JOURNAL OF THE BULGARIAN GEOGRAPHICAL SOCIETY

Journal of the Bulgarian Geographical Society 52: 1–20 (2025)
DOI: 10.3897/jbgs.e135659

Research Article

Possibilities for inclusion of Bulgarian protected areas on the IUCN Green List

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Abstract

The most successful approach to conserving biodiversity is the development of a worldwide network of protected areas that are effectively managed through various tools and criteria. The latest global project for management quality of protected areas is the IUCN Green List Standard. It offers an instrument for regular assessment and implementation of protected area management efficiency. Listed sites gain recognition as a good example in nature preservation, international promotion, know-how, access to and exchange of global expertise, support and financial resources for good conservation outcomes. Bulgaria has a well-developed network of protected areas and participates in international programs with several nature sites. Joining the Green List program could influence national policy and actions for further excellence of the national network and its effective management, as well confirm Bulgarian commitment to global conservation efforts. The aim of this study is to assess the possibilities for including sites from the Bulgarian protected areas network on the IUCN Green List, identifying sites, ready to complete the application phase and be credible candidates for inscription. A review of the Bulgarian protected areas network was done and an evaluation, corresponding to the application phase of the Green List, of 49 natural sites (three national parks, 11 nature parks and 35 managed reserves) showed that the best potential candidates for the Green List are the administrations of Central Balkan National Park, Bulgarka Nature Park, Persina Nature Park and Belasitsa Nature Park. It is recommended that they start an application procedure and join the IUCN network.

Key words: Management effectiveness, management plan, national park, nature park, quality criteria, reserve

OPEN ACCESS

Academic editor: Hristina Prodanova
Received: 27 August 2024
Accepted: 26 December 2024
Published: 10 January 2025

Citation: Bancheva-Preslavska H (2025) Possibilities for inclusion of Bulgarian protected areas on the IUCN Green List. Journal of the Bulgarian Geographical Society 52: 1–20. https://doi.org/10.3897/jbgs.e135659

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1. Introduction

The establishment and management of protected areas (PA) is the most successful approach to preserve biodiversity and ecosystems, respectively to ensure ecosystem services, providing a wide range of environmental, social, economic, cultural and spiritual benefits (Tsvetkova et al. 2012; Pavlova and Kuzmanova 2019; Nedkov et al. 2021; Petrova et al. 2022; Petrov et al. 2023).

The global network of protected areas is growing and PAs cover 17% of land and 10% of water (IUCN 2024), thus in the World Database of Protected Areas are included 284 242 sites in 247 countries (Protected Planet 2024). Despite

the expansion and their value for in-situ biodiversity conservation there are serious challenges in PA management (Hockings 2003; Worboys et al. 2015). The latest global report on the contribution of protected areas to biodiversity conservation (UNDP et al. 2021) shows limited progress towards achieving effective management with only 10% of protected areas assessing the effectiveness of their management.

Globally, there are more than 100 quantitative and qualitative instruments, used to assess the effectiveness of protected area management (PAN Parks 2002; Hockings 2003; Pomeroy et al. 2004; Staub and Hatziolos 2004; Wagner et al. 2005; BirdLife International 2006; Stoll-Kleemann 2008; Leverington et al. 2010a, 2010b; EUROPARC 2018). Among the most famous methodologies are: Rapid Assessment and Prioritization of Protected Area Management (Ervin 2003), Management Effectiveness Tracking Tool (Stolton et al. 2021) and Parks in Peril Site Consolidation Scorecard (Balloffet and Martin 2007). In Europe, numerous methodologies, both international and national, specific to different types of PA are also applied (Gilligan et al. 2005; Köster et al. 2006; Pfleger 2008; EUROPARC Deutschland e.V. 2008; Leverington et al. 2010c; Heiland et al. 2020; Nationale Naturlandschaften e. V. 2022; Bancheva-Preslavska 2022).

This abundancy of assessment approaches makes it difficult to standardize the evaluations and analyse global situation in protected area management. Therefore, IUCN works for a common global assessment instrument for PA management since the development of the Framework for Assessing Management Effectiveness of Protected Areas (Hockings et al. 2000, 2006) that offers evaluation methods and criteria to PA managers and governments. However, this was used as a base for development of many other assessment tools and another attempt of IUCN for a uniform PA management tool is the global standard Green List of Protected and Conserved Areas (IUCN Green List 2024). Therefore, IUCN World Commission on Protected Areas and the global IUCN Protected Areas Program convene a global development and consultation process to create and test the new IUCN Green List Standard, launched in 2017. The IUCN Green List (GL) is the only worldwide program that acknowledges protected areas through a verified, accredited process. It is in accordance with the Code of Good Practice for Sustainability Systems of the International Social and Environmental Accreditation and Labelling Alliance and is supported by the International Accreditation Service.

The GL program intends to recognize well-managed protected areas and to promote best practices in conservation. Global studies on the IUCN Green List have two directions—research on effectiveness in achieving conservation outcomes and integration into policy like in targets of the Convention on Biological Diversity, where it is used as an indicator of protected area success (Wells et al. 2016; Hockings et al. 2019; UNDP et al. 2021; IUCN WCPA 2024).

Regional investigations support these findings. For example, Australia's national parks work actively towards Green List recognition and the government is using the framework as part of broader biodiversity policy (Tanner-McAllister et al. 2024). Research on the protected areas in the Maldives finds ways to use the Green List Standard for gap analysis and for strengthening PA management in the country (Dryden et al. 2023). In Austria, a case study finds the potential of the Green List as a self-assessment tool that provides an overview of suc-

cesses and areas for improvement in protected area management (Glatz-Jorde et al. 2020).

The Green List is implemented globally with a growing number of protected areas, having by now 87 sites from 60 countries inscribed (IUCN Green List 2024). Active are countries all around the world like Mexico, Columbia, Peru, Brazil, also Kenia, Saudi Arabia, China, Australia. From Western Europe participating countries are France, Spain, Italy and Switzerland. There are no countries participating from Eastern Europe, and even being a biodiversity hotspot, no one from the Balkan Peninsula.

The Standard is still not known neither in Bulgaria. At the same time, there is no regular and consecutive monitoring on management efficiency of Bulgarian protected areas. The Bulgarian legislation regulates the requirements for PA management in the country, but in the only existing audit report on the management of national parks, the Audit Chamber found that management of national parks is not effective (Bulgarian Audit Chamber 2014). A comprehensive approach to regular assessment and implementation of PA management efficiency in the country is still not applied. The IUCN Green List can offer the instrument for that and the participation of Bulgarian sites in the GL program could influence national policy and actions for further excellence of the national protected areas network and its management. It can provide a clear path to improve conservation management, increase international acceptance, attract support and contribute to the world's nature preservation. This would also confirm Bulgaria's commitment to national and global sustainability. The participation in the Green List has benefits for different parties. It gains prestige to the listed sites, international recognition and national pride, enhanced political and financial support, acknowledgement for local communities, promotion to visitors and motivation for further excellence.

The study on the inclusion of Bulgarian protected areas on the IUCN Green List reveals some challenges of managing protected areas in an eastern European country, and the potential advantage of the recognition under international conservation frameworks. It assists broader goals such as the global biodiversity targets and sustainable development goals, enhances international cooperation in conservation, provides an opportunity for cross-regional learning and knowledge exchange between countries, enriches the methodological work on the topic. The study increases international awareness about Bulgarian protected areas and inspires international support for conservation.

The findings from this study could serve for evaluating future improvements in the management of Bulgarian protected areas. They could provide evidence-based recommendations that inform national and local policy and help government agencies prioritize funding and support for protected areas that are on the verge of meeting the Green List criteria, maximizing the impact of available resources. The study could also support protected areas management goals, encouraging the integration of the Green List criteria into PA management systems.

However, the inclusion of Bulgarian PA in the Green List requires a preliminary identification of potential sites where efforts of government, administrations, interested parties and stakeholders could be focused. Identifying these sites and barriers for participating in the GL is a subject of research, essential

to develop targeted strategies for overcoming them and improving PA management.

Therefore, this study aims to assess the possibilities for including sites from the Bulgarian protected areas network on the IUCN Green List, identifying sites, ready to complete the application phase and be credible candidates for inscription. To achieve that, several tasks should be completed:

- The criteria system of the IUCN Green List with attention to the different phases of the inscription procedure to be explored.
- The Bulgarian regulations regarding protected area management categories respecting the IUCN requirements to be analysed.
- A preselection of corresponding protected area categories to be done.
- All nature sites form the relevant categories to be examinate for their possibility to meet the Green List indicators from the application phase.
- Potential candidates for the IUCN recognition to be identified.

2. Material and methods

2.1. Case study area

Bulgaria is one of the first countries in Europe that announced nature sites under protection at the beginning of the last century and has a long history of managing them (Ordinance-Act for the Protection of Native Nature in Bulgaria 1936). The contemporaneous Protected Areas Act (1998) reflects the IUCN recommendations for categorization and management regime (Dudley 2008; Stolton et al. 2013), defining six categories of protected areas: reserve, national park, natural monument, managed reserve, nature park and protected site. The national protected areas network includes a total of 1027 sites—3 national and 11 nature parks, 55 reserves and 35 managed reserves, 349 natural monuments and 574 protected sites, covering almost 5% of the country (EEA 2023).

According to the Protected Areas Act (1998), the protected areas are intended for conservation of biological diversity in ecosystems and the natural processes occurring in them, as well as for the protection of characteristic or remarkable objects of inanimate nature and landscapes. Each protected area category has its proper characteristics, management goal and restriction regime. They are presented in Table 1 regarding their correspondence to the IUCN protected area categories.

Parks are managed by a nature or national park administration, which are regional governmental structures dedicated explicitly to their management. The control in other categories is executed by the Regional Inspectorates of Environment and Water, structures of the Ministry of Environment and Water. In cases, when reserves are included in the boundaries of national parks, they are managed by the park administrations which are directly subordinated to the environmental ministry. Executive state properties are national parks, reserves and managed reserves.

Management plans must be developed for a ten-year period for the categories: reserve and managed reserve, nature and national park (Ordinance for the Development of Protected Area Management Plans 2000). They contain a detailed description and assessment of the territory from a natural, cultural and socioeconomic point of view, information on management objectives, rules,

Table 1. Protected area management categories in Bulgaria.

National category	IUCN category	Management goal	Restriction regime
Reserve	Ia	Preserve their natural character, support science and education, protect conservation important species and their habitats.	All activities are prohibited, except security, visits for scientific purposes, passing by marked paths and extinguishing fires.
National Park	II	Protect wild nature and maintain biodiversity in ecosystems, develop science, education, recreation and tourism, support ecological livelihood.	Prohibited are construction, production, gathering herbs, berries, plants in certain places, hunting and fishing, grazing animals outside pastures and meadows, pollution of water and terrains, bivouac outside the designated places, etc.
Natural monument	III	Preserve their natural features.	Prohibited are activities that may disturb their natural features.
Managed Reserve	IV	Maintain their natural character, protection and restoration of species populations and their habitats conditions, science and education.	Any activities are prohibited as in reserves with an additional exception—it is allowed to maintain, support, regulate and restore species and habitats.
Nature Park	IV, V and/or VI	Maintain ecosystem and biological diversity, development of scientific, educational and recreational activities, tourism and sustainable use of resources.	Prohibited are mining by an open-cut method, bare logging, introduce nonnative species, pollute water and terrains, bivouac and light fire outside the designated places, collect conservation important species, except for scientific purposes, etc.
Protected Site	IV or V	Conserve landscape, habitats and species, scientific research, education and monitoring, as well as tourism development.	Prohibited are activities according to the requirements for protection of the respective subjects of conservation.

regimes and conditions for carrying out activities in their boundaries, action programs for scientific research, monitoring, maintenance of conservation important species, environmental education, etc. in the short and long term. Management plans for national parks, nature parks and managed reserves must undergo mandatory public consultation.

All Bulgarian sites are listed as protected areas under the World Database on Protected Areas (WDPA), accessible through the Protected Planet (2024) portal.

Some of the sites are included in the lists of intergovernmental conventions and programs. Thus, announced in Bulgaria are: 11 wetlands of international importance under the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat (1971), four biosphere reserves under the UNESCO Man and Biosphere Programme (1971), three world natural heritage sites under the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention 1972). Following the tradition of being an active member of the global community for nature conservation, Bulgaria is expected to make steps to participate also in the IUCN Green List program.

2.2. Overview of the IUCN Green List criteria system

The Green List Standard includes four components and 17 criteria (Fig. 1) with 50 indicators for detailed measurement of management results. The main components for effective nature conservation in protected areas on the IUCN Green List refer to: good governance, sound design and planning, effective management. Together, they support the fourth component related to achieving the goals and objectives of the site—successful conservation outcomes. The Standard covers the social, environmental and economic practices of the site. It requires the managers of protected areas to prove and maintain real results in nature conservation.

To achieve an IUCN Green List status, the protected areas must complete an evaluation process of three phases. A first evaluation is done during an application phase, when the site provides evidence against five basic indicators from the three main components of the IUCN Green List Standard. If this is successful, follows the candidate phase, when the PA must meet all other criteria and indicators of the GL. The third is the Green List phase, which is the mid-term review of the compliance with the Standard and is done every five years.

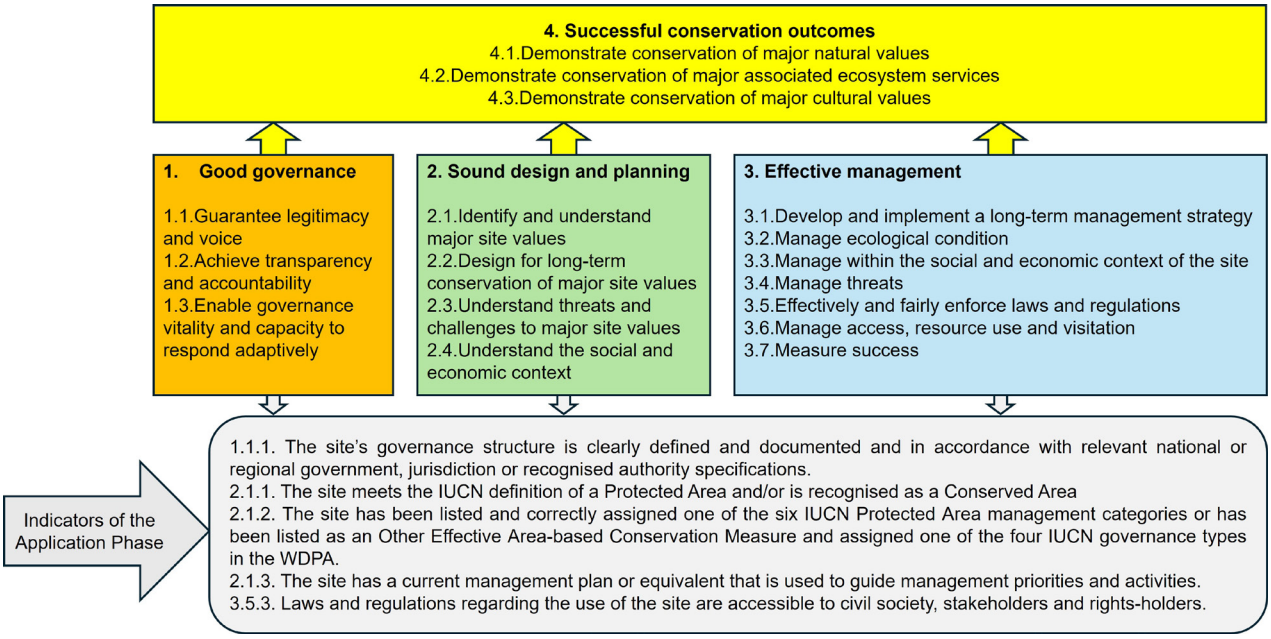

Figure 1. Components and criteria of the Green List, and indicators of the application phase (IUCN Green List 2024).

In the application phase, the site should complete the following five indicators, related to the components and criteria from the Fig. 1 with corresponding numbering.

1.1.1. The site's governance structure is clearly defined and documented and in accordance with relevant national or regional government, jurisdiction or recognised authority specifications.

2.1.1. The site meets the IUCN definition of a Protected Area and/or is recognised as a Conserved Area.

2.1.2. The site has been listed and correctly assigned one of the six IUCN Protected Area management categories or has been listed as an Other Effective Area-based Conservation Measure and assigned one of the four IUCN governance types in the WDPA.

2.1.3. The site has a current management plan or equivalent that is used to guide management priorities and activities.

3.5.3. Laws and regulations regarding the use of the site are accessible to civil society, stakeholders and rights-holders.

This study assesses the possibility of concrete sites from the national protected area network of Bulgaria to complete the application phase and screens the sites that are credible candidates for the IUCN recognition.

In addition, some other indicators were also considered to avoid obvious discrepancy of the PA category reserve with the Green List. Indicators are related to the involvement of interested parties in the PA management—indicators from criteria 1.1., 1.2., 2.4. and 3.3., where IUCN observes the availability of public discussions and consultation with stakeholders about site management, their participation in management planning, in decision-making and governance interaction. Indicators of criterion 3.6. about access, resource use, tourism activities and criterion 4.3. about the cultural values of the site are commented as well.

Criterion 2.2. that includes indicators about the size and connectivity of the site was also respected regarding protected objects with a very limited area that evidently could not complete the candidate phase.

2.3. Materials and methods

The study used the systematic research approach, including the following main stages: analysis of existing information, synthesis of analytical information, evaluation of the obtained results (Dettmer 2007).

In the first stage, primary information was collected for the IUCN Green List Standard and for the sites of the national protected areas network. Existing sources were used: WDPA, website of the Green List, guidelines for implementation of the Standard, Bulgarian Protected Areas Act, Ordinance for the Development of Protected Area Management Plans, Register of Protected Areas in Bulgaria of the Executive Environmental Agency, orders for the announcement of protected areas and management plans, data from the Regional Inspectorates of Environment and Water and publications.

In the second stage, the information was refined and summarized. Protected area management categories in Bulgaria are mapped out and structured, based on the indicators from the application phase of the Green List and considering national regulations. Excluded were categories that cannot meet the requirements of the GL application phase because of normative reasons in Bulgarian legislation.

At the third stage, the obtained results were evaluated. The possibilities for meeting the requirements of the global standard for protected area management from the application phase of the procedure were assessed and specific natural sites from the national PA network that could be trusted candidates for the IUCN Green List were identified. A SWOT analysis was done to find strengths weaknesses, opportunities and threats for these sites. A ranking of the sites by readiness for the IUCN Green List recognition was introduced. The steps of the study are presented in Fig. 2 below.

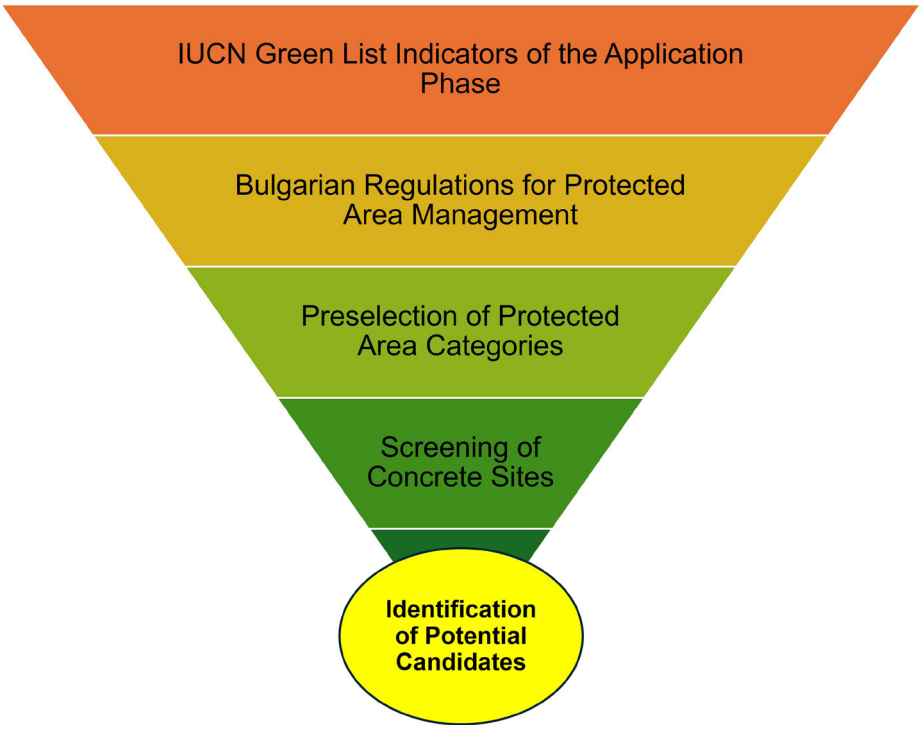

Figure 2. Conceptual scheme of the study.

3. Results and Discussion

The analysis of the Green List criteria system showed that the main directions for determining the achievements of the sites are related to ensuring legitimacy, transparency, accountability and adaptability of management. At the core is an understanding of the main site values and their threats, the socioeconomic context and the planned conservation measures. This, in turn, is related to the implementation of a long-term strategy and the management of environmental and socioeconomic conditions, risks and the use of resources in compliance with regulatory requirements. The success of the sites is determined by the extent of preserved natural and cultural values.

One of the sites obligations according to the Green List Standard, first provable in the application phase, is that they have a relevant management plan, which is used to navigate priorities and activities. The management plan is an essential tool in the management of protected areas, and this precondition is clearly highlighted in the IUCN criteria for including sites on the Green List. Various criteria specify the requirement for an effective and up-to-date management plan, and many of the indicators for different criteria are only achievable if a management plan is available. The management plan is necessary e.g. to satisfy the criteria of providing effective planning and management to address threats and challenges to the main values of the site, and to understand and reflect in the management goals and objectives the social and economic context of the site, including the positive and the negative social and economic impacts of governance. The availability of current management

plan is required already in one of the five indicators for completing the application phase.

By law, management plans in Bulgaria are developed for national and nature parks, reserves and managed reserves and this condition determines the review of these four protected area categories to meet the criteria of the IUCN Green List further.

Bulgarian legislation provides for the adoption of management plans for natural monuments and protected sites but does not require their development. And given the complexity of the process, its time-consuming and resource-intensive nature, the development of a management plan is rather an exception to these two categories. Therefore, they were not considered as potential Green List candidates in the present study.

The management plans projects of national parks, nature parks and managed reserves are subject to mandatory public discussion by law. This is the statutory means for civil participation and involvement of interested parties in the governance process. There is no requirement for public consultation on management plans projects of reserves, which excludes the possibility of stakeholder and local community participation in their management. This is logical regarding the strict nature protection regime of this protected area category. For the inclusion on the IUCN Green List, however, it does not meet the criteria of the Standard for ensuring consultation and coordination of the protected area management with the interested parties.

Also, the socioeconomic context, which is important aspect of the GL, in reserves is highly limited and is more common in adjacent territories, as these protected areas provide regulating and sustaining ecosystem services, but not direct material benefits to the population, given the regulatory restrictions therein. The Standard criteria, which is not related to the reserves, is regarding the management of access and use of resources for direct uses, as these are inadmissible to the reserve regime. Another irrelevant criterion is the demonstration of conservation of cultural values, which can be considered for reserves only in the context of cultural ecosystem services or intangible benefits, such as spiritual enrichment, aesthetic enjoyment, etc., but entry of visitors in reserves is also restricted.

Due to these conditions the Bulgarian reserves as a PA category are not considered proper sites for inclusion in the Green List.

In managed reserves, despite their strict conservation regime, there are still more opportunities for economic uses, compared to reserves, arising from the permissible activities of restoration, maintenance, management and regulation of populations or habitat conditions.

An example can be cited at the Srebarna Managed Reserve. As indicated in the Management Plan of Srebarna (Ministry of Environment and Water 2016), some of the conservation measures to restore the ecological conditions in the site are related to cutting the reed and removing the gray willow in order to ensure greater buoyancy of the reed islands, possibility of circulation of waters and silt under them and, accordingly, removal of larger amounts of silt than the annually accumulated. At the same time, the removal of gray willow and cut reed reduces the deposition of new silt. The mosaic and phased removal of plant biomass is mandatory to preserve the biotope diversity in all parts of the managed reserve. In the past, reed and papyrus resources are widely used

in the lives of the local people—as building materials or as raw materials for various handcrafts. By applying the above-mentioned conservation measures of cutting the reed, it can again be used directly as a natural resource.

On this point, the protected area category of managed reserve can more fully meet the requirements of the IUCN Green List for the socioeconomic context of the territory compared to reserves.

However, the most appropriate protected area categories for inclusion in the IUCN Green List are nature and national parks. Their management goals by law cover both the ecological and socioeconomic context of the territories, seeking for the development of recreational and tourism activities, traditional livelihoods, sustainable use of resources etc. They have a large area to ensure the connectivity of ecosystems and habitats. The presence of separate regional government structures—the park administrations, imply a serious capacity for effective management. Further, more than half of the area of all the reserves in Bulgaria falls into the national parks, which determines their importance for the network of protected areas in the country (Bancheva-Preslavska 2022) and indirectly ensures the participation of reserves in the IUCN Green List when park administrations cover the Standard.

The results from the preselection of protected area categories showed that the appropriate categories to be studied are nature and national parks and managed reserves. Natural monuments and protected sites are excluded because they do not have a management plan, which eliminates them already in the application phase. For reserves, additional criteria and indicators were considered to avoid obvious discrepancy in the candidate phase.

Based on the stated conditions and national regulations, all sites from the protected area categories national park (NatlP), nature park (NP) and managed reserve (MR) are further discussed below. A quick screening of all 49 Bulgarian sites from these categories and their readiness to meet the indicators from the application phase of the Green List is done in Table 2.

All sites meet four of the indicators, related to the inclusion in WDPA (2.1.2) and to the Bulgarian legislation that regulates the governance structure (1.1.1), governance type, correspondence to IUCN definitions of PA (2.1.1) and accessibility of laws for civil society (3.5.3). 18 sites meet the indicator for having a management plan (2.1.3), 11 sites do not meet it, and 20 sites partly meet it, because their management plan is not actual and therefore are considered not relevant applicants.

Corresponding to the application phase for inclusion in the Green List, the sites are studied primarily on the basic requirement of the Standard to have a current management plan, that is practically related to almost all other criteria. In addition, other characteristics are also commented on, such as the size, important to meet the design criterion of long-term conservation of the site main values in relation to sufficient size and ecological connectivity, which is a requirement for the candidate phase, but its consideration can prevent premature rejection of the site application.

The results of the survey showed that currently, of the three national parks in Bulgaria, only the Central Balkan National Park has an up-to-date management plan from 2016, although the other two have management plans projects, they are working on old, over 20-year-old plans. The current management plan of Pirin National Park from 2004 is not updated, despite the existence of a devel-

Table 2. Screening of Bulgarian protected areas for their readiness to complete the application phase of the IUCN Green List standard. Legend: "+" = meets the criteria; "+/-" = partly meets the criteria; "-" = does not meet the criteria.

Protected site	Meeting the indicators of the application phase				
	Good governance	Sound design and planning			Effective management
	1.1.1	2.1.1	2.1.2	2.1.3	3.5.3
Bulgarka NP	+	+	+	+	+
Central Balkan NatlP	+	+	+	+	+
Persina NP	+	+	+	+	+
Belasitsa NP	+	+	+	+	+
Srebarna MG	+	+	+	+	+
Dolna Topchiya MG	+	+	+	+	+
Uchilishtna Gora MG	+	+	+	+	+
Ardachlyka MG	+	+	+	+	+
Bogdan MG	+	+	+	+	+
Savchov Chair MG	+	+	+	+	+
Balabana MG	+	+	+	+	+
Chamdzha MG	+	+	+	+	+
Kazyl Cherpa (Zhenda) MG	+	+	+	+	+
Sini Bryag MG	+	+	+	+	+
Borovets MG	+	+	+	+	+
Izgoryaloto Gyune MG	+	+	+	+	+
Boraka MG	+	+	+	+	+
Chamlyka MG	+	+	+	+	+
Ibisha MG	+	+	+	+/-	+
Velyov Vir (Vodnite Lilii) MG	+	+	+	+/-	+
Pyasychna Liliya MG	+	+	+	+/-	+
Vrachansky Balkan NP	+	+	+	+/-	+
Shumensko Plato NP	+	+	+	+/-	+
Zlatni Pyasatsi NP	+	+	+	+/-	+
Rilski Manastir NP	+	+	+	+/-	+
Vitosha NP	+	+	+	+/-	+
Rusenski Lom NP	+	+	+	+/-	+
Pirin NatlP	+	+	+	+/-	+
Rila NatlP	+	+	+	+/-	+
Vylchi Prohod MG	+	+	+	+/-	+
Konski Dol MG	+	+	+	+/-	+
Tymna Gora MG	+	+	+	+/-	+
Momchilovski Dol MG	+	+	+	+/-	+
Shabanitsa MG	+	+	+	+/-	+
Baltata MG	+	+	+	+/-	+
Atanasovsko Ezero MG	+	+	+	+/-	+
Ostritsa MG	+	+	+	+/-	+

Protected site	Meeting the indicators of the application phase				
	Good governance	Sound design and planning			Effective management
	1.1.1	2.1.1	2.1.2	2.1.3	3.5.3
Gabra MG	+	+	+	+/-	+
Strandzha NP	+	+	+	-	+
Sinite Kamani NP	+	+	+	-	+
Persinski Blata MG	+	+	+	-	+
Vyrbov Dol MG	+	+	+	-	+
Kirov Dol MG	+	+	+	-	+
Kalfata MG	+	+	+	-	+
Patleyna MG	+	+	+	-	+
Haydushki Chukar MG	+	+	+	-	+
Dervisha MG	+	+	+	-	+
Momin Grad MG	+	+	+	-	+
Amzovo MG	+	+	+	-	+

oped project, because it is not accepted. Rila National Park Administration has been working with a management plan from 2001, since the beginning of the century. An update of the plan is prepared for the period 2015–2024 but is not implemented due to public criticism.

Only three of the eleven nature parks have an up-to-date management plan. These are Bulgarka Nature Park (management plan from 2021), Persina Nature Park (plan from 2016) and Belasitsa Nature Park (plan from 2016). Six of the others work with management plans, adopted between 2005–2011. Sinite Kamani Nature Park has no management plan, despite the legal requirements. Strandzha Nature Park also does not have an operational management plan, although in 2005 a project version was submitted for discussion to the Ministry of Environment and Water, but there is no decision of the Council of Ministers on its adoption. Vitosha Nature Park has a project of an updated management plan for the period 2015–2024, but it is neither adopted by the Council of Ministers.

In Fig. 3 a ranking of nature and national parks by readiness to complete the GL application phase was made according to the availability and relevance of their management plan, presenting also the size of the territories.

On the other hand, fourteen managed reserves have an up-to-date management plan. Three managed reserves have a management plan until the end of 2024, which however should be considered outdated. Nine managed reserves do not have a management plan, and the management plans for the remaining nine sites were adopted in the period 2002–2014.

By managed reserves, there is another issue. Additional requirements of the GL are considered to avoid obvious irrelevance in the candidate phase. The criterion for design for long-term conservation of major site values requires sites to be large enough and sufficiently connected to ecosystems and habitats. The Standard does not indicate a minimum size of the territory, but regarding this criterion, it is necessary to mention that two of the managed reserves

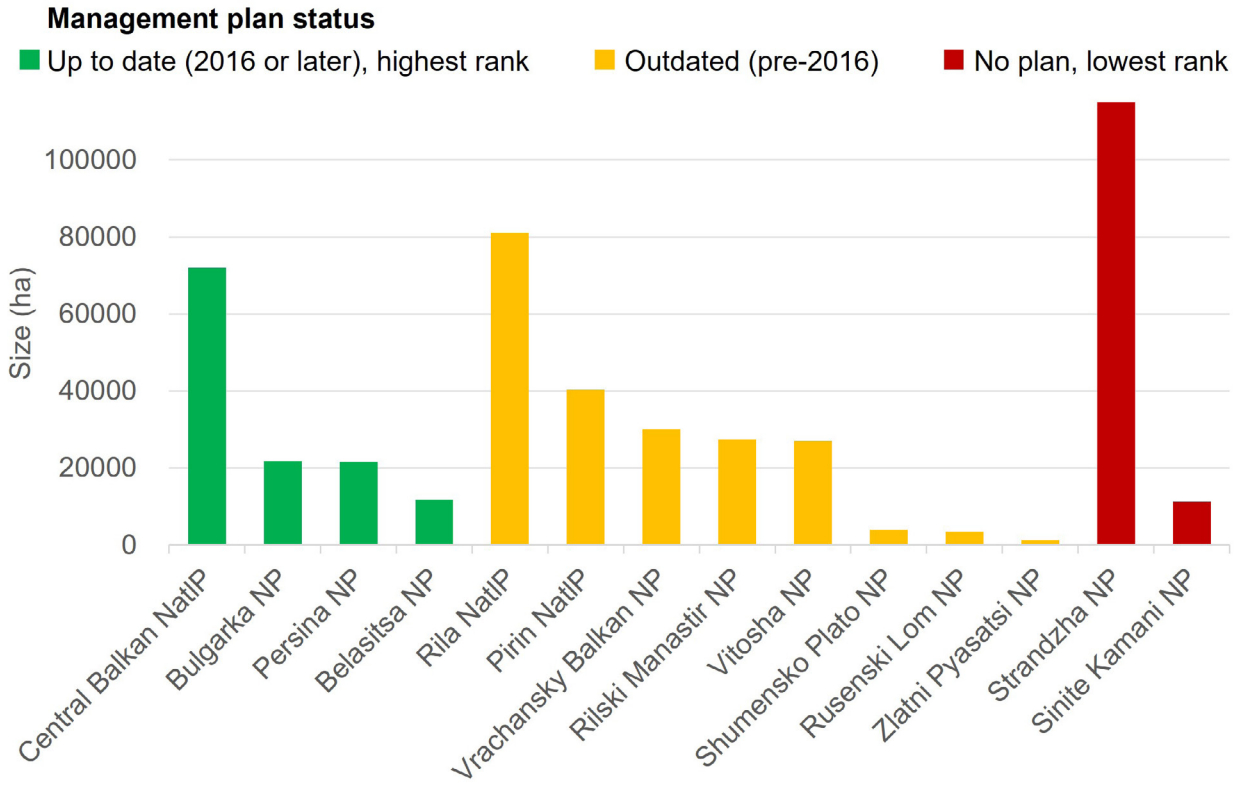

Figure 3. Ranking of Bulgarian nature and national parks by readiness for application on the IUCN Green List.

have a territory of less than 1 ha (Amzovo and Pyasachna Liliya), another five have a territory of less than 15 ha (Boraka, Velyov Vir, Dervisha, Momin Grad and Chamlaka), and in total 25 of all 35 managed reserves are less than 100 ha in size. The small areas cannot provide ecological connectivity as proven in the latest scientific research by Laner et al. (2024) and respectively, to meet the Green List criterion, although 11 of these small managed reserves have an up-to-date management plan.

Considering that managed reserves are part of the protected areas network, the case of managed reserves bordering other protected areas is also examined. If there are any, the neighbouring territories are mainly in the category protected site (PS) and do not have a management plan—one of the main indicators of the Green List. Regarding the criteria guidance of the Standard, if connectivity with other sites is essential, these sites should also be properly managed, accordingly having a management plan. Examples are Ibisha MR and its bordering Ostrov Tsibar PS, Balabana MR and Ptitsite PS, Chamdzha MR and Borsuk Kaya PS, Kazyl Cherpa MR and Borovete PS, Patleyna MR and Div Rozhkov PS. In addition, small managed reserves like: Momin grad, Chamlyka, Dervisha, etc. although bordering protected sites together do not even have a surface above 100 ha. Therefore, such small sites are not a priority for an application.

The case of Persinski Blata Managed Reserve is special. It is the only site included within the boundaries of a larger protected area—Persina Nature Park, which in turn has an up-to-date management plan. Therefore, Persinski Blata

can participate in the Green List together with an application from the nature park.

An example ranking by eligibility of application for the Green List, based on the relevance of the management plan and the size of the managed reserves is made in Fig. 4.

A SWOT analysis (Table 3) of the reviewed protected areas is also done to show their suitability for the Green List, underlying their strengths, weaknesses, opportunities, and threats. It helps with better analysis visualization and assessment of their readiness for the Green List.

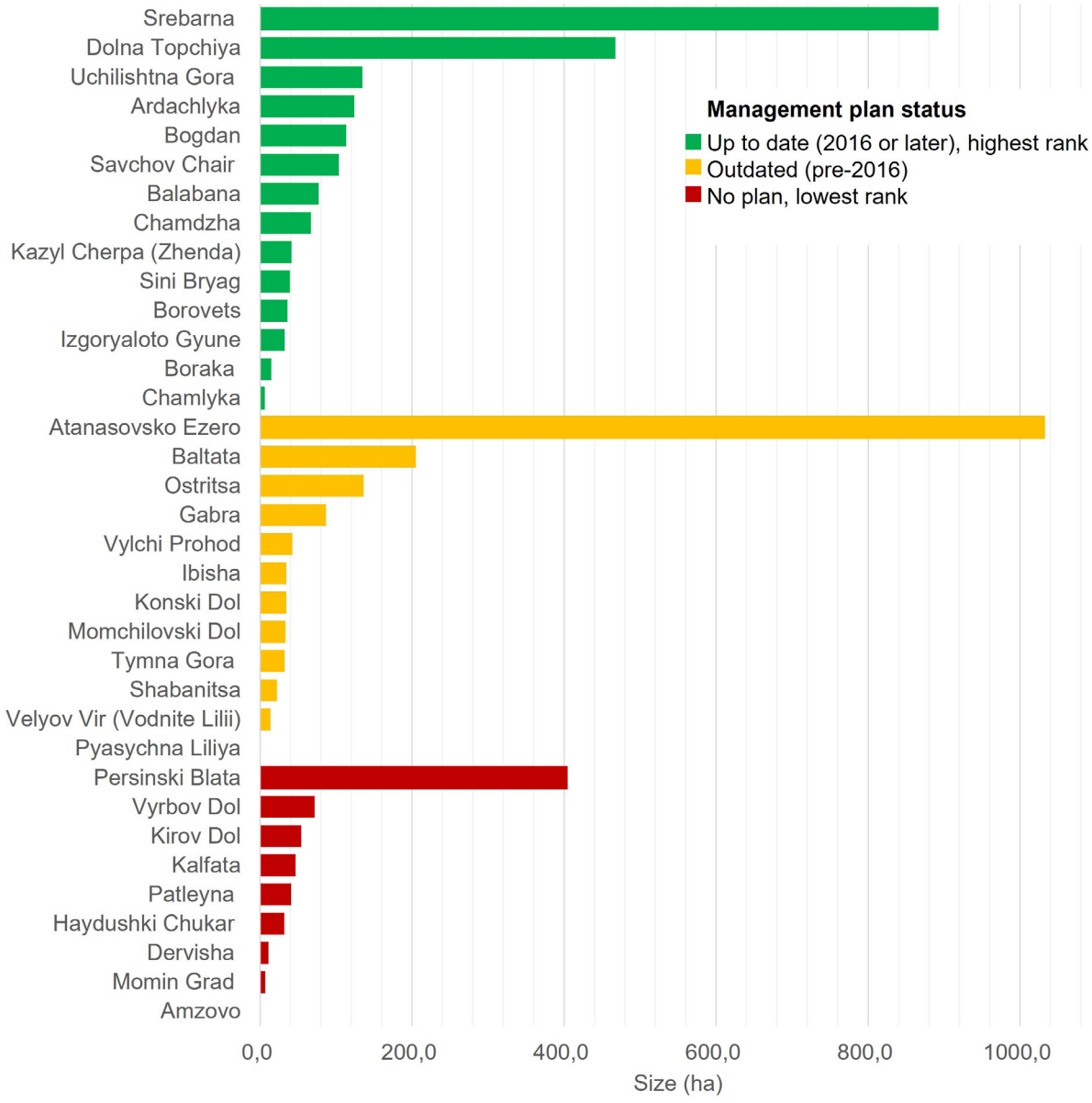

Figure 4. Ranking of Bulgarian managed reserves by readiness for application on the IUCN Green List.

Table 3. SWOT analysis of Bulgarian Managed Reserves, National and Nature Parks to complete the application phase of the IUCN Green List Standard.

Strengths	Weaknesses
• Protected areas are included in WDPA • PA management categories correspond to the recommendations of IUCN • Bulgaria has clear regulations regarding PA management • Bulgarian PA participate in international conventions and programs • The country has experience in global initiatives for nature protection • Nature and national parks have an own administration dedicated to their management • Nature and national parks have a large area for achieving their management goals	• Only three of six PA categories can complete the application of the Green List • Most of the sites have outdated or no management plan • There are many managed reserves with too small area to meet the IUCN requirements for size and connectivity • Bulgarian legislation does not regulate the support for management plans development
Opportunities	**Threats**
• One national park, 3 nature parks and 6 managed reserves are potential candidates for the IUCN Green List • Bulgarian government and local stakeholders could focus efforts to support the identified sites for being listed in the GL • Nature and national parks realize clearly defined ecological and social functions • Nature and national parks have administrative capacity for GL implementation	• Slow actualization of management plans hides a risk for sites being competitive over time • Regional Inspectorates of Environment and Water are not a direct administration of MR but reconcile many tasks and issues • Lower administration capacity of managed reserves • Managed reserves have primarily ecological functions

4. Conclusion

The Green List components and criteria were overviewed, as well as the three phases of applicant, candidate and periodical review. The study focused on the first step of the procedure when five indicators must be completed to proceed to the candidate phase. The five indicators from the application phase were further explored. Most significant resulted the availability of a management plan. Additionally, selected criteria regarding the risk of certain protected area categories to complete the candidate phase were also analysed. These additional criteria considered the Bulgarian regulations, which give the framework of PA management, the goals and restrictions in different PA categories.

Based on both the IUCN requirements and the national legislation the preselection of the corresponding protected area categories excluded from further research the categories natural monuments and protected sites, which by law do not meet the indicator for having a management plan from the application phase. The additional criteria that obviously eliminate the PA category reserve, related to involvement of stakeholders in PA management and use of natural resources, argued the exclusion of this category as well from the following screening of concrete natural sites.

All sites from the PA categories nature park, national park and managed reserve, existing in Bulgaria, were tested for their readiness to complete the five indicators from the application phase. Results show that from all three national parks, 11 nature parks and 35 managed reserves, only 18 sites meet all five indicators from the GL application phase. Based on the additional criterion

for enough size and ecological connectivity of the territories, an initial ranking of specific nature sites for their candidate preparedness was made. From the managed reserves, potential candidates resulted: Srebarna, Dolna Topchia, Uchilishtna Gora, Ardachlaka, Bogdan, Savchov Chair and Persinski Blata as part of Persina Nature Park.

On the other hand, all nature and national parks have an area of more than 1000 ha. Therefore, the park administrations with an up-to-date management plan—Central Balkan, Bulgarka, Persina and Belasitsa are identified as potential candidates for the GL and are recommended to take steps to prepare an application for inclusion in the IUCN Green List.

Beside their considerable area, a serious advantage for the parks over managed reserves is the presence of a park administration, which is associated with human resources and a separate budget for the management of the territory. As a regional governmental structure, they would effectively organize the process of preparing information and applying to the Green List.

As a result of the study can be concluded that one national (Central Balkan) and three nature parks (Bulgarka, Persina and Belasitsa) are the most credible Bulgarian candidates for the IUCN Green List. It reveals the possibility for Bulgaria to participate in the global initiative for effective management. Consequently, efforts and support of government and stakeholders should be focused on these sites to foster a successful recognition process.

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Additional information

Conflict of interest

No conflict of interest was declared.

Ethical statement

No ethical statement was reported.

Funding

No funding was reported.

Author contributions

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Data availability

All of the data that support the findings of this study are available in the main text or Supplementary Information.