Riffard, O., Panaïotis, C., Cannac, M. & Ferrat, L. (2011). A GIS-based multicriteria evaluation for aiding risk management Pinus pinaster Ait. Forests: A case study in Corsican island, western Mediterranean region. *Environmental Management*, **48**, 38–56.
52	Reubens, B., Moeremans, C., Poesen, J., Nyssen, J., Tewoldeberhan, S., Franzel, S., Deckers, J., Orwa, C. & Muys, B. (2011). Tree species selection for land rehabilitation in Ethiopia: From fragmented knowledge to an integrated multi-criteria decision approach. *Agroforestry Systems*, **82**, 303–330.
53	Mustajoki, J., Saarikoski, H., Marttunen, M., Ahtikoski, A., Hallikainen, V., Helle, T., Hyppönen, M., Jokinen, M., Naskali, A., Tuulentie, S., Varmola, M., Vatanen, E. & Ylisirniö, A.L. (2011). Use of decision analysis interviews to support the sustainable use of the forests in Finnish Upper Lapland. *Journal of Environmental Management*, **92**, 1550–1563.
54	Ianni, E. & Geneletti, D. (2010). Applying the ecosystem approach to select priority areas for forest landscape restoration in the Yungas, northwestern Argentina. *Environmental Management*, **46**, 748–760.
55*	Orsi, F. & Geneletti, D. (2010). Identifying priority areas for Forest Landscape Restoration in Chiapas (Mexico): An operational approach combining ecological and socioeconomic criteria. *Landscape and Urban Planning*, **94**, 20–30.
56	Kint, V., Lasch, P., Lindner, M. & Muys, B. (2009). Multipurpose conversion management of Scots pine towards mixed oak-birch stands-A long-term simulation approach. *Forest Ecology and Management*, **257**, 199–214.
57	Briceño-Elizondo, E., Jäger, D., Lexer, M.J., Garcia-Gonzalo, J., Peltola, H. & Kellomäki, S. (2008). Multi-criteria evaluation of multi-purpose stand treatment programmes for Finnish boreal forests under changing climate. *Ecological Indicators*, **8**, 26–45.
58	Fürstenau, C., Badeck, F.W., Lasch, P., Lexer, M.J., Lindner, M., Mohr, P. & Suckow, F. (2007). Multiple-use forest management in consideration of climate change and the interests of stakeholder groups. *European Journal of Forest Research*, **126**, 225–239.
59	Van Der Horst, D. & Gimona, A. (2005). Where new farm woodlands support biodiversity action plans: A spatial multi-criteria analysis. *Biological Conservation*, **123**, 421–432.
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61	Cordingley, J.E., Newton, A.C., Rose, R.J., Clarke, R.T. & Bullock, J.M. (2016). Can landscape-scale approaches to conservation management resolve biodiversity-ecosystem service trade-offs? *Journal of Applied Ecology*, **53**, 96–105.
62	Datta, D. & Kumar Ghosh, P. (2015). Evaluating sustainability of community endeavours in an Indian floodplain wetland using multi-criteria decision analysis. *Singapore Journal of Tropical Geography*, **36**, 38–56.
63	Hodder, K.H., Newton, A.C., Cantarello, E. & Perrella, L. (2014). Does landscape-scale conservation management enhance the provision of ecosystem services? *International Journal of Biodiversity Science, Ecosystem Services & Management*, **10**, 71–83.
64	Janssen, R., Knudsen, S., Todorova, V. & Hoşgör, A.G. (2014). Managing Rapana in the Black Sea: Stakeholder workshops on both sides. *Ocean and Coastal Management*, **87**, 75–87.
65	Forsyth, G.G., Le Maitre, D.C., O'Farrell, P.J. & van Wilgen, B.W. (2012). The prioritisation of invasive alien plant control projects using a multi-criteria decision model informed by stakeholder input and spatial data. *Journal of Environmental Management*, **103**, 51–57.

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66	O'Connor, T.G., Kuyler, P., Kirkman, K.P. & Corcoran, B. (2010). Which grazing management practices are most appropriate for maintaining biodiversity in South African grassland? *African Journal of Range & Forage Science*, **27**, 67–76.
67	García de Jalón, S., Iglesias, A., Cunningham, R. & Pérez Díaz, J.I. (2014). Building resilience to water scarcity in southern Spain: A case study of rice farming in Doñana protected wetlands. *Regional Environmental Change*, **14**, 1229–1242.
68	Oliver, I., Jones, H. & Schmoldt, D.L. (2007). Expert panel assessment of attributes for natural variability benchmarks for biodiversity. *Austral Ecology*, **32**, 453–475.
69	Rohde, S., Hostmann, M., Peter, A. & Ewald, K.C. (2006). Room for rivers: An integrative search strategy for floodplain restoration. *Landscape and Urban Planning*, **78**, 50–70.
70	Redpath, S.M., Arroyo, B.E., Leckie, F.M., Bacon, P., Bayfield, N., Guttiérrez, R.J. & Thirgood, S.J. (2004). Using decision modeling with stakeholders to reduce human-wildlife conflict: A raptor-grouse case study. *Conservation Biology*, **18**, 350–359.
71	Riccioli, F., Fratini, R., Boncinelli, F., El Asmar, T., El Asmar, J.P. & Casini, L. (2016). Spatial analysis of selected biodiversity features in protected areas: A case study in Tuscany region. *Land Use Policy*, **57**, 540–554.
72	Gülci, S. & Akay, A.E. (2015). Assessment of ecological passages along road networks within the Mediterranean forest using GIS-based multi criteria evaluation approach. *Environmental Monitoring and Assessment*, **187**, 1–13.
73	Comino, E., Bottero, M., Pomarico, S. & Rosso, M. (2014). Exploring the environmental value of ecosystem services for a river basin through a spatial multicriteria analysis. *Land Use Policy*, **36**, 381–395.
74	Orsi, F., Geneletti, D. & Borsdorf, A. (2013). Mapping wildness for protected area management: A methodological approach and application to the Dolomites UNESCO World Heritage Site (Italy). *Landscape and Urban Planning*, **120**, 1–15.
75	Momeni Dehaghi, I., Mahiny, A.S., Shabani, A.A., Karami, M., Taylor, P. & Dehaghi, I.M. (2013). Efficiency of current reserve network in Golestan Province (Iran) for the protection of hoofed ungulates. *Biodiversity*, **14**, 162–168.
76	Carver, S., Comber, A., McMorran, R. & Nutter, S. (2012). A GIS model for mapping spatial patterns and distribution of wild land in Scotland. *Landscape and Urban Planning*, **104**, 395–409.
77	Geneletti, D. (2008). Incorporating biodiversity assets in spatial planning: Methodological proposal and development of a planning support system. *Landscape and Urban Planning*, **84**, 252–265.
78*	Karlson, M., Karlsson, C.S.J., Mörtberg, U., Olofsson, B. & Balfors, B. (2016). Design and evaluation of railway corridors based on spatial ecological and geological criteria. *Transportation Research Part D: Transport and Environment*, **46**, 207–228.
79	Marre, J.B., Pascoe, S., Thébaud, O., Jennings, S., Boncoeur, J. & Coglan, L. (2016). Information preferences for the evaluation of coastal development impacts on ecosystem services: A multi-criteria assessment in the Australian context. *Journal of Environmental Management*, **173**, 141–150.
80	Ferretti, V. & Comino, E. (2015). An integrated framework to assess complex cultural and natural heritage systems with Multi-Attribute Value Theory. *Journal of Cultural Heritage*, **16**, 688–697.
81	Stoms, D.M., Dashiell, S.L. & Davis, F.W. (2013). Siting solar energy development to minimize biological impacts. *Renewable Energy*, **57**, 289–298.
82	Alavi, I. & Alinejad-Rokny, H. (2011). Comparison of Fuzzy AHP and Fuzzy TOPSIS Methods for Plant Species Selection (Case study : Reclamation Plan of Sungun Copper Mine ; Iran). *Australian Journal of Basic and Applied Sciences*, **5**, 1104–1113.
83	Reig, E., Aznar, J. & Estruch, V. (2010). A comparative analysis of the sustainability of rice cultivation technologies using the analytic network process. *Spanish Journal of Agricultural Research*, **8**, 273–284.
84	Snep, R., Van Ierland, E. & Opdam, P. (2009). Enhancing biodiversity at business sites: What are the options, and which of these do stakeholders prefer? *Landscape and Urban Planning*, **91**, 26–35.
85	Svoray, T., Bar, P. & Bannet, T. (2005). Urban land-use allocation in a Mediterranean ecotone: Habitat Heterogeneity Model incorporated in a GIS using a multi-criteria mechanism. *Landscape and Urban Planning*, **72**, 337–351.
86	Curtis, I.A. (2004). Valuing ecosystem goods and services: A new approach using a surrogate market and the combination of a multiple criteria analysis and a Delphi panel to assign weights to the attributes. *Ecological Economics*, **50**, 163–194.

TOPIC OF MULTI-CRITERIA DECISION ANALYSIS
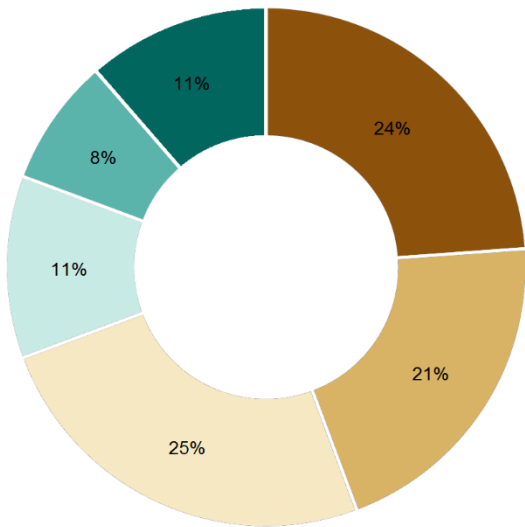
GEOGRAPHIC EXTENT

Conservation prioritization and planning

Forest management/restoration

Protected areas management/zoning

Management/restoration of other ecosystems

Mapping of biodiversity, wilderness, natureness, etc.

Other
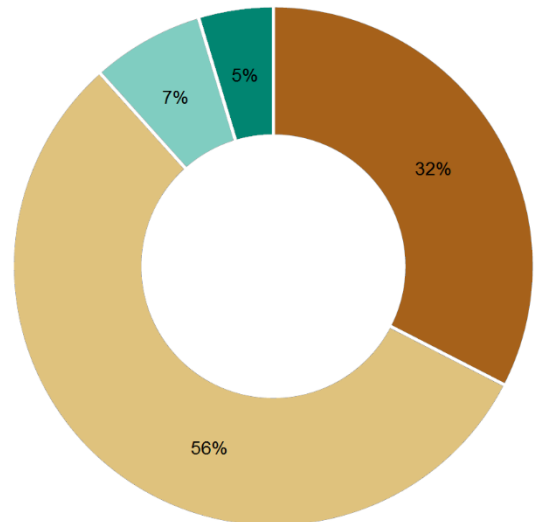
Local

Regional

National

Continental

Figure S1. Topics addressed in the MCDA applications and geographic extent of the study area.

Table S3: Summary of the 86 reviewed articles in which MCDA was applied to issues relating to biodiversity and conservation (See the legend below).

N.	Article	Country	Geographic extent	Objective of MCDA	Alternative definition	Criteria formulation	Criteria assessment	Weighting	Criteria aggregation	Sensitivity analysis	Result of MCDA	Decision
1	(Ferretti and Pomarico, 2013b)	Italy	R	Supporting land use planning and ecological corridor development	0	1	3	4	Ordered weighted Average	1	Suitability maps for each criterion plus 11 overall suitability maps for a set of order weights. A summary map of areas of high (0.6-0.8) and very high (0.8-1.0) suitability.	0; 1
2	(Ferretti and Pomarico, 2013a)	Italy	R	Identifying suitable areas for conservation and for developing ecological networks	0	0	3	4	WCL	1	Suitability maps for each criterion and 2 overall suitability maps to compare different standardization (linear vs. sigmoidal). 3 suitability maps showing different perspectives (different weights).	0; 1; 2
3	(Bottero et al., 2013)	Italy	R	Assessing the conditions of biodiversity conservation, to support spatial planning.	0	0	3	3	WCL	0	A suitability map for biodiversity conservation combining high values of natural and environmental quality, used for assessing the existing PAs.	0
4	(Newton et al., 2012)	UK	L	Exploring the relative effectiveness of habitat restoration in terms of ES provision and impact on biodiversity	1	0	1	4	WCL	0	Ranking of 3 habitat restoration scenarios according to ES provision and biodiversity value. Tradeoff analysis between ES and biodiversity, and between different ES.	0; 1
5	(Vimal et al., 2012)	France	R	Identifying priority sites based on their vulnerability and analysing their spatial variability	1	0	2	1	WCL + simple overlap	0	Vulnerability maps for 4 types of individual and combined threats, considering 3 biodiversity descriptors.	0; 1
6	(Wu et al., 2012)	China	L	Evaluating alternative policy options to secure water for wetland conservation	3	3	3	3	WCL	2	Ranking of 4 policy options based on 4 criteria (both individually and combined).	0; 1
7	(Toledo-Aceves et al., 2011)	Mexico	R	Prioritizing tropical montane cloud forests for conservation (in Mexico).	1	1	2	3	WCL	0	Classification of the 55 sub regions of tropical montane cloud forests into three classes of priority (i.e. critical, high and medium).	0
8	(Fuller et al., 2010)	Indonesia	R	Identifying conservation threats and priority in an area of high biodiversity	0	0	2	2	WCL	0	4 normalized maps of threat according to 4 perspectives and mean MCDA score of the maps.	0; 2
9	(Gorokhovich and Voustianiouk, 2010)	USA	R	Selecting specific land parcels for conservation.	1	0	2	4	WCL	1	Ranking of the analysed vacant parcels (744), and identification of large clusters with high significance for conservation (122)	0
10	(Valente and Vettorazzi, 2008)	Brazil	R	Defining priority areas for forest conservation (in a Brazilian river basin).	0	1	2	2*	Ordered weighted averaging	1	5-class priority area map (excluding one of the original criteria based on the sensitivity analysis)	0
11	(Hajkowicz et al., 2008)	Australia	C	Evaluating conservation sites within a competitive tendering program.	1	0	2	1	WCL	3	Overall score of each site based on tender offer and investor preference. (Selection of 65 sites out of 95, based on binary combinatorial optimization within available budget).	0
12	(Martínez-Harms and Gajardo, 2008)	Chile	N	Evaluating supply of bundles of ecosystem services (ES) and threats in landscape units	1	0	2	1*	WCL	0	ES value and threat value for 26 Providers Units of Ecosystem Services (PUES), mapped to identify areas of conservation significance.	0
13	(Dhar et al., 2008)	Austria	L	Evaluating conservation management strategies to maintain tree species at risk, and identifying courses of action to improve their viability.	2	2	2	2	WCL	1;2	Ranking of 6 conservation management strategies under 5 scenarios.	0; 2
14	(Regan et al., 2007)	USA	N	Developing a comprehensive set of criteria and weights for assigning biodiversity value	0	2	0	4	AHP	5	Consensus over the criteria and weights.	0
15	(Geneletti, 2007)	Italy	R	Assessing the nature conservation value of agricultural landscapes to support land-use planning.	0	0	2	1	WCL	1;3;6	Map of nature conservation value aggregated into three classes. (The results have been used to support the procedure of Environmental Impact Assessment).	0
16	(Ausseil et al., 2007)	New Zealand	R	Defining and applying a rapid method to prioritize wetlands conservation at the regional scale with no need of field data.	1	0	3	1	WCL	1	List of the 10 first wetlands in New Zealand, ranked by score order.	0
17	(Strager and Rosenberger, 2006)	USA	R	Mapping priority areas for conservation.	0	3	1	4	WCL	6	Seven maps of high priority locations integrating different preference weights	0; 1; 2

#	Reference	Country		Objective					Method		Output	
18	(Moffett et al., 2006)	Namibia	R	Designing conservation area networks, by ranking 49 non-dominated alternative (selected from 94 unique alternatives generated by a heuristic algorithm).	2	0	2	3*	WCL	1	Ranking of the alternatives, identification of the highest ranked, and spatially-explicit comparison of the alternatives (only one among the 5 highest ranked differed from the preferred alternative by more than one cell).	0
19	(Geneletti, 2004)	Italy	L	Identifying nature conservation priorities among the remnant ecosystems within a study area.	1	0	3	2	WCL	2;3	Selection of the site with the highest relevance for nature conservation and definition of a strategy for the area.	0; 2
20	(Noss et al., 2002)	USA	R	Prioritizing additional protection sites (selected using a site selection algorithm) for multiple conservation goals	2	1	2	1	WLC	5	Combined evaluation of irreplaceability and vulnerability of the additional sites, and prioritization according to 3 classes (high-high, high-low and low-high, low-low).	0
21	(Sierra et al., 2002)	Ecuador	R	Evaluating the conservation status of ecosystems (in Ecuador)	1	2	2	1	WLC	0	Ranking of national ecosystems based on 4 criteria (representativeness, habitat loss, exposure to human pressure, species-level ecosystem attribute). Identification of 26 critical ecosystems, clustered in 6 priority regions. Definition of an ecosystem-level conservation priority for the country and discussion of the effectiveness of the current conservation policies.	0; 1
22	(Farashi et al., 2016)	Iran	L	Supporting zoning in a PA to reduce conflicts between conservation and tourism, road construction, cultivation, and grazing.	0	2	1	1	WCL	0	Suitability map for preservation in the park and new zoning proposal, completely different from the old zoning based on expert knowledge alone.	0
23	(Habtemariam and Fang, 2016)	Eritrea	L	Supporting a process of zoning of a marine PA, considering natural ecosystems, social demands, and stakeholders' preferences.	0	0	1	4*	WCL + BOOLEAN	0	3 partial suitability maps according to the 3 objectives and 3 overall suitability maps, leading to a zoning proposal.	0; 1; 2
24	(Etxano et al., 2015)	Spain	L	Comparing alternative management options for Natura 2000 sites through participatory approaches (workshops, in-depth interviews, large scale surveys)	3	2	1	3	NAIADE	4	Ranking of alternative management options, plus a dendrogram of coalition formation provided.	0; 3
25	(Bali et al., 2015)	Iran	R	Assessing suitability for ecotourism.	0	1	2	3*	WCL	0	Map of land suitability for ecotourism development, aggregated into 4 classes: Restricted area, Fairly, Moderately, and Highly suitable.	0
26	(Cortina and Boggia, 2014)	Italy	R	Characterizing the biodiversity level of 104 Natura 2000 sites to check if a management plan is needed, in addition to the typical conservation measures.	1	2	1	3	WCL	1	Ranking of N2000 sites based on their biodiversity value. (Hence, an assessment of the potential to set up of an ecological network).	0; 1
27	(Grazhdani, 2014)	Albania	L	Comparing options for managing ES in a PA.	2	3	3	3	PROMETHEE	2	Ranking of 4 management scenarios (generated by stakeholders in a participatory workshop) based on impact on relevant ES.	0
28	(García de Jalón et al., 2014)	Spain	L	Assessing adaptation options to water scarcity in an agricultural area influenced by a national park.	3	2	3	4	WCL	2	Ranking of 8 adaptation strategies under two water scarcity scenarios.	0; 2
29	(Lu et al., 2014)	Taiwan	R	Identifying priority areas to support the zoning of a marine PA.	2	2	0	2	Simple overlap	0	Maps of the priority areas for different MPA objectives. Maps combined by simple overlap, using different weights to represent zoning proposal under 4 perspectives.	0
30	(Zhang et al., 2013)	China	L	Supporting zoning of PAs (a model to be applied to the whole of China).	0	3	2	3	WCL + Ad hoc rule	0	3 suitability maps (nature conservation, recreation and tourism, and community development), and an overall suitability map, later classified into management zones.	0; 1
31	(Hajehforooshnia et al., 2011)	Iran	R	Supporting zoning of PA selecting the best zones for conservation.	0	0	2	1	WLC	0	4 suitability maps (conservation, recreation, rehabilitation, and cultural activities), used as input of MOLA to select best zones for conservation.	0; 1
32	(Oikonomou et al., 2011)	Greece	L	Comparing alternative scenarios of implementation of a Natura 2000 site.	3	2	2	4	NAIADE	4	Ranking of 3 scenarios based on the impact on a set of ES (MCDA) and on stakeholders' preference (social evaluation).	0; 2
33	(Zia et al., 2011)	Tanzania	R	Applying deliberative evaluation to 5 alternative management scenario of a national park, eliciting different stakeholders' values at multiple spatial scales.	3	2	3	4	WCL	0	Pre and post-deliberative expected value of 5 alternative management scenarios, based on 6 criteria and at 3 spatial scales.	0; 2; 3
34	(Khoi and Murayama, 2010)	Vietnam	R	Assessing land suitability for crops in PA.	0	1	3	3*	WCL	0	Map of land suitability for cropland in PA and overlap with recent land-use map to analyse the spatial matching.	0
35	(Graziano et al., 2009)	Italy	L	Estimating the level of threat on specific areas (H-6230 and H-7140 polygons in the habitat map).	1	0	2	3	WCL	0	Estimation of threats and prescription of a management strategy (e.g. no interventions, long-term monitoring, delimitation using mobile electric fences, construction of woody fences etc.).	0
36	(Gurung, D.B. and Scholz, 2008)	Bhutan	R	Evaluating 4 scenarios of ecotourism developments in a conservation area.	3	2	3	4	Statistical analysis	0	Evaluation of scenarios according to different local and international experts' perspectives.	0; 2; 3
37	(Geneletti and van Duren, 2008)	Italy	L	Supporting zoning of a PA.	0	0	2	2	WCL	1;4	Map of suitability for priority zones, aggregated into the previously identified land unit polygons. Then, assignation of a protection level to each land unit through a multi-objective land allocation procedure.	0; 2
38	(Wood and Dragicevic, 2007)	Canada	N	Spatially identifying marine locations for protection using a reduced set of criteria.	0	0	2	2	WCL	1;2	Partial and overall suitability maps (biodiversity and fisheries), used as input for a multi-objective space allocation analysis, to assign 30% of the area to MPA and 70% to fisheries.	0

#	Reference	Location		Description					Method		Output	
39	(Boteva et al., 2004)	West Crete	L	Evaluating the conservation significance of each community type within a Natura 2000 site, and selecting priority areas and habitats for management and conservation.	1	0	2	1*	WCL	0	Identification of 3 community types within the site as areas with the highest conservation value.	0
40	(Grošelj et al., 2015)	Slovenia	R	Assessing scenarios/strategies to sustainability in forest management, building on the results of a participatory SWOT analysis.	1	2	0	3	AHP + ANP	0	Ranking of the 6 scenarios/strategies	0
41	(Fernández and Morales, 2016)	Chile	R	Identifying potential areas for restoration of threatened endemic tree species, at regional scale and accounting for future climatic change.	0	0	2	0	WLC	0	Maps with priority areas for restoration for 2 species and 3 climate scenarios.	0
42	(Suryabhagavan et al., 2016)	Ethiopia	R	Assessing fire susceptibility of forest areas (in Ethiopia)	0	0	1	1	WCL	0	Map of fire risk aggregated into 4 categories.	0
43	(Derak and Cortina, 2014)	Spain	L	Comparing provision of ES in planted (with Aleppo pine) versus unplanted areas	1	1	1	3*	WCL	1;2	Ranking of 5 land units (1 planted + 4 unplanted) based on their total provision of ES.	0; 1
44	(Lin et al., 2014)	Tanzania	N	Developing a spatial targeting strategy for REDD+ projects (in Tanzania).	1	0	1	4	WCL	1	2 suitability maps for REDD+ projects according to 2 overall objectives: "efficient targeting" & "co-benefit targeting". Identification of "no-regret" areas through an overlap of the 2 maps.	0; 2
45	(Uribe et al., 2014)	Mexico	R	Assessing land suitability for forest restoration, reflecting the preference of different stakeholders.	0	2	2	3	WCL	0	5 maps of forest landscape restoration priorities, one for each stakeholder group and one combining all the groups. Design of restoration options by selecting the best pixels from the suitability maps.	0; 2
46	(Jactel et al., 2012)	Portugal, France, United Kingdom, Poland, Sweden, Germany, Austria	C	Comparing forest management alternatives (FMA) for European forests in relation to multiple risk factors.	0	2	2	1	PROMETHEE II	1; 2	A complete ranking of 4 FMAs according to their impact on biotic and abiotic risks (for 5 main hazards in 8 EU case studies).	0; 1
47	(Rantala et al., 2012)	Finland	N	Assessing the sustainability (socio-cultural impacts) of developmental forest resource management projects (in Finland).	2	2	2	4	MAVT	0	Quantification of socio-cultural impacts of developmental forest resource management projects in 7 case studies considering separately stakeholder weights.	0; 3
48	(Jalilova et al., 2012)	Kyrgyzstan	R	Evaluating Sustainable Forest Management (SFM) strategies.	3	3	0	4	AHP	0	Participatory development of 7 criteria and 45 indicators, and ranking of 4 management strategies according to various stakeholders' perspectives.	0; 2
49	(Schwenk et al., 2012)	USA	L	Evaluating (simulated) forest management alternatives.	2	0	2	2	WCL	1	Evaluation of 4 forest management alternatives based on the tradeoffs between ES for the given management strategy and on the change in ES between the 4 management strategies.	0; 2
50	(Nordström et al., 2011)	Sweden	L	Selecting place-, and time-specific treatments for forest management maximizing stakeholders' objectives.	3	2	1	1	MAVT	0	Ranking of the 3 alternative forest management plans. (The highest-ranking plan later adopted by the municipality and the forest owners).	0
51	(Pasqualini et al., 2011)	Island of Corsica	R	Evaluating values and risks of (P. pinaster) forest to support fire and phytosanitary management (in Corsica).	0	1	2	4	WCL	1; 4	2 maps of priority areas for managing fire and phytosanitary risks, based on maps of forest values (land cover; legislative tools; tourist sites and access routes; and wood sales).	0; 1
52	(Reubens et al., 2011)	Ethiopia	R	Supporting multi-purpose woody species selection for restoration in dryland regions.	3	0	3	4	SMART	1; 4	Multi-criteria species selection analysis for two alternative scenarios (private planting and gully rehabilitation).	0
53	(Mustajoki et al., 2011)	Finland	R	Addressing controversy between forest management options, supporting stakeholders' learning and increasing overall understanding.	3	3	3	4	MAVT	1	Ranking of 5 alternatives (without aggregation of opinions).	0; 3
54	(Ianni and Geneletti, 2010)	Argentina	L	Selecting forest restoration priorities, combining stakeholder analysis and participatory MCDA	3	2	2	4	WCL	1;5	Ranking of 10 alternative areas for restoration and identification of the 2 highest scoring areas.	0
55*	(Orsi and Geneletti, 2010)	Mexico	R	Identifying reforestation priority sites for the design of landscape-scale reforestation options.	0	0	2	1	WCL	0	2 suitability maps, used to design 24 restoration options	0
55*	(Orsi and Geneletti, 2010)	Mexico	R	Comparing restoration options identified with a previous SMCA, considering ecological and socioeconomic criteria	2	0	2	2	WCL	1;2	Ranking of 14 reforestation options 2 options performed significantly better than the other ones under any perspective)	0
56	(Kint et al., 2009)	Netherlands	L	Comparing simulations of forest conversion scenarios (based on different conversion strategies and conversion regimes)	2	0	1	2	WCL	1	Overall utility of 12 different scenarios, comparison of different conversion strategies with respect to productivity and biodiversity, and identification of the optimal strategy.	0; 2;
57	(Briceño-Elizondo et al., 2008)	Finland,	R	Assessing the utility of different multi-objective stand treatment programs (STP) under 3 different climate scenarios (100 years).	1	0	2	2	MAVT	1	Mean utility value for the different STP under the different climate scenarios. Probability of 1st rank as indicator of preferentiality for treatments	0
58	(Fürstenau et al., 2007)	Germany	L	Evaluating the overall utility of forest management alternatives at the forest management unit level with regard to multi-purpose and multi-user settings	2	2	3	4	MAVT	2	Identification of the "best" management strategy among the analysed alternatives.	0; 3

#	Reference	Country		Purpose					Method		Output description	
59	(Van Der Horst and Gimona, 2005)	UK	R	Identifying broad areas where planting would or would not be advisable	0	0	2	1	WCL	1	Maps of the "Aggregate potential biodiversity score" based on different threshold values, representing different perspectives.	0
60	(Van Elegem et al., 2002)	Belgium	L	Assessing suitability and feasibility of areas for urban forestation.	2	0	3	1	WLC	1; 5	First selection of 4 out of 11 sites based on suitability criteria and final selection of the 2 highest scoring based on feasibility criteria.	0
61	(Cordingley et al., 2016)	UK	R	Comparing future scenarios resulting from different landscape management types with respect to their relative effectiveness in providing biodiversity benefits and a set of ES.	2	0	1	2	WCL	0	Ranking of scenarios (year 2032) considering different weights and discussion of the sensitivity to the selected weights.	0; 1
62	(Datta and Kumar Ghosh, 2015)	India	L	Comparing community-based management scenarios of wetlands.	3	3	3	4*	WCL	0	Ranking of 6 alternative wetlands utilization strategies.	0; 3
63	(Hodder et al., 2014)	UK	R	Assessing the effectiveness of landscape-scale conservation interventions, considering the impact on ES (in 5 case studies).	2	2	1	2	WCL	0	Individual and total values of 6 to 8 ES before and after the landscape-scale conservation interventions, used for a trade-off analysis.	0; 1
64	(Janssen et al., 2014)	Turkey, Bulgaria	R	Comparing alternative management options of a non-indigenous, commercially valuable fish species (in Turkey and Bulgaria).	2	2	1	3	WCL	1;2	Ranking of 6 management alternatives of a non-indigenous specie considering stakeholders input from 2 case studies.	0
65	(Forsyth et al., 2012)	South Africa	R	Prioritizing sub-catchments with respect to invasive alien plant control initiatives.	1	2	2	3*	AHP	0	Prioritization of 309 sub-catchments in 6 primary catchments, for invasive alien plant control, based on criteria defined by stakeholders	0
66	(O'Connor et al., 2010)	South Africa	N	Assessing relative impact of different grazing systems on grassland biodiversity integrity (in South Africa).	2	0	0	3	AHP	0	Ranking of 8 alternative grazing systems.	0
67	(García-Marmolejo et al., 2008)	Mexico	R	Evaluating performance and sustainability of 6 Management Units for Conservation and Sustainable Use of Wildlife (UMA).	1	0	1	1	Ad hoc rule	0	Spidergrams illustrating the evaluation of each UMA according to 5 thematic areas and a spidergram comparing the 6 UMAs according to the economic, environmental, social, and legislative thematic areas.	0; 1
68	(Oliver et al., 2007)	Australia	C	Determining a practical and defensible minimum set of ecosystem attributes to form the basis of natural variability benchmarks for site-based measurement and monitoring of terrestrial vegetation condition.	0	1	0	4	AHP	6	A minimum set of landscape and vegetation condition attributes criteria with AHP structure and weights (selected based on their high importance and high feasibility).	0; 3
69	(Rohde et al., 2006)	Switzerland.	R	Identifying stream systems where present environmental (e.g. natural flow, sufficient bed load material) and socio-economic (e.g. public attitude) conditions favour the eco-morphological restoration of floodplains.	1	1	2	3	MAVT + Boolean type + visual overlap	1	Map of ecological suitability of river systems combined with public attitudes toward environmental projects.	0; 1
70	(Redpath et al., 2004)	UK	L	Exploring management options to reduce human-wildlife conflicts.	3	2	3	4	WCL	1;2;6	Evaluation of seven different management options according to 2 "opposing" stakeholder groups perspectives.	0; 2; 3
71	(Riccioli et al., 2016)	Italy	R	Identifying areas with high biodiversity value to assess the effectiveness of existing environmental policies.	0	0	1	1	WCL	0	Map of areas of high biodiversity value, and comparison with existing regional and national PAs.	0
72	(Gülci and Akay, 2015)	Turkey.	R	Assessing habitat suitability for roe deer.	0	0	2	1	WLC	0	A map of habitat suitability for roe deer, used in LCP analysis to identify movement corridors, to check their interference with a motorway, and find optimum solutions for eco-passages.	0
73	(Comino et al., 2014)	Italy	L	Highlighting the most important zones for environmental quality preservation, based on their naturalness value.	0	1	3	4	WCL	2	A "naturalness map" and a "pressures map" then combined using different weights to represent different perspectives.	0; 1; 2
74	(Orsi et al., 2013)	Italy	R	Mapping wilderness in PA (to validate wilderness maps prepared using unsupervised classification).	0	0	2	1	WCL	0	Maps of the wildness gradient, aggregated into 3 classes.	0
75	(Momeni Dehaghi et al., 2013)	Iran	R	Determining habitat suitability for protecting hoofed ungulates.	0	1	1	1	WCL	0	Maps of habitat suitability for 4 selected ungulates, used as inputs for Marxan).	0
76	(Carver et al., 2012)	UK	R	Mapping and modelling wildness in 2 national parks.	0	0	1	4	WCL	1	Maps of the 4 criteria (Naturalness; Remoteness; Absence of artefacts; Ruggedness) and aggregated maps of wilderness values with 2 sets of weights (equal or residents' weights). Example of wideness map aggregated in a 3-class typology (core, buffer, and periphery) to support planning of the 2 parks.	0; 1
77	(Geneletti, 2008)	Italy	R	Mapping and assessing biodiversity assets.	0	0	2	0	WCL + Ad hoc rule	5	Maps of warning levels related to 6 biodiversity themes (relating to animal, and plant species, and 4 different alpine ecosystems)	0; 1
78*	(Karlson et al., 2016).	Sweden	R	Assessing geological and ecological suitability for railway corridors.	0	0	2	2	MAVT	0	3 overall suitability maps, representing "ecological", "geological", and "neutral" perspectives. (Input for designing 6 railway corridors with LCP.	0; 1; 2
78*	(Karlson et al., 2016).	Sweden	R	Comparing alternative railway corridor, considering ecological and geological criteria, within 3 different perspectives	2	0	1	2	WCL	1	Ranking of 6 alternative corridors (representing different perspectives), based on 5 ecological and geological criteria + sensitivity analysis	0; 2
79	(Marre et al., 2016)	Australia	C	Assessing impact of large-scale coastal developments.	0	1	0	5*	AHP	5	A hierarchical framework for assessing impact of large-scale marine developments. Information preference of different stakeholders through a national survey; followed by a cluster analysis	0; 3

X

80	(Ferretti and Comino, 2015)	Italy	L	Determining the suitability of farms (located within a PA) to be recovered for touristic purposes.	1	2	3	3	MAVT	1;2;5	Ranking of 10 farms based on criteria and weights assigned by a group of experts, with a detailed discussion of the standardization methods.	0; 1
81	(Stoms et al., 2013)	USA	R	Identifying areas of low potential conservation as suitable for solar energy development.	0	0	2	1	Ad hoc rule	3;6	Suitability map for solar energy development based on high "On-Site Degradation" and "Off-Site Impact" scores, and identification of "no regret" areas.	0
82	(Alinejad-rokny, 2011)	Iran	L	Selecting plant species for mine reclamation.	1	0	0	3	AHP + TOPSIS	4	Ranking of 6 alternative plant species, using two different MCDA methods: fuzzy AHP and TOPIS.	0
83	(Reig et al., 2010)	Spain	L	Ranking a set of cultivation scenarios according to their relative sustainability (composite sustainability indicator), an ANP structure.	2	2	0	4	ANP	0	Ranking of the 3 alternative cultivation systems, ranking/weighting of the selected criteria, and exploration of 3 different perspectives (economic, socio-cultural, and environmental).	0; 2
84	(Snep et al., 2009)	Netherlands	R	Analysing scenarios for enhancing biodiversity at business sites.	2	1	2	4	WCL	1;2;3	Ranking of scenarios in terms of stakeholders' preferences.	0
85	(Svoray et al., 2005)	Israel	L	Assessing land suitability for urban development in an ecologically sensitive zone.	0	0	2	3*	WCL	1	Suitability maps for 4 competing land uses (forest, industry, residence, natural reserve) and a related zoning proposal.	0; 1
86	(Curtis, 2004)	Australia	R	Exploring weighting of ES provided by a World Heritage Area from different perspectives (for economic valuation using shadow prices).	0	0	2	1	MAVT	6	Weighting of 20 ES from three different perspectives + an overall weighting.	0; 1; 3

LEGEND

STAGE 1: Decision context and structuring

Objectives cluster
Prioritization/planning of conservation
Management/zoning of protected areas
Management/restoration of forest
Management/restoration of other ecosystems
Mapping of biodiversity, naturalness, or wilderness
Other

Geographic extent
Local extent = less than 500 Km^2
Regional extent: between 500 Km^2 and 250.000 Km^2
National extent = between 250.000 Km^2 and 1.500.000 Km^2
Continental extent = above 1.500.000 Km^2.

Alternatives identification
0 = No, no pre-defined alternatives;
1 = Yes. Alternatives are already existing;
2 = Yes. Alternatives are identified/designed during the study solely by the authors;
3 = Yes. Alternatives are defined/designed during the study, with input from stakeholders

Criteria formulation
0 = Formulated by the authors;
1 = Formulated with input from other experts;
2 = Formulated with input from stakeholders (if applicable, specify technique)
3 = Formulated with input from the public (e.g. national survey).

STAGE 2: Analysis

Criteria Assessment
0 = Not described/not performed;
1 = Assessment performed by the authors without providing justification;
2 = Assessment performed by the authors with justification;
3 = Assessment performed based on input from experts or stakeholders;

Weighting
0 = Not mentioned/not performed;
1 = Weighting performed by the authors;
2 = Weighting performed by the authors through multiple weight sets that simulate different perspectives;
3 = Weighting performed by involving experts or representatives of stakeholders;
4 = Multiple weighting performed by involving experts or representatives of stakeholders;

Sensitivity analysis
0 = Not mentioned/nor performed;
1 = By changing weights (if applicable, specify the technique adopted);
2 = By changing scores;
3 = By changing criteria assessment method;
4 = By changing criteria aggregation rule;
5 = Testing the robustness of the results by collecting general feedback from participants;
6 = Testing the robustness of the results by consulting additional data sources
By performing two of the above analyses
By performing three of the above analyses

STAGE 3: Decision

Criteria Assessment
0 = Overall alternative ranking or suitability;
1 = Partial ranking or suitability according to specific criterion included
2 = Multiple ranking or suitability according to different perspectives;
3 = Analysis and clustering of preference/stakeholders;