ЗБЕРЕЖЕННЯ ЕКОЛОГІЧНОГО СТАНУ МОРСЬКОЇ ПРИБЕРЕЖНОЇ ЗОНИ УКРАЇНИ ЯК СТРАТЕГІЧНА ЦІЛЬ БЛАКИТНОГО ЗРОСТАННЯ

Актуальність: На сьогоднішній день питання охорони та збереження морської прибережної зони є одним із найважливіших напрямків у законодавчій та науковій галузях Світу, зокрема Європейського Союзу. Відомо, що прибережні екосистеми є одними з найпродуктивніших на Землі. Вони надають основні екосистемні послуги, такі як захист узереження від штормів, місця налаштування та інші. Переконливість актуальності та безперечної науково-практичної значущості цих питань підтверджується імплементацією директив та інших нормативних актів ЄС у законодавство України. Один з прикладів може слугувати імплементація Рамкової Директиви з Морської стратегії ЄС 2008/56/. На підставі якої розпорядженням Кабінету Міністрів України від 11 жовтня 2021 р. № 1240-р схвалена Морська природоохоронна стратегія України. У цій стратегії особлива увага приділяється збереженню та відтворенню екосистемних щитових зон та забезпеченню блакитних зростань. Інші приклади включують законодавчі акти від 11 жовтня 2021 р. № 1240-р, які мають бути включені, зокрема і до планів інтегрованого управління прибережними територіями Азовського та Чорного морів. Значно підкреслює актуальність й те, що за підтримки Європейської комісії експерти різних галузей причорноморських країн розробляють концептуальні документи. Одним з таких документів є Бургаська Візія (Burgas Vision Paper). У цьому документі визначено спільне бачення експертів та завдання щодо наближення до «Ініціативи блакитного зростання» для досліджень та інновацій у Чорному морі».

Мета та завдання: Метою цієї статті є аналіз чинників збереження екологічного стану морської прибережної зони як складової Морської природоохоронної стратегії України та блакитного зростання. Мета дослідження полягає в аналізі завдань та перспектив збереження екосистемних щитових зон та забезпечення блакитних зростань. Мета також полягає в визначенні основних наукових положень та поняття прибережної смуги та їх інтегрованого управління, вивченні стратегічних цілей та пріоритетних завдань усіх Стратегічних цілей морської природоохоронної політики та виокремлення їх відповідно до концепції блакитного зростання.

Матеріали та методи: Вихідною інформацією для досліджень слугували законодавчі акти у галузі екології Європейського Союзу та України, вітчизняні та зарубіжні наукові матеріали за напрямком блакитного зростання, береговими смугами морів України та інтегрованого управління прибережною зоною. У роботі використовувалися діалектичний метод наукового пізнання, логічний аналіз вихідної інформації.

Результати: У статті узагальнено наведено визначені основні наукові положення та поняття прибережної захисної смуги та прибережної зони та інтегрованого управління ними. На підставі концептуального документу (Burgas Vision Paper) опановано загальні напрямки Чорноморської програми стратегічних досліджень та інновацій, яка орієнтована на наочання та підтримку продуктивного, здорового, стійкого, стабільного та більш ефективного Чорного моря до 2030 року. Проведено аналіз стратегічних цілей та пріоритетних завдань Морська природоохоронна стратегія України та виокремлення їх відношення до прибережної смуги моря.

Висновки: В статті проведено аналіз чинників збереження екологічного стану морської прибережної зони як складової Морської природоохоронної стратегії України та блакитного зростання. Створення Європейського законодавчих актів, міжнародних проєктів, спрямованих на захист довкілля, моніторинг характеристик природних ресурсів, розвиток «Блакитної економіки» у країнах Європи та, зокрема, у Чорноморському регіоні є значним підтриманням для покращення екологічного стану прибережної зони морів України. За підтримки Європейської комісії експерти розглянули ризики щодо впливу морських ресурсів, у тому числі на здоров'я людей, та визначили стратегічні напрямки розробки нормативно-правових актів.

На підставі проведенного аналізу пріоритетних завдань усіх Стратегічних цілей морської природоохоронної політики України можна констатувати, що майже всі вони мають пряме чи опосередковане відношення до прибережних смуг морів України. Це, у свою чергу, означає, що дослідження прибережної смуги морів України мають переконливу актуальність та безперечно науково-практичної значущості дослідження, зокрема, як на національному, так і на регіональному рівнях.

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Today, the issue of protection and preservation of the marine coastal zone is one of the most important directions in the legislative and scientific sectors of the World, in particular the European Union. Coastal ecosystems are known to be among the most productive on Earth. They provide essential ecosystem services such as coastal protection from storms, fish feeding grounds and others. The convincing relevance and absolute scientific and practical significance of these issues is confirmed by the implementation of EU directives and other regulations in the legislation of Ukraine. The implementation of the EU Marine Strategy Framework Directive 2008/56/ can serve as one example. On the basis of which the Decree of the Cabinet of Ministers of Ukraine of October 11, 2021 No. 1240-p approved the Marine Environmental Protection Strategy of Ukraine. In this strategy, special attention is paid to the conservation and restoration of the ecological state of coastal protective strips and the identification of the most dangerous pollutants. Also, further development and approval of a list of measures that should be included, in particular, in the plans for integrated management of the coastal territories of the Azov and Black Seas. Significantly emphasizes the relevance and the fact that, with the support of the European Commission, experts from various sectors of the Black Sea countries are developing conceptual documents. One such document is the Burgas Vision Paper. This document defines the shared vision of the experts and the tasks for approaching the "Blue Growth Initiative for Research and Innovation in the Black Sea".

**Aim and tasks.** The aim of this paper is to analyze the factors of preserving the ecological state of the marine coastal zone as a component of the Marine Environmental Strategy of Ukraine and blue growth. The aim is decomposed into the following main tasks: to determine the general scientific provisions and concepts of the coastal strip and zone, their integrated management, to analyze the strategic aims and priority tasks of the state environmental protection policy in accordance with the concept of blue growth.

**Materials and Methods.** The initial information for the research was the legislative acts in the field of ecology of the European Union and Ukraine, domestic and foreign scientific materials in the direction of blue growth, coastal strips of the seas of Ukraine and integrated coastal zone management. The work used the dialectical method of scientific knowledge, logical analysis of the initial information.

**Research results.** The paper summarizes the identified main scientific provisions and concepts of the coastal protection strip and coastal zone and their integrated management. Based on the conceptual document (Burgas Vision Paper), the general directions of the Black Sea Strategic Research and Innovation Program are described, which is aimed at achieving and maintaining a productive, healthy, resilient, sustainable, and better-valued Black Sea by 2030. An analysis of the strategic goals and priority objectives of the Marine Environmental Strategy of Ukraine was carried out and their relationship to the coastal strip of the sea was highlighted.

**Conclusion.** This paper analyzes the factors of preserving the ecological state of the marine coastal zone as a component of the Marine Environmental Strategy of Ukraine and blue growth. The creation by the European Union of legislative acts, international projects aimed at protecting the environment, monitoring the characteristics of natural resources, the development of the "Blue Economy" in European countries and, in particular, in the Black Sea region is a significant basis for improving the ecological condition of the coastal zone of the seas of Ukraine. With the support of the European Commission, experts from various sectors of the Black Sea countries are developing concept documents. These documents define the joint vision of the experts and the tasks for approaching the "Blue Growth Initiative for Research and Innovation in the Black Sea". Based on the analysis of the priority objectives of all the Strategic goals of the marine environmental policy of Ukraine, it can be stated that almost all of them are directly or indirectly related to the coastal strips of the seas of Ukraine. This means that the research of the coastal strip of the seas of Ukraine has a convincing relevance and indisputable scientific and practical significance of research, in particular, both at the national and regional levels. Described by the mechanisms for achieving the strategic goals of the Marine Environmental Strategy of Ukraine, the development, improvement, and assimilation of which will finally give grounds to regulate the principles of integrated coastal strip management at the legislative level. Also, which is no less
important, it will significantly improve the awareness of the population regarding the rational use of coastal natural resources.

**Keywords:** coastal protective strip of the sea, coastal zone of the sea, management, blue growth, environmental strategy, ecological state, European Union, Black Sea, Sea of Azov, sustainable development, blue economy, innovations.

Problem statement and its connection with important scientific and practical tasks. This paper presents the main areas of problems related to the coastal strips of the seas at the scientific and legislative levels. In scientific, academic and administrative sources of information, the question of defining the term "coastal strip of the sea" arises. After all, in these sources of information, the terms "seaside zone", "coastal zone", "coastal areas" are associated with the term "coastal strip of the sea". But if we take a more detailed and careful look at the terms, for example, "coastal protection strip" and "coastal zone", there is a significant discrepancy in their definition. Today, the terms "complex management" and "integrated management" are widely used in the scientific literature as equivalent, but there is a difference in their definition. In this paper, the Strategic goals of the Marine Environmental Strategy of Ukraine and the priority objectives and main mechanisms for their achievement are given. As a result of the analysis, it was established that almost all priority objectives are directly or indirectly related to the coastal strips of the seas of Ukraine. This means that the research of the coastal strip of the seas of Ukraine has a convincing relevance and indisputable scientific and practical significance of research, in particular, both at the national and regional levels.

Analysis of recent publications on the problem. While writing this paper, a lot of Ukrainian and international scientific literature, legislation of the European Union and Ukraine was analyzed. The following are the main sources of information.

It is known from international documents and scientific publications (European Commission, 2023a; European Commission, 2018; European Commission, 2008; Koundouri, et. al., 2022; Shiiba et al., 2022) that the development of the potential of "blue growth" of natural resources is an urgent task at the international level, as well as at the national and regional level, in particular the Black Sea region. The EU Marine Strategy Framework Directive 2008/56/ by order of the Cabinet of Ministers of Ukraine dated October 11, 2021 No. 1240-p. the Marine Environmental Strategy of Ukraine was approved (Cabinet of Ministers of Ukraine, 2021).

In the monographs "Economic and ecological bases of regional nature management and development" (Burkinskyi et al., 2005), "Integrated management of resources and security in the Sea of Azov basin" (Burkinskyi et al., 2010) from the authors Burkinsky B.V., Stepanov V.N. and other specialists of the SO "Institute of Market and Economic and Environmental Research of the NAS of Ukraine" the conceptual theoretical-methodological and applied foundations of the organization of integrated management of nature use and provision of economic and ecological security in the Sea of Azov basin, as well as the conceptual vision of the concept of "coastal zone of the sea" are highlighted.

In the work (UkrSCES, 2022) by the authors Komorin V.M. and other specialists of Ukrainian Scientific Center of Ecology of the Sea (UkrSCES) information is provided on the creation of integrated management plans for the coastal areas of the Azov and Black Seas, and, in particular, the conceptual vision of the term "integrated coastal zone management" (ICZM) is highlighted.

Among the scientific works that describe sustainable development in Ukraine, the management of territorial environmental conflicts served by the works of the authors Petrushenko M., Burkinsky B. and others (Petrushenko et al., 2021; Prokopenko & Petrushenko, 2013).

Allocation of previously unsolved parts of the general problem. To date, questions regarding the exact definition of the terms "coastal strip" and "integrated coastal zone management" in the scientific literature and at the legislative level remain open. Questions remain regarding the full resolution of the set priority objectives to achieve the Strategic goals of the Marine Environmental Policy of Ukraine during the state of martial law in Ukraine.

Formulation of research objectives (problem statement). The aim of this paper is to analyze the factors of preserving the ecological state of the coastal zone as a component of the Marine Environmental Strategy of Ukraine and blue growth. The aim is decomposed into the following main tasks: to determine the general scientific
provisions and concepts of the coastal strip and zone, their integrated management, to analyze the strategic aims and priority tasks of the state environmental protection policy in accordance with the concept of blue growth.

Materials and Methods. The initial information for the research was the legislative acts in the field of ecology of the European Union and Ukraine, domestic and foreign scientific materials in the direction of blue growth, coastal strips of the seas of Ukraine and integrated coastal zone management. The work used the dialectical method of scientific knowledge, logical analysis of the initial information.

An outline of the main results and their justification. Ukraine is a maritime state and has access to the Black and Azov Seas - the most closed and remote seas from the World Ocean. The territories of Odesa, Mykolayiv, Kherson, Zaporizhzhya, Donetsk oblasts, AR Crimea as an independent administrative unit are adjacent to these seas. In these territories, a coastal strip of seas is distinguished, which includes the administrative regions of the seaside regions and the Autonomous Republic of Crimea, as well as internal waters and waters of the territorial sea of Ukraine (National report of Ukraine, 2002; Karamushka, 2009). Today, the peculiarities of the distribution of hydrophysical characteristics and dynamic processes in the open part of the Black Sea are very well studied. This is confirmed by works, for example (Sryberko, 2021; 2022). While there are still simple questions about the study of coastal strips. For example, the definition of the terms "coastal strip", "coastal zone" and which territories are included in them, a clear interpretation of the concept of integrated environmental management within the water protection zone of the seas, the coastal strip of the seas, the territorial sea waters of Ukraine, etc.

Compared to other Black Sea states, Ukraine has the longest coastline. It is known (Kulikov et al., 2021) that the length of the coastline of the Ukrainian part of the Black and Azov seas is a starting point for planning nature management in the seaside regions and the development of economic activity by various branches of the Ukrainian economy. According to the "National Atlas of Ukraine" (National atlas of Ukraine, 2007), the length of the sea coast of Ukraine is about 2500 km, of which 1160 km are valuable beaches. The paper (Kulikov et al., 2021) states that according to the "Geographical Encyclopedia of Ukraine" the length of the coastline of the Ukrainian part of the Black and Azov Seas is 2,835 km, of which: within the Black Sea – 1,628 km; within the Sea of Azov – 1207 km (including 330 km of Sivash Bay and 53 km along the western shore of the Kerch strait). As specified by Yu.D. Shuiskyi (Shuiskyi, 2001), the length of the coastline of the Black and Azov Seas within Ukraine is a total of 2692.9 km. At the same time, the length of the Black Sea coast is 1,829.1 km; Sea of Azov – 799.8 km, to which the length of the western shore of the Kerch strait – 64 km must be added. According to data (National report of Ukraine, 2002; Karamushka, 2009), the total length of the coastline of the Sea of Azov is 1,472 km, half of which (732 km) belongs to the coastline of Ukraine. The Ukrainian part of the Black Sea coastline (from the Danube Delta to Cape Takyl in the Kerch Strait) is 1628 km.

In general, the coastal strip of the seas (CSS) is a unique natural and economic complex, formed due to the diversity of environments (such, in particular, as wetlands, beaches, estuaries, agricultural lands, urbanized areas, industrial complexes, etc.), natural conditions and resources. It was these conditions and possibilities that attracted people and provided them with a variety of productive activities, which, in turn, encouraged the excessive use of CSS resources and was accompanied by negative consequences for the natural environment. More and more noticeable processes of degradation of the natural base of CSS are observed practically along the entire sea coast (Karamushka, 2009).

The author (Karamushka, 2009) presents the most essential characteristics of PSM, which are important for understanding its use and related problems. First of all, the seaside areas of Ukraine are characterized by extremely high intensity of nature use, on which various types of economic activity are concentrated. Special demographic characteristics are also related to this: if CSS is 1/50 of the territory of Ukraine, then 1/10 of the population lives here (SE "DIPROMISTO", 2006). Secondly, the CSS of Ukraine is characterized by a high tourist, recreational and health potential, but its use creates an uneven load on the ecosystem along the coastline. Thus, the southern coast of Crimea and the Odesa region are characterized by an extremely high level of development, and the eastern and western parts of the Crimean Peninsula are slightly less developed. But the coast of the northwestern part of the Black Sea and the coast of the Sea of Azov, with some exceptions, is significantly inferior in terms of the level of use of recreational opportunities. Thirdly, a special characteristic of CSS is the dynamism of the coastline, which manifests itself in practice not only in the form of losses, but also in the form of
land expansion. Such expansion occurs due to the removal by river currents and the deposition of suspended particles of solid matter (in particular, clay and sand minerals) in the deltaic parts. Fourth, the CSS includes deltas and estuaries of large and small rivers, as well as wetlands of a different type (in particular, the Sivash Bay), which are of significant natural importance and characterized by high bioproductivity. A significant part of such territories is included in nature protection objects, including those of international importance. The latter include two biosphere reserves (Danube and Black Sea) and several dozen wetlands included in the Ramsar list (Frasier, 2000). It is these circumstances that make it necessary to assign CSS to the territories, the use of which requires a special frugal management regime, and therefore is legally limited (Karamushka, 2009).

We described the concept of the coastal strip of the sea above, and from its context it follows (Karamushka, 2009) that we are actually talking about saeside (coastal) territories, which are actually the territories of administrative units (districts). In this regard, according to the opinion of the author (Karamushka, 2009), which also coincides with our opinion, it is suggested to dwell in more detail on the terminological aspects. In the scientific and management literature, you can meet many terms that cause similar associations. Thus, the terms "seaside zone", "coastal zone", "coastal areas", "coastal regions" are used. In principle, everyone understands what we are talking about, so there are no special comments regarding the adequacy of the use of these terms, but there remains a feeling of discomfort and uncertainty that the authors mean the same thing by a specific term (Karamushka, 2009).

For a more correct coverage of the analyzed scientific bibliographic material for writing this article and to prevent confusion in terminology, we will use the terms "coastal strip" and "coastal zone" as synonyms. After all, according to the authors (UkrSCES, 2022), which also coincides with our opinion, that in Ukraine the term "coastal zone" is mostly used in the academic environment, and the term "coastal strip" is used in scientific works. Today, these terms compete almost as equals, which contributes to the chaoticization of the terminology of coastal and maritime problems. But if we take a more detailed and careful look at the terms, for example, "coastal protection strip" and "coastal zone", there is a significant difference in their definition. This discrepancy mainly lies in the spatial dimensions of the coastal protection strip and the coastal zone. In the first case, on the basis of the definitions of the Water Code of Ukraine (Code of Ukraine, Water, 1995) and the Land Code of Ukraine (Code of Ukraine, Land, 2002), along the seas and around sea bays and estuaries, at least two kilometers from the water's edge are established, and within the boundaries of populated areas, they are defined as 100 meters wide from the water's edge of these reservoirs. In the second case, in relation to the coastal zone, for example, according by Burkinskyi B.V. and specialists of the SO "Institute of Market and Economic and Ecological Research of the NAS of Ukraine"– the coast and coastal waters of the Black and Azov seas constitute the marine coastal zone of Ukraine, which is a particularly important regional resource for strengthening national security – economic, social, ecological, political, defense and other (Burkinskyi et al., 2005). That is, if we fundamentally approach the concepts of the terms "coastal protective strip" and "coastal zone", then the width of the coastal strip of the sea begins from the edge of the water, and the width of the coastal zone includes, in addition to the coast, also coastal water areas. So, nevertheless, as described above, for the purpose of writing this article and to avoid confusion in terminology, we will use the terms "coastal strip" and "coastal zone" as synonymous terms. This does not apply to the case of coastal protection strips. This term is determined on the basis of the Water and Land Codes of Ukraine.

The experience of the leading maritime countries shows that the most effective approach to solving complex problems of nature management both in the coastal territory and in the coastal water area is the creation of a system of the integrated coastal zone management (ICZM). The methodology of integrated coastal zone management (ICZM) considers the CSS as a specific object of nature management, which includes geographic, ecological, economic and social systems. At the same time, the object of management is the CSS, in which various natural, human, economic, organizational, etc. factors exist and interact, and the subject of management is nature management in the CSS. Allocation of the CSS into an independent management object allows balancing the interests of various nature users and developing legal mechanisms that meet the tasks of sustainable development of coastal areas (UkrSCES, 2022). The work (UkrSCES, 2022) also provides general definitions: ICZM is an innovative management technology that provides a continuous process of supporting administrative decisions aimed at research and rational use of natural, social and economic resources. It also ensures the integration of
economic development plans with the tasks of solving social problems and preserving the environment of the territories. The concept of ICZM is based on the general principle of the system approach, which considers together resources, ecosystem processes, anthropogenic activity and interaction between these components. ICZM’s goals and objectives are fully aligned with the goals and expected outcomes of any sustainable development program. ICZM is the main tool for achieving sustainable development of coastal zones. The application of ICZM provides benefits not only at the local, but also at the regional and national levels, including improving the economic situation and improving the quality of life of the population. These benefits are created, in particular, by preserving the environment. This approach is increasingly used as a management tool for the sustainable development of coastal regions in the world, but it is still taking its first steps in Ukraine. Although the coastal zone of the seas of Ukraine is characterized by a global trend of increasing anthropogenic load due to the concentration of population and intensification of economic activity in this territory, the aggravation of intersectoral competition and the deterioration of the state of coastal and marine ecosystems. The purpose of the ICZM is to prevent inefficient land use, overexploitation, pollution, destruction of settlements, harmonization of various economic activities. The final result is the achievement of the goals of sustainable development of the coastal zone of the sea, as a component of the sustainable development of the seaside regions of Ukraine.

According to Burkinskyi B.V. (Burkinskyi et al., 2010) the organization of the system of integrated management of the use of natural resources and environmental protection in the sea basins of Ukraine should be based on the following principles: balance of economic and ecological interests; harmonization of interaction between nature and society in the region; economically and ecologically efficient use of natural resources; adequacy of the level of resource and environmental safety in the basins; environmental examination of all projects.

In scientific publications of the late 20th and early 21st centuries, the term "complex management" is widely used instead of the term "integrated management" (and, accordingly, the abbreviation KCZM instead of ICZM), but such a replacement is not equivalent. The term KCZM obviously indicates the complexity of the object of management, which is a multifaceted complex economic activity within the complex aquatorial territorial space - PZM, as well as the complexity and multifacetedness of the management process. However, it does not say anything about the specifics of this complex process, about the methodological approach to overcoming its complexity. Such an approach is the integration of management activities on a whole range of indicators. The idea of integration in the process of coastal zone management is expressed by the rule of three "C" (UkrSCES, 2022; UK Environment for Europe Fund, 2007; Studennikov & Diakov, 2005):

- coordination - harmonization of actions in the process of coastal zone management;
- cooperation - cooperation between interested parties (both people and organizations) in the process of determining a common goal and ways to achieve it, as well as directly in the process of joint work aimed at achieving this goal.

The implementation of this rule is ensured by the implementation of various types of integration in the field of management, namely:

- vertical – between different levels of management and decision-making;
- horizontal – between neighboring administrative-territorial units and at the interdepartmental level;
- spatial – which takes into account the geographical scale;
- time – which takes into account the time frame of various types of activities in CSS;
- interdisciplinary – between representatives of different scientific disciplines and specialties studying CSS.

Thus, the distinctive features of integrated management of the coastal zone are (UkrSCES, 2022):

- interagency;
- multi-level;
- intersectorality;
- interdisciplinary;
- multi-purpose orientation.

The authors (UkrSCES, 2022) proposed the best option for defining the term ICZM: «ICZM is a continuous process of making and making decisions aimed at harmonizing the socio-economic development of the coastal zone of the sea for the goal of sustainable development of coastal regions and coastal marine water areas». The authors (UkrSCES, 2022) also point out that the ultimate goal of ICZM is to achieve sustainable development of coastal and marine regions, which will lead to sustainable exploitation of coastal and marine resources, to the creation of favorable
conditions for the production of material values and support of the structure, functions and productivity of existing ecosystems in this marine region.

Today, the European Union creates legislative acts, international projects aimed at protecting the environment, monitoring the characteristics of natural resources, developing the "Blue Economy" in European countries and, in particular, in the Black Sea region. Scientists, graduate students, students from various fields of science need to be fully aware of such projects, current research in the field of science, which is aimed at protecting the environment and research problems that have arisen, based on international experience. This will allow you to increase your professional potential, as well as provide the opportunity to provide the necessary recommendations to the relevant state organizations for their decision-making regarding the preservation and protection of the environment (Sryberko, 2023). As you know (Sryberko et al, 2023), over the past 50 years there has been an increase in the load on the environment and ecosystem of the Black Sea basin. This is mainly due to the influence of anthropogenic factors such as eutrophication (growth of harmful algal blooms) and hypoxia (loss of oxygen), overfishing and the introduction of alien species. Finally, climate change also has a clear negative impact on the Black Sea (European Commission, 2023 b).

The Black Sea, together with its sea basin and coastal socio-economic systems, is a natural laboratory of global importance for basic science, sustainable development policy and the "blue economy". In 2018, experts from 7 countries bordering the Black Sea, in cooperation with marine science experts from leading European maritime institutes and organizations and with the support of the European Commission, developed a joint vision of a productive, healthy, resilient, sustainable, and better-valued Black Sea by 2030. As a result, a conceptual document was created – Burgas Vision Paper (European Commission, 2023a). This document defines the shared vision of the experts and the tasks for approaching the "Blue Growth Initiative for Research and Innovation in the Black Sea".

Burgas Vision Paper focuses on creating a Strategic Research and Innovation Agenda (SRIA), which is based on identifying the most important research problems. It also concerns the development of advanced technologies and education (European Commission, 2023c).

The Black Sea Program of Strategic Research and Innovation is focused on the following directions:

- The Black Sea is defined as a common resource, a paleoclimatic archive and a natural laboratory that preserves unique life forms in its diverse ecosystems, which must be supported by joint actions based on this vision, following the Strategic Research and Innovation Program.
- The Black Sea is the largest anoxic, hydrogen sulfide-rich sea basin on Earth. Any local, national or cross-border policy initiatives related to the Black Sea must take into account the peculiarities of its ecosystem, biodiversity and underwater cultural heritage sites.
- It is necessary to pay attention to emerging problems caused by a number of anthropogenic and natural factors, such as pollution, maritime transport, eutrophication, climate change and dangerous phenomena in the coastal zone.
- Colossal reserves of gas hydrates are a special asset of the Black Sea, which represents both opportunities and risks.
- Fish stocks and biodiversity are overburdened. Collaborative research and monitoring can provide a basis for better assessment, management and prevention.
- Provision of accurate forecasting tools that allow solving the problems of the influence of an increasingly complex set of stressors and their insufficiently studied interactions, including their connection with rivers flowing into the Black Sea.
- Education, science and innovation are considered as the most important tool that can fully reveal the potential of "blue growth" in relation to living resources, renewable energy sources in the sea, tourism, culture, transport, hydrocarbons of the seabed, which form the basis of the "blue economy" of the region.
- Science and innovation contribute to the development and implementation of coastal and marine policies and strategies in the Black Sea, including improving ecosystem assessments, forecasts and management, awareness of ecosystem vulnerabilities, risks and possible mitigation measures.
- Knowledge ensures scientifically based decision-making in the interests of sustainable development of the Black Sea economies in response to social and environmental challenges or climate-related problems.

It is known from international documents and scientific publications (European Commission, 2023a; European Commission, 2018; European Commission, 2008; Koundouri et al., 2022; Shiiba et al., 2022) that the development of the potential of "blue growth" of natural resources is an urgent task at the international level, as well as at the national and regional level, in particular the Black
Sea region. The EU Marine Strategy Framework Directive 2008/56/ (European Commission, 2008) establishes the framework within which EU member states must take the necessary measures to achieve or maintain a “good” environmental status of the marine environment, in particular the Black Sea. As part of the implementation of the EU Maritime Strategy Framework Directive 2008/56/ by order of the Cabinet of Ministers of Ukraine dated October 11, 2021 No. 1240-p. the Marine Environmental Strategy of Ukraine was approved (Cabinet of Ministers of Ukraine, 2021). The strategic goals of marine environmental policy and priority objectives are aimed at achieving and maintaining a “good” ecological state of the Black and Azov Seas for the period up to 2030. The main strategic goals of marine environmental policy are shown in fig. 1.

Figure 1. Strategic goals of marine environmental policy of Ukraine
Source: Developed from (Cabinet of Ministers of Ukraine, 2021).

The priority objectives for achieving the Strategic goals are listed in Tables 1-3 (Cabinet of Ministers of Ukraine, 2021). As can be seen from Table 1, 10 out of 15 items of priority objectives for the achievement of Strategic goal 1 are directly related to the coastal strip of the seas – these are items 1, 3-9, 13, 15. Indirect relation to coastal strips, namely, if the priorities are taken in the context of management or, more precisely, integrated coastal strips management, then points 10-13 and 14 are also related to the coastal strip.

<table>
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<tr>
<th>№</th>
<th>Tasks</th>
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<tbody>
<tr>
<td>1</td>
<td>Reducing the negative impact of river runoff on marine ecosystems</td>
</tr>
<tr>
<td>2</td>
<td>Introduction of monitoring of the hydrogen sulphide zone of the Black Sea</td>
</tr>
<tr>
<td>3</td>
<td>Carrying out an inventory of household wastewater discharges within the coastal protection zone and determining the most dangerous pollutants with further development and approval of a list of measures to be included in river basin management plans, integrated management plans for the coastal areas of the Azov and Black Seas, or action plans to achieve and maintenance of the &quot;good&quot; ecological state of the Azov and Black Seas and to aim at reducing volumes and preventing the inflow of pollutants</td>
</tr>
<tr>
<td>4</td>
<td>Initiation and completion of the construction of urban sewage treatment plants, as well as sewage treatment plants of industrial, agricultural and other objects, the activities of which significantly affect the ecological state of the seas, as well as the introduction of modern methods of treatment (processing) and disposal of waste generated at sewage treatment plants</td>
</tr>
</tbody>
</table>
5. Development and implementation of separate local action plans for environmental protection aimed at preventing sea pollution in the most ecologically dangerous regions, in particular Mariupol, Mykolaiv, Odesa, Berdyansk, Zaporizhzhia, Kherson, including optimization of recreational use of coastal areas

6. Development and approval in accordance with the procedure established by law of regulations aimed at the implementation of Council Directive 91/676/EEC of December 12, 1991 on the protection of waters against pollution caused by nitrates from agricultural sources, carrying out on their basis the assessment of the impact of diffuse sources on the quality of sea water and the initiation of regulation with the aim of reducing the volume of inputs of pollutants from diffuse sources

7. Regulating the existing drainage of rainwater from the territories of settlements located in the coastal protective strip of the seas, creating a system of monitoring the entry of pollutants into the waters of the Azov and Black Seas from built-up lands, as well as due to military activities, developing measures aimed at preventing the pollution of sea waters by collecting - drainage drain

8. Establishing and rendering in nature the boundaries of water protection zones and coastal protective strips of the seas, sea bays and estuaries and ensuring the regulation of the coastal protective strip of the seas

9. Conducting an inventory of sources of atmospheric air pollution and estimating the volume of emissions of pollutants from stationary and mobile sources in the sea and in the coastal protective strip

10. Ensuring control of pollution and littering of the sea from ships, preventing the spread of marine invasive alien species with ballast water

11. Preventing dangerous substances from entering the sea by creating facilities for transshipment and storage of oil products, chemicals, and introducing a system for controlling the movement of dangerous substances within the maritime borders of Ukraine

12. Carrying out scientific developments and pilot studies on the implementation of biological methods of cleaning the water areas of seaports from oil products

13. Improvement of approaches to the management of waste generated in the coastal protective strip of the seas, implementation of waste technologies on ships, vehicles in ports

14. Creation of an information system for forecasting the movement of oil products on the surface of the sea and implementation of other measures

15. Implementation of measures to determine the ways of using waste generated as a result of cleaning the bottom of reservoirs and reducing siltation of the bottom and pollution of the seas, which, in particular, is caused as a result of dredging works, determining the locations of such waste during dredging, construction and shore protection works

Source: based on (Cabinet of Ministers of Ukraine, 2021)

It can be seen from Table 2 that 7 (items 1, 3, 4, 8-11) out of 11 items of priority objectives for the achievement of Strategic goal 2 are directly related to the coastal strip of the seas. Items 10-13 and 14 have an indirect relation to the coastal strip if priority tasks are perceived in the context of integrated coastal strips management.

Table 2.

Priority objectives for achieving Strategic goal 2

<table>
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<tr>
<th>№</th>
<th>Tasks</th>
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<tbody>
<tr>
<td>1</td>
<td>Development of separate nature management regimes within territories (water areas) classified as wetlands of international importance</td>
</tr>
<tr>
<td>2</td>
<td>Preparation of scientifically based recommendations on the reproduction of relict species of flora and fauna of the Azov and Black Seas</td>
</tr>
<tr>
<td>3</td>
<td>Expansion of fundamental and applied scientific research aimed at determining the main patterns of functioning of marine and coastal ecosystems and preventing the negative effects of factors affecting them, with the aim of preserving the bio- and landscape diversity of the Azov and Black Seas, the Zernov phyllophore field and other territories and areas objects of the nature reserve fund</td>
</tr>
</tbody>
</table>
Implementation of measures aimed at the creation of the Azov-Black Sea natural (ecological) corridor, ensuring the further increase in the area of territories and objects of the nature reserve fund, as well as their arrangement

Creation of two biological stations (in the waters of the Black and Azov Seas) with the aim of preserving and reproducing rare species of plants and animals and species listed in the Red Book of Ukraine

Creation of centers for the reproduction of rare plant and animal species and species listed in the Red Book of Ukraine on the basis of natural and biosphere reserves, national natural parks, other territories and objects of the nature reserve fund

Reintroduction of rare and endangered species of plants and animals

Development and implementation of measures aimed at the protection of waterfowl, their habitats and nesting places, mainly through the creation of territories under special protection

Implementation of measures to prevent the emergence of new species of plants and animals dangerous for local flora and fauna

Implementation of measures to reproduce endangered species of marine plants and animals in the waters of the Azov and Black Seas

Conservation of marine mammals within internal marine waters and territorial sea (including establishment of rehabilitation centers).

Table 3.

<table>
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<tr>
<th>№</th>
<th>Tasks</th>
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<tbody>
<tr>
<td>1</td>
<td>Improvement of legislation on the management, protection, use and reproduction of aquatic biological resources in the Azov and Black seas</td>
</tr>
<tr>
<td>2</td>
<td>Creation of cadastres of populations of marine species of plants and animals of economic importance and determination of their resource potential</td>
</tr>
<tr>
<td>3</td>
<td>Conducting fundamental and applied scientific research related to the reproduction and enrichment of aquatic biological resources of the Azov and Black Seas, the introduction of appropriate environmentally safe technologies</td>
</tr>
<tr>
<td>4</td>
<td>Building and modernization of fish breeding complexes, state support for breeding industrial fish species</td>
</tr>
<tr>
<td>5</td>
<td>Determination of ecologically safe and economically feasible spatial zones for the breeding of mariculture objects, as well as places for the development of mariculture, creation of fish farms</td>
</tr>
<tr>
<td>6</td>
<td>Providing the population living in the coastal protection zone with information about the technologies and economic advantages of fish breeding complexes and fish farms</td>
</tr>
<tr>
<td>7</td>
<td>Development and implementation of regional interdisciplinary programs for the construction and modernization of fish breeding complexes</td>
</tr>
<tr>
<td>8</td>
<td>Implementation of measures aimed at improving the condition of spawning grounds, feeding places for young fish and increasing feed resources, protection of fish migration routes, enrichment of aquatic biological resources and ensuring their tireless use</td>
</tr>
<tr>
<td>9</td>
<td>Creation in the basin of the Azov and Black seas of modern experimental and demonstrative multifunctional, full-system fisheries, which will include all possible and acceptable for Ukraine elements and methods of conducting scientific research, environmental protection, fishery and educational activities</td>
</tr>
</tbody>
</table>

Source: based on (Cabinet of Ministers of Ukraine, 2021)
Thus, on the basis of the given priority objectives (tables 1-3) of all Strategic goals of marine environmental policy of Ukraine, it can be stated that almost all of them are directly or indirectly related to the coastal strips of the seas of Ukraine. This means that the research of the coastal strip of the seas of Ukraine has a convincing relevance and indisputable scientific and practical significance of research, in particular, both at the national and regional levels.

It will be interesting to note the main mechanisms for achieving the strategic goals of the marine environmental policy of Ukraine (Cabinet of Ministers of Ukraine, 2021), the development, improvement, and assimilation of which will finally give grounds to regulate the principles of integrated coastal strips management at the legislative level, and also, no less important, will significantly improve the public's awareness of rational use of coastal natural resources:

1. Increasing the level of information, environmental education and education of the population, as well as involving the communities of seaside towns and villages and the ecologically oriented public in the implementation of environmental protection measures.


3. Implementation of management plans for areas of river basins that direct their waters to the Azov and Black seas.

4. Creation of a system of integrated management of nature use within the water protection zone of the seas, the coastal strip of the seas, territorial sea waters of Ukraine.

5. Improvement of economic mechanisms for regulating the use of natural resources, including the use of seas for shipping and hydropower purposes.

6. Improvement of the legal framework for the implementation of state policy in the sphere of protection and reproduction of the environment of the Azov and Black Seas, development of fisheries and mariculture of the Azov-Black Sea basin, its alignment with the requirements of the Association Agreement, as well as other international treaties to which Ukraine is a party, including the initiation program principles for the gradual improvement and achievement and maintenance of a "good" ecological state of the marine environment.

Conclusions and perspectives of further research. This paper analyzes the factors of preserving the ecological state of the coastal zone as a component of the Marine Environmental Strategy of Ukraine and blue growth. Today, in the scientific literature, the coastal strip of the sea is associated as "seaside zone", "coastal zone", "coastal areas", "coastal regions". In general, the term "coastal zone" is mostly used in the academic environment, and the term "coastal strip" is used in scientific works. But if we take a more detailed and careful look at the terms, for example, "coastal protection strip" and "coastal zone", there is a significant difference in their definition. This discrepancy mainly lies in the spatial dimensions of the coastal protection strip and the coastal zone. That is, if we fundamentally approach the concepts of the terms "coastal protective strip" and "coastal zone", then the width of the coastal protective strip of the sea begins from the edge of the water, and the width of the coastal zone includes, in addition to the coast, also coastal water areas.

The concept of "integrated coastal zone management ", its principles, methodology, goals and objectives need to be precisely defined at the legislative level to stop misunderstandings among scientists of various fields of science.

The creation by the European Union of legislative acts, international projects aimed at protecting the environment, monitoring the characteristics of natural resources, the development of the "Blue Economy" in European countries and, in particular, in the Black Sea region is a significant basis for improving the ecological condition of the coastal zone of the seas of Ukraine. The implementation of the EU Marine Strategy Framework Directive 2008/56/ contributed to the approval of the Marine Environmental Strategy of Ukraine. In this strategy, special attention is paid to the preservation and restoration of the ecological state of the coastal protective strips and the identification of the most dangerous pollutants, with the subsequent development and approval of a list of measures that should be included, in particular, in the plans for the integrated coastal areas management of the Azov and Black Seas.

The relevance of research on the preservation of the ecological state of the coastal strips of the seas of Ukraine is greatly emphasized by the fact that, with the support of the European Commission, experts in various fields of the Black Sea countries are developing conceptual documents. These documents define the joint vision of the experts and the tasks for approaching the "Blue Growth Initiative for Research and Innovation in the Black Sea".

Based on the analysis of the priority objectives of all Strategic goals of marine environmental policy of Ukraine, it can be stated that almost all of them are directly or indirectly related to the coastal
strips of the seas of Ukraine. This means that the research of the coastal strip of the seas of Ukraine has a convincing relevance and indisputable scientific and practical significance of research, in particular, both at the national and regional levels.

Described by the mechanisms for achieving the strategic goals of the Marine Environmental Strategy of Ukraine, the development, improvement, and assimilation of which will finally give grounds to regulate the principles of integrated coastal strip management at the legislative level. Also, which is no less important, it will significantly improve the awareness of the population regarding the rational use of coastal natural resources.

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