

Annex I

SCIENTIFIC CRITERIA FOR IDENTIFYING ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS IN NEED OF PROTECTION IN OPEN-OCEAN WATERS AND DEEP-SEA HABITATS ^{1/}

Criteria	Definition	Rationale	Examples	Consideration in application
Uniqueness or rarity	Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features	<ul style="list-style-type: none"> • Irreplaceable • Loss would mean the probable permanent disappearance of diversity or a feature, or reduction of the diversity at any level. 	<p><i>Open ocean waters</i> Sargasso Sea, Taylor column, persistent polynyas.</p> <p><i>Deep-sea habitats</i> endemic communities around submerged atolls; hydrothermal vents; sea mounts; pseudo-abyssal depression</p>	<ul style="list-style-type: none"> • Risk of biased-view of the perceived uniqueness depending on the information availability • Scale dependency of features such that unique features at one scale may be typical at another, thus a global and regional perspective must be taken
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.	Various biotic and abiotic conditions coupled with species-specific physiological constraints and preferences tend to make some parts of marine regions more suitable to particular life-stages and functions than other parts.	Area containing: (i) breeding grounds, spawning areas, nursery areas, juvenile habitat or other areas important for life history stages of species; or (ii) habitats of migratory species (feeding, wintering or resting areas, breeding, moulting, migratory routes).	<ul style="list-style-type: none"> • Connectivity between life-history stages and linkages between areas: trophic interactions, physical transport, physical oceanography, life history of species • Sources for information include: e.g. remote sensing, satellite tracking, historical catch and by-catch data, vessel monitoring system (VMS) data. • Spatial and temporal distribution and/or aggregation of the species.

^{1/} Referred to in paragraph 1 of annex II to decision VIII/24.

Criteria	Definition	Rationale	Examples	Consideration in application
<p>Importance for threatened, endangered or declining species and/or habitats</p>	<p>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</p>	<p>To ensure the restoration and recovery of such species and habitats.</p>	<p>Areas critical for threatened, endangered or declining species and/or habitats, containing (i) breeding grounds, spawning areas, nursery areas, juvenile habitat or other areas important for life history stages of species; or (ii) habitats of migratory species (feeding, wintering or resting areas, breeding, moulting, migratory routes).</p>	<ul style="list-style-type: none"> • Includes species with very large geographic ranges. • In many cases recovery will require reestablishment of the species in areas of its historic range. • Sources for information include: e.g. remote sensing, satellite tracking, historical catch and by-catch data, vessel monitoring system (VMS) data.
<p>Vulnerability, fragility, sensitivity, or slow recovery</p>	<p>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</p>	<p>The criteria indicate the degree of risk that will be incurred if human activities or natural events in the area or component cannot be managed effectively, or are pursued at an unsustainable rate.</p>	<p><i>Vulnerability of species</i></p> <ul style="list-style-type: none"> • Inferred from the history of how species or populations in other similar areas responded to perturbations. • Species of low fecundity, slow growth, long time to sexual maturity, longevity (e.g. sharks, etc). • Species with structures providing biogenic habitats, such 	<ul style="list-style-type: none"> • Interactions between vulnerability to human impacts and natural events • Existing definition emphasizes site specific ideas and requires consideration for highly mobile species • Criteria can be used both in its own right and in conjunction with other criteria.

Criteria	Definition	Rationale	Examples	Consideration in application
			<p>as deepwater corals, sponges and bryozoans; deep-water species.</p> <p><i>Vulnerability of habitats</i></p> <ul style="list-style-type: none"> • Ice-covered areas susceptible to ship-based pollution. • Ocean acidification can make deep-sea habitats more vulnerable to others, and increase susceptibility to human-induced changes. 	
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	Important role in fuelling ecosystems and increasing the growth rates of organisms and their capacity for reproduction	<ul style="list-style-type: none"> • Frontal areas • Upwellings • Hydrothermal vents • Seamounts polynyas 	<ul style="list-style-type: none"> • Can be measured as the rate of growth of marine organisms and their populations, either through the fixation of inorganic carbon by photosynthesis, chemosynthesis, or through the ingestion of prey, dissolved organic matter or particulate organic matter • Can be inferred from remote-sensed products, e.g., ocean colour or process-based models • Time-series fisheries data can be used, but caution is required

Criteria	Definition	Rationale	Examples	Consideration in application
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	Important for evolution and maintaining the resilience of marine species and ecosystems	<ul style="list-style-type: none"> • Sea-mounts • Fronts and convergence zones • Cold coral communities • Deep-water sponge communities 	<ul style="list-style-type: none"> • Diversity needs to be seen in relation to the surrounding environment • Diversity indices are indifferent to species substitutions • Diversity indices are indifferent to which species may be contributing to the value of the index, and hence would not pick up areas important to species of special concern, such as endangered species • Can be inferred from habitat heterogeneity or diversity as a surrogate for species diversity in areas where biodiversity has not been sampled intensively.
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.	<ul style="list-style-type: none"> • To protect areas with near natural structure, processes and functions • To maintain these areas as reference sites • To safeguard and enhance ecosystem resilience 	Most ecosystems and habitats have examples with varying levels of naturalness, and the intent is that the more natural examples should be selected.	<ul style="list-style-type: none"> • Priority should be given to areas having a low level of disturbance relative to their surroundings • In areas where no natural areas remain, areas that have successfully recovered, including reestablishment of species, should be considered. • Criteria can be used both in their own right and in conjunction with other criteria.

FAO (2009) INTERNATIONAL GUIDELINES FOR THE MANAGEMENT OF DEEP-SEA FISHERIES IN THE HIGH SEAS

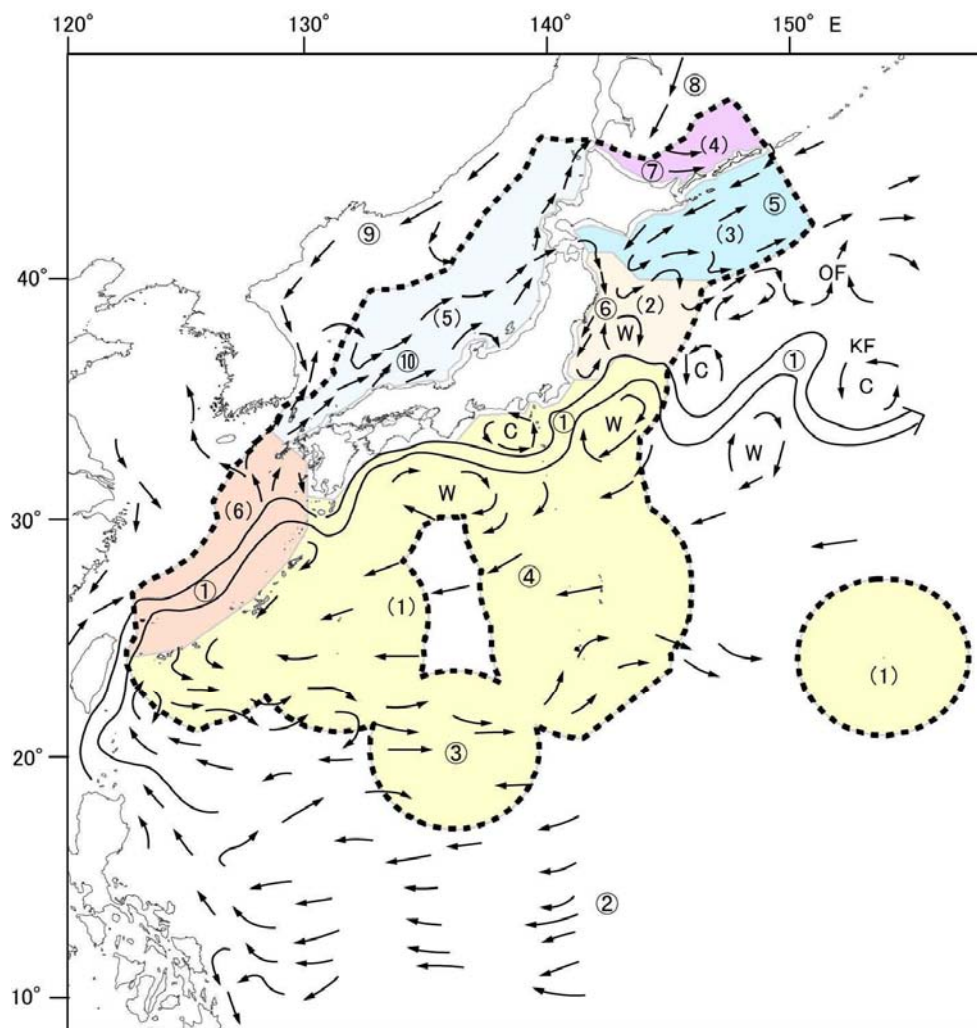
Identifying vulnerable marine ecosystems and assessing significant adverse impacts

42. A marine ecosystem should be classified as vulnerable based on the characteristics that it possesses. The following list of characteristics should be used as criteria in the identification of VMEs.

- i. Uniqueness or rarity – an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems. These include:
 - habitats that contain endemic species;
 - habitats of rare, threatened or endangered species that occur only in discrete areas; or
 - nurseries or discrete feeding, breeding, or spawning areas.
- ii. Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.
- iii. Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities.
- iv. Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:
 - slow growth rates;
 - late age of maturity;
 - low or unpredictable recruitment; or
 - long-lived.
- v. Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.

Examples of potentially vulnerable species groups, communities and habitats, as well as features that potentially support them are contained in the Annex.

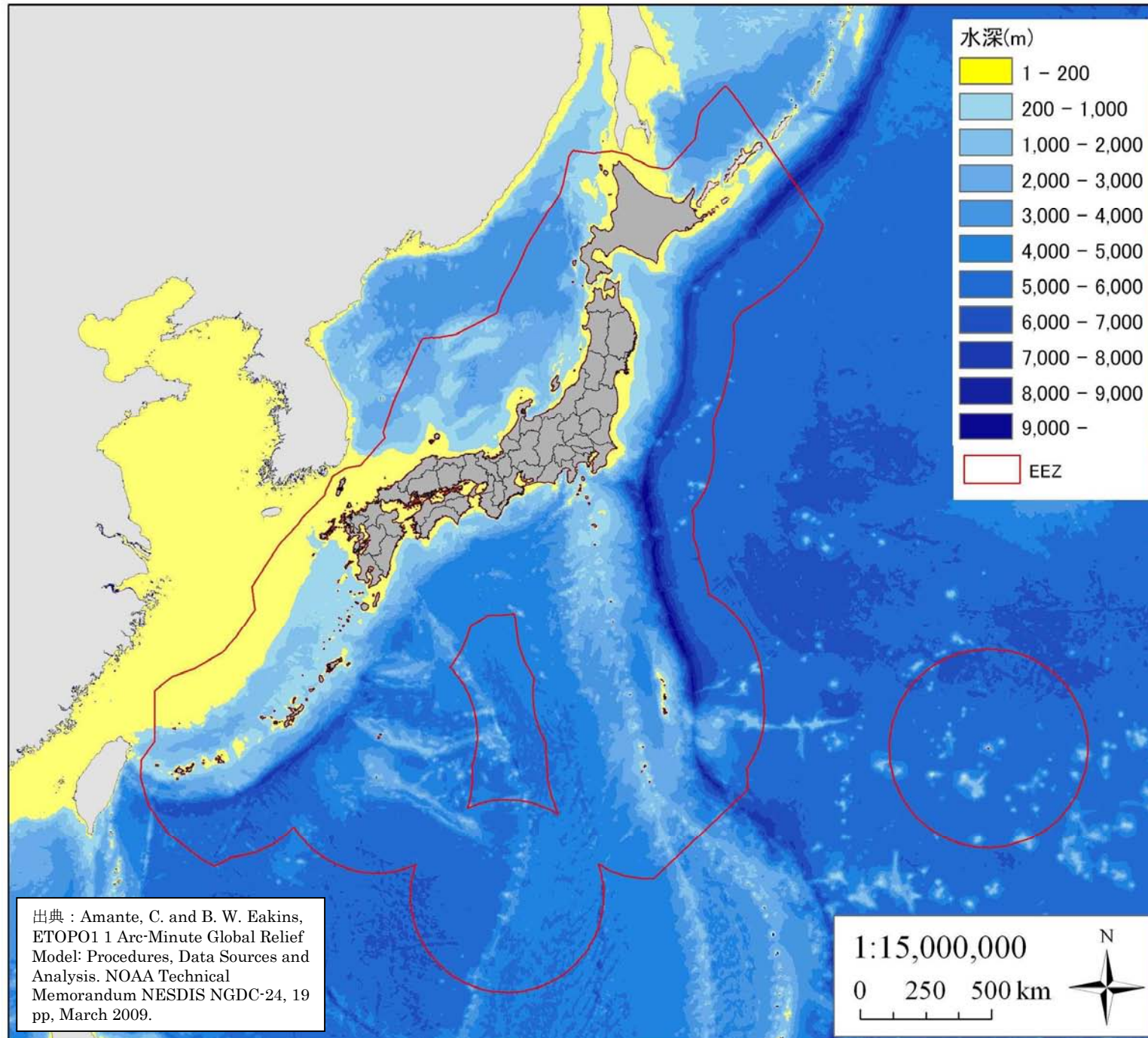
海洋生物多様性保全戦略における海域区分 (4章 3.)



(1) 黒潮・亜熱帯海域、(2) 本州東方混合水域、(3) 親潮・亜寒帯海域、(4) オホーツク海、
 (5) 日本海、(6) 東シナ海

①黒潮、②北赤道海流、③亜熱帯反流、④黒潮反流、⑤親潮、⑥津軽暖流、⑦宗谷暖流、
 ⑧東カラフト海流、⑨リマン海流、⑩対馬暖流

KF: 黒潮前線、OF: 親潮前線、W: 暖水塊、C: 冷水塊



水深 200m 以浅の分布状況図

配慮事項（時間的要素の考慮について）

時間の経過にともなう環境の変動や、知見・科学データの充実によって、抽出された重要海域への評価が中期的・長期的に変動することが考えられる。

このような時間的要素は、重要海域の点検や保全施策への活用にあたって考慮しておく必要があり、カルテの記述における各生態系の各要素については、以下の事項を参照するものとする。なお、この配慮事項は、資料3にて示されている「抽出される海域の点検」に基づきまとめたものである。

環境変動の影響：海流、水温、地形などの物理環境の変動にともない、海の生態系や生物の生息地が変化し、重要海域の抽出の根拠とした状況が変わることが想定される。レジームシフトや自然災害（台風、津波）の影響、地質学的現象（火山活動）の消長などの人為に寄らないものや、地球温暖化や海洋酸性化の影響などの人為由来のものが含まれる。具体的事例は下記表を参照。海の生態系の時間軸の変化については不明なことが多いことにも留意する。

科学的知見等の充実：現時点で、海域の生物や生態系についてのデータは非常に限られているため、今後、重要海域の抽出の根拠とした科学的知見やデータが充実することが想定される。

表 生態系の変動の事例

生態系（等）	時間的尺度	解説	出典
熱水噴出孔生物群集	中期的	熱水噴出孔は新しい地殻が形成される中央海嶺や海底の拡散作用に伴ってできる裂け目などで発見され、熱水の噴出活動はおおよそ10年かそれ以下で終わる。	大森、Torne-Miller（2006）海の生物多様性（Marine Biodiversity）築地書館、東京 pp230
サンゴ礁生態系	短・中期的	サンゴ礁生態系は中規模の自然攪乱を常に受けるが、エルニーニョ現象（平均4年、2～7年の間隔をおいて発生）などの影響により白化現象を起こすなどして変動する。	川崎他著（2007）レジームシフト－気候変動と生物資源管理－成山堂書店、東京 pp216 など
レジームシフト	中・長期的	数年～数十年単位でシフトする	海洋生物多様性保全戦略（2010）川崎他著（2007）レジームシフト－気候変動と生物資源管理－成山堂書店、東京 pp216

<参考>

短期的：1,2年の変動

中期的：10年程度の変動

長期的：30年以上の変動