



Strategic Environmental Assessment Study
of the Spatial Plan of the Exclusive Economic Zone of
the Republic of Croatia in the Adriatic Sea –
NON-TECHNICAL SUMMARY

Zagreb, 2025

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List of acronyms

Acronym	Definition
DGU	State Geodetic Administration
EEDI	Energy Efficiency Design Index
EEZ	Exclusive Economic Zone
EGCS	Exhaust Gas Clean System
EPU	Hydrocarbon Exploitation Field
EU	European Union
IPCC	Intergovernmental Panel on Climate Change
ISPU	Physical Planning Information System
LNG	Liquefied Natural Gas
MARPOL	International Convention for the Prevention of Pollution from Ships
MINGOR	Ministry of Economy and Sustainable Development
MSFD	Marine Strategy Framework Directive
MZOZT	Ministry of Environmental Protection and Green Transition
pSCI	Probable ecological network conservation area significant for species and habitat types
SCI	Ecological network conservation area significant for species and habitat types
SEA	Strategic Environmental Assessment
SPA	Ecological network conservation area significant for birds
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
ZERP	Ecological and Fisheries Protection Zone

1 Introduction

The Strategic Environmental Assessment (hereinafter referred to as: SEA) is the procedure which assesses probably significant impacts on the environment and human health which may occur due to the implementation of a strategy, plan or programme, which enables the adoption of relevant decisions on the acceptance of strategies, plans and programmes based on knowledge of potential significant impacts the implementation of a strategy, plan or programme could have on the environment, while the competent project authorities receive an operational framework and the possibility to include important environmental protection elements into the decision-making process in accordance with the Environmental Protection Act (OG 80/13, 153/13, 78/15, 12/18, 118/18).

In the SEA procedure, a Strategic Environmental Assessment Study (hereinafter referred to as: the Study) is developed, a specialist base document which determines, describes and assesses probably significant impacts on the environment and human health which may occur due to the implementation of a strategy, plan or programme. The Strategic Study must include all the necessary data, explanations and descriptions in textual and graphical form, it is attached to the strategy, plan or programme and it is developed by a legal person authorised to perform expert tasks in the field of environmental protection (hereinafter referred to as: authorised entity). The purpose of the SEA procedure is to ensure the consequences on the environment and human health are assessed during the preparation of the strategy, plan or programme, prior to determining the final proposal and submitting to the adoption procedure. The SEA implementation procedure also enables stakeholders to participate in the procedure and ensures both public outreach and public participation during the decision-making process in accordance with the Regulation on public and the public concerned outreach and participation in the matter of environmental protection (OG 64/08).

The subject of this Study is the assessment of probably significant impacts on the environment and human health which may occur due to the implementation of the Spatial Plan of the Exclusive Economic Zone of the Republic of Croatia in the Adriatic Sea (hereinafter referred to as: the Plan). The development procedure of the Plan is in progress simultaneously with the SEA procedure. The SEA procedure of the Plan is carried out on the basis of the provisions of the Environmental Protection Act, Nature Protection Act (OG 80/13, 15/18, 14/19, 127/19, 155/23), Regulation on the strategic environmental assessment of a strategy, plan and programme (OG 3/17) and the Regulation on public and the public concerned outreach and participation in the matter of environmental protection (OG 64/08).

The Decision on the development of the Plan was adopted by the Minister of Physical Planning, Construction and State Assets on December 18, 2023 (CLASS: 350-01/23-01/205, FILE NUMBER: 531-08-1-1-23-5) (Attachment 14.3 of the Study). The expert developer of the Plan is the Institute for Spatial Development of the Ministry of Physical Planning, Construction and State Assets. The duties of the competent development authority are performed by the Directorate for Physical Planning and Permits of State Significance of the Ministry of Physical Planning, Construction and State Assets.

In accordance with the Decision on the development of the Plan, the Minister of Physical Planning, Construction and State Assets also adopted the Decision on the initiation of the strategic environmental assessment procedure of the Plan (CLASS: 350-02/24-03/1, FILE NUMBER: 531-08-1-24-1 from February 20, 2024) (Attachment 14.4 of the Study), based on which the SEA procedure initiates. The authority competent for the implementation of the strategic assessment procedure is the Ministry of Physical Planning, Construction and State Assets (hereinafter referred to as: the competent authority), which conducts all procedures prescribed by law. The same Decision states that, within the framework of the strategic environmental assessment of the Plan, a procedure for the main assessment of acceptability for the ecological network of the Plan will also be conducted.

In the procedure, public participation is ensured by publishing the Information on conducting the procedure of determining the content of the Strategic Environmental Assessment Study of the Plan on the official website of the competent authority.

The competent authority conducted the procedure of determining the content of the Study, pursuant to Article 8 of the Regulation on the strategic environmental assessment of a strategy, plan and programme, by obtaining opinions of authorities determined by special regulations on the content of the Study and on the scope of the data that need to be addressed in the Study, concerning the area of competence of this authority.

The Decision on the content of the Strategic Environmental Assessment Study of the Plan was adopted on September 26, 2024 (CLASS: 350-02/24-03/1, FILE NUMBER: 531-8-1-1-24-12) (Attachment 14.5 of the Study).

The authorised entity to develop the Study is the IRES EKOLOGIJA d.o.o., authorised by the Ministry of Environmental Protection and Green Transition to perform the duties of nature and environmental protection. The decisions are found in the Attachments 14.1. and 14.2. of the Study.

1.1 Reasons to develop the Plan, objectives and programme starting points

Based on the provisions of the Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning (OJ L 257, 28.8.2014.), hereinafter referred to as: MSP Directive, the Republic of Croatia is obligated to develop spatial plans for the marine area over which it exercises the right in accordance with the United Nations Convention on the Law of the Sea from 1994 (UNCLOS) and the Maritime Code (OG 181/04, 76/07, 146/08, 61/11, 56/13, 26/15, 17/19). By adopting the Decision on the proclamation of the exclusive economic zone of the Republic of Croatia in the Adriatic Sea (OG, 10/21), the Act on Amendment to the Physical Planning Act (OG 67/23), the prerequisites to launch the development of the Plan were met. The Decision on the proclamation of the exclusive economic zone of the Republic of Croatia in the Adriatic Sea stipulates what is relevant for the development of the Plan and/or what must be complied with when developing the Plan:

- boundaries of the exclusive economic zone of the Republic of Croatia in the Adriatic Sea
- application of the legal regime of the exclusive economic zone where the exclusive economic zone of the Republic of Croatia remains a maritime space in which all states enjoy the ensured freedoms of navigation and overflight, laying of submarine cables and pipelines and other maritime uses under international law, without prejudice to the sovereign rights and jurisdiction of the Republic of Croatia
- cooperation of the Republic of Croatia with all Adriatic and coastal Mediterranean states in order to protect and conserve, through concerted practices, natural resources of the sea and of the marine environment of the Adriatic and the entire Mediterranean.

By developing and adopting the Plan, it is necessary to ensure the establishment and implementation of marine area spatial planning within the scope of the Plan, i.e. to develop spatial-planning solutions to determine spatial and temporal distribution of relevant existing and future activities and uses in their marine waters (waters, seabed and subsoil).

In the process of spatial planning, it is necessary, in accordance with spatial planning principles determined by the Physical Planning Act, to examine and determine potential activities, uses and interests. The framework of activities considered in the development of the Plan is related to the activities and protection of:

- aquaculture areas
- fishing areas
- installations and infrastructure for the exploration and exploitation of hydrocarbons in the northern Adriatic
- maritime transport routes and traffic flows
- military training areas
- nature and species conservation sites and marine protected areas
- scientific research
- submarine cables and pipelines
- underwater cultural heritage.

The main objectives of the development and adoption of the Plan, as well as the programme starting points, are generally determined by the Physical Planning Act and the MSP Directive and they entail the following:

- in the process of developing the Plan, the objective is to determine spatial-planning solutions based on the evaluation of the existing status, marine area special features and significant existing activities, purposes and uses of the marine area and their impact on the environment and on the safety of navigation, as well as natural resources, taking into consideration the interaction with the surrounding marine area and long-term changes caused by climate change in accordance with available data
- connecting the territory of the Republic of Croatia with European systems of physical planning; mutually aligned and complementary distribution of various human actions and activities in space in order to achieve a functional and harmonised community development, while protecting integral spatial values; rational use and protection of natural resources, nature conservation, environmental protection and prevention from pollution risks; protection of cultural property and values; integrity of valuable ecosystems and seawater quality; appropriate transport system; national security and defence of the Republic of Croatia and protection from natural and other calamities

- the planning imperative is to contribute to the sustainable development of the maritime traffic sector, fisheries sector, aquaculture sector, economy sector, energy sector and the conservation, protection and improvement of the environmental status, including resilience to climate change impacts, and other objectives
- when establishing and implementing spatial planning of the exclusive economic zone, it is necessary to consider economic, social and environmental aspects in order to support sustainable development by applying an approach based on ecosystems, the promotion of the coexistence of relevant activities and uses, and the conservation, protection and improvement of the environmental status. The programme starting points of the Plan are contained in the fundamental national document for directing spatial development – the Spatial Development Strategy of the Republic of Croatia (OG, 106/17), and other strategic documents of the Republic of Croatia. The integral part of the Plan's starting points is the analysis and assessment of existing spatial development planning concept and planning solutions of valid physical planning documents: Physical Planning Programme of the Republic of Croatia (OG, 50/99, 84/13), valid spatial plans of the counties bordering the Plan's boundary, for the purpose of, through the development of the Plan, considering and aligning the area of the exclusive economic zone with the area of the internal and the territorial sea of the Republic of Croatia, as well as all the Adriatic Sea waters, since the data on various topics intertwine across different fields.

1.2 Scope of the Plan

The scope of the Plan is determined by the adoption of the Decision on the proclamation of the exclusive economic zone of the Republic of Croatia in the Adriatic Sea in the following manner:

- the exclusive economic zone of the Republic of Croatia comprises the maritime space from the outer boundary of the territorial sea seaward up to the maximum boundary allowed under general international law
- the outer EEZ boundary towards Italy is determined by the agreement between the Republic of Croatia and the Italian Republic on the delimitation of exclusive economic zones signed on May 22, 2022 in Rome and ratified in the Croatian Parliament. The outer EEZ boundary with Montenegro, until the conclusion of an international agreement on delimitation, temporarily follows the direction of and continues along the provisional delimitation line of the territorial seas determined by the 2002 Protocol between the Government of the Republic of Croatia and the Federal Government of the Federal Republic of Yugoslavia on the Interim Regime along the Southern Border between the Two States.

The scope of the Plan including the boundary is represented schematically in the cartographic representation – Attachment – Scope of the Spatial Plan of the Exclusive Economic Zone of the Republic of Croatia in the Adriatic Sea on an orthophoto base of A4 paper size, and it is entered into the Physical Planning Information System (hereinafter referred to as: ISPU). The scope of the Plan is represented in the following image (Image 1.1).

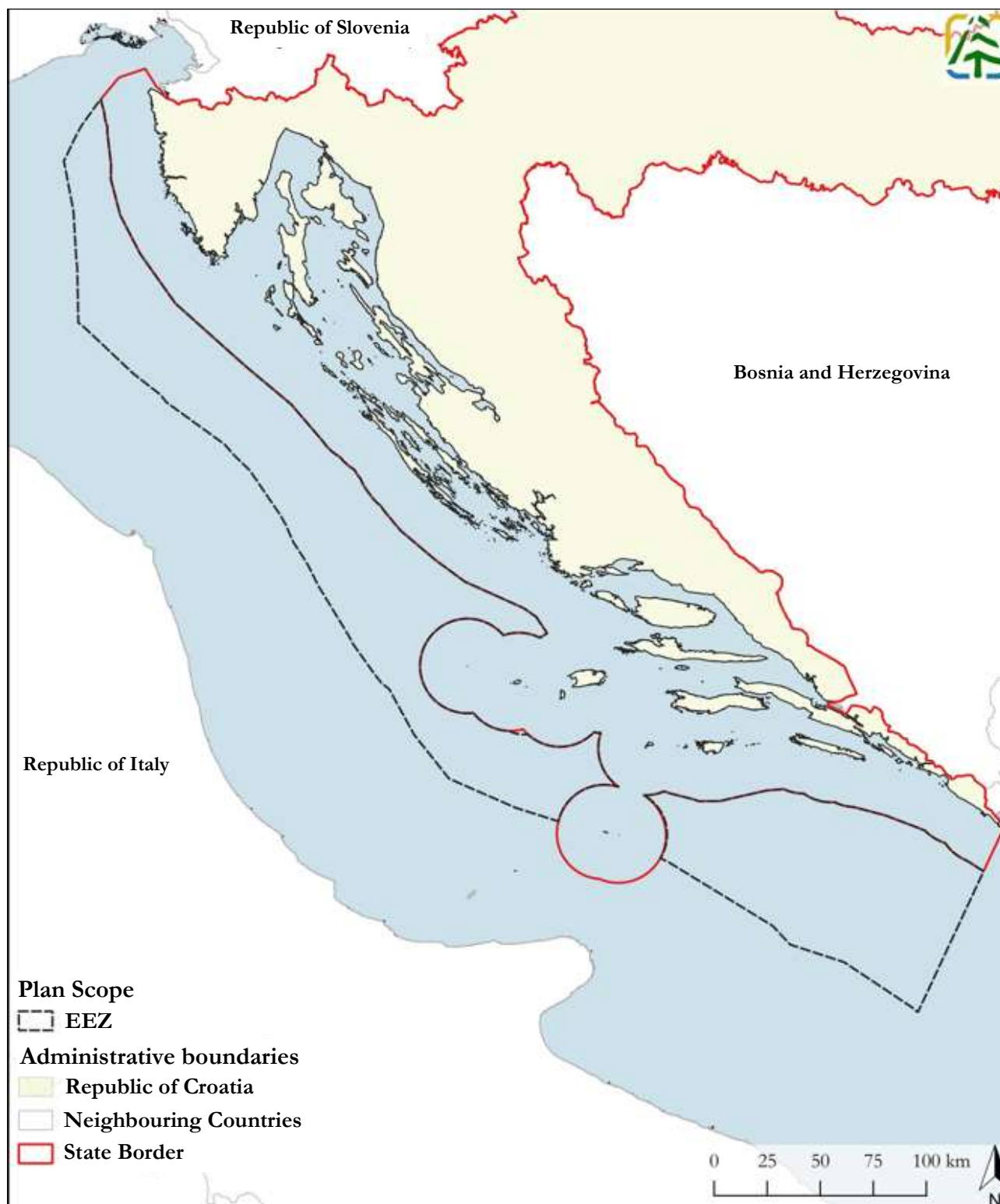


Image 1.1 Scope of the Plan

Rights and obligations of the Republic of Croatia in the EEZ

Prior to the proclamation of the EEZ, Croatia exercised sovereign rights and jurisdiction in the Adriatic Sea outside its borders (of the territorial sea) through the legal regime of the Ecological and Fisheries Protection Zone (ZERP) and through the regime of the continental shelf (in accordance with Part VI, UNCLOS and Part Two, Chapter V, Maritime Code).

Based on the legal status of the continental shelf, installations and structures for the purpose of exploration and exploitation of hydrocarbons have been constructed in this area.

By proclaiming ZERP in the water column above the continental shelf in 2003, the Republic of Croatia gained the possibility to exercise the following:

- sovereign rights of exploration and exploitation, conservation and management of living natural resources in the waters outside the territorial sea boundary
- jurisdiction related to marine scientific research
- jurisdiction related to the protection and conservation of the marine environment.

In accordance with the subsequent decisions of the Croatian Parliament from 2004, 2006 and 2008, the legal regime of ZERP did not apply to EU Member States.

The proclamation of the EEZ enables the Republic of Croatia to manage the natural resources in the area, including fisheries resources and mineral raw materials, but it also determines the obligation to implement measures for marine environmental protection.

The application of the EEZ legal regime is conducted in accordance with the previously mentioned relevant provisions of UNCLOS, as implemented in the Maritime Code, and the relevant European legislation (namely in the field of conservation of the marine environment and habitats and the European Union Common Fisheries Policy).

The European Union (EU), as an UNCLOS party, has exclusive competence in one part, while in some areas the competence is shared between Member States implementing UNCLOS.

In its EEZ, the Republic of Croatia has sovereign rights of exploration and exploitation, conservation and management of natural resources, whether living or non-living, and of energy production using the sea, currents and winds.

The jurisdiction of the Republic of Croatia in the EEZ refers to the establishment and use of artificial islands, installations and structures at the sea, marine scientific research and the protection and conservation of the marine environment.

The conservation and protection of the marine environment in the EEZ is regulated by law and regulations of national legislation in the field of nature and environmental protection, while adhering to obligations from European regulations and internationally transposed obligations.

Other states, within the framework of UNCLOS, enjoy the freedom of navigation, overflight and the laying of submarine cables and pipelines, and other internationally lawful uses of the sea related to these freedoms, such as those associated with the operation of ships, aircrafts and submarine cables and pipelines (Article 58, UNCLOS).

1.3 Planning solution explanations

1.3.1 *Aquaculture*

The Plan, on the basis of the methodological framework, designates areas for potential development of the EEZ aquaculture (Image 1.2). When designating areas for potential offshore aquaculture development, the following restrictions were taken into consideration: intensive maritime traffic, submarine cables and pipelines, areas which include platforms for hydrocarbon exploitation, areas of special fisheries management regime – the Jabuka/Pomo Pit FRA, as well as special purpose areas.

In order to determine specific aquaculture breeding site locations, it is necessary to conduct more detailed spatial analyses of suitability and sensitivity with respect to biophysical characteristics of the sea, predominant climate and oceanographic conditions, necessary maritime and land infrastructure and other instances concerning the questions whether the area is suitable for breeding certain species and what is the maximum breeding capacity, whereby the following parameters are taken into account:

- distance from the shore
- necessary land infrastructure
- bathymetry, winds, wave height, precipitation, vertical water temperature, current velocity, benthic topography, structure and composition of sediments, suspended solids, seawater quality, etc.

- planned breeding method and organism type
- ecological conditions
- habitat and species protection
- underwater cultural heritage, etc.

The number of environmental parameters that need to be considered and the level of analysis will mostly depend on the examined area, as well as on the aquaculture type which will be carried out. The better the meteorological conditions in the examined area, the higher the safety of the aquaculture objects. In this respect, low frequency of severe storms and the presence of medium-strong winds are elements which contribute to stimulating the circulation of water without jeopardising the safety of the objects and bred organisms.

Offshore aquaculture includes two types of cages: floating and underwater (submersible). The underwater (submersible) cages are a better option for avoiding the effects of thunderstorms on the water surface, as well as for minimising navigational conflicts. Anchoring systems follow the predominant sea conditions, regardless of floating or submersible breeding installations. The design of quick-release anchoring systems for floating structures enables quick harvesting of fish from the cage and quick repositioning of cages away from adverse conditions (e.g. oil spills).

The equipment at the site usually involves a crane, a generator, a fuel depot, a place for storing and distributing bulk fish feed, tools, fire extinguishers, equipment for harvesting fish from the cage, such as surroundings nets, baskets and other specific equipment. It is suggested to integrate marine aquaculture with inactive oil and/or gas platforms whose design life cycle has expired in order to make use of the existing available space and storage facilities and potentially secure an energy source.

Offshore aquaculture must have onshore logistical support and a supply of high-quality juvenile fish from hatcheries/nurseries. Coastal infrastructure should also include a dock for transport vessels with storage space for the regular use of fish feed, fuel, and auxiliary equipment, and potentially facilities for temporary holding and acclimatisation of juveniles before settling them into cages for further breeding.

The monitoring programme and reporting are also important aspects of managing offshore marine aquaculture.

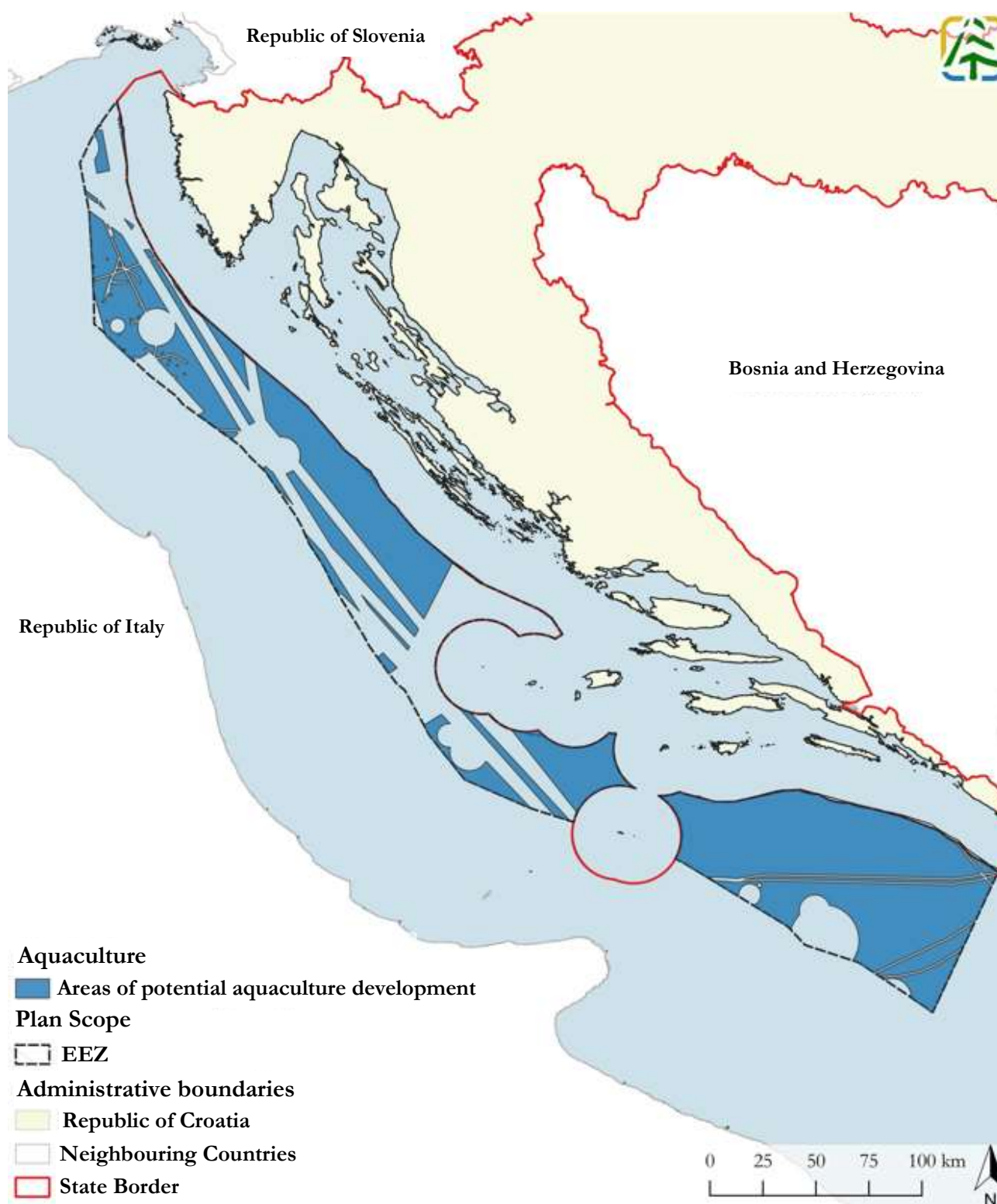


Image 1.2 Areas of potential aquaculture development in the EEZ (Source: Plan – elaboration by IRES EKOLOGIJA d.o.o.)

1.3.2 Fishing areas

Fisheries is a traditionally important economic activity in the Republic of Croatia, whose economic significance needs to be stronger in the EEZ area. The conservation of natural resources is a prerequisite for their use so, in order to conserve fish stocks in the long run, they should be managed in a sustainable manner. An important factor

in this respect is focusing on the concept of a maximum sustainable yield without reducing its future efficiency, which corresponds to the EU Common Fisheries Policy objectives.

The conservation of the fish stock is an important segment of future development of the fisheries sector, and of marine ecosystem protection as well. The priority areas in this respect are natural nurseries and hatcheries of the most important species in terms of economy. It is necessary to protect especially sensitive areas important for the fish stock in order to ensure natural repopulation of certain species important for the fisheries sector.

It is necessary to apply innovative technical and technological solutions focused on reducing underwater noise and its negative impact on marine life. With respect to marine activities, it is necessary to conduct further activities focused on reducing marine pollution and the introduction of non-native organisms through ballast water. With the aim of further promoting responsible fisheries and sustainable fishing, it is necessary to expand knowledge on important habitats of marine organisms and endangered species and to take necessary measures of concerted monitoring and sustainable management through national programmes and international cooperation.

Taking into account the bio-ecological importance of the Jabuka/Pomo Pit waters for the reproduction and growth of economically important species of fish and other marine organisms – particularly the phenomenon of “spillover” into neighbouring fishing areas – there is a clear need for concerted monitoring and taking joint measures of sustainable fishing management in the Jabuka/Pomo Pit FRA with the aim of protecting natural values of these important waters.

Fishing activities are permitted within the entire EEZ area, except within the safety zones of platforms for hydrocarbon exploitation and the areas around aquaculture breeding projects. It is necessary to establish no-take zones with the aim of ensuring sufficient food in order to conserve target species of the ecological network areas.

In certain EEZ areas, fishing activities are permitted with restrictions. The restrictions for fishing activities refer to corridors for underwater cables and pipelines, areas of special fisheries management regime – FRA, sea areas deeper than 1000 m, and areas for the disposal of unexploded ordnance. It is necessary to reduce the pressure on fisheries in the ecological network areas based on scientific data.

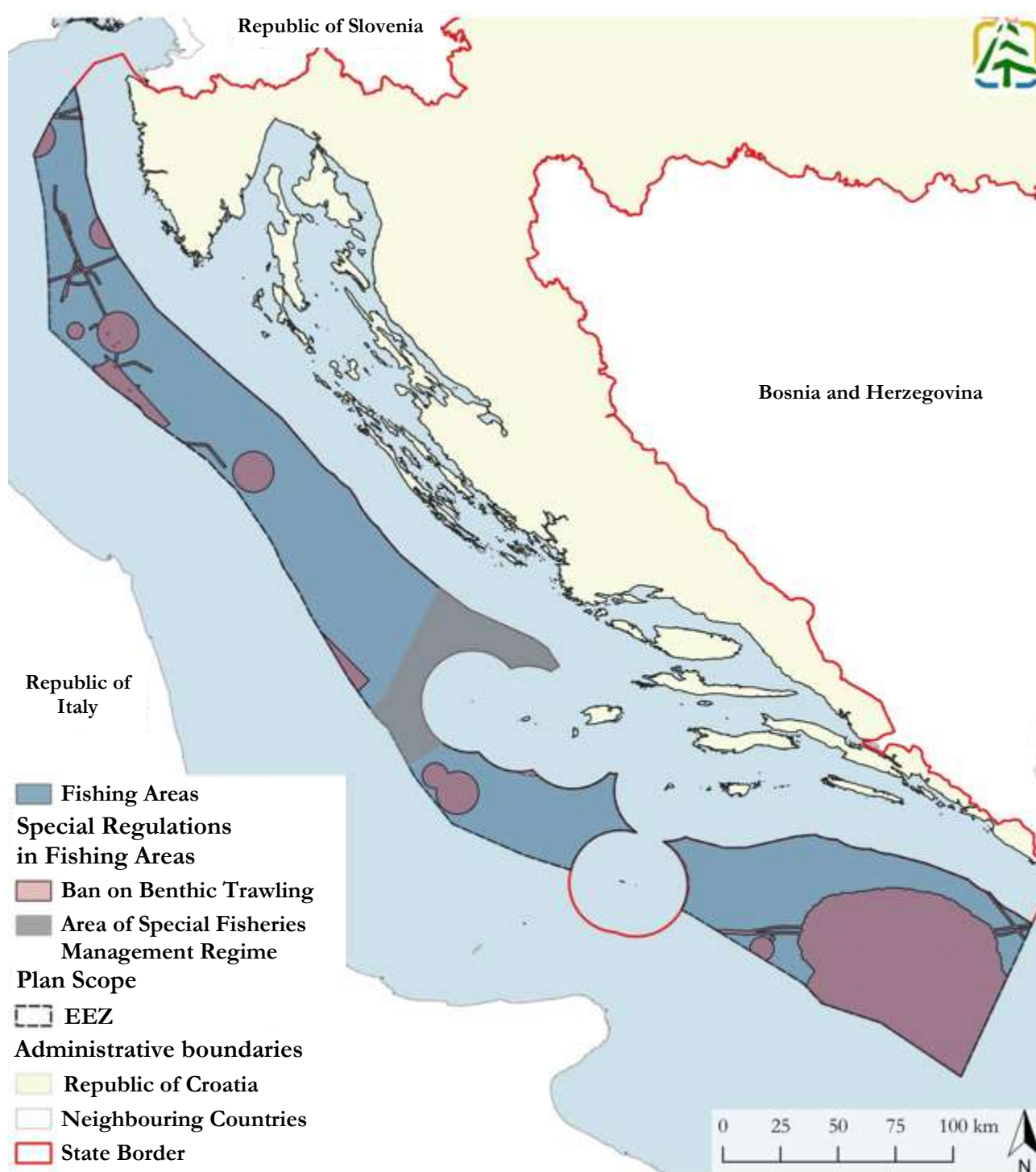


Image 1.3 Fishing areas in the EEZ (Source: Plan – elaboration by IRES EKOLOGIJA d.o.o.)

1.3.3 Exploration and exploitation of hydrocarbons

Exploration and exploitation of hydrocarbons is not permitted outside existing, approved hydrocarbon exploitation fields. Within the existing, approved hydrocarbon exploitation fields, the following projects are planned:

- construction and commissioning of new appraisal wells Annamaria A-13 DIR, Božica-2, Ika A-1 DIR, Ika C-1 VER, Ira-1 DIR, Ivana E-2 R and Ivana F-1 Ver with the corresponding exploitation platforms Ida D1, Ida D2, Ika C, Ilena, Ira and Ivana F with connecting pipelines, all in the „Sjeverni Jadran“ EPU

- construction and commissioning of three new wells Irena-2, Izabela-9 Ver and Izabela-10 Ver including the corresponding platforms Irena 3, Izabela Jugoistok 1 and Izabela Jugoistok 2 with connecting pipelines, as well as the construction of a new exploitation platform Irena 2 for connecting the existing well Irena-2, all in the “Izabela” EPU.

Except the previously listed projects, based on new insights obtained during the performance of oil and mining works, application of newly developed technologies and a significant increase in hydrocarbon prices which enable economically viable exploitation, all existing, approved EPUs include the possibility of constructing new appraisal wells, constructing new or reconstructing existing oil and mining installations and plants for the purpose of developing and exploiting hydrocarbons. In this respect, the construction and commissioning of new appraisal wells is being considered.

Since the procedures of exploration and exploitation of hydrocarbons are defined by special directives (Directive 94/22/EU and Directive 2009/31/EC), the procedure of granting the right of exploration and exploitation of hydrocarbons is, according to Directive 2014/23/EU, exempt from the application of regulations governing concessions, and are applied pursuant to the Act on Exploration and Exploitation of Hydrocarbons.

The existing, approved hydrocarbon exploitation fields where all the activities listed are enabled are shown in the attached image (Image 1.4).



Image 1.4 Areas for the exploration and exploitation of hydrocarbons within the EEZ (Source: Plan – elaboration by IRES EKOLOGIJA d.o.o.)

1.3.4 Submarine cables and pipelines

The Plan determines corridors for existing cables and pipelines, which should be complied with in order to ensure their protection and safe conduct of other activities.

The conditions for laying planned cables and pipelines are given in accordance with recommendations from the methodological framework, taking into account cross-impacts with other activities (e.g. fishing using benthic trawl

nets, aquaculture, maritime traffic) and possible impact on the marine environment, namely in protected areas or especially sensitive habitats.

Existing submarine cables (communications, energy) and pipelines can be maintained, replaced and reconstructed in accordance with special regulations taking into account other activities and the protection of nature and the marine environment, habitats and species, and the rights and obligations of other states if it does not pose a threat to the environmental status.

When planning the laying of new communication cables (ECI, PKI), it is necessary to comply with UNCLOS provisions which guarantee other states the right to lay submarine cables in the EEZ while adhering to the obligations towards the coastal state and reporting to international bodies on the cable position. Other states also need to take into consideration the rights of the coastal state, including the obligation of reporting on planned activities, as well as adhering to the laws and regulations of the coastal state which refer to environmental protection, the safety of navigation and other relevant aspects.

During planning, positioning and further maintenance of new submarine communication cables in the EEZ area, it is necessary to obtain relevant construction permissions and consent prescribed by the Electronic Communications Act, the Cybersecurity Act and the Ordinance on the conditions for issuing permissions for laying pipelines and maintaining submarine cables and pipelines in the continental shelf of the Republic of Croatia, the Maritime Code, the Ordinance on the manner and conditions of determining the zone of electronic communication infrastructure and other related equipment, protection zone and radio corridor, and the obligations of the works or construction work investors.

Reasons for prohibiting the laying of cables and pipelines can include: protection of sensitive ecosystems (e.g. coral reefs, the *Posidonia Oceanica* seagrass), geological instability (e.g. areas prone to underwater landslides), the presence of other objects (e.g. existing submarine cables or pipelines, aquaculture).

In order to protect submarine cables and pipelines amid performing various offshore and onshore activities, it is necessary to mark the laid submarine cables and pipelines with corresponding labels (Article 18 of the Ordinance on the waterway marking system and the objects of the safety of navigation). Within the same Ordinance, Article 28 defines marking submarine cables, pipelines and outfall across three paragraphs.

Submarine cables

After positioning the communication cables, it is necessary to define the ways (measures) to protect critical infrastructure (electronic communications infrastructure – EKI, submarine cable infrastructure – PKI) from cybernetic threats.

When taking measures based on the Recommendation of the Commission (EU) 2024/779, if applicable and appropriate, it is necessary to comply with relevant provisions, obligations and mechanisms determined by the Directive (EU) 2018/1792 of the European Parliament and of the Council, Directive (EU) 2022/2555 of the European Parliament and of the Council (Directive NIS2) and Directive (EU) 2022/2557 of the European Parliament and of the Council (Directive on the resilience of critical entities).

Accordingly, when positioning and maintaining submarine communication cables, it is necessary to comply with the National strategies for cybernetic security of the Republic of Croatia, the Cybersecurity Act and Cybersecurity Regulation, which, together, define the guidelines and obligations to protect critical infrastructure. In doing so, the Cybersecurity Act and Regulation implement the EU Directive on network and information security (NIS2) (EU 2022/2555) into the legislation framework of the Republic of Croatia. This Directive requires all Member States to align their national legislation with the high standards of protecting critical infrastructure, including submarine telecommunication networks as part of digital infrastructure. In addition, the Critical Infrastructure Act plays a key role in identifying and protecting infrastructures which are vital for the society and economy of the Republic of Croatia. This act enables identification and protection of infrastructural objects and systems whose disruption or destruction would have a severe effect on the health, safety or economic stability of the state.

All the measures together form a robust legal framework which ensures that PKI is not only effective and efficient, but also resilient to cybernetic threats, which minimises the risk of communication interference and ensures continuous protection of vital national interests.

Compliance with international standards entails adhering to the recommendations of the International Cable Protection Committee (ICPC) and ensuring the right to maintain the cables seamlessly, which includes protection from illegal activities (e.g. unregistered anchoring or fishing at the location where a telecommunication cable has

been laid). In order to protect submarine telecommunication cables from potential damage, the Maritime Code regulates the matter of positioning and maintaining objects of the safety of navigation used to mark objects, equipment or other offshore or onshore projects which obstruct waterways permanently or temporarily, which also include submarine telecommunication cables. Pursuant to Article 52(4) of the Maritime Code, the investor, owner or user of the object or equipment, or the competent project authority, is considered a responsible person to position and maintain the objects of the safety of navigation.

The submarine telecommunication cables which are abandoned or no longer used in the EEZ must be removed taking into account marine environmental protection, the safety of navigation, international law and other maritime activities. When removing the abandoned infrastructure, it is important to:

- ensure the procedures for unimpeded exercise of rights of other states to use submarine telecommunication cables and other EKI/PKI elements
- ensure cooperation with international regulatory bodies and compliance with international standards in order to avoid legal disputes and
- notify other states and relevant maritime organisations about planned removal works.

The process of removing submarine telecommunication cables requires the application of specialised technologies and strict safety measures in order to reduce the risks to people and the environment. It involves using contemporary ICT solutions for inspection and safe removal of the infrastructure (EKI/PKI) in order to avoid sudden collapse and seabed disturbance, and appropriate management and recycling of extracted materials in order to reduce the environmental footprint.

If the removal could cause significant ecological consequences, alternative solutions can be considered, such as stabilising the infrastructure and marking it in nautical charts. The purpose of this procedure is to maintain ecological balance, the safety of maritime traffic and the protection of rights of all stakeholders using the maritime space. The EKI/PKI in the EEZ require responsible management, both in the installation and maintenance phase and the removal or replacement phase. The ecological approach ensures that the sea and marine ecosystems are not disrupted by unnecessary interventions, while at the same time it enables a safe and efficient development of submarine infrastructure (EKI/PKI).

Testing, drilling or anchoring works, benthic trawling and disposing of unexploded ordnance in the corridors for submarine cables and pipelines are not permitted.

Submarine pipelines

Pursuant to Article 1 of the Act on the Safety of Oil and Gas Pipeline Transport, oil and gas pipelines entail underground and underwater oil and gas pipelines. Article 2 of the same Act stipulates that, depending on their purpose and significance, oil and gas pipelines can be oil and gas pipelines for international transport, major and local oil and gas pipelines. The definition of major oil and gas pipelines explicitly states submarine oil and gas pipelines for transporting raw oil and gas as well.

Provisions on submarine pipelines are also present in the Maritime Code, a fundamental maritime regulation, and the Ordinance on the conditions for issuing permissions for laying pipelines and maintaining submarine cables and pipelines in the continental shelf of the Republic of Croatia. Article 5(1)(23) of the Maritime Code defines a fixed offshore object as a marine object completely or partially embedded in the seabed or laid onto the seabed, which is not intended for navigation (e.g. a fixed offshore object for exploration and exploitation of the submarine area, submarine pipeline, etc.), except for a submarine cable and objects of traffic infrastructure (e.g. a submarine tunnel, a bridge mounted on the seabed, etc.). Article 2 of the Ordinance on the conditions for issuing permissions for laying pipelines and maintaining submarine cables and pipelines in the continental shelf of the Republic of Croatia defines that submarine pipelines are those pipelines laid below the sea level and, for the purpose of exploration, exploitation or performing economic activities of transporting gas, hydrocarbons or water, partly or completely positioned on supports above the seabed, laid onto the seabed or embedded into the seabed.

Restrictions and procedures related to submarine pipelines

Pipelines also include a safety zone along the pipeline route (Article 61(3) of the Ordinance on important technical requirements, safety and protection during exploration and exploitation of hydrocarbons from the submarine area of the Republic of Croatia – OG 52/10). Once the pipelines have been used (the exploitation has stopped), it is necessary to completely remove the transported fluid and fill the pipelines with seawater (render them inert) and remove them from the seabed.

Currently known routes of existing and planned cables and pipelines in the EEZ are shown in the following image (Image 1.5).

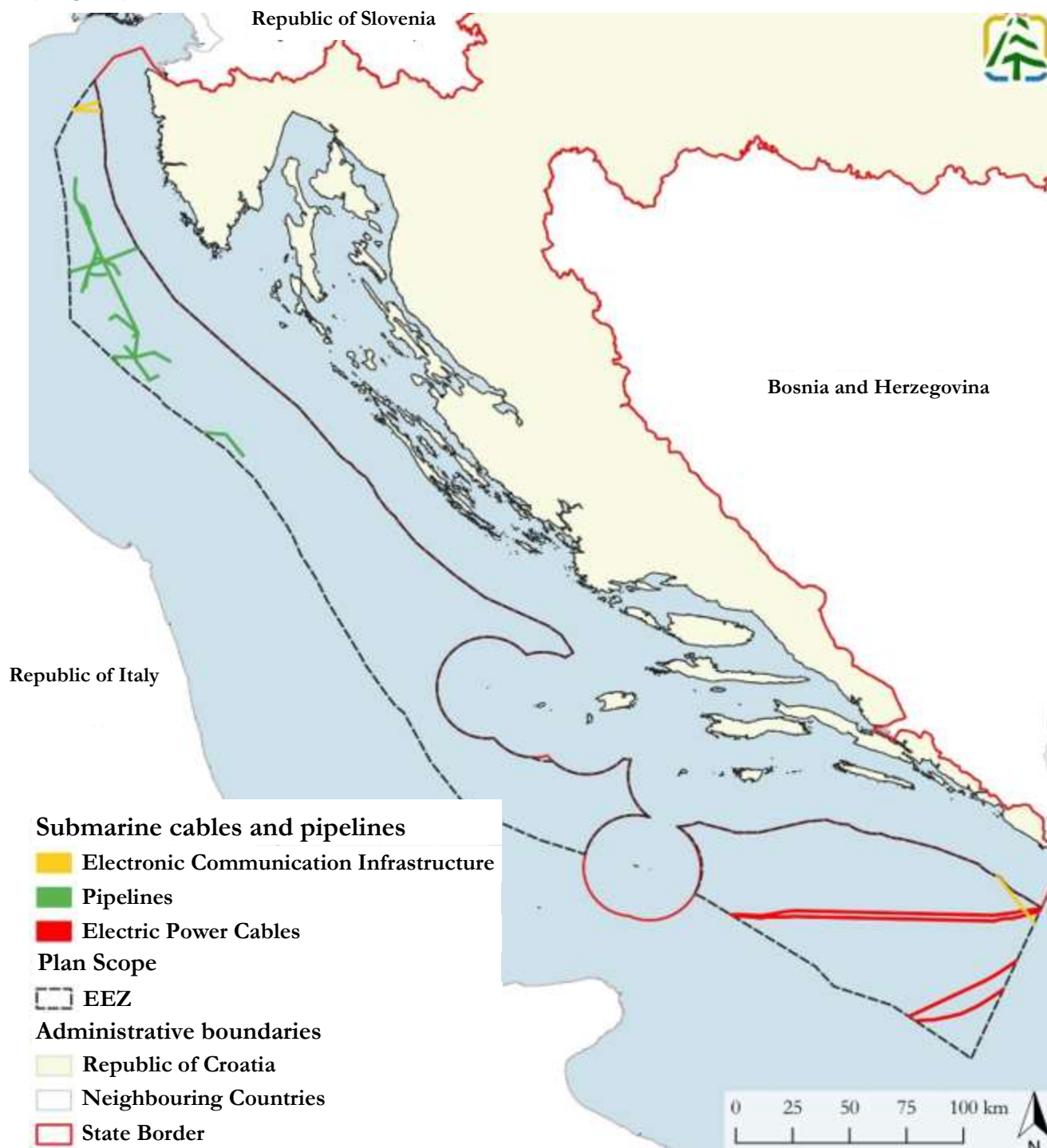


Image 1.5 Submarine cables and pipelines in the EEZ (Source: Plan – elaboration by IRES EKOLOGIJA d.o.o.)

1.3.5 Maritime traffic

In the EEZ area, navigation without restrictions is generally permitted in accordance with international rules for preventing collisions at sea. Exceptionally, in traffic separation areas all vessels are obliged to follow the routing zones.

Navigation restrictions within the EEZ can be imposed due to:

- measures for the safety of navigation
- measures for marine environmental protection
- other planning activities.

In this respect, the restrictions can be:

- short-term or
- long-term.

Short-term navigation restrictions in the EEZ are established in the event of activities which cannot be performed safely or without jeopardising environmental protection under the conditions of navigation without restrictions.

Short-term restrictions are mandatorily declared in the event of:

- conducting scientific and research measurements and works
- navigation, i.e. the towing of vessels that cannot efficiently apply the rules for preventing collisions at sea for any reason
- military and other exercises
- other activities that require navigation restrictions for other vessels.

Navigation restrictions are published as notice for mariners or navigational warnings and marked by corresponding maritime labels, as appropriate. Short-term restrictions are generally not represented in nautical charts.

Long-term navigation restrictions in the EEZ area are established for the purpose of protecting the environment from adverse effects of maritime traffic or activities which, for safety and environmental reasons, require distancing maritime traffic, i.e. reducing traffic density in the immediate proximity. Long-term navigation restrictions apply in the event of:

- positioning offshore floating or fixed installations for submarine exploitation
- positioning installations intended for aquaculture
- establishing areas of nature and species conservation
- establishing areas of cultural heritage protection
- other justified reasons.

The area involving long-term navigation restrictions in the EEZ area is determined in the procedure for obtaining permission. Long-term navigation restrictions are generally not established for the routing systems and for the areas of navigation with increased caution.

In the event of establishing long-term navigation restrictions, a safety zone of 500 m, measured from every point of the area, is also established. If it is necessary to establish a zone wider than 500 m, the zone is established according to the rules for establishing or changing the routing system.

The establishment of long-term navigational restrictions in the EEZ area is announced at least six months prior to the establishment and published as notice for mariners or navigational warnings and marked in nautical charts. The areas involving navigational restrictions are marked by maritime labels, as appropriate.

While using the EEZ, the navigation of ships, yachts and boats will:

- take precedence over other activities if there are no other options (namely with respect to aquaculture)
- be adapted to the needs of other space users if such adaptation does not jeopardise measures for the safety of navigation and measures for marine environmental protection.

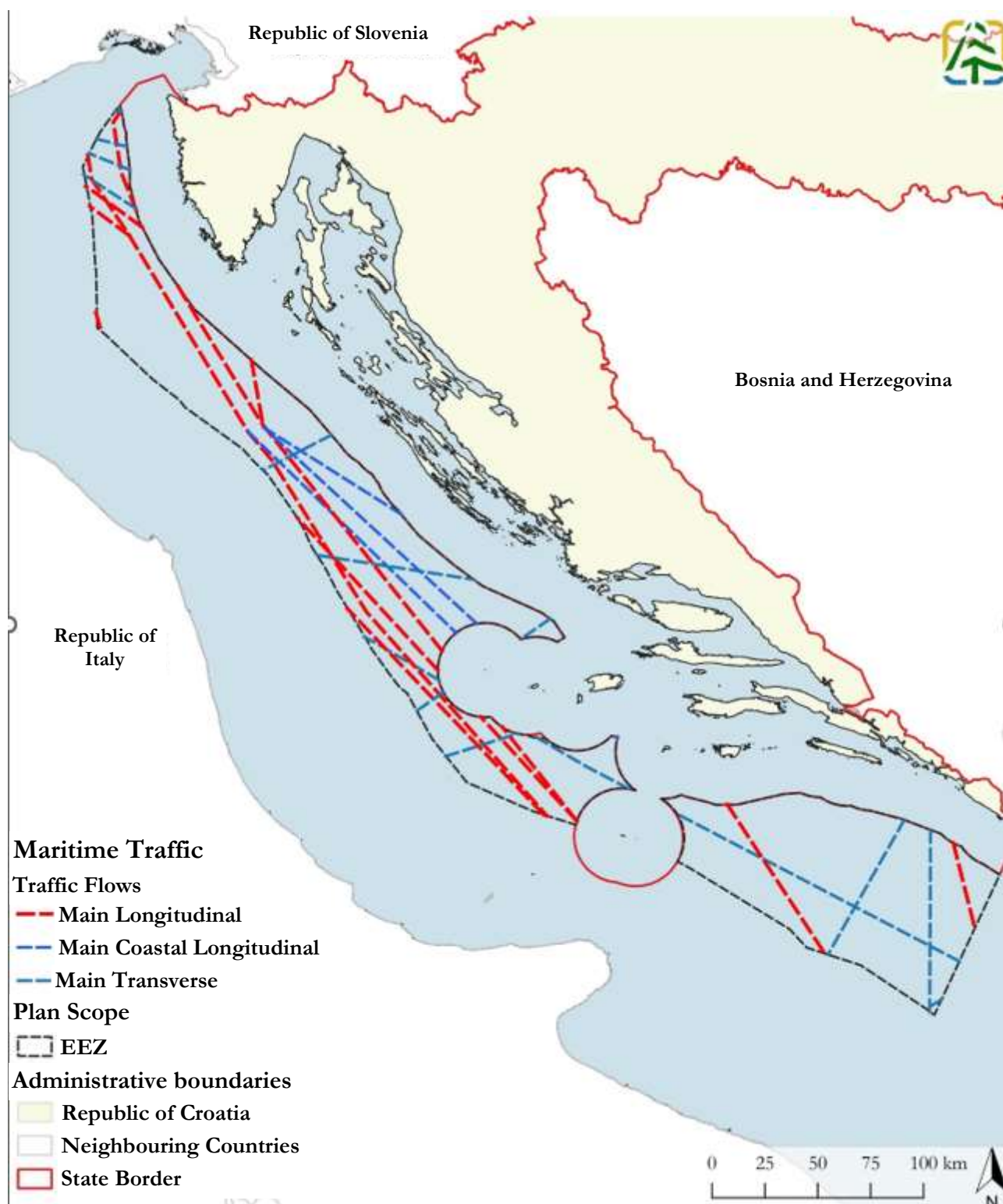


Image 1.6 Maritime traffic in the EEZ (Source: Plan – elaboration by IRES EKOLOGIJA d.o.o.)

1.3.6 *Special Purpose*

UNCLOS does not explicitly mention the performance of any military activities in the exclusive economic zone, nor it restricts them in any sense. The Republic of Croatia can intervene if the performance of such activities includes prejudice to its rights in the EEZ.

In practice, all exercises carried out in the Adriatic Sea, with the Republic of Croatia as a participant, are coordinated and announced.

During military exercises, other activities are restricted (e.g. restrictions for navigation and the use of segregated airspace).

With respect to areas for the disposal of unexploded ordnance, it is necessary to conduct further research in order to register the areas and propose the manner of marking and rehabilitating them, as well as to eliminate danger while activities are in progress in these areas.

For all construction works/installations whose planned height exceeds 60 m above the sea level, it is necessary to obtain consent in accordance with the provisions of the Ordinance on the construction and establishment of aviation obstacles (OG 100/19).

1.3.7 Nature and species conservation and marine protected areas

Adopting special regulations for nature conservation, and hence for proclaiming marine protected areas, is under the jurisdiction of the sector in the field of nature and environment conservation. The Plan supports protection by reserving space for nature protection based on conducted scientific research. The use of this space that is incongruent with the conservation of nature, species and environment is prohibited or restricted.

Nature and species conservation and marine protected areas are, by the Decision on development, included in the framework of potential activities within the EEZ area.

Planned uses must not cause a significant negative impact with respect to the distribution of target species and habitat types within the ecological network area, or with respect to species and habitat types in general, or by permanent habitat occupation, changes in habitat conditions, reduction in the number and distribution or the disappearance of target species and habitat types, habitat fragmentation, decline in target species and other species in general, or by degrading the favourable state of the goals of conservation and integrity of a certain ecological network area.

Spatial-planning solutions should contribute to sustainable development and must not cause additional significant pressures to biodiversity, considering the distribution of species and habitat types, as well as the areas important for their survival.

When developing the Plan, Attachment II to the Regulation on the development and implementation of documents of the management strategy of the marine environment and coastal area (Framework list of ecosystem elements, anthropogenic pressures and human activity significant for marine waters) is taken into consideration. Said Attachment is in accordance with the amendments to MSFD from 2017 (Directive of the Commission (EU) 2017/845 of 17 May 2017 on the amendments to Directive 2008/56/EC of the European Parliament and of the Council with regard to framework list of elements that must be taken into consideration when developing marine strategies).

Restriction analysis

The starting point is information on constraints that must be taken into consideration when determining the spatial and temporal distribution of relevant existing and future activities, as well as uses, including designating areas suitable for the development of economic activities, in accordance with the objectives of protecting marine protected areas and conserving important marine species. Currently, marine protected areas in the EEZ include proposed conservation areas for birds (SPA) and proposed conservation areas for species and habitats (pSCI), and fishing-related areas (the Jabuka/Pomo Pit FRA), with possibilities for new protected areas established through similar mechanisms.

Restrictions arise from regulatory mechanisms, ecological requirements, and other spatial conflicts that may affect the feasibility of performing certain activities in these areas, which is detailed further in the Plan itself.

1.3.8 Underwater cultural heritage

The procedure in the event of finding underwater archaeological heritage and its protection are determined by regulations in the field of cultural heritage protection and conservation, taking into account relevant provisions of the UNESCO Convention on the Protection of Underwater Cultural Heritage and of the Maritime Code.

1.3.9 Scientific research

Scientific research not conducted for the purpose of economic utilisation of the EEZ can be conducted in the entire EEZ area in accordance with special regulations and the provisions of the Plan.

Research activities must not disrupt maritime traffic or the activities of hydrocarbon exploitation and aquaculture.

Submarine research (of the seabed and its subsoil) must be conducted with caution in the corridors for cables and pipelines and in the areas of the disposal of unexploded ordnance.

Research for the purpose of hydrocarbon exploitation can be conducted only within designated exploitation fields. In the areas where other activities are performed, subject to restrictions or prohibitions, additional conditions to conduct scientific research are determined as needed and for the purpose of:

- ensuring safety and efficiency of maritime traffic
- avoiding damage on oil and mining installations and plants for exploration and exploitation of hydrocarbons
- avoiding the disruption of military exercises and manoeuvres
- assessing and protecting cultural property with bodies competent for cultural property protection.

An increase in the number of research stations and the frequency of sampling is planned in order to improve spatial and temporal coverage of the area. The range of monitored parameters will also be expanded, including research on the seabed status (D6) and underwater noise (D11), which are currently not fully covered in the EEZ. By increasing the spatial coverage of the EEZ and by including additional descriptors in the monitoring, more detailed information on the environmental status of this part of the Adriatic Sea will be obtained. The planned activities will be aligned with the EU objectives for marine environmental conservation, thereby further strengthening Croatia's role in the conservation and sustainable use of the Adriatic Sea. The implementation of the expanded research programmes in the EEZ will enable a better understanding of the impacts of anthropogenic activities on the marine ecosystem and will assist in adapting management strategies to meet the goals of biodiversity and resource conservation.

Croatia will encourage new research in accordance with the needs of development plans and programmes, taking into account the adoption of new technologies and knowledge that can significantly improve the efficiency of certain processes (e.g., fisheries, aquaculture, energy, etc.) and reduce their environmental impact (e.g., increased selectivity of fishing gear, reduction of impacts on habitats and non-target species).

2 Correlation of the Plan with other relevant strategies, plans and programmes

This chapter thoroughly addresses strategies, plans and programmes at the national, county and local level, purpose and objectives of these documents and their comparison to the objectives of the Plan in question. According to the analysis, the Plan is aligned with or not in conflict with the following documents:

- Spatial Development Strategy of the Republic of Croatia (OG 106/17)
- National Development Strategy of the Republic of Croatia until 2030 (OG 13/21)
- Climate Change Adaptation Strategy of the Republic of Croatia for the period until 2040 with an outlook to 2070 (OG 46/20)
- Low-carbon Development Strategy of the Republic of Croatia until 2030 with an outlook to 2050 (OG 63/21)
- Nature Protection Strategy and Action Plan of the Republic of Croatia for the period 2017-2025 (OG 72/17)
- Energy Development Strategy of the Republic of Croatia until 2030 with an outlook to 2050 (OG 25/20)
- National Aquaculture Development Plan for the period until 2027 (OG 133/22)
- Marine Environment and Coastal Area Management Strategies (OG 112/14, 39/17, 112/18)
- National Recovery and Resilience Plan 2021-2026
- Air Pollution Control Programme for the period 2020-2029 (OG 90/19)
- Framework Plan and Programme for the Exploration and Exploitation of Hydrocarbons in the Adriatic
- Fisheries and Aquaculture Programme of the Republic of Croatia for the programme period 2021-2027.

3 Existing environmental status and potential environmental development without the implementation of the Plan

The document development approach is based on an internationally accepted framework for reporting on the environmental status – the DPSIR (driver, pressure, state, impact, response) methodology. This framework suggests causal links of interconnected components of social and economic systems and the environment. It recognises a chain of driver systems and processes of specific pressures on the environment, the consequences of these pressures, i.e. the state of the environment, which generate different problems and impacts on the environment. These pressures and impacts of human activity on environmental components and factors result in the response of the society which includes a series of measures to affect all the links in a chain. According to this methodology, the existing environmental status is analysed through chapters:

- Drivers of change in the environment: traffic, fisheries and aquaculture, energy
- Pressures on the environment: marine waste, noise, light pollution, invasive species
- Environmental components and factors, in accordance with the Environmental Protection Act¹

¹ According to the Environmental Protection Act (OG 80/13, 153/13, 78/15, 12/18, 118/18), Article 4(1)(67), environmental components are: air, water, sea, soil, landscape, flora and fauna and Earth's lithosphere. Article 76(2) states that environmental impact assessments determine effects on the following environmental factors: land, soil, water, air and climate, forest, population and human health, flora and fauna, biodiversity, natural values, landscape, material assets, cultural heritage and susceptibility to the risk of havoc or catastrophe. However, due to the specific scope of the Plan referring to the marine space of the exclusive economic zone of the Republic of Croatia, some parts of the chapters listed are not relevant. Therefore, chapters of this Study are defined in accordance with the Decision on content and depending on available data.

3.1 Potential environmental development without the implementation of the Plan

Air

The pressure on air quality in the area of the Plan, in other words, at the closest state network stations which can be relevant for the EEZ scope (Pula Fižela, Višnjan, Hum (the Island of Vis), Polača, Vela Straža, Opuzen), is registered as exceedance of the target values for ground-level ozone (O₃) in measuring stations Pula Fižela, Višnjan and Hum (the Island of Vis). Since ground-level ozone pollution is a regional issue, exceedance of target values is expected to continue, and it may vary from one year to another.

Climate and climate change

Since climate change is a global issue in terms of both its causes and consequences, it is necessary to achieve a long-term comprehensive international cooperation in order to tackle it. Global climate change is related to the changes in global energy balance of the Earth, hence, it can be deduced that, even without the implementation of the Plan, there will still be a rise in annual air temperature, mild reduction in precipitation quantity, increase in the number of dry spells, increase in the frequency and intensity of precipitation in a short period of time, etc. – which will affect the environment, infrastructure and people. Without applying the adaptation measures and reducing vulnerability across sectors, new conditions are expected to continue and intensify the existing negative trends. Coastal areas are especially vulnerable, where inundation may occur due to rising sea levels and coastal floods. Even though the consequences of climate change will become more prominent in the future, the society as a whole is making progress in raising awareness of necessary changes and planning of climate change adaptation measures. The progress is made on the basis of various plans, strategies, programmes or at the level of specific projects, which is why it can be expected that infrastructural and environmental systems will become more resilient to negative consequences of climate change in the future.

Sea and seabed

Natural processes causing changes in physical and chemical properties of the sea and seabed progress slowly and their effect cannot be easily measured. Without the implementation of the Plan, it is expected that the existing anthropogenic pressures will continue, such as those stemming from industry, tourism and maritime traffic, which are constantly increasing in the Adriatic Sea area. However, considering the sea volume and low intensity of these changes, significant changes in physical and chemical properties are not expected.

Biodiversity

Within the EEZ area, there is currently lower intensity fishing and maritime traffic, and there are also hydrocarbon exploitation fields, submarine cables and pipelines. Without the implementation of the Plan, there would be no spatial regulation of the listed, existing economic activities within the EEZ. This means that their negative aspects which are potentially harmful to biodiversity of the Adriatic will also continue to take place, e.g. habitat loss or disturbance and destruction of marine fauna due to trawling. On the other hand, there would be no planning of aquaculture sites, positioning of new cables and pipelines or platforms for hydrocarbon exploitation, so there would also be no further habitat loss and degradation. There would also be no increased disturbance and destruction of marine fauna due to fishing development within the EEZ. Without expanding the existing economic activities and adding new ones, there would be no increased anthropogenic pressures, such as increased marine waste quantity and easier expansion of invasive species.

Landscape characteristics

If there is no implementation of the Plan, the area would continue to develop without clear regulation of spatial development, which could lead to uncontrolled and uncoordinated space use and have a negative impact on marine landscape. Activities such as aquaculture, fishing, hydrocarbon exploitation and positioning of infrastructural routes and cables can develop spontaneously, without considering landscape values and space capacity. Such development increases the risk of degradation of natural views and distortion of visual identity of the coastal and marine space. Landscape fragmenting may also occur due to uncoordinated projects of different space users. With no Plan, it is not possible to achieve a systematic protection of sensitive landscape areas and the implementation of measures for the conservation of visual and ambient space quality is hindered. Consequently, this leads to a loss of potential for sustainable development based on landscape and natural values.

Cultural and historical heritage

If there is no implementation of the Plan, the fact that underwater cultural heritage in the EEZ is not researched enough and that legislation or competence is not clear enough remains the main issue within the cultural and historical heritage component. The main identified threats to under-researched underwater cultural heritage are anchoring, trawling, forming of new wells and the realisation of communication and energy infrastructure in the area.

4 Existing environmental issues important for the Plan

Analysis of the existing state and trends of environmental change drivers, pressures on the environment and environmental components and factors has resulted in distinguishing existing environmental issues across all environmental components and factors from the perspective of the scope of the Plan. This chapter emphasises their significance, locations, causes and links to drivers of change and pressures on the environment.

Table 4.1 Existing environmental issues important for the Plan

Environmental components/factors	Existing environmental issues
Air	Degraded air quality – category II considering ground-level ozone (O₃)
Climate change	- Rising trend of annual air temperatures and total amount of precipitation in comparison to the multiannual average - More frequent thunderstorms followed by strong winds - Rising sea levels
Sea and seabed	Floating waste
Biodiversity	- Marine waste, namely plastic - Overfishing of marine organisms - Incidental catch of strictly protected species of marine fauna - Illegal oil spills from ships during routine ship operations - Pollution caused by oil spills and other dangerous matter - Pollution of underwater environment by explosive ordnance - Mariculture which leads to increasing concentration of organic matter, introduction of disease, non-native species, etc. - Underwater noise caused by maritime traffic, sonars (fishing, military, scientific), underwater operations - Invasive foreign species - Increased frequency of extreme events and changes in hydrographic properties of the Adriatic caused by climate change
Landscape characteristics	- Degrading night landscape and night sky at the sea by expanding and intensifying both maritime traffic and coastal cities - Pressures on marine landscape and island landscape due to increased marine waste and maritime traffic - Changes of marine landscape due to climate change
Cultural and historical heritage	- Under-researched underwater cultural heritage in the EEZ area - Sometimes unclear legislation which does not adequately define competence and procedures over cultural heritage in the EEZ - Forming new wells poses a risk of degradation of undiscovered archaeological heritage

5 Environmental properties of the area which can be significantly affected by the implementation of the Plan

Environmental properties of the area which can be significantly affected by the implementation of the Plan are described in Chapter 3.3 Description of the state of environmental components and factors, while this chapter distinguishes and depicts the properties in accordance with preliminary identified impacts that are probable to significantly affect them through the implementation of the Plan.

Table 5.1 Environmental properties which can be significantly impacted by the implementation of the Plan across environmental components and factors

Environmental component/ factor	Environmental property	Impact
Biodiversity	Rare and endangered habitat types	Fishing by trawling leads to the destruction of the seabed, which results in the loss and degradation of benthic habitats and the loss of key habitats for hatching, feeding and shelter.
	High-risk endangered and strictly protected species	Fishing activities can lead to incidental catch of species which are not target fishing species, such as strictly protected species of sharks, rays, turtles, dolphins and birds and – since they cannot escape or they get injured in the fishing gear – they often get harmed.

6 Environmental protection objectives established upon completion of international treaties and agreements, referring to the Plan

Conventions, protocols and charters are international treaties whose provisions the signatories of the document must comply with. By ratifying them, states formally commit to implementing the provisions, by law and in practice. What follows is an overview of documents whose correlation with the Plan was analysed:

Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus (1998) (OG – IT 10/01)
Protocol on Strategic Environmental Assessment, Kiev (2003) (OG – IT 3/10)
European Green Deal
UN Framework Convention on Climate Change (UNFCCC, 1992) (OG – IT 02/96)
Paris Agreement on Climate Change (2015) (OG – IT 3/17)
Convention on Biological Diversity, Rio de Janeiro (1992) (OG – IT 6/96)
Convention on the Conservation of European Wildlife and Natural Habitats – Bern Convention, Bern (1979) (OG – IT 6/00)
European Landscape Convention, Florence (2000) (OG – IT 12/02)
Convention concerning the Protection of the World Cultural and Natural Heritage, UNESCO (1972) (OG – IT 12/93)
EU Biodiversity Strategy for 2030
Forging a climate-resilient Europe – new EU climate change adaptation strategy (2021)
UN 2030 Agenda for Sustainable Development (2030 Agenda) (2015)
Convention on the Protection of Underwater Cultural Heritage (2001) (OG – IT 10/04)

7 Environmental impacts of the implementation of the Plan

7.1 Impact assessment methodology

Impact assessment of the implementation of the Plan categories analyses the change or consequence the planning activities or elements will have on the environmental components and factors.

The impacts of the Plan on the environmental components and factors are evaluated using the expert assessment method based on the available data on the characteristics of the activities and elements of the Plan categories and the available national and international scientific and specialist literature on potential impacts of specific characteristics of planned activities or elements.

Finally, the following chapters are specifically emphasised: Climate change impacts, Impact in the event of an uncontrolled event, Cross-border impacts and Cumulative impact assessment.

During the analysis of the impact assessment on the environmental components and other factors, the following categories of impacts are used for the purpose of further defining the type and scope of specific impacts:

- according to significance: positive, neutral, negligible, moderately negative and significantly negative
- according to action direction: direct and indirect
- according to time span: short-term and long-term

The purposes of the Plan which are not considered during impact assessment on environmental components and factors are:

- Special purpose – since the Plan only registers potential areas of unexploded ordnance, dangerous areas in air space and since it enables the performance of military exercises with certain restrictions. The provisions of the Plan stipulate that, in the event of certain activities in potential areas of unexploded ordnance, and prior to commencing the works, it is necessary to survey the seabed and, if unexploded ordnance is found, notify the competent authorities to safely remove the ordnance
- Nature and species conservation and protected areas – since the Plan only registers habitats and since there is a proposal of the ecological network areas
- Underwater cultural heritage – since the Plan does not chart any site of underwater cultural heritage due to a lack of data
- Scientific research – since scientific research can be conducted in the entire EEZ area, and the Plan only registers specific planned activities.

Further analysis of potential impacts on environmental components and pressures exempts the component Protected nature areas, since the Plan will not have an impact on it, as determined during the analysis of environmental status data.

7.2 Summary of the environmental impact assessment of the implementation of the Plan

7.2.1 *Aquaculture*

The activities of the Plan do not generate precursors which can lead to an increase in the ground-level ozone (O₃) concentration. Therefore, the impact on air quality is assessed as neutral.

With respect to aquaculture impact on the sea and seabed, activities such as discharge of nutrient-rich waters and establishment of breeding structures may disrupt natural sea circulation, increase temperature and salinity and lead to a reduction in the amount of dissolved oxygen, which may cause eutrophication. Such disruptions are assessed as moderately negative, indirect and long-term. In addition, aquaculture waste can pollute the sea surface, water column and seabed, which also generates a moderately negative, direct and long-term impact.

Aquaculture may have various impacts on marine ecosystem biodiversity, mostly moderately negative, indirect and long-term. Fish feeding leads to the introduction of nutrients, namely nitrogen and phosphorus, which may cause eutrophication and algal blooms, especially on the seabed, where organic waste is deposited and oxygen is reduced,

although anoxia is not expected due to strong currents in the EEZ area. Breeding of shellfish also affects the sediment, but no significant impact is expected. Breeding attracts wild fish species which may benefit from it, but there is also a risk of entanglement for protected species such as dolphins, turtles and birds. In order to reduce the negative impact on strictly protected species which can be found around the breeding sites, protection measures are prescribed. Activities such as operation of equipment and vessels create noise and light pollution, which can disturb wild species, but do not cause permanent damage – these impacts are also assessed as direct, long-term and moderately negative. The only equipment which emits sound at a level which may cause damage are pingers, which is why a protection measure is prescribed. There is a risk of collision with vessels, namely for marine mammals and turtles, and in order to reduce the risk of collision and the negative impact of hurting strictly protected fauna, a protection measure is prescribed. During treatment of fish, it is possible for medication to appear in the environment, which also poses a moderately indirect, periodical and moderately negative impact. Breeding of tuna also includes fishing for juveniles, which may have additional negative impacts.

As stated in the Plan, there is no clear consensus on defining the term “offshore aquaculture”, but it generally entails activities in open waters, a few kilometres off the shore. The EEZ area is dominated by open sea, whose spatial characteristics and limited shore visibility create a unique visual experience. Normal breeding forms include cages for fish (such as sea bass and gilthead sea bream), floating feeders and ropes for shellfish (mussels, oysters). Modern cages and feeders, although functional, may disrupt visual identity of the landscape, especially in calmer parts of the Adriatic with lower traffic density. Aquaculture activities may also have a negative impact on night time landscape due to light pollution and increased traffic between the cage and land. Nevertheless, if landscape sensitive measures are applied, such as adapting the cage colour, using underwater systems and allocation in less sensitive areas, the impact is expected to be direct, long-term and moderately negative.

The only physical impact on the seabed refers to anchorages which may endanger underwater cultural heritage, namely in poorly researched parts of the Adriatic rich in archaeological sites. Even though there is a potential risk of damaging underwater archaeological heritage, if prescribed protection measures are applied and with minimal intervention level, the impact is assessed to be negligible, direct and long-term.

7.2.2 *Fishing areas*

The activities of the Plan do not generate precursors which can lead to an increase in the ground-level ozone (O₃) concentration. Therefore, the impact on air quality is assessed as neutral.

Using fishing tools, i.e. dragging or moving it across the seabed, may cause physical damage to the seabed. It also causes the sediment to stir up and move, which may result in erosion and disturbance of the seabed structure. Such operations can lead to the loss of a biologically active sediment layer. Moreover, fishing activities can contribute to the amount of marine waste which degrades slowly and can remain there for years. Said impact is assessed as moderately negative, direct and long-term. On the other hand, trawling frequently leads to passive collecting of waste from the seabed (the so-called fishing for litter), which reduces the total amount of environmental waste and thus represents a positive impact. In this way, fisheries indirectly contribute to removing marine waste, namely plastic and discarded fishing gear.

Overfishing in the Adriatic endangers important species such as hake, shrimp, sardines and anchovies, reduces populations, disrupts the ecosystem and increases the risk of fish stock collapse. Trawling is the most harmful fishing method because it physically destroys the seabed, degrades habitats and contributes to the disappearance of important species. Since trawling is permitted in areas of rare and endangered habitats, a significantly negative impact is expected, which can be mitigated to the level of a moderately negative impact by applying the measure prescribed by the Main Assessment. Incidental catch of unwanted and protected species (dolphins, sea turtles, sharks, birds) represents a significantly negative impact, but it can be mitigated by applying technical solutions like TED devices, acoustic deterrent devices or the so-called Medina panel, but endangered species are still at risk. Since the endangered and strictly protected Yelkouan shearwater (*Puffinus yelkouan*) belongs to the Shearwater family and is spotted around fishing ships, a negative impact of incidental catch of this species cannot be ruled out. In order to mitigate the effect of harming the strictly protected Yelkouan shearwater and other species as well (Audouin's gull, Scopoli's shearwater, etc.), a measure is prescribed by the Main Assessment. Noise and fishing ship traffic generate a moderately negative, direct and long-term impact on the marine environment, while trawling additionally increases the noise levels, but, due to spatial and temporal limitations, this impact remains moderately negative and periodical. The risk of collisions of ships and marine fauna is low, but also considered direct, periodical and moderately negative.

The surface area of marine landscape is variable and dynamic. The sea surface itself changes shape depending on superficial and underwater impacts such as wind, time of day, sea currents, etc. Apart from these natural factors, the appearance of the sea surface, and thus the marine landscape as well, changes depending on the type, size and intensity of maritime vessels navigating through it. The sea surface can be completely solitary or saturated with numerous vessels of different purposes. The largest and most prominent are cruise ships and cargo ships which navigate down the middle of the Adriatic in the EEZ area. Additionally, some parts of the EEZ are more saturated with fishing vessels. However, given the occasional character of these anthropogenic elements moving across the sea surface and the fact that they occur only in specific temporal windows of both the day and the season, it can be concluded that the development of this activity will only have a negligible, direct and long-term impact on the surface landscape of the Adriatic.

Fishing activities which involve the seabed, such as trawling, using crab pots and longlines, can damage underwater cultural heritage like shipwrecks, sunken cities, prehistoric settlements and other historical remnants beneath the sea. Heavy gear can break structures, disperse artifacts and degrade archaeological context. Furthermore, fishing can stir up the sediment, accelerate erosion, change the conservation conditions and hence additionally jeopardise the sites. Incidental findings of artifacts, which are then kept or discarded, are also frequent, which increases the risk of illegal trade. Considering the above, it is assessed that fishing, namely trawling and positioning and dragging heavy objects along the seabed, can potentially have a significantly negative, direct and long-term impact on cultural and historical heritage. Since underwater cultural heritage in the EEZ area is poorly researched and considering the measures prescribed by this Study, this impact can be considered acceptable.

7.2.3 *Exploration and exploitation of hydrocarbons*

The impact on air is moderately negative, direct and long-term, mostly due to emissions of nitrogen oxides (NO_x), volatile organic compounds (VOC) and particles (PM_{2.5} and PM₁₀) which form during combustion processes and gas emissions, and which contribute to the formation of ground-level ozone (O₃), especially in areas with favourable climate and geographical conditions for its formation.

With respect to the sea and seabed, the impact is also assessed as moderately negative, direct and long-term, since activities such as drilling and scouring of the seabed may stir up the sediment, degrade a biologically active layer and potentially pollute the sea, despite the restrictions prescribed by law with regard to discharging harmful matter and waste.

The impact on biodiversity is considered moderately negative, direct and long-term because it involves the loss of rare and endangered habitat types and potentially harmful consequences for strictly protected species such as dolphins, sharks, sea turtles and birds due to noise, vibrations, light pollution and potential collisions with vessels and platforms as well.

With regard to landscape characteristics, new appraisal wells and the construction of new oil and mining installations has a negligible, direct and long-term impact because, even though industrial structures are introduced into natural marine environment, changes happen within the already anthropogenically affected area with existing platforms, with a relatively low mutual visual exposure due to the distance between them.

The impact on cultural and historical heritage is assessed as moderately negative, direct and long-term, with the possibility of degrading underwater archaeological sites during the performance of works, even though the chances of finding new sites are limited by already present infrastructure, and the protection measures prescribed further reduce the risk.

7.2.4 *Submarine cables and pipelines*

The activities of the Plan do not generate precursors which can lead to an increase in the ground-level ozone (O₃) concentration. Therefore, the impact on air quality is assessed as neutral.

Laying submarine cables in southern Adriatic, which predominantly consist of muddy sediments rich in organic carbon, may cause water turbidity and release of CO₂, which contributes to acidification of the sea and affects global carbon cycles. Moreover, it can lead to changes in seabed morphology and current dynamics, which affects the distribution of nutrients, heat and oxygen. During maintenance, pollutants such as chemicals or fuels may be discharged. Considering the above, a moderately negative, direct and long-term impact on the sea and seabed is expected.

Prior to positioning submarine cables and pipelines, research of the seabed is conducted, which causes noise, potentially harmful for endangered species of fish, mammals and turtles. The noise during positioning and embedding may affect the behaviour and health of marine animals, hence the impact is assessed as moderately negative, but it is restricted in terms of time and can be mitigated by protection measures. Collisions of vessels with marine animals may also occur, but, because of the low speed of ships, the impact is assessed as short-term and moderately negative. The impact on strictly protected marine birds is assessed as negligible.

The positioning of submarine cables and pipelines leads to a direct and long-term loss of marine habitat, but considering the small diameter of the infrastructure, this loss is negligible. Cables are positioned in the areas of two habitat types, whose loss will also be minimal. Around the cable, there can be changes in habitat conditions due to heat, electromagnetic radiation and using artificial materials, which can affect the behaviour of certain protected species and facilitate the expansion of invasive species, but, since the intensity is low, the impact is considered not significant. In the event of damage, incidental pollution may occur, but the probability is very low, and the impact is negligible.

The activity of positioning cables may cause a temporary disturbance of the seabed, but it essentially does not pose any impact on marine landscape as a whole. During the performance of certain works, such as the implementation and removal of cables, the realisation of this activity keeps vessels at the sea surface, which causes a negligible, direct and short-term impact on marine landscape characteristics. But since this refers to the surface area of the Adriatic, these impacts will be perceived almost exclusively by other vessels navigating the area, and since traffic in this area of the Adriatic is of low density, the impact is further mitigated.

Laying and removing submarine cables poses risks to cultural heritage, which involve the risk of physical damage of archaeological sites and secondary degradation as a result of sediment movement and changes in oxidative conditions. Changes in sea currents may additionally affect the conservation status of the site. Even minimal disturbance may degrade the archaeological context. Still, considering the small number of planned corridors and their location in deep parts of the Adriatic, a significantly negative impact is not expected, with the prerequisite of conducting prior archaeological prospection using non-invasive methods.

7.2.5 *Maritime traffic*

With regard to air, fossil fuel combustion in ship engines contributes to increasing concentration of pollutants such as CO, SO₂, NO_x, HC, PM_{2,5} and PM₁₀, with some of them being the precursors of ground-level ozone. Even though the SO₂ emission is declining, NO_x emissions are increasing in the period 2015-2023. Despite the existing and planned measures, such as the introduction of a SECA zone and using fuel low in sulphur, the impact of maritime traffic on air is assessed as moderately negative, direct and long-term.

With respect to the sea and seabed, negative impacts include sediment rising, discharge of process water from EGCS systems, oil pollution and operational wastewater discharges. Notwithstanding, considering international conventions such as MARPOL and valid regulations, the impact is assessed as negligible, direct and short-term.

Ships which pass through the EEZ area may cause sea pollution by discharging oil, sanitary water, antifouling compounds, plastic and other matter, which affects marine species negatively, especially larger carnivores like dolphins, sea turtles and sharks. Microplastics and toxic matter are introduced into the food chain and cause health problems and a decline of populations. Incidental pollution and entanglement in plastic waste pose additional risks. Ballast waters and ship biofouling encourage the expansion of invasive species, and considering traffic activity in the EEZ, this impact is assessed as direct, long-term and moderately negative. Furthermore, ship traffic generates substantial submarine noise which may cause injuries, stress, reduced reproduction and emigration of animals from habitats. Light pollution may also affect strictly protected species of birds. Collisions of ships with marine animals, although declining, still pose a moderately negative and long-term impact.

Open sea landscape characteristics are degraded by visual domination of ships, light pollution at night and underwater noise which affects the acoustic dynamic and marine mammal habitats negatively. Although ship routes are already established, additional traffic contributes to the conversion of natural space into functionally degraded environment, hence the impact on landscape is assessed as moderately negative, direct and long-term.

Finally, cultural and historical heritage, namely underwater archaeological sites, may be affected by sedimentation of pollutants, increased dynamic of the seabed and vibrations and noise which potentially destabilise the sites. Since there are no measurements and quantified representations of seabed pollution, and underwater heritage in

the EEZ is still not researched, a potential increase of traffic will not have a significant impact on this environmental component.

7.3 Climate change impact

7.3.1 *Mitigating climate change*

Aquaculture and fishing areas

According to the document Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030 (SWD (2021) 102 *final*), it is important to adapt and develop aquaculture in accordance with low-carbon development goals. With appropriate management, aquaculture can contribute to mitigating climate change. With respect to spatial planning for aquaculture, it is recommended to prioritise species which have the potential to positively affect climate change mitigation. For instance, breeding of seaweed and molluscs can contribute to carbon sequestration². The document emphasises the need for greenhouse gas emission reduction and energy consumption reduction within all phases of aquaculture – from production to processing and transport, which is aimed at reducing the negative impact on mitigating climate change. It is further highlighted that aquaculture can represent a more sustainable alternative in the production of protein in comparison to the traditional livestock production. Breeding of low trophic species³ (seaweed, shellfish, other invertebrates, herbivorous fish) has a lower carbon and environmental footprint, which supports sustainable food transition.

Even though fishing does not have the same carbon sequestration capacity as aquaculture, its contribution to mitigating climate change stems from sustainable management of fish resources, conservation of marine habitats (e.g. seagrass meadow and seaweed) which sequester carbon naturally and the conversion to more energy efficient fishing practices. The application of selective fishing gear, optimisation of fishing routes and fleet modernisation can reduce greenhouse gas emissions.

Considering the above, the impact of aquaculture and fishing activities on climate change mitigation is assessed as positive, indirect and long-term.

Exploration and exploitation of hydrocarbons

Activities which include exploration and exploitation of hydrocarbons, as well as construction, reconstruction, investment maintenance and removal of oil and mining installations and plants, including submarine pipelines, inevitably contributes to greenhouse gas emissions affecting climate change mitigation. During these activities, greenhouse gases are released, such as carbon dioxide (CO₂), methane (CH₄) and nitrogen oxides (NO_x), which will form as a result of fuel combustion in the machines and gear and of potential gas release during drilling and production.

Methane (CH₄) emissions, for instance, have 84 times higher global warming potential than CO₂ over a 20-year period, making them particularly concerning in the context of climate change mitigation. The oil and gas sector in Croatia significantly contributes to said emissions, and according to research by *Greenpeace Croatia* and *Clean Air Task Force*, Croatia is among the top three EU states in methane (CH₄) emissions in this industry.

However, since August 2024, Regulation (EU) 2024/1787 on the reduction of methane emissions in the energy sector applies, which prohibits routine methane flaring and venting and introduces the obligation to measure, detect and prevent methane leaks using LDAR activities and active monitoring. Although this Regulation directly addresses the reduction of methane emissions, it indirectly affects the overall greenhouse gas emissions during carbon production. In the areas designated as areas for the purpose of exploration and exploitation of hydrocarbons, there is a valid restriction regarding the safety zone around the platform as defined in the Ordinance on important technical requirements, safety and protection when exploring and exploiting hydrocarbons in the submarine area of the Republic of Croatia. Although the Ordinance primarily focuses on the safety and protection during exploration and exploitation of hydrocarbons, it also contains provisions which may have an indirect impact on climate change mitigation, e.g. it prohibits discharging liquid hydrocarbons and toxic matter into the sea during the performance of works. In accordance with the Ordinance, the competent authority for granting permissions

² Carbon sequestration is a process in which carbon dioxide (CO₂) is removed from the atmosphere and stored in organisms.

³ Low trophic species are organisms at the bottom of the food chain.

to explore hydrocarbons and the entity authorised to exploit hydrocarbons are obliged to take measures necessary to protect the environment according to valid regulations.

Based on the above, it can be concluded that the impact of exploitation of hydrocarbons on climate change mitigation will be moderately negative, direct and long-term.

Submarine cables and pipelines

This Plan element does not generate greenhouse gas emissions which might affect climate change, hence the impact on climate change mitigation is assessed as neutral.

Maritime traffic

A potential impact on climate change mitigation can be found in greenhouse gas emissions (CO_2 , NO_x , CH_4 , N_2O) as a result of fossil fuel combustion in ship engines as the vessel navigates. In order to reduce said emissions, the International Maritime Organisation introduced mandatory application of EEDI⁴ in 2011 by amending the MARPOL Annex VI. The EEDI is a tool used to measure the energy efficiency of new ships, expressing the amount of CO_2 emissions per ton of cargo transported over a certain distance and aiming to encourage the application of energy efficient technologies, which directly reduces the contribution of maritime traffic to global greenhouse gas emissions. Alongside carbon dioxide (CO_2) emissions, a significant increase in methane (CH_4) emissions from maritime traffic has been observed in recent years. This trend is primarily associated with an increase in the number of ships fuelled by LNG, which emit more methane in comparison to conventional fuels. According to estimates, methane from maritime traffic now comprises approximately 26% of the overall methane emissions in the EU traffic sector, with a potential to increase 2-5 times in the period 2018-2023.

Despite technical advancement, data from Croatian greenhouse gas inventory for the period 1990 – 2022 indicate that emissions from maritime and inland waterways traffic in 2022 amounted to 154,48 kt $\text{CO}_{2\text{eq}}$ ⁵, which comprises 2.3% of emissions from the traffic sector. Considering a relatively small share in total emissions and with adhering to the obligation of using EEDI, it can be concluded that the impact of maritime traffic on climate change mitigation will be moderately negative, direct and long-term.

Conclusion on readiness for climate neutrality

Even though there are no known data on projects and objects in planned areas/zones/corridors at the strategic level, it can be concluded that the Plan will have no significantly negative impact on climate change mitigation. A moderately negative impact is possible due to greenhouse gas emissions generated as a result of hydrocarbon exploitation and fossil fuel combustion in ship engines. Said impact will not be significant because there will be no new emission sources in space, since there are existing exploration and exploitation wells in the EEZ, and maritime traffic flows within existing water corridors.

Moreover, breeding of low trophic species such as seaweed and molluscs can contribute to lower greenhouse gas emissions, which has a positive impact on climate change mitigation.

7.3.2 Adaptation to climate change

Aquaculture and fishing areas

Climate factors important for fisheries and aquaculture sectors are sea temperature (water column), salinity, pH levels, as well as chlorophyll and nitrates. According to the Results of climate modelling, the expected annual increase of surface temperature of the Adriatic Sea by 2070 will range from 0.8 to 2.4 °C (Image 3.16 of the Study). In the coming period, an increase in salinity is expected throughout the Adriatic, driven by rising average annual air temperatures, which increases evaporation. Nitrate concentration is expected to reduce, which leads to a decline of primary production and, consequently, lower chlorophyll levels and reduced food availability for higher trophic levels⁶. Further acidification of the sea is also expected, which will result in reduced growth and increased mortality

⁴ Energy Efficiency Design Index.

⁵ CO_2 equivalent ($\text{CO}_{2\text{eq}}$) – measure used to compare emission of different greenhouse gases based on their global warming potential (GWP), by converting the amounts of other gases into the equivalent amount of carbon dioxide with the same global warming potential.

⁶ Higher trophic levels comprise organisms which are at the top of the food chain.

of shellfish, as well as disrupted development of zooplanktons. The estimated increase of acidification of the Adriatic Sea is between 0.1 and 0.2 pH units.

Climate change will affect economic sustainability of fishing, and the impact on marine organism breeding will be dual – rising temperatures favour some species but pose a stress factor to others. According to the Climate Change Adaptation Strategy of the Republic of Croatia for the period until 2040 with an outlook to 2070, impacts and challenges which may cause high vulnerability in fisheries and aquaculture areas include migration of cold water species towards northern or deeper parts of the Adriatic, increase in the number of foreign species, reduction of primary production due to water circulation changes and sea acidification which has a negative impact on the growth and survival of shellfish. These impacts further degrade the ability of marine habitats to provide ecosystem services important for economically valuable species and simultaneously destabilise socio-economic foundations of the sector. In order to reduce this vulnerability, said Strategy suggests measures such as strengthening the capacity for forecasting the status of bioresources, developing techniques to exploit foreign species, improving breeding in recirculatory systems, improving selective breeding and conserving most vulnerable habitats. Furthermore, integrating fishermen into tourism activities is recognised as a potential measure of strengthening socio-economic resilience of the sector. Extreme weather conditions (severe weather, windstorms) will have additional negative impact on aquaculture, with the risk of damaging breeding cages and escaping of fish. Shellfish breeding might be additionally jeopardised by increasing acidification of the sea and more frequent algal blooming, especially phytoplankton species toxic to humans. Considering the above, the impact of aquaculture and fishing areas adaptation to climate change is assessed as moderately negative, direct and long-term.

On the other hand, rising temperatures, within margins of tolerance for certain species, may have a positive impact on their metabolism, growth, reproduction and breeding viability. Increased temperatures also make way for introducing new economically valuable warm water species and certain new species with a high market value, through fishing or aquaculture. Therefore, the impact of aquaculture and fishing areas adaptation to climate change is assessed as positive, indirect and long-term.

Exploration and exploitation of hydrocarbons

Climate factors affecting the sensitivity of commissioning new appraisal wells are increased maximum wind speed, sea level changes and severe weather. According to the Results of climate modelling, in the future a moderate, almost negligible wind speed increase is expected, up to 0.1 m/s (Image 3.12 in the Study) in the northern part of the EEZ, where the exploitation fields are located. Current sea level rises in recent decades is approximately 3 mm/year, i.e. approximately 30 cm/100 years, while projections of the Adriatic Sea level changes by the end of the 21st century (from IPCC AR5 and national resources) provide an average increase ranging from 40 to 65 cm. However, it should be noted that this assessment entails substantial uncertainties already present in sea level calculations for historic climate. With regard to severe weather, its occurrence depends on the season and year, but future climate projections forecast more frequent severe weather events in the future because of reduced total amount of precipitation (Image 3.11 in the Study) and increased air temperature (Image 3.10 in the Study). When realising the activities, it is necessary to include and implement a measure of climate change adaptation in order to reduce the vulnerability to the lowest possible level.

Since current climate factors (average annual maximum wind speed, sea level rise, severe weather events) and their expected changes/projections can be followed and mitigated in a timely manner, it can be concluded that the impact of climate change on the exploration and exploitation of hydrocarbons will be negligible, indirect and long-term.

Submarine cables and pipelines

In accordance with the Ordinance on the conditions for granting permission to lay pipelines and maintain submarine cables and pipelines in the continental shelf of the Republic of Croatia (126/7), the submarine pipelines are positioned partly or completely on supports above the seabed, laid onto the seabed or embedded into the seabed. Given the above, no increase of their vulnerability or resilience to climate factors such as rising sea levels, sea temperatures, sea acidification or severe thunderstorm intensity is expected, hence the impact is assessed as neutral.

Maritime traffic

According to data from Adapting infrastructure to climate change⁷, the most significant climate factors affecting maritime traffic are rising sea levels, changes in the conditions at sea (severe thunderstorms and high-altitude waves), fewer days with temperatures below freezing point⁸ and receding sea ice. Since the Adriatic Sea is geographically located in a temperate climate zone, where winter temperatures rarely reach values below freezing point, no impact of the reduced number of subzero days or receding sea ice is expected. Rising sea levels may affect maritime traffic through changes in sedimentation patterns and shallow⁹ positions, which may hinder navigability and require more frequent waterway adjustments or their temporary closure. Changes in sea conditions, such as more frequent and stronger storms and extreme waves, may jeopardise the safety of navigation and the resilience of ship structure, increasing the risk of accidents and traffic disruptions. The depth of seaways in the EEZ area ranges from 50 to 1233 m, while current sea level increase is 3 mm/year, i.e. 30 cm/100 years. Given the above, and the projected increase of the Adriatic Sea level, which ranges from 40 to 65 cm by the end of the 21st century, the impact of climate change on maritime traffic is expected to be negligible, direct and long-term.

Conclusion on readiness for climate change resilience

Climate change adaptation entails taking a set of actions aimed at reducing vulnerability of natural and social systems to climate change, increasing their ability to recover after being affected by climate change, and also make the most of positive impacts which can also be a result of climate change.

In areas, zones and/or corridors for the exploration and exploitation of hydrocarbons and maritime traffic, a negligible impact of climate change adaptation is expected, since said activities and elements of the Plan will generate minor, local and temporary consequences with respect to environmental changes within existing limits of natural variations. In fishing and aquaculture areas, a moderately negative, but also a positive impact of climate change adaptation is expected, since, for instance, rising temperatures can have a harmful effect on cold water species and, at the same time, a favourable effect on warm water species encouraging their growth. The impact of climate change adaptation of submarine cables and pipelines is assessed as neutral because they are positioned in such a way that climate factors will not affect them.

The Plan does not directly provide for infrastructural projects for which it would be possible to conduct a climate change adaptation impact assessment at the strategic level, so this cannot be analysed. In the event of designing a project stemming from the Plan, which would include infrastructural projects, the Study determines an environmental protection measure which comprises an impact assessment according to Technical Guidance on Climate Proofing of Infrastructure for the period 2021-2027.

7.3.3 Conclusion on readiness for climate change

The adaptation is the basis for considering the appropriate resilience of different projects to harmful effects of climate change, which is based on the vulnerability and risk assessment. The mitigation, on the other hand, is the basis for reducing greenhouse gas emissions by opting for low carbon alternatives. In accordance with the conducted environmental impact assessment of the Plan on climate change mitigation and climate change adaptation, specific areas/zones/corridors which will generate positive, neutral, negligible and moderately negative impacts are determined. Accordingly, it has been determined that the Plan will not generate significantly negative impact on any of the listed pillars of climate change.

It was not possible to conduct a detailed assessment of the significance of a negative impact of planned areas/zones/corridors on climate change mitigation and adaptation at the strategic level due to a lack of key information. Since the Plan entails infrastructure construction in the area which is prone to rising temperatures, frequent severe weather events and rising sea levels, it is necessary to conduct a detailed vulnerability and risk analysis at the level of specific projects in accordance with valid Technical Guidance (2021/C 373/01) in order to apply both physical and non-physical solutions during construction which significantly reduce the most important physical climate risks. The adaptation solutions introduced must not have an unfavourable effect on climate change

⁷Commission staff working document Adapting infrastructure to climate change, accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, an EU Strategy on adaptation to climate change.

⁸ The freezing point is the temperature at which a substance turns from a liquid to a solid. The freezing point for water is 0 °C.

⁹ A shallow is a geomorphological seabed relief form which is classified as coastal seabed elevation.

adaptation, or on the resilience level of people, nature, cultural heritage, property and other economic activities to climate risks and, as much as possible, they should rely on nature-based solutions (NbS). Given the above, and adhering to prescribed measures, with the aim of reducing potential negative impacts on climate change mitigation and adaptation to the lowest possible level, it is assessed that the Plan will have no negative impact on climate change mitigation and adaptation.

7.4 Impact in the event of an uncontrolled event

Uncontrolled events (accidents) occur as a consequence of natural forces (storm, drought, hailstorm, flood, earthquake) or human factor (fire, wastewater spills, fuel spills in the event of traffic accidents, oil spills in the event of well accidents, explosions, etc.), with the common factor being the endangerment of people's lives, wildlife and the environment. This chapter will analyse the activities of the Plan for which a risk of uncontrolled events has been established.

Aquaculture

When performing aquaculture activities, accidents can happen with respect to an escape of breeding fish if the cage breaks or gets damaged. If a fish escapes from the breeding site, it mixes with wild populations and introduces unwanted genes. Changing the genetic structure of wild populations can lead to a reduction in their reproduction success and resilience to environmental changes. In order to prevent cages from breaking, it is necessary to maintain them regularly and use infrastructure appropriate for surface conditions and resilient to weather events.

Fishing areas

Since fishing entails vessel traffic, there is a risk of accidents in the event of vessel damage and fuel spills into the sea. In the event of larger damage, a vessel can sink to the seabed and have a negative impact on benthic communities. Although it is difficult to prevent such situations, it is important to comply with the maritime traffic rules and have an adequate intervention plan in order to resolve the situation and avoid significant consequences for the marine environment.

Exploration and exploitation of hydrocarbons

Accidental situation during exploration and exploitation of hydrocarbons involve oil, grease, fuel and chemical spills into the marine environment due to damage or sinking of drilling platforms, pipeline ruptures or other equipment failures which can occur as a result of natural disasters or human error. These events may have negative impacts on the marine ecosystem, such as a massive die-off of organism and long-lasting habitat degradation. There is also a risk of explosion and fire, which can also lead to negative impacts. The probability of accidental situations can be reduced or prevented by proper work organisation and application of adequate measures, and in the event of incidental pollution, actions should be taken in accordance with the Emergency Response Plan for Marine Pollution Incidents (OG 92/08).

The Ivana D platform located within the EEZ is an example of an incident involving its sinking. All potential pollutants were removed from the overturned platform, the Ivana D-Ivana E connecting gas pipeline was rendered inert (April 2023) and the Ivana D-1 DIR exploitation well was permanently abandoned in oil and mining works which took place from May 3 to June 15, 2023. Currently there is a signal buoy at the location of the overturned Ivana D platform.

Submarine cables and pipelines

Submarine cables may contain hydrocarbon-based liquids as grease or refrigerants, and pipelines may transport hydrocarbons, hence in the event of their damage or rupture, the liquids may spill and pollute the surrounding habitats, which may have a negative impact on the marine environment. In order to avoid such accidental situations, it is necessary to carry out maintenance, replacement and reconstruction of existing cables and pipelines in accordance with valid regulations, and in the event of incidental pollution, actions should be taken in accordance with the Emergency Response Plan for Marine Pollution Incidents.

Maritime traffic

During vessel navigation in the EEZ area, there is a risk of accidental situations of oil and gasoline spills from the vessels or chemicals and substances being transported spilling into the sea, which especially refers to ships transporting dangerous cargo. These situations are unforeseeable and difficult to prevent, which is precisely why

it is necessary to have adequate intervention plans in order to resolve the potential accidental situation without significant consequences to the marine environment.

7.5 Cross-border impacts

Cross-border impacts are consequences of certain activities which may cause change in environmental components in the states bordering the state territory where a certain activity takes place. The Act on Ratification of the Convention on Environmental Impact Assessment in a Transboundary Context (OG IT 6/96, entered into force in relation to the Republic of Croatia on September 10, 1997) defines a cross-border impact as “impact across state borders”, which marks any impact, not necessarily of global nature, in the area under the jurisdiction of a signatory caused by a planned activity whose physical origin is entirely or partly in the area under the jurisdiction of another signatory.

In accordance with the Act on Ratification of the Protocol on Strategic Environmental Assessment from the Convention on Environmental Impact Assessment in a Transboundary Context (OG 07/09), it is necessary to carry out an assessment of potential significant cross-border environmental impact of the Plan, including the impact on human health.

According to the Protocol on Environmental Impact Assessment in a Transboundary Context (the Espoo Convention), every state that plans activities which may have a negative impact on the environment of a neighbouring state should carry out cross-border consultation with affected neighbouring states. As a state that develops a spatial plan for its exclusive economic zone, Croatia is obliged to carry out this consultation in accordance with international law and ensure that the activities in this area do not harm neighbouring states’ interests – those of Italy and Montenegro. Based on the consultation, Croatia can take necessary measures to mitigate negative impacts, if such are identified. The consultation procedure includes reporting, information exchange, impact assessment and considering the opinions of neighbouring countries.

The cross-border nature of the marine environment requires regional cooperation of neighbouring states in order to accomplish common, coherent and more efficient action and methods. In this respect, Marine Strategy Framework Directive (MSFD, 2008/56/EC) guarantees a solid political and legal framework to accomplish international obligations related to marine biological diversity protection, which represents an important instrument for managing the maritime system and fosters the adoption of complex strategies aimed at conserving marine ecosystems and achieving good environmental status.

Considering individual and cumulative assessment of the planning solutions of the Plan, it has been determined that the following cross-border impacts may arise:

Aquaculture

The implementation of aquaculture in the EEZ, depending on the proximity of the border, may have a negative impact on ecological systems of the neighbouring states, namely through pollution and eutrophication, which can reduce sea quality and cause a reduction of biodiversity. The transmission of diseases and parasites from aquaculture may affect wild fish populations in the neighbouring countries, reducing their sustainability. Moreover, invasive species imported into aquaculture may spread to the surrounding waters, compete with local species and degrade ecological balance.

Fishing areas

Fishing activities in the EEZ, depending on the proximity of the border, may have a negative impact on ecological systems of the neighbouring states, namely through the reduction of the fish stock because of excessive fishing or unsustainable practices. Pollution and habitat degradation due to fishing methods such as fishing using benthic trawl gear may worsen the quality of the sea and the seabed and reduce biodiversity in neighbouring waters. The transmission of pollutants and fish affected by diseases may affect ecosystems of other states, causing long-term damage to fishing industries. It is important to understand that the fish stock within the Adriatic Sea is a joint resource which migrates across state borders, which requires coordinated management at the international level. Therefore, fishing management measures in the EEZ should be concerted among all contracting parties in order for them to be efficient and sustainable.

Exploration and exploitation of hydrocarbons

The exploitation of hydrocarbons in the EEZ may have cross-border ecological and economic impacts on the neighbouring states. Potential pollutions, such as oil and gas leaks, may jeopardise marine ecosystems, reduce biodiversity and have a negative impact on the fishing industry in the neighbouring states. There is also a prominent negative impact of underwater noise resulting from hydrocarbon exploration and exploitation activities on major groups of marine fauna (mammals, fish, invertebrates). Furthermore, potential pollution of the sea and air may reduce the quality of the environment. Within the framework of these activities, new platforms may be positioned, dominating the horizon view, which may affect the visual identity of marine landscapes of the neighbouring states. And finally, such projects may also have a political connotation, i.e. cause disputes between countries over the division of marine space and the right to resources. Exploitation may also lead to safety threats, such as marine casualties with cross-border consequences.

Submarine cables and pipelines

The positioning, maintenance and removal of submarine cables and pipelines in the EEZ may have cross-border impacts on the neighbouring states. The performance of works may lead to water turbidity, benthos damage and the expansion of pollution through sea currents towards the neighbouring states. Laying and maintenance must be aligned with UNCLOS and international standards, along with mandatory reporting to relevant international bodies. In addition, risks to migratory marine species and impacts on fisheries crossing the borders should be prevented. Due to the application of international standards, works monitoring, restrictions in sensitive areas, along with mandatory reporting to other states and compliance with UNCLOS principles, the cross-border impact of this purpose will not be significant.

Maritime traffic

Considering the fact that the EEZ area mostly entails navigation in accordance with international rules without restrictions and that the existing traffic routes remain unchanged, cross-border impacts on maritime traffic will not be significant. Short-term and long-term navigational restrictions may occur only in strictly defined and exceptional situations (e.g. for the safety of navigation, environmental protection or for conducting certain activities) and they will be announced and marked in a timely manner, which ensures predictability and the safety of traffic. Long-term restrictions will be imposed only with prior announcement and corresponding planning measures, without degrading existing international maritime corridors. Additionally, navigation takes precedence over other activities wherever necessary for the purpose of preserving free movement, which additionally minimises the possibility of cross-border negative consequences. Accordingly, the impact on cross-border navigation will be very limited and will not lead to significant disruption of other states' maritime activities.

7.6 Cumulative impact assessment

7.6.1 Assessment methodology

Individual impacts of multiple activities may not be significant in themselves, but in interaction with different impacts of other activities in a certain area these impacts may become significant. This is why it is necessary to analyse the environmental impact assessment of the Plan in a cumulative and synergistic manner. SEA facilitates the analysis of cumulative and synergistic impacts, since its scope corresponds with the temporal and geographic scope to assess such impacts, i.e. potential impact of many individual minor activities may become clearer from the strategic perspective.

Cumulative impacts refer to an additive effect of a repeating impact of the same nature ($a+a+a+a+a\dots$) generated through one or more activities. Cumulative impacts become significant to the environment when they occur so frequent in time or so densely in space, that the environmental changes they generate exceed existing limits of natural variations, i.e. the self-sustainable natural environment becomes questionable.

A cumulative impact is assessed by singling out significant impacts of the implementation of existing and planned zones or corridors of a purpose under the scope of the Plan in question, followed by defining a specific environmental receptor which is, according to available data, already jeopardised, degraded, fragile or under

pressure by certain human activities, then by analysing whether this impact is accumulated by the implementation of the zones or corridors or various purpose from hierarchically higher plans, i.e. whether this will lead to further degradation or improvement of the environmental receptor. In this case, all planning purposes/activities, or planning solutions (described in Chapter 1.3), of the Plan in question are considered for cumulative assessment, since this is a comprehensive Plan, first for the EEZ area.

Environmental receptors assessed in the Study as prone to cumulative impacts are the concentration of pollutants in the air, the concentration of greenhouse gases in the atmosphere, vulnerability of the environment regarding climate change consequences, pollution of the Adriatic Sea and the creation of marine waste, morphology and sediment of the seabed, horizon and visual integrity of the sea surface, cultural legacy of the Adriatic, changes in habitat conditions, disturbance and die-off of species.

8 Environmental protection measures

Environmental protection measures are suggested based on the analysis of the existing state and the analysis of potential impact on the environmental components and factors due to the implementation of the Plan. They comprise mitigation measures of the Plan's impact on the environmental components and factors, which are prescribed in order to reduce potential negative environmental impacts generated through the implementation of the zones/corridors of various purposes.

8.1 Aquaculture

Components/factors	Measure	Implementing provision
Biodiversity	1. Carry out aquaculture activities in accordance with the Handbook and Guide for Good Manufacturing and Hygiene Practices (Croatian Chamber of Agriculture) in order to prevent excessive emission of organic waste into the marine ecosystem. 2. Use predator deterrent measures in breeding sites and maintain the nets regularly in order to avoid entanglement and harming of strictly protected species of dolphins, sharks and birds. 3. When using devices to deter predators, limit their number to minimum and specify maximum application time. Said devices should be designed in such a way that the noise levels gradually increase, so the animals in immediate proximity of the device could move away before the sound reaches the highest level. 4. Limit and use underwater and external lighting only when necessary and direct the light depending on the purpose, preventing it from spreading in other directions in	4.1. Aquaculture

	order to reduce the attraction of wild species. 5. Limit the speed of vessels in a 500 m radius around the breeding site to 1m/s and avoid navigation under night time conditions in order to reduce the risk of collision and harming of strictly protected species. Use automatic feeding devices for the purpose of reducing the frequency of navigation.	
Landscape characteristics	6. When choosing locations to realise aquaculture activities, give precedence to EEZ parts already saturated by fishing traffic and/or infrastructure (the Po oil and gas field of the depressional platform margin of the northern Adriatic) in order to preserve the night time landscape quality and visual integrity of calmer parts of the Adriatic, such as the south Adriatic depression. 7. Consider the possibility of a combine use of existing platforms and aquaculture in order to optimise the EEZ space use and reduce the pressures on the seabed in terms of anchoring.	4.1 Aquaculture
Cultural and historical heritage	8. When analysing the seabed and collecting data for defining locations for the implementation of aquaculture activities in detail, during geophysical analysis and surveying the seabed using magnetometer, side-scan sonar and multibeam bathymetry, ensure consultation with archaeologists over verification of the locations suggested for anchoring and adaptation of research	4.1. Aquaculture

	specifications to further archaeological analysis.	
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8.2 Fishing areas

Components/factors	Measure	Implementing provision
Biodiversity	9. Consider the need to use a turtle excluder devise (TED) during the performance of trawl fishing based on scientific research and referring to the interaction of fishing gear and strictly protected turtle species. 10. During fishing using single gillnets, consider the need to use the devices and/or methods to deter strictly protected dolphins in order to reduce the risk of harming them.	4.2. Fishing areas
Cultural and historical heritage	11. Conduct an analysis and inventory of underwater cultural heritage in order to determine the no-go zones, i.e. the areas where fishing would be prohibited with the aim of protecting especially sensitive sites.	4.2. Fishing areas

8.3 Exploration and exploitation of hydrocarbons

Components/factors	Measure	Implementing provision
Air	12. Ensure monitoring of the concentration of pollutants in the air (NO _x , HOS, PM _{2.5} i PM ₁₀) during exploration and exploitation of hydrocarbons with the aim of preventing exceeding the prescribed limit values, preserving air quality and protecting human health.	4.3. Exploration and exploitation of hydrocarbons, Article 14
Sea and the seabed	13. In the areas of exploration and exploitation of hydrocarbons measure the sea pH value, oxygen saturation, the concentration of nutrients and organic matter in the environment prior to commencing the activities and ensure their continuous monitoring. In the event of parameter values exceeding the estimated permissible range, prescribe additional mitigation measures. 14. Use water-based drilling fluid. If there is a need to use other types of drilling fluids (oil-based, synthetic), obtain special approval from competent authorities. 15. It is recommended to dispose of the drilling fluid onshore. 16. Carry out satellite imaging and interpretation of sea surface data in all phases of exploration and exploitation in order to detect pollution in a timely manner.	4.3. Exploration and exploitation of hydrocarbons, Article 14

Biodiversity	17. When constructing new infrastructure for the purpose of hydrocarbon exploitation, use adequate lighting less attractive to seabirds. Plan external lighting within minimal frames necessary for functional project use. Use ecologically acceptable lighting with a beam of light directed towards objects, with minimal dissipation in other directions. 18. If possible, use existing conductor casing for drilling new wells. 19. Conduct seismic research and plan air jet use in such a way that no multiple sound sources are used simultaneously or that no multiple vessels perform activities in nearby areas simultaneously. If more than one vessel is active in one area simultaneously, hold minimal mutual distance allowing animals to escape between the sound fields. 20. During seismic research of the seabed, use the weakest energy source necessary to accomplish the goal of the seismic research. 21. When activating devices which generate noise for seismic hydrocarbon research, apply a slow increase of acoustic power, the so-called soft start, over a 30-minute period in order to provide strictly protected species with sufficient time to leave the activity area. 22. During works or using devices which generate impulsive noise when constructing infrastructure necessary for hydrocarbon exploitation (such as pile driving into the seabed, installation of foundation or	4.3 Exploration and exploitation of hydrocarbons
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	anchors, etc.), reduce the noise level by applying a slow increase of acoustic power, the so-called soft start, over a 30-minute period in order to provide strictly protected animals with sufficient time to leave the activity area. 23. Plan offshore platforms for hydrocarbon exploitation and their operation in such a way as to produce the lowest possible noise level during all activities/work.	
Cultural and historical heritage	24. Prior to commencing the realisation of wells and/or positioning new platforms, conduct archaeological research and an assessment of risks to underwater archaeological heritage.	4.3 Exploration and exploitation of hydrocarbons

8.4 Submarine cables and pipelines

Components/factors	Measure	Implementing provision
Biodiversity	25. For embedding submarine cables and pipelines use a substrate of the same composition as that at the embedding location. 26. Plan the conducting of research of the seabed for the purpose of positioning submarine cables/pipelines in such a way that no multiple sound sources are used simultaneously and that no multiple vessels perform activities in the same or nearby areas simultaneously. If more than one vessel is active in one area at the same time,	4.4. Submarine cables and pipelines

	hold minimal mutual distance allowing animals to escape between the sound fields. 27. During research of the seabed for the purpose of positioning submarine cables and pipelines, use the weakest energy source necessary to accomplish the goals of the research. 28. When activating devices which generate noise, apply a slow increase of acoustic power, the so-called ramp-up or soft start, over a 30-minute period in order to provide strictly protected species with sufficient time to leave the activity area.	
Cultural and historical heritage	29. During research of corridors for laying or removing cables use non-invasive methods, such as sonar and magnetic inspections.	4.4. Submarine cables and pipelines

9 Reasonable alternative

Since the Plan, as a baseline document and the subject of the strategic environmental assessment, prescribes the conditions for the implementation of all projects/purposes within its scope and does not foresee other realisation possibilities, the Study does not consider environmental alternative solutions. With the aim of preventing damage to the environment and nature and respecting the principles of nature and environmental protection, as permitted by law, the SEA Study of the Plan, as well as the Main Assessment of acceptability for the ecological network, prescribes environmental protection measures and mitigation measures for impacts on the ecological network, which should apply to ensure the realisation of the Plan is environmentally acceptable.

10 Environmental status monitoring

Pursuant to Article 26 of the Regulation on the strategic environmental assessment of a strategy, plan or programme, the environmental status monitoring programme, including monitoring the status of the goals of conservation and integrity of the ecological network areas – if the strategic assessment entails a main assessment of acceptability of a strategy, plan or programme for the ecological network – is an integral part of a strategy, plan or programme.

In the area of the Republic of Croatia, monitoring is carried out for a series of environmental status parameters whose results mostly form an integral part of the Environmental Information System (ISZO) led by the Ministry of Environmental Protection and Green Transition and of the database at the disposal of other competent institutions. The structure and content of ISZO Metabase are adapted in accordance with the Regulation on Environmental Information System (OG 68/08), and the system is upgraded according to the document “Programme for managing the Environmental Information System of the Republic of Croatia” for certain periods. Moreover, in the Republic of Croatia, environmental status monitoring mechanisms have been established through environmental impact assessment procedures of the project. As a result of the strategic environmental assessment procedure, the Study does not determine the need for establishing new, separate environmental status monitoring systems in the area under the scope of the Plan.

The Study prescribes prevention and mitigation measures for the impacts of the implementation of the Plan on environmental components and factors, i.e. the conditions for environmentally acceptable performance of activities in the areas/zones/corridors which are the subject of the Plan, which need to be adequately implemented into the Implementing provisions of the Plan and then follow their implementation during planning/approving the project at the project level. Competent authorities issuing legal documents are competent for the implementation of environmental status monitoring.

Existing monitoring systems relevant for the implementation of the Plan include the Environmental Information System (ISZO), which comprises monitoring the quality of air, water, ground, noise and the status of biodiversity and protected areas. Furthermore, competent institutions like the Ministry of Environmental Protection and Green Transition, Croatian Institute for Public Health and State Inspectorate, continuously monitor and report on environmental status according to valid law and international obligations. These systems represent a foundation for monitoring the effects of the implementation of the Plan and enable a timely response in the event of negative impacts.

11 Conclusion of the Study

This Study identifies, describes and assesses potential impacts on environmental components and factors which will be generated through the implementation of suggested planning solutions of the Spatial Plan of the Exclusive Economic Zone in the Adriatic Sea. The impact assessment of the implementation of the Plan on environmental components is performed textually by categories of planning purposes and environmental components defined by the Decision on the content of the Study.

Based on the impacts assessed, a suggestion of environmental protection measures is made, whose application can reduce or exclude potential negative environmental impacts. The body competent for the implementation of the strategic study, together with the developer of the Plan, is obliged to implement the prescribed measures into textual provisions of the Plan, adhere to them and apply them, and protection measures during the implementation

of the Plan. Additionally, for all activities which will be performed by the implementation of the Plan, it will be necessary, according to law regulations, to carry out the procedures of Screening Opinions for Environmental Impact Assessment or the Environmental Impact Assessment.

Given the above, it is assessed that the Plan in question, with the application of environmental protection measures, is acceptable for the environment.

12 Main assessment of acceptability of the Plan for the ecological network

12.1 Introduction

Directorate for Nature Protection of the Ministry of Economy and Sustainable Development¹⁰, for the implementation of the previous assessment of acceptability for the ecological network for the Spatial Plan of the EEZ of the Republic of Croatia, adopted the Decision (CLASS: UP/I 352-03/23-05/133, FILE NUMBER: 517-10-2-3-23-2, Zagreb, October 19, 2023) on the obligation to conduct a main assessment of acceptability for the ecological network. A copy of the Decision is in the Attachment 14.4 in the Study.

The Main Assessment of acceptability for the ecological network is developed in accordance with the Nature Protection Act (OG 80/13, 15/18, 14/19, 127/19, 155/23) and the Regulation on the ecological network and competencies of public institutions for managing ecological network areas (OG 80/19, 119/23, 87/25). Pursuant to Article 26 of the Nature Protection Act for strategies, plans and programmes for which it is obligatory to conduct a strategic assessment, the Main Assessment is conducted within the framework of the strategic environmental assessment (SEA) procedure of a strategy, plan and programme and, thus, the Study in question contains the chapter Main assessment of acceptability for the ecological network (hereinafter referred to as: Main Assessment).

The developer of the Main Assessment chapter is the IRES EKOLOGIJA d.o.o. company with headquarters in Zagreb, at the address Prilaz baruna Filipovića 21. A copy of the Decision to perform expert duties in the field of nature protection issued by the Ministry of Economy and Sustainable Development is in the Attachment 14.2 in the Study.

12.2 Description of the ecological network area

Within the EEZ, according to the Regulation on the ecological network and competencies of public institutions for managing ecological network areas (OG 80/19, 119/23, 87/25, there is one area of ecological conservation network significant for species and habitat types (hereinafter referred to as: SCI), four probable areas of ecological conservation network significant for species and habitat types (hereinafter referred to as: pSCI) and one conservation area significant for birds (hereinafter referred to as: SPA) (Table 12.1, Image 12.1).

¹⁰ By the Decision on the declaration of the Act on Amendments to the Act on the Structure and Scope of State Administration Bodies (OG 57/24) since May 16, 2024, the duties previously within the scope of the Ministry of Economy and Sustainable Development that relate to environmental protection, nature conservation, and water management are taken over by the Ministry of Environmental Protection and Green Transition.

Table 12.1 Ecological network areas and corresponding target species(habitat types within the EEZ (Source: Bioportal, Regulation on the ecological network and competencies of public institutions for managing ecological network areas and DGU Geoportal)

	Map number	Area code	Area name	Total surface area of the ecological network area (ha)	Total surface area within the EEZ (ha)	Share of the area within the EEZ (%)	Habitat type code/Species name in Latin	Habitat type name in English/Species name in English
SPA	2	HR1000041	Northern Adriatic (EEZ)	52 978.68	52,978.68	100	<i>Puffinus yelkouan</i>	Yelkouan shearwater*
SCI	1	HR3000477	Reefs in the Jabuka/Pomo Pit	1078,33	963.95	89.39	1170	reefs
pSCI	3	HR3000511	Northern Adriatic 1 (EEZ)	152,549.07	152,549.07	100	<i>Tursiops truncatus</i>	common bottlenose dolphin
							<i>Caretta caretta</i>	loggerhead sea turtle
	4	HR3000512	Northern Adriatic 2 (EEZ + the territorial sea of Croatia)	330,453.66	277,182.508	83.88	<i>Tursiops truncatus</i>	common bottlenose dolphin
							<i>Caretta caretta</i>	loggerhead sea turtle
	5	HR3000513	Jabuka/Pomo Pit (EEZ)	139,323.69	139,323.69	100	<i>Tursiops truncatus</i>	common bottlenose dolphin
							<i>Caretta caretta</i>	loggerhead sea turtle
	6	HR3000514	Southern Adriatic (EEZ)	584,153.58	584,153.58	100	<i>Tursiops truncatus</i>	common bottlenose dolphin
*during nesting season, birds which nest in the SPA HR1000038 Lastovo Archipelago feed in the area								

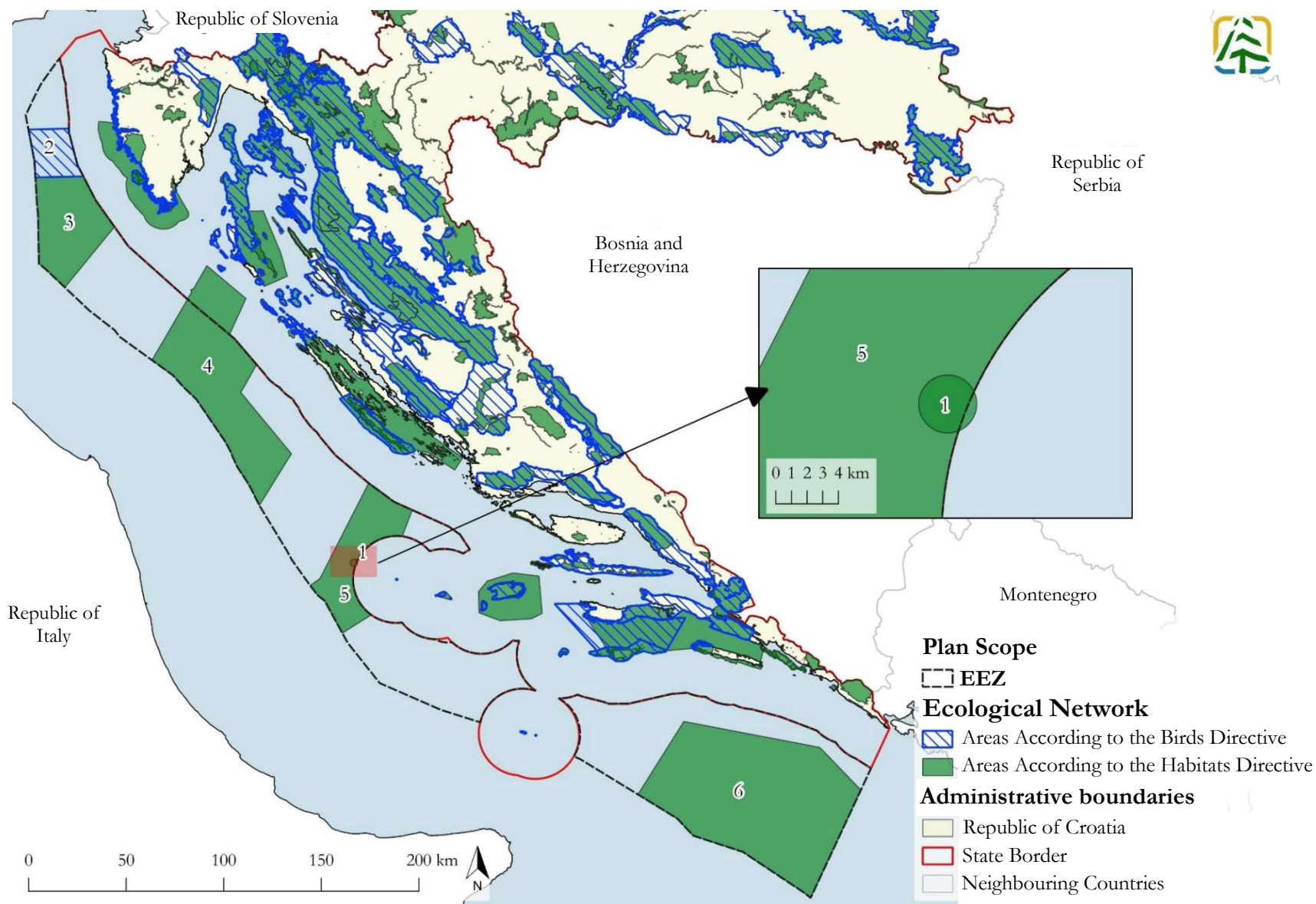


Image 12.1. Ecological network areas in comparison to the EEZ (Source: Bioportal and DGU Geoportal)

12.3 Impact assessment methodology

The Main Assessment analysed all activities or elements of the Plan categories in relation to the ecological network areas which involve the EEZ.

The first step included identifying all Plan categories whose indirect or direct action cannot eliminate impacts on the goals of ecological network area conservation. The second step singled out ecological network areas which the impacts identified in the first step refer to, and a more detailed impact assessment of activities or elements of the Plan categories on a certain ecological network area was undertaken. During assessment of cumulative impacts, all activities and elements of the Plan categories, as well as existing and approved projects in the database of the Ministry of Environmental Protection and Green Transition, were taken into account in order to determine the possibility of a significant impact on the goals of conservation. With the aim of eliminating the possibility of a significantly negative individual or cumulative impacts, mitigation measures are prescribed, which may also include proposals for erasing or rectifying the Plan elements.

During impact assessment, the following was used:

- spatial data on the distribution of target habitat types, target species and their suitable habitats (database of the Ministry of Environmental Protection and Green Transition);
- Marine habitats map (2023);
- EUSeaMap data (2021) aligned with the Map of coastal and benthic marine habitats of the Adriatic (Ministry of Environmental Protection and Green Transition, 2024) according to the Final document of the consolidated revised National classification of marine habitats in the Republic of Croatia harmonised with EUNIS classification (2023);
- Guidelines for considering and mitigating the impact of anthropogenic noise on marine mammals and sea turtles in the environmental impact assessment procedures, strategic environmental assessment procedures of strategies, plans and programmes, an assessment of acceptability for the ecological network (Ministry of Economy and Sustainable Development, 2022);
- available scientific and specialist literature.

For the purpose of presenting the intensity of impacts, a standard scale was used, in accordance with the Guidelines for the assessment of acceptability for the ecological network for the Strategic Environmental Assessment (SEA) (Table 12.2).

Table 12.2 Applied scale for assessing the impact intensity of the Plan implementation (Source: Annex 1. Guidelines for the assessment of acceptability for the ecological network, 2014)

Value	Explanation	Description
-2	Probability of a significantly negative impact	Significantly negative impact Excluding SPP implementation Significant disturbance or a destructive impact on a habitat or species population, or a substantial portion of them, significant disturbance of ecological requirements of a habitat or species, significant impact on a habitat or natural species development. It is necessary to reduce these impacts by mitigation measures below the level of significance. If this is not possible, the element with a -2 value needs to be removed from the SPP.
-1	Probability of a moderately negative impact	Limited/moderate/minor negative impact SPP implementation not excluded Moderately challenging impact on a habitat or species population, moderate degradation of ecological conditions necessary for habitat or species conservation, marginal impact on a habitat or natural species development. It is possible to mitigate or remove it by appropriate mitigation measures, but it is not obligatory to prescribe them with respect to the Main Assessment.
0	Probably no impact	SPP shows no visible impacts.
+1	Probability of a moderately positive impact	Moderate favourable impact on a habitat or species population, moderate improvement of ecological requirements of a habitat or species, moderate favourable impact on a habitat or natural species development.
+2	Probability of a significantly positive impact	Significant favourable impact on a habitat or species population, significant improvement of ecological requirements of a habitat or species, significant favourable impact on a habitat or natural species development.

When assessing the impact of the Plan on the ecological network areas, the starting point is the fact that the implementation of planned activities and category elements will comply with all legal provisions. Moreover, the

worst possible impact scenario was assessed, since this strategic assessment does not specify the implementation method or the exact implementation location for a specific type of spatial-planning activities and elements within the planned locations. Therefore, such an assessment should help define the project level when the planned activities will be defined as projects, including the assessment or screening opinions for environmental impact assessment and assessment of acceptability for the ecological network.

Purposes of the Plan not considered during ecological network impact assessment:

- Special purpose – since the Plan only registers potential areas of unexploded ordnance and dangerous air space areas
- Nature and species protection and protected areas – since the Plan only registers habitats and considering the given proposal of the ecological network areas
- Underwater cultural heritage – since no site of underwater cultural heritage is charted into the Plan due to a lack of data
- Scientific research – since scientific research can be conducted in the entire EEZ area, and the Plan only registers certain planned activities

12.4 Description of the Plan's impact on the ecological network

12.4.1 Potential individual and cumulative impacts

Table 12.3 Area/zones/corridors of the Plan which can generate impacts on the ecological network areas

Area/zones/corridors	Distance between the Plan zone and the ecological network area (km)	Potential individual and cumulative impact on the ecological network area
Aquaculture	HR1000041 Northern Adriatic (EEZ)	• Habitat occupation • Disturbance and harm to species
	Within the ecological network area	
	HR3000511 Northern Adriatic 1 (EEZ)	
	HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia)	• Habitat occupation • Change in habitat conditions • Disturbance and harm to species
	HR3000514 Southern Adriatic (EEZ)	
	Alongside the ecological network area	
	HR3000513 Jabuka/Pomo Pit (EEZ)	• Change in habitat conditions
	10	
	HR3000477 Reefs in the Jabuka/Pomo Pit	No impact on the ecological network area HR3000477 Reefs in the Jabuka/Pomo Pit, since it is located at approximately 10 km from the planned zone of the Plan.

Fishing areas	Within the ecological network area	HR1000041 Northern Adriatic (EEZ)	
		HR3000511 Northern Adriatic 1 (EEZ)	
		HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia)	• Change in habitat conditions • Disturbance and harm to species
		HR3000513 Jabuka/Pomo Pit (EEZ)	
		HR3000514 Southern Adriatic (EEZ)	
Exploration and exploitation of hydrocarbons	Within the ecological network area	HR1000041 Northern Adriatic (EEZ)	
		HR3000511 Northern Adriatic 1 (EEZ)	• Habitat loss • Change in habitat conditions • Disturbance and harm to species
		HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia)	
	100	HR3000477 Reefs in the Jabuka/Pomo Pit	• No impact on the ecological network area HR3000477 Reefs in the Jabuka/Pomo Pit, since it is located at approximately 100 km from the planned zone of the Plan.
	118	HR3000513 Jabuka/Pomo Pit (EEZ)	• No impact on the ecological network area HR3000477 Reefs in the Jabuka/Pomo Pit, since it is located at approximately 118 km from the planned zone of the Plan.
	302	HR3000514 Southern Adriatic (EEZ)	• No impact on the ecological network area HR3000477 Reefs in the Jabuka/Pomo Pit, since it is located at approximately 302 km from the planned zone of the Plan.
Submarine cables and pipelines	Within the ecological network area	HR1000041 Northern Adriatic (EEZ)	• Disturbance of species
		HR3000477 Reefs in the Jabuka/Pomo Pit	• Habitat loss
		HR3000511 Northern Adriatic 1 (EEZ)	
		HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia)	• Habitat loss • Change in habitat conditions • Disturbance of species
		HR3000513 Jabuka/Pomo Pit (EEZ)	
		HR3000514 Southern Adriatic (EEZ)	

¹¹The area is under the scope of a fishing restricted area where it is prohibited to carry out any form of benthic fishing, including benthic trawling. Moreover, in this area fishing using sardine purse seine nets, bottom longlines, fish traps, as well as sports and recreational fishing, is prohibited.

Maritime traffic	Within the ecological network area	HR3000477 Reefs in the Jabuka/Pomo Pit	• Change in habitat conditions
		HR1000041 Northern Adriatic (EEZ)	
		HR3000511 Northern Adriatic 1 (EEZ)	
		HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia)	• Change in habitat conditions • Disturbance and harm to species
		HR3000513 Jabuka/Pomo Pit (EEZ)	
		HR3000514 Southern Adriatic (EEZ)	

12.5 Mitigation measures for negative impacts of planned activities on the goals of conservation and integrity of the ecological network area

Aquaculture

1. Carry out aquaculture activities in accordance with the Handbook and Guide for Good Manufacturing and Hygiene Practices (Croatian Chamber of Agriculture) in order to prevent excessive emission of organic waste into the marine ecosystem.
2. Use predator deterrent measures in breeding sites and maintain the nets regularly in order to avoid entanglement and harming of strictly protected species: *Puffinus yelkouan*, *Tursiops truncatus* and *Caretta caretta*.
3. When using devices to deter predators, limit their number to minimum and specify maximum application time. Said devices should be designed in such a way that the noise levels gradually increase, so the animals in immediate proximity of the device could move away before the sound reaches the highest level.
4. Limit and use underwater and external lighting only when necessary and direct the light depending on the purpose, preventing it from spreading in other directions in order to reduce the attraction of target species: *Puffinus yelkouan*, *Tursiops truncatus* and *Caretta caretta*.
5. Limit the speed of vessels in a 500 m radius around the breeding site to 1m/s and avoid navigation under night time conditions in order to reduce the risk of collision and harming of target species: *Tursiops truncatus* and *Caretta caretta*. Use automatic feeding devices for the purpose of reducing the frequency of navigation.
6. Limit the areas designated for aquaculture outside the ecological network area HR1000041 Northern Adriatic (EEZ), HR3000511 Northern Adriatic 1 (EEZ), HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia) and HR3000514 Southern Adriatic (EEZ) (Image 12.2 in the Study).

Fishing areas

7. Reduce the pressure on fisheries in the ecological network areas based on scientific data.
8. Establish no take zones with the aim of ensuring sufficient amount of food for the conservation of target species of the ecological network area.
9. Use turtle excluder devices (TED) during trawling fishing in the ecological network areas aimed at the conservation of the target species *Caretta caretta* in order to prevent the harming of this target species.
10. Use devices and/or methods to deter dolphins during fishing using single gillnets in the ecological network area aimed at the conservation of the common bottlenose dolphin *Tursiops truncatus* in order to reduce the risk of harming this target species.
11. Within the ecological network area SPA HR1000041 Northern Adriatic (EEZ), maintain sufficient amount of fish stock for maintaining the target population size of the species *Puffinus yelkouan*.

Exploration and exploitation of hydrocarbons

12. Within the ecological network area HR1000041 Northern Adriatic (EEZ), when constructing new infrastructure for the purpose of hydrocarbon exploitation, use adequate lighting less attractive to seabirds. Plan external lighting within minimal frames necessary for functional project use. Use ecologically acceptable lighting with a beam of light directed towards objects, with minimal dissipation in other directions.
13. Conduct seismic research and use air jets within the existing hydrocarbon exploitation field "Izabela" outside the early chick-rearing period of the target species *Puffinus yelkouan*, i.e. outside the period from May 1 to July 1.
14. If possible, use existing conductor casing for drilling new wells.
15. Conduct seismic research and plan air jet use in the ecological network area HR1000041 Northern Adriatic (EEZ), HR3000511 Northern Adriatic 1 (EEZ) and HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia) in such a way that no multiple vessels perform activities simultaneously. If more than one vessel is active in one area at the same time, hold minimal mutual distance allowing target species to escape between the sound fields.
16. During seismic research of the seabed, use the weakest energy source necessary to accomplish the goal of the seismic research.
17. When activating devices which generate noise for seismic research, apply a slow increase of acoustic power, the so-called soft start, over a 30-minute period in order to provide target species with sufficient time to leave the activity area.
18. During works or using devices which generate impulsive noise when constructing infrastructure necessary for hydrocarbon exploitation (such as pile driving into the seabed, installation of foundation or anchors, etc.),

reduce the noise level by applying a slow increase of acoustic power, the so-called soft start, over a 30-minute period in order to provide target species with sufficient time to leave the activity area.

19. Within the ecological network area HR1000041 Northern Adriatic (EEZ), HR3000511 Northern Adriatic 1 (EEZ) and HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia), plan offshore platforms for hydrocarbon exploitation and their operation in such a way as to produce the lowest possible noise level during all activities/work.

Submarine cables and pipelines

20. For embedding submarine cables and pipelines use a substrate of the same composition as that at the embedding location.
21. Do not plan the positioning of submarine cables and pipelines in the proximity of the target habitat type 1170 Reefs of the ecological network area HR3000477 Reefs in the Jabuka/Pomo Pit.
22. Conduct seismic research and plan air jet use, for the purpose of positioning submarine cables/pipelines, within the ecological network area HR1000041 Northern Adriatic (EEZ), HR3000511 Northern Adriatic 1 (EEZ), HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia), HR3000513 Jabuka/Pomo Pit (EEZ) and HR3000514 Southern Adriatic (EEZ) in such a way that no multiple vessels perform activities simultaneously. If more than one vessel is active in one area at the same time, hold minimal mutual distance allowing target species to escape between the sound fields.
23. During seismic research of the seabed for the purpose of positioning submarine cables and pipelines, use the weakest energy source necessary to accomplish the goals of the seismic research.
24. When activating devices which generate noise for seismic research for the purpose of positioning submarine cables/pipelines, apply a slow increase of acoustic power, the so-called ramp-up or soft start, over a 30-minute period in order to provide target species with sufficient time to leave the activity area.

12.6 Conclusion on the impact of the Plan on the ecological network

Within the EEZ, there is one ecological network conservation area significant for species and habitat types (SCI), four probable ecological network conservation areas significant for species and habitat types (pSCI) and one conservation area significant for birds (SPA). The Main Assessment analysed all proposed activities and elements of the Plan, with respect to ecological network areas which involve the EEZ. For the purpose of presenting the intensity of the impacts, a standard scale was used, in accordance with the Guidelines for the assessment of acceptability for the ecological network for the Strategic Environmental Assessment (SEA).

A preliminary analysis determined that a part of the activities and elements of the Plan will not generate impacts on the goals of conservation of the ecological network areas, while other parts entail potential impacts, further analysed in a later phase. A detailed analysis showed that there is a possibility of individual significantly negative impacts on the goals of conservation of the ecological network areas by the implementation of activities and elements of the Plan referring to fishing areas. In order to mitigate the impact, a mitigation measure is prescribed in order to reduce the pressure on fisheries in the ecological network areas. Furthermore, a mitigation measure is prescribed to establish no take zones with the aim of ensuring sufficient amount of food for conserving target species of the ecological network areas. In conclusion, mitigation measures are prescribed for activities and elements related to fishing areas, which will be implemented in the Plan and prevent the occurrence of significant negative impacts on the goals of conservation.

Moreover, considering the analysis of cumulative impacts, suitable habitats and target species of the ecological network area, generated by activities and elements of the Plan, as well as existing and approved projects (Ministry of Environmental Protection and Green Transition), there is a possibility of significantly negative cumulative impacts. Since it is not known how many activities and elements of the Plan will be realised within or in the proximity of the ecological network areas and since there are no specified locations, a potential risk is determined. The possibility of significant cumulative impacts is identified if the aquaculture activity is carried out in the entire EEZ area, with no restrictions involving the ecological network areas. In order to reduce the cumulative impact to an acceptable level, a mitigation measure is prescribed, which defines the aquaculture restriction zone within the ecological network areas where it is planned (HR1000041 Northern Adriatic (EEZ), HR3000511 Northern Adriatic 1 (EEZ), HR3000512 Northern Adriatic 2 (EEZ + the territorial sea of the Republic of Croatia) and HR3000514 Southern Adriatic (EEZ)).

The Main Assessment prescribed mitigation measures in order to avoid potential significantly negative individual and cumulative impacts on the ecological network and their implementation in the Plan can eliminate significantly negative impacts on the goals of conservation and integrity of the ecological network areas.