UNIWERSYTET ZIELONOGÓRSKI

DYSKURS PRAWNICZY I ADMINISTRACYJNY 2/2022 ISSN 2657-926X

Katarzyna Szlachetko
University of Gdańsk
ORCID 0000-0003-4667-3756
katarzyna.szlachetko@prawo.ug.edu.pl

The legal challenge of universal dark skies protection. Some comments on opportunities and limitations

Keywords: dark skies protection, artificial light pollution, dark skies heritage

Summary. In public discourse, dark skies have long been considered as a common heritage of humanity that is being lost due to uncontrolled, excessive, and harmful artificial light emissions. The purpose of this paper is to identify an international model for the legal protection of dark skies. The qualification of the dark skies as a separate element of legal protection is problematic, because of the impossibility of defining its boundaries and territorial affiliation. However, the dark skies can be treated as a unique element of the cultural, natural (or mixed) landscape, which creates the identity of a site, giving it an outstanding universal value. The normative analysis included: The Convention Concerning the Protection of the World Cultural and Natural Heritage, the European Landscape Convention, and resolutions of international organizations whose mission is to protect dark skies. In addition, the paper considers the source of the human right to dark skies as an inalienable human right, which grows out of the right to a clean environment.

Wyzwanie prawne dotyczące powszechnej ochrony ciemnego nieba. Kilka uwag na temat możliwości i ograniczeń

Słowa kluczowe: prawna ochrona ciemnego nieba, zanieczyszczenie sztucznym światłem, dziedzictwo ciemnego nieba

Streszczenie. W dyskursie publicznym ciemne niebo od dawna jest uważane za wspólne dziedzictwo ludzkości, które jest zagrożone niekontrolowaną, nadmierną i szkodliwą emisją sztucznego światła, która stanowi specyficzny rodzaj „zanieczyszczenia światłem". Celem artykułu jest ustalenie międzynarodowego modelu prawnej ochrony ciemnego nieba. Kwalifikacja ciemnego nieba jako odrębnego elementu ochrony prawnej jest problematyczna ze względu na brak możliwości określenia jego granic oraz przynależności terytorialnej. Nocne niebo można jednak traktować jako unikatowy element krajobrazu kulturowego, naturalnego (bądź mieszanego), który tworzy tożsamość danego miejsca, nadając mu ponadprzeciętną uniwersalną wartość. W artykule analizie normatywnej poddano regulacje: Konwencji w sprawie ochrony światowego dziedzictwa kulturowego i naturalnego, Europejskiej Konwencji Krajobrazowej oraz rezolucji organizacji międzynarodowych, których misją jest ochrona ciemnego nieba. Dodatkowo poruszono kwestię źródła prawa człowieka do ciemnego nieba, które wyrasta z prawa do czystego środowiska, stanowiącego niezbywalne prawo człowieka.

Introductory remarks

The disappearance of the nocturnal landscape with its naturally starry dark skies is a growing problem in the modern world. According to scientific research conducted in 2016, up to 83% of humanity lives under skies polluted by artificial light and 1/3 of humanity has thus lost the opportunity to see the Milky Way at night[1]. What is more, the study shows that between 2012 and 2016, the artificially illuminated area of the Earth increased by 2.2 percent per year, and the total increase in radiation was 1.8 percent per year[2]. The loss of dark skies is a universal problem concerning not only metropolises[3] and big urban agglomerations, but also smaller cities, towns, and villages. Its source is excessive and uncontrolled emission of artificial light at night from streetlamps, squares, parking lots, sports facilities, office buildings, advertisements and billboards, illumination of architectural objects and other devices and objects belonging to outdoor lighting infrastructure[4]. The result of improper, excessive, and intrusive artificial lighting is a kind of environmental pollution called 'light pollution', which is the phenomenon of negative (even harmful) impact of man-made light on the environment and humans[5]. This kind of environmental pollution results from the alteration of natural night light levels by artificial light sources. This is one of the most visible contaminants in the Anthropocene epoch[6]. The increase in artificial light pollution is also induced by the advancement of modern technologies that make it possible to locate so-called mega-constellations of artificial satellites in low Earth orbit. It turns out that constellations of such satellites are visible from the Earth, especially right after their launch and also at dawn and dusk, providing a new source of artificial light pollution[7].

---

[1] The detailed statistics released by the researchers in „The new world atlas of artificial night skies brightness" also indicate that over 99% of the population of the United States and Europe lives under skies polluted with artificial light. Territorially, as much as 23% of the world's land area between 75°N and 60°S, as well as 88% of Europe and nearly half of the United States experience light-polluted nights. See more F. Falchi, P. Cinzano, D. Duriscoe, C.C.M. Kyba, C.D. Elvidge, K. Baugh, B.A. Portnov, N.A. Rybnikova, R. Furgoni, *The new world atlas of artificial night skies brightness*, "Science Advances" 2016, no. 2(6), p. 4.

[2] C.C.M. Kyba, T. Kuester, A. Sánchez del Miguel, K. Baugh, A. Jechow, F. Hölker, J. Bennie, Ch.D. Elvidge, K.J. Gaston, L. Guanter, *Artificially lit surface of Earth at night increasing inradiance and extent*, "Science Advances" 2017, no. 3(11), p. 2.

[3] See more: E.E. Goronczy, *Light pollution in Metropolises. Analysis, Impacts and Solutions, Springer Fachmedien Wiesbaden GmbH*, part of "Springer Nature 2021".

[4] The most common sources of light pollution are described on the International Dark-Skies Association website, https://www.darkskies.org/light-pollution/ (accessed on 25.03.2022).

[5] Cf. F. Hölker, *et al.*, *The Dark Side of Light: A Transdisciplinary Research Agenda for Light Pollution Policy*, „"Ecology and Society" 2010, p. 2.

[6] F. Falchi, R. Furgoni, T.A. Gallaway, *et al.*, *Light Pollution in USA and Europe: The Good, the Bad and the Ugly,* "Journal of Environmental Management" 2019, vol. 248, p. 1.

[7] A. Venkatesan, J. Lowenthal, P. Prem, M. Vidaurri, *The impact of satellite constellations on space as an ancestral global commons*, "Nature Astronomy" 2020, vol. 4, p. 1044; J.S. Koller, R.C. Thompson,

The negative influence of artificial light on the night landscape was first noticed by astronomers[8]. They pointed out that excessive emission hinders not only amateur, but also professional astronomical observations. The basis of those observations is the contrast disturbed by streams of artificial light[9]. In addition to the loss of aesthetic value provided by the dark skies, it is necessary to emphasize the degrading effect of improper artificial lighting on biodiversity (especially the biological cycles and rhythms of animals and plants), human physical and mental health, traffic safety, and on the economy (causing energy waste) and climate too (enhancing the greenhouse effect)[10]. The issues related to light pollution are of interdisciplinary matter and the problems within particular disciplines are complex, which is also specific for legal aspects that require consideration of environmental and nature protection law, spatial planning law and construction law. Therefore, the considerations presented in this paper focus on dark skies protection from the perspective of legal landscape protection at the international level. The normative analysis includes: the Convention Concerning the Protection of the World Cultural and Natural Heritage adopted by UNESCO, The European Landscape Convention and non-binding resolutions of international organizations with the mission to protect the dark skies.

The legal protection of dark skies as a world heritage of humanity

First of all, it is necessary to determine whether the dark skies can be treated as a separate object of protection? Such a distinction is actually justified. It is hard to disagree with the statement that: "any area observed at night is very different from the same area seen in sunlight"[11]. The uniqueness of the nightscape comes from its diversity and dynamism. It can be a lunar or moonless night landscape, a starry

L.H. Riesbeck, *Light pollution from the satellites. Space Agenda 2021, Aeorospace 2020, Center for Space, Policy and Strategy*, https://aerospace.org/paper/light-pollution-satellites (accessed on 29.01.2021). The unofficial sources predict that the number of artificial satellites will rise to 100,000 in the next decade, a sign of the scramble to colonize space not only by individual countries, but also by large private consortiums.

[8] N. Sperling, *The disappearance of darkness*, [in:] D.L. Crawford (ed.), *Light Pollution, Radio Interference, and Space Debris*, "ASP Conference Series" 1991, vol. 17, pp. 103-104.

[9] K. Narisada, D. Schreuder, *Light pollution and astronomy*, [in:] K. Narisada, D. Schreuder (eds.), *Light pollution. Handbook*, "Springer Netherlands" 2004, p. 115.

[10] See more: J. Falcón, A, Torriglia, D. Attia, F. Viénot, *et al.*, *Exposure to Artificial Light at Night and the Consequences for Flora, Fauna, and Ecosystems*, "Frontiers in Neuroscience" 2020, passim; F. Hölker, C. Wolter, E.K. Perkin, K. Tockner, *Light pollution is a biodiversity threat*, "Trends in Ecology & Evolution" 2010, vol. 25 no. 12, pp. 681-682; T. Gallaway, R.N. Olsen, D.M. Mitchell, *The economics of global light pollution*, "Ecological Economics" 2010, no. 69, pp. 658-665.

[11] E. Mocior, P. Franczak, J. Hibner, P. Krąż, A. Nowak, M. Rechciński, N. Tokarczyk, *Typologia naturalnych krajobrazów efemerycznych w świetle dotychczasowych badań*, [in:] P. Krąż (ed.), *Współczesne problemy i kierunki badawcze w geografii*, Kraków 2014, vol. 2, pp. 85-86.

night landscape with meteors and comets sometimes visible[12] or stellar landscapes related to urban or rural areas, geoparks, as well as natural areas or sites related to tangible and intangible astronomical heritage[13]. As Edensor points out, the dark skies take on a different form under the influence of the changing position of the stars and the cloud cover, which varies its degree of illumination, and also under the influence of a given phase of the moon[14]. The dynamics of the nightscape is thus determined by the arrangement of the celestial bodies relative to the Earth, the time of night, and the weather[15]. Undoubtedly, the inimitable qualities of dark skies – in fact – justify the separation of the night landscape.

Another question is what does the protection of the dark skies mean? Lee defines this protection in a very simplified, but universal way as maintaining the possibility of observing the skies in conditions similar to those that existed before the industrial age and the related population explosion[16]. The given normative analysis presents whether the dark skies can be also the subject of separate legal protection or as a protected element of a landscape. In the world's public discourse, the naturally dark night skies have long been recognized as a common and universal heritage, inseparably linked to human civilization.

The Convention Concerning the Protection of the World Cultural and Natural Heritage

Formally, the term "World Heritage" covers places and objects on Earth inscribed by the World Heritage Committee on the World Heritage List due to their unique and universal value for humanity. The List was introduced by the Convention Concerning the Protection of the World Cultural and Natural Heritage adopted by UNESCO at its 17th session in Paris on November 16, 1972, which entered into force on December 17, 1975 (the Republic of Poland was one of the first States to have ratified the Convention on May 6, 1976)[17]. Determining whether dark skies can be considered a separate World Heritage Site within the meaning of this Convention requires an analysis of the legal basis for qualifying a listing.

---

[12] *Ibidem*.

[13] https://www3.astronomicalheritage.net/index.php (accessed on 12.01.2021).

[14] T. Edensor, *Reconnecting with darkness: Gloomy landscapes, lightless places*, "Social & Cultural Geography" 2013, no. 14(4), p. 455.

[15] E. Mocior, P. Franczak, J. Hibner, P. Krąż, A. Nowak, M. Rechciński, N. Tokarczyk, *op. cit.*, pp. 85-86.

[16] W.H. Lee, *What Does it Mean to Preserve Dark Skies?*, [in:] *United Nations Educational, Scientific and Cultural Organization*, UNESCO Office in Mexico City, *The Right To Dark Skies*, p. 10. https://unesdoc.unesco.org/ark:/48223/pf0000246131 (accessed on 29.01.2022).

[17] Journal of Laws of 1976 no. 32 item 190.

The provisions of the Convention distinguish two categories of heritage: "cultural" and "natural", which are protected because of their "outstanding universal value". According to Article 1 of the Convention, "cultural heritage" is considered to be:

– monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings andcombinations of features, which are of outstanding universal value from the point of view of history, art, or science;
– groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity, or their place in the landscape, are of outstanding universal value from the point of view of history, art, or science;
– sites: works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.

Despite the obvious cultural values of the dark skies, which are ingrained in human civilization, especially: art, literature, science, philosophy, and religious beliefs[18], it cannot be considered cultural heritage on its own in the light of the cited Article 1. The unconditional basis in this case is the material factor or at least the participation of the anthropogenic factor in the creation of such heritage. The dark skies qualification issues also apply to natural heritage, which according to Article 2 of the Convention are:

– natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view;
– geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation;
– natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty.

Only the listed "goods of nature" can be protected under the Convention, and Article 2 is not subject to an expansive interpretation. At first glance, it may seem that the dark skies should be considered as s "natural site" that demonstrates "outstanding natural value from the point of view of science, conservation or natural beauty". However, the "delineated natural areas" condition for dark skies is problematic. The detailed criteria justifying protection are further elaborated in the "Operational Guidelines for the Implementation of the World Heritage Convention", which are intended to facilitate the implementation of its provisions.

[18] See more: D.W. Hamacher, K. De Napoli, B. Mott, *Whitening the Sky: light pollution as a form of cultural genocide*, "Journal of Dark Sky Studies" 2020, vol. 1, preprint.

The Operational Guidelines are amended from time to time to update approach of the World Heritage Committee. The Guidelines No. WHC 21/01 of July 31, 2021, are currently in force[19]. Although the 1972 Convention itself does not mention it, the Operational Guidelines also stipulate the protection of "mixed cultural and natural heritage", provided that some or all of the definitional criteria in Articles 1 and 2 are met. According to paragraph 49 of the Operational Guidelines, the "outstanding universal value" means "cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity". Despite its obvious qualities, dark skies do not withstand confrontation with the detailed assessment criteria, in particular "boundaries for effective protection". An essential requirement for establishing effective protection of nominated properties is the delineation of boundaries. The Operational Guidelines specify how the boundaries are to be drawn. Whereas it is not possible to draw precise boundaries of the dark skies as a separate object of protection, as well as it is not possible to determine its territorial affiliation to a particular state. The dark skies category is not subject to qualification as "property" in the juridical sense under the rules provided for other World Heritage sites, and therefore cannot be the sole element of nomination for inscription on the UNESCO World Heritage List[20].

This does not mean that dark skies cannot be protected as a natural attribute of another place or object. After all, dark skies are a natural environmental component of a place. Noteworthy is the concept of "Windows to the Universe" which are astronomical observatories. Their value is expressed by cultural attributes supported by intangible values from the point of view of science of astronomy, philosophy, and religion, as well as the natural attribute which is the unpredictable quality of dark skies enabling astronomical observations[21]. The UNESCO World Heritage criteria can be met for a site that constitutes a "Window to the Universe" which is composed of three elements: (1) the "dark skies" itself treated solely as an object of observation; (2) a specific place set apart in a permanent geographical, atmospheric, architectural, landscape or natural context; and (3) humanity using the observation site[22].

---

[19] https://whc.unesco.org/en/guidelines/ (accessed on 30.03.2022).

[20] M. Cotte, *How can UNESCO World Heritage Criteria be applied to the "Windows to the Universe" Sites?*, "Proceedings of the International Astronomical Union" 2015, no. 11(A29A), pp. 121-123.

[21] M.G. Smith, *Session 21.6. Preserving Dark Skies and Protecting against Light Pollution in a World Heritage Framework*, [in:] *Proceedings of the International Astronomical Union 2015 11 (A29A)*, pp. 480–481. See also: A. Loveridge, R. Duell, J. Abbari, M. Moffat, *Night Landscapes: A Challenge to World Heritage Protocols*, "Landscape Review" 2014, vol. 15(1), p. 64.

[22] M. Cotte, *op. cit.*, p. 122.

The European Landscape Convention

The European Landscape Convention, drawn up in Florence on 20 October 2020[23], provides a universal and laconic definition of "landscape", defining it as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Article 1(a) of the Convention). This Act refers to both natural landscape, *i.e.*, an area with no human influence (of a primordial nature)[24], the anthropogenic landscape, which is an area with varying degrees of human influence on its structure and functions[25], as well as takes into account the mutual permeation of natural and anthropogenic elements[26] forming the so-called cultural landscape[27]. As Solon points out, the term "landscape" in the Convention's terms refers to "the spatial and material dimension of terrestrial reality and denotes a complex, heterogeneous system consisting of forms, relief and waters, vegetation and soils, rocks and atmosphere, and the work of human hands"[28]. The scope of the Convention is broad. According to Article 2, it covers natural, rural, urban, and peri-urban areas. It includes land, inlandwater and marine areas. What is more, it concerns landscapes that might be considered outstanding, as well as everyday or degraded landscapes. The definition of landscape will be narrowed by Article 15(1), which refers to "the territory or territories" to which the Convention will apply. These two cited provisions clearly express that only 'the part of the land' (possibly also inland water and marine areas) is involved. This means that, under the Convention, the nocturnal dark skies landscape cannot constitute a distinct and separate object of protection.

Additionally, according to Recommendation CM/Rec (2008)3 of the Committee of Ministers to member states on the guidelines for the implementation of the European Landscape Convention (adopted by the Committee of Ministers on 6 February 2008 at the 1017th meeting of the Ministers' Deputies): "Attention

---

[23] Journal of Laws of 2006 no. 14 item 98.

[24] See J. Kovarik, *Sustainability and Natural Landscape Stewardship: A US Conservation Case Study,* [in:] R. Brinkmann, S.J. Garren (eds.), *The palgrave handbook of sustianability. Case study and practical solutions*, The Palgrave MacMillan 2018, p. 22.

[25] U. Myga-Piątek, *Natural, anthropogenic, and cultural landscape and attempt to define mutual relations and the scope of notions*, "Prace Komisji Krajobrazu Kulturowego" 2014, no. 23, p. 46.

[26] The Convention takes into account the classical approach represented by A. von Humboldt, P. Vidal de la Blanche and A. Hettner, who defines landscape as a complex whole including elements from the natural and social sphere. See: U. Myga-Piątek, *op. cit.*, pp. 40-41.

[27] The cultural landscape is an area of "integration of natural and cultural heritage". See more: Z. Myczkowski, *Krajobraz kulturowy – fenomen integracji ochrony dziedzictwa kulturowego i przyrodniczego*, "Wiadomości Konserwatorskie" 2018, no. 56, pp. 70-87.

[28] J. Solon, *Krajobraz jako przestrzeń integrująca różne podejścia do ochrony dziedzictwa przyrodniczego i kulturowego oraz kształtowania warunków życia społeczeństwa,* [in:] S. Ratajski, M. Ziółkowski (eds.), *Krajobraz kulturowo-przyrodniczy z perspektywy społecznej*, Warszawa 2015, p. 30.

is focused on the territory as a whole, without distinguishing between the urban, peri-urban, rural and natural parts, or between parts that may be regarded as outstanding, everyday or degraded; it is not limited to cultural, artificial and natural elements: the landscape forms a whole whose constituent parts are considered simultaneously in their interrelations"[29]. It seems that such a holistic approach allows for the inclusion of the dark skies in the category of a protected landscape element. The Convention indicates the need for States Parties to pursue a "landscape policy" that means an expression by the competent public authorities of general principles, strategies and guidelines that permit the taking of specific measures aimed at the protection, management and planning of landscapes[30]. According to the Guidelines, it is about drawing up specific landscape policies as incorporated integral part of sectoral policies influence on changes of the territory, so that the landscape is not an add-on to other policies but is an integral part of them. The Convention regulation recommends four activities: (1) promoting "landscape protection"[31]; (2) "landscape management"[32] and (3) "landscape planning"[33], as also (4) organizing co-operation between the Parties[34].

The Convention allows Parties the flexibility to implement its provisions in accordance with national law and respecting the principle of subsidiarity. Due to the lack of explicit regulations for the protection of the night landscape, it should be considered that the dark skies as a landscape element can only be protected on the basis of internal (national) legal regulations. In this matter, the practice varies greatly, depending on the general awareness of the threat of light pollution, which leads to the loss of mankind's original heritage of unpolluted dark skies.

Soft law of international organizations

The special effort to protect the dark skies is made by the International Astronomical Union, which brings together professional astronomers from all over the world[35]. Decisions and recommendations of the International Astronomical Union are made

[29] https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=09000016802f80c9 (accessed on 30.03.20220).

[30] Article 1(b) of the Convention.

[31] That means "actions to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value derived from its natural configuration and/or from human activity" (Article 1 (d) of the Convention).

[32] That means "action, from a perspective of sustainable development, to ensure the regular upkeep of a landscape, so as to guide and harmonise changes which are brought about by social, economic and environmental processes" (Article 1 (e) of the Convention).

[33] That means "a strong forward-looking action to enhance, restore or create landscapes" (Article 1 (f) of the Convention).

[34] The principles of cooperation are set forth in Chapter III of the Convention.

[35] https://www.iau.org/news/pressreleases/detail/iau2201/ (accessed on 30.03.2022).

by its General Assembly, so they are primarily addressed to professional members. However, due to the great authority of this Organization, the factual impact of the resolution is much greater than its legal nature implies. Therefore, very important step in drawing attention to the dark skies, as a world heritage, was the adoption by the International Astronomical Union of the Resolution No. A1 "Protection of the Night Sky" (XXIIIrd IAU General Assembly, Kyoto 1997)[36]. While this document is not generally binding, it does make a very clear recognition of the dark skies as the heritage of all humanity, which should therefore be preserved untouched. The resolution strongly indicated that protection of the night sky should be no less than has been given to the world heritage sites on Earth. Besides, this document marked an important point for the spread of considerations about the legal protection of dark skies.

Another non-binding act that has strengthened 'the dark skies protection matter' was the La Palma Declaration made at the International Conference in Defence of the Quality of the Night Skies and the Right to Observe the Stars (the Canary Islands, 2007)[37]. The meeting was organized under the auspices of UNESCO. Although, the promulgated document should be treated more as a manifesto (supported by international scientific organizations and expert institutions from 42 countries[38]), it included an explicit declaration of human right to dark skies. According to point one of the La Palma Declaration (2007): "An unpolluted night skies that allows the enjoyment and contemplation of the firmament should be considered an inalienable right of humankind equivalent to all other environmental, social, and cultural rights, due to its impact on the development of all peoples and on the conservation of biodiversity". The declaration very strongly emphasized that the preservation, protection and restoration of natural and cultural heritage of night landscapes is a commitment to work together for the quality of life. In addition, the signatories underlined that it is not possible to separate the conservation mission of places such as those belonging to the World Network of Biosphere Reserves, Ramsar wetlands, World Heritage sites, national parks and all those protected areas that combine unique landscape and natural values that also depend on the quality of the night skies. The Declaration made clear the need for action to save the dark skies as a common heritage, but due to its non-binding nature, it could only underline the need for raising awareness and spreading information among the entities responsible for the dark skies' protection. No landscape conservation policy can be regarded as effective and complete without taking into

[36] https://www.iau.org/static/resolutions/IAU1997_French.pdf (accessed on 30.03.2022).

[37] http://research.iac.es/congreso/quietdarkskies2020/media/2007StarlightDeclarationEN.pdf (accessed on 30.03.2022).

[38] C. Marin, *Starlight: a common heritage*, [in:] D. Valls-Gabaud, A, Boksenberg, *The role of Astronomy in Society and Culture*, "Proceedings IAU Symposium" 2009, no. 260, p. 449.

account the possibility of preserving naturally unpolluted dark skies. This impact on awareness should be multiphased and involve authorities at the international, national, regional and local levels. It was promoted by (among others) UNESCO, the International Astronomical Union, the UN-World Tourism Organisation (UNWTO) and the Instituto de Astrofísica de Canarias (IAC), with the support of several International Programmes and Conventions, such as the World Heritage Convention (WHC), the Convention on Biological Diversity (CBD), the Ramsar Convention on Wetlands, the Convention on Migratory Species (CMS), the Man and the Biosphere (MaB) Programme, and the European Landscape Convention[39].

In response to an appeal from La Palma, International Astronomical Union unanimously adopted Resolution B5 in Defense of the Night Skies and the Right to Starlight at the XXVII General Assembly in Rio de Janeiro (2009). The initiators of the resolution were the IAU Executive Working Group, the International Year of Astronomy 2009 Cornerstone Project Dark Skies Awareness Working Group, the Starlight Initiative, and the IAU Division XII/Commission 50 Working Group on Controlling Light Pollution[40]. The following Act treats the dark skies as a source of inspiration, emphasizes its scientific and cultural values, the phenomenon of the deteriorating view of the night skies. In addition, the resolution pointed out the need to educate how to use the intelligent lighting. It should be noted that the resolution was adopted during the International Year of Astronomy commemorating the 400th anniversary of the first recorded astronomical observations with a telescope by Galileo and the publication of Johannes Kepler's Astronomia nova[41]. The main objectives of the International Year of Astronomy explicitly included: "Facilitate the preservation and protection of the world's cultural and natural heritage of dark skies in places such as urban oases, national parks and astronomical sites". The provisions of Resolution B5 reaffirmed and extended the La Palma Declaration:

– an unpolluted night skies that allows the enjoyment and contemplation of the firmament should be considered a fundamental socio-cultural and environmental right, and that the progressive degradation of the night skies should be regarded as a fundamental loss;
– control of obtrusive and skies glow-enhancing lighting should be a basic element of nature conservation policies since it has adverse impacts on humans and wildlife, habitats, ecosystems, and landscapes;

[39] https://www3.astronomicalheritage.net/index.php/show-theme?idtheme=21 (accessed on 30.03.2022).
[40] https://starlight2007.net/iauresolutionb5.html (accessed on 30.03.2022).
[41] https://www.iau.org/public_press/iya/ (accessed on 30.03.2022).

– responsible tourism, in its many forms, should be encouraged to take on board the night skies as a resource to protect and value in all destinations;
– IAU members be encouraged to take all necessary measures to involve the parties related to skiesscape protection in raising public awareness – be it at local, regional, national, or international level – about the contents and objectives of the International Conference in Defence of the Quality of the Night Skies and the Right to Observe Stars.

The presented IAU Resolutions and La Palma Declaration do not constitute generally applicable law that would impose specific obligations on individual countries to ensure dark skies protection. The norms expressed therein are only internally binding in a given organization or represent a voluntary commitment of certain communities to undertake initiatives to protect the natural and cultural heritage of dark skies. Although the acts reviewed above constitute a rather unsanctioned soft-law system, they are nonetheless the source of basic policy standards for dark skies protection. Because of the authority of their signatories, they have significant factual impact, which should be appreciated.

An important component of the voluntary (soft) model for legal protection of dark skies is the certification system created by the U.S. International Dark-Sky Association. This organization has been working since 1988. Its dark skies protection efforts include publishing activities (handbooks, guidelines, policy documents) and efficient influence the creation of best practices in responsible outdoor lighting. IDA's flagship program is "The International Dark Sky Places". The aim is to recognize and promote excellent stewardship of the night skies in 5 categories: (1) International Dark Sky Community; (2) International Darky Sky Parks; (3) International Darky Sky Reserves; (4) International Dark Sky Sanctuaries[42]. Category status may be granted to an application that meets rigorous location requirements and technical standards for outdoor lighting, which ensure the protection of dark skies from harmful artificial light emission[43]. IDA works with administrators of certified sites to promote their work through media relations, member communications, and social media. The international designation of dark sky sites helps increase the visibility of designated locations and promotes increased tourism and local economic activity. Despite the real benefits for dark sky protection, Dark Sky Places are not universally protected forms of conservation. This model is based only on the recognition and authority of IDA.

[42] https://www.darksky.org/our-work/conservation/idsp/ (accessed on 30.03.2022).
[43] IDA, *How To Become An International Dark Skies Place?*, https://www.darkskies.org/our-work/conservation/idsp/become-a-dark-skies-place/ (accessed on 30.03.2022).

The right to dark skies versus the right to a clean environment

The issue of dark skies protection as a separate object or as an element of the nocturnal landscape (natural, cultural, or mixed) is an open discussion, not without controversy. Currently, there is a lack of evident legal means of protection at the international level that would provide a common model for dark skies protection. Meanwhile, it seems that this is the necessary impetus to take action at the national level. Legislative practice of individual countries is very diverse in this respect – from dedicated legal acts (France, Croatia, or Slovenia), through consideration of light pollution in nature protection regulation (such as in Germany, Hungary, or Spain, in the United States) to the lack of effective norms (as for example in Poland). There should be no doubt that the right to the dark skies' heritage grows out of the category of human rights, specifically the right to a clean environment.

In public discourse, the 'right to a clean environment' is considered an 'inalienable human right[44]. On October 21, 2021, the UN Human Rights Council adopted a milestone resolution recognizing the human right to a clean, healthy and sustainable environment as an important human right[45]. Although the resolution does not explicitly mention protection from environmental light pollution, as a universal manifesto it should also be an important step in recognizing naturally dark skies as an inherent part of the environment. Taking into account the results of scientific research, which testify to the undoubtedly negative impact of external artificial lighting on human physical and mental health, as well as nature and the natural landscape of the dark sky – the concept of "clean environment" should be enriched with an additional component, *i.e.*, reduction of excessive and harmful emission of artificial light.

Conclusion

In the new approach to landscape protection, P. Laureano points out the need to take into account: (1) the diversity and dynamics of landscapes, (2) variability of landscape definition and the need to adapt it to regional conditions, (3) integrated approach – taking into account "nature and culture", both tangible and intangible heritage; (4) protection not only of "extraordinary values", but simply everyday life (which is a great value in itself – note by K.Sz.), taking care not only of monuments, but also ecosystems; (5) not

[44] See more: G. Handl, *The Human Right to a Clean Environment and Rights of Nature: Between Advocacy and Reality*, [in:] A. Von Arnauld, K. Von der Decken, & M. Susi (eds.), *The Cambridge Handbook of New Human Rights: Recognition, Novelty, Rhetoric*, Cambridge 2020, pp. 137-153.

[45] https://documents-dds-ny.un.org/doc/UNDOC/GEN/G21/289/50/PDF/G2128950.pdf?OpenElement (accessed on 30.03.2022).

only protection, but also prevention, management and security, (6) caring not only about "heritage", but also about society and people[46]. The presented tips fit perfectly with the concept of protecting the nightscape, of which the dark and starry sky is a key element. With no doubt, the primary threat to this heritage of humanity is artificial light pollution, which is still a rather neglected danger. On the other hand, it is not possible to completely abandon external lighting sources, which are the main cause of polluted dark skies. The answer to this challenge should be a sustainable outdoor lighting policy that aims to protect dark skies while ensuring that people's artificial light needs are met after nightfall.

Unfortunately, legal protection of nocturnal landscapes with a natural dark skies' component is ineffective at the international level. A systemic change in international landscape protection is necessary and should take into account the importance of dark skies not only because of unique aesthetic values, but also for the protection of ecosystems, human health, and life. The dark skies are an indivisible element of the natural environment and cultural property, which has accompanied mankind since time immemorial, creating the identity of a place, both in its material and immaterial dimensions. Legal protection of the landscape should be comprehensive – taking into account its diversity, providing flexibility in the selection of protective measures, which is particularly important in the context of the specificity and dynamics of the night skies.

References

Cotte M., *How can UNESCO World Heritage Criteria be applied to the "Windows to the Universe" Sites?,* Proceedings of the International Astronomical Union 2015, no. 11(A29A).

Edensor T., *Reconnecting with darkness: Gloomy landscapes, lightless places*, "Social & Cultural Geography" 2013, no. 14(4).

Falchi F., Furgoni R., Gallaway T.A., et. al., *Light Pollution in USA and Europe: The Good, the Bad and the Ugly*, "Journal of Environmental Management" 2019, vol. 248.

Falchi F., Cinzano P., Duriscoe D., Kyba C.C.M., Elvidge C.D., Baugh K., Portnov B.A., Rybnikov N.A, Furgoni R., *The new world atlas of artificial night sky brightness*, "Science Advances" 2016, no. 2(6).

Gallaway T., Olsen R.N., Mitchell D.M., *The economics of global light pollution*, "Ecological Economics" 2010, no. 69.

Goronczy E.E., *Light pollution in Metropolises. Analysis, Impacts and Solutions*, Springer Fachmedien Wiesbaden GmbH, part of "Springer Nature 2021".

Hamacher D.W., De Napoli K., Mott B., *Whitening the Sky: light pollution as a form of cultural genocide*, "Journal of Dark Sky Studies" 2020, vol. 1, preprint.

Handl G., *The Human Right to a Clean Environment and Rights of Nature: Between Advocacy and Reality*, [in:] A. Von Arnauld, K. Von der Decken, & M. Susi (eds.), *The Cambridge Handbook of New Human Rights: Recognition, Novelty, Rhetoric*, Cambridge 2020.

[46] P. Laureano, *From the monument to the people: the new landscape vision to manage ecosystems with traditional knowledge and its innovative use*, [in:] Conference proceedings UNESCO, *The International Protection of Landscapes*, Florence, Italy, September 2012, vol. 19-21, p. 7.

Hölker F., Wolter C., Perkin E.K., Tockner K., *Light pollution is a biodiversity threat*, "Trends in Ecology & Evolution" 2010, vol. 25, no. 12.
Hölker F., *et al.*, T*he Dark Side of Light: A Transdisciplinary Research Agenda for Light Pollution Policy*, "Ecology and Society" 2010.
Koller J.S., Thompson R.C., Riesbeck L.H., *Light pollution from the satellites. Space Agenda 2021*, Aeorospace 2020, Center for Space, Policy and Strategy. https://aerospace.org/paper/light-pollution-satellites.
Kovarik J., *Sustainability and Natural Landscape Stewardship: A US Conservation Case Study*, [in:] R. Brinkmann, S.J. Garren (eds.), *The palgrave handbook of ustainability. Case study and practical solutions*, The Palgrave MacMillan 2018.
Kyba C.C.M., Kuester, T., Sánchez del Miguel A., Baugh K., Jechow A., Hölker F., Bennie J., Elvidge Ch.D., Gaston K.J., Guanter L., *Artificially lit surface of Earth at night increasing inradiance and extent*, "Science Advances" 2017, no. 3(11).
Laureano P., *From the monument to the people: the new landscape vision to manage ecosystems with traditional knowledge and its innovative use*, [in:] Conference proceedings UNESCO, *The International Protection of Landscapes*, Florence, Italy, September 2012, vol. 19-21.
Lee W.H., *What Does it Mean to Preserve Dark Skies?,* [in:] United Nations Educational, Scientific and Cultural Organization, UNESCO Office in Mexico City, *The Right To Dark Skies.*
Loveridge A., Duell R., Abbari J., Moffat M., *Night Landscapes: A Challenge to World Heritage Protocols*, "Landscape Review" 2014, vol. 15(1).
Marin C., *Starlight: a common heritage*, [in:] D. Valls-Gabaud, A, Boksenberg, *The role of Astronomy in Society and Culture*. Proceedings IAU Symposium 2009, no. 260.
Mocior E., Franczak P., Hibner J., Krąż P., Nowak A., Rechciński M., Tokarczyk N., *Typologia naturalnych krajobrazów efemerycznych w świetle dotychczasowych badań. Współczesne problemy i kierunki badawcze w geografii*, vol. 2, Kraków 2014.
Myczkowski Z., *Krajobraz kulturowy – fenomen integracji ochrony dziedzictwa kulturowego i przyrodniczego*, "Wiadomości Konserwatorskie" 2018, no. 56.
Myga-Piątek U., *Natural, anthropogenic and cultural landscape and attempt to define mutual relations and the scope of notions*, "Prace Komisji Krajobrazu Kulturowego" 2014, no. 23.
Narisada K., Schreuder D., *Light pollution and astronomy*, [in:] K. Narisada, D. Schreuder (eds.), *Light pollution. Handbook*, Springer Netherlands 2004, p. 115.
Smith M.G., *Session 21.6. Preserving Dark Skies and Protecting against Light Pollution in a World Heritage Framework*, [in:] Proceedings of the International Astronomical Union 2015 [Online] 11 (A29A).
Solon J., *Krajobraz jako przestrzeń integrująca różne podejścia do ochrony dziedzictwa przyrodniczego i kulturowego oraz kształtowania warunków życia społeczeństwa*, [in:] S. Ratajski, M. Ziółkowski (eds.), *Krajobraz kulturowo-przyrodniczy z perspektywy społecznej*, Warszawa 2015.
Sperling N., *The disappearance of darkness*, [in:] D.L. Crawford (ed.), *Light Pollution, Radio Interference, and Space Debris, ASP Conference Series* 1991, vol. 17, IAU Colloquium 112.
Venkatesan A., Lowenthal J., Prem P., Vidaurri M., *The impact of satellite constellations on space as an ancestral global commons*, "Nature Astronomy" 2020, vol. 4.