Template for Submission of Scientific Information
to Describe Areas Meeting Scientific Criteria for
Ecologically or Biologically Significant Marine Areas

Title/Name of the area: Murman coast and Varanger fjord

Presented by (*names, affiliations, title, contact details)* Vassily A.Spiridonov, P.P. Shirshov Institute of Oceanology of Russian Academy of Sciences, vspiridonov@ocean.ru

Abstract (*in less than 150 words)* The Murman coast and Varanger fjord EBSA in the Barents Sea data presented here are based on synthesizing , extending and updating the assessment done by the WWF Barents Ecoregion Biodiversity Assessment (Larsen et al., 2003), IUCN/NRDC and AMSA workshop reports (Speer and Laughlin, 2011; Skjoldal et al., 2012). This EBSA is characterizied by medium uniqueness, high level of importance for life history stages of key or iconic species, high level of importance for endangered or threatened species, high level of biological productivity, high level of diversity, high vulnerability and medium level of naturalness.

Introduction

(To include: feature type(s) presented, geographic description, depth range, oceanography, general information data reported, availability of models)

The IUCN/NRDC Workshop to Identify Areas of Ecological and Biological Significance or Vulnerability in the Arctic Marine Environment (Speer and Laughlin, 2011) identified a super-EBSA named "White Sea/ Barents Sea Coast" as meeting nearly all CBD criteria. "This region is characterized by highly productive coastal waters influenced by a coastal branch of warm current originating from the North-Atlantic current. The area supports diverse and productive benthic communities including kelp, provides important nursery habitat for several species of pelagic fishes, and supports Atlantic salmon as well as seabird colonies with diverse species composition. The area is important for breeding Common eiders, and provides staging, molting and wintering grounds for three eider species including Steller's eider, which is considered globally vulnerable by IUCN. The White Sea/Barents Sea coast also supports local populations of White Sea beluga whales and provides pupping and molting areas for the entire East Ice harp seal population" (Speers and Laughlin, 2011). The report on identifying Arctic marine areas of heightened ecological significance (AMSA) also revealed the coastal waters of the Barents Sea as an important area (Skjoldal et al., 2012). As the White Sea and the Barents Sea coast is a really big and complex area that includes parts which meet EBSA criteria in different ways we provide here a separate description and recent information for the included areas which correspond to "elementary" EBSA mapped and listed in Annexes 1 and 2 to the IUCN/NRDC Workshop report.

Location

(Indicate the geographic location of the area/feature. This should include a location map. It should state if the area is within or outside national jurisdiction, or straddling both.)

This area covers part "super – EBSA" 12 (Annex 1.1 in Speer and Laughlin, 2011) and part of area 2 of the Barents Sea LME identified in the AMSA workshop report (Skjoldal et al., 2012). In the east a conventional boundary of the area is the meridian of Sviatoi Nos Cape. In the west we consider it up to the Russian/ Norwegian maritime border but in fact large and relatively open to the sea fjords of Finmark can be also considered as part of this area. The offshore boundary is within the influence of the Murmansk Coastal Current, conventionally within 30 km from shore and generally shallower than 200 m depth. Most of the area is within Russia's jurisdiction while Varanger fjord is divided between Russia and Norway. Alternatively, the Murmansk coast can be considered as a separate natural area while Russian fjords east of Kola Bay and Varanger fjord can be considered part of another priority natural area called "the Norwegian coastal current – Tromsø Bank area" (Larsen et al., 2003) and fitting the EBSA criteria. Important is, however, that although these areas have considerable specificity, they may be divided in different ways and form a continuous super-EBSA going from Tromsø Bank to the northern White Sea.

Feature description of the proposed area

(This should include information about the characteristics of the feature to be proposed, e.g. in terms of physical description (water column feature, benthic feature, or both), biological communities, role in ecosystem function, and then refer to the data/information that is available to support the proposal and whether models are available in the absence of data. This needs to be supported where possible with maps, models, reference to analysis, or the level of research in the area)

In the western part of the area Varanger fjord , the fjords of Rybachiy Peninsula and Motovsky Bay has a complex fjordic shore. A variety of fjords of different types and size, steep rocks and small beaches create a complex coastal environment. In the eastern part of the area lowlying,shallow coastline is typical for the southeastern Barents Sea, but remnants of the western fjord and skerries system are still present. Groups of small islands and capes are found along the coast of the area. Complex tectonic and glacial processes along with the isostatic uplift of the Scandinavian shield create several fjordic lagoons with limited to various extent water exchange with the sea (Semenov, 1988); on the coast of Kildin I. there is also another type of the waterbody having separated from the sea: Mogilnoe Lake, the only known anchialine lake in the Arctic (Strelkov et al., 2014).

Oceanographical regime of the area is dominated by the Murmansk Coastal current (in the west also by Norwegian Coastal current) which transports the transformed water of Atlantic origin. Transformation leads to some freshening of the water and warming of surface and subsurface layers compared to the waters of the North Cape and the Murmansk currents transporting the Atlantic water in the more offshore part of the Barents Sea. The coastal waters are generally ice free; nutrients input with Atlantic waters and seasonal cycle of stratification and mixing make the primary production regime different from the offshore Barents Sea. A complex system of oceanographicacal fronts is developed in the southern Barents Sea (Kostianoy et al., 2004). The area is generally productive but distribution of phytoplankton is mosaic owing to numerous eddies and local fronts (Makarevich, Druzhkova, 2010). The bulk of zooplankton which provides abundant food for fish and, to some extent sea birds is formed due to *Calanus finmarchicus* and the larvae of benthic invertebrates (Kamshilov, 1958; Stiansen et al., 2009) but krill is also important (Zelikman, 1961). Bottom topography in the area is very complex. Together with mosaic distribution of different types of sediments this provides conditions for fine scale mosaics of hard and soft bottom habitats and respective communities (Derjugin, 1915; Sharonov, 1948; Pergament, 1957; Zatsepin, 1962; Zatsepin, Rittikh, 1968; Propp, 1971; Pereladov, 2003; Sokolov, Shtrik, 2003; Anisimova et al., 2010; Britayev et al., 2010). The coastal area has been long time known for abundant fish, sea birds and mammal populations, many of them forming seasonal aggregations and having been exploited by indigenous Saami people, Russians and Norwegians for centuries (Lajus et al., 2005; Lajus and Lajus, 2010, Bohanov et al., 2013).

Feature condition and future outlook of the proposed area

(Description of the current condition of the area – is this static, declining, improving, what are the particular vulnerabilities? Any planned research/programmes/investigations?)

The Barents Sea ecosystem is known for its fluctuating nature which strongly depends on global processes and interactions between atmosphere and ocean (Stiansen et al., 2009). The decadal variation in oceanographical and biological characteristics is well documented and clearly shows different periods interfering with the impact of fishing on fish and benthic invertebrates communities (Borisov et al. 2001; Yaragina and Dolgov, 2009). Comparison of the Barents Sea ecosystem with its broad shelf to the neighboring Norwegina Sea ecosystem indicate that the former may have higher resilience owing to longer trophic chains, providing more energy flow into their benthic assemblages (Yaragina and Dolgov, 2009). However, the coastal ecosystem is particularly more vulnerable to the accidental oil pollution.

Assessment of the area against CBD EBSA Criteria

(Discuss the area in relation to each of the CBD criteria and relate the best available science. Note that a proposed area for EBSA description may qualify on the basis of one or more of the criteria, and that the polygons of the EBSA need not be defined with exact precision. And modeling may be used to estimate the presence of EBSA attributes. Please note where there are significant information gaps)

CBD EBSA Criteria (Annex I to decision	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		No informat	**Low**	**Medi um**	**High**

IX/20)		**ion**			
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.			X	
Explanation for ranking The area hauses no endemic species except the subspecies of Atlantic cod *Gadus morhua mogilniesis* which is living the the anchialine Mogilnoe Lake, but some habitas are unique, namely Mogilnoe Lake itself (Derjugin, 1925) as the only anchialine marine basin in the Arctic (Strelkov et al., 2014).					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				X
Explanation for ranking Coastal waters of the Kola Peninsula are the main habitat for sand eel (*Ammodites* spp.), most important spawning ground of capelin (*Mallotus mallotus*) , and feeding area for most key demersal fishes, such as cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), halibuts, walfish, and plaice and, in certain periods of time herring (*Clupea harengus*). The rivers of Kola Peninsula retain importance for maintaining genetically diverse stocks of Atlantic salmon (*Salmo salar*) (Larsen et al., 2003; Stiansen et al., 2009). At least seven colonies of the size larger than 50000 breeding pairs and a number of smaller colonies located on the coast from Russia/Norway border to Sviatoi Nos Cape hold a broad range of species because distribution ranges of eastern and western species meet there with kittiwake (*Rissa tridactyla*) being most numerous but the area is also important for breeding of guillemots (*Uria aalgae* and *U. lomvia*, *Cepphus grille*), herring and black-backed gulls (Larus argentatus and L. marinus), cormorants (*Phalacrocrax aristotelis*, *P. carbo),* and Atlantic puffin (*Fratercula arctica*). The islands also provide nesting habitats to common eider (*Somateria molissima*) (Krasnov et al., 1995; Bakken et al., 2000; Gavrilo, 2011). The coastal waters with its high productivity and seasonal mass shoreward migration of pelagic fishes is also one of the most important feeding area of colonial sea birds (Krasnov et al., 1995; 2006; Ezhov, 2008; Krasnov et al., 2012) and marine mammals – bearded seal (*Erignathus barbatus*), ringed seal (*Phoca hispida*), minke whales (*Balaenoptera acutorostrata*) (Larsen et al., 2003; Krasnov et al., 2012). The coastal waters of Kola Peninsual are also used by beluga whales (*Delphinapterus beluga*) as migration corridor and feeding area (With the onset of the sea ice season most sea birds migrate from the eastern Barents Sea to the Kola Peninsula coast and the Norwegian shores of the Barents Sea (Krasnov et al.,2002; Krasnov, 2004). The coastal area of Kola and Rybachiy peninsulas and Varanger fjord form continuation of the wintering area of eiders and other seabirds which is integrated with similar wintering area in the northern part of the White Sea. The common eider,which is most characteristic of this area, ranges moreor less continuously along the Kola Peninsula coast, while the king eider (*Somateria spectabilis*) and Steller eider (*Polysticta stelleri*) congregate in several spots (Krasnov et al., 2004).					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				X
Explanation for ranking The coast of Kola Peninsula and Varanger fjord is home to population of white-tailed sea eagle (*Haliaeetus albicilla*) and is a wintering area for Steller and king eiders. The area is important as a feeding and breeding area for grey seal (*Halichoerus grypus*) and a feeding regularly visited by minke whales, harbor porpoise (*Phocoena phocoena*) orcas (*Orcinus orca*) and commonly by other cetaceans listed in the IUCN Red List, i.e. humpback whales (*Megaptera novangliae*) and sei whales (*Balaenoptera borealis*) as well as white-beaked dolphin (*Lagenorhynchus albirostris*) (Burdin et al., 2009).					
Vulnerability, fragility, sensitivity, or slow recovery	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.				X
Explanation for ranking Overfishing has been well documented in the Barents Sea ecosystem (Borisov et al., 2001; Bohanov et al., 2013)					

that had also impact on survival and breeding success of seabirds in the colonies of the Murman Coast (Ktrasnov et al., 1995). Sensitive habitats in the area include benthic habitats with rich epifaunal communities (i.e. bryozoans, sponges, scallops) on hard and mixed substrates vulnerable to the bottom trawling and dredging (Denisenko, 2001; Denisenko and Zgurovsky, 2013). The coastal zone with its complex coastline is also highly vulnerable to oil spills.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				X
Explanation for ranking Coastal zone off Kola Peninsula (3%) of the shelf area provides 9-13% of annual net primary production Productivity of the narrow coastal band between 0 and 10 m where macrophytes contributes to production is especially high (Makarevich, Druzhkova, 2010). Coastal zooplankton may reach high biomass owing to local and development and transport of dominant copepod species *Calanus finmarchicus*, seasonal development of meroplankton (Kamshilov, 1958) and aggregating of krill (Zelikman, 1961: Drobysheva, 1994). The benthic biomass and production is also particularly high that basically allowed to add to the ecosystem a new generalistic predator – introduced Kamchatka (red) king crab (*Paralithodes camtschaticus*) .					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				X
Explanation for ranking Species richness of the coastal waters in the south-western and central Barents Sea is particularly high. In particular, 414 species of pelagic algae (not counting numerous forms and varieties) have been recorded in the coastal waters (Makarevich, Druzhkova, 2010). The Barents Sea is known for highest species richness of fishes and macroinvertebrates among the Arctic seas (over 2300 species of macroinvertebrates, about 200 species of fish – Spiridonov, 2011; Spiridonov et al., 2011) – most of them occurring in the coastal zone of Kola and Rybachiy peninsulas. In a single fjord-like inlet only sand and shell habitats house 190 species of macroinvertebrates (Sharonov, 1948). Coastal area belongs to a different biogeographical unit than the offshore Barenst Sea regardless of what regionalization scheme is adopted (Spiridonov, 2011a) and it can be also considered as corridor for migration of Atlantic species to the East following periods of warming and increasing input of the Atlantic water. The Barents Sea also houses the greatest among Arctic seas number of marine colonial, facultative colonial birds and sea ducks (30), practically all of them nesting or aggregating in the coastal area (Bakken et al., 2000; Spiridonov et al., 2011) The coastal zone contains a variety of semi-isolated fjord-like inlets with a specific oceanographical regime which are in process of separation from the sea owing to isostatic rise (Semenov, 1988; Bobkov et al., 2010, 2013; Pereladov et al., 2013). Seasonal successions in coastal planktonic communities show considerable variation (Makarevich, Druzhkova, 2010). A variety of benthic habitats and biotopes includes particularly important kelp and calacareous algae communities, scallop banks, and hard bottom communities dominated by bryozoans and sponges (Pergament, 1957).					
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.			X	
Explanation for ranking The biological resources of the coastal waters of the Barents Sea have been exploited for centuries (Lajus et al,, 2005; Lajus and Lajus, 2010). In the XX century the Barents Sea fishery experienced several crises (Borisov et al., 2001; Bohanov et al., 2013).In particular, large fluctuations in the capelin abundance have been strengthened by intensive fishery (Yaragina and Dolgov, 2009) and this affected sea bird colonies of Murman coast and reproductive success of particular bird species (Krasnov et al., 1995) while the bottom trawling pressure apparently impacted benthic communities (Denisenko, 2001; Denisenko and Zgurovsky., 2013). However most changes appear to be reversible. Kamchatka (red) king crab was introduced in the Barents Sea in the 1960s and became component of the coastal ecosystem. Its impact on benthic communities varies from place to place and at different time scales but generally can be considerate as moderate (Spiridonov et al., 2009; Britayev et al., 2010). Some bays, first of all Kola Bay with its urbanized and industrialized coast have been strongly impacted by pollution (Matishov, 2009). In spite of all disturbances the coastal ecosystems appear to be operating in a natural mode and manner, even if there are disturbances from fisheries and other exploitation; so that naturalness can be qualified as medium.					

Sharing experiences and information applying other criteria (Optional)

Other Criteria	Description	Ranking of criterion relevance (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**

Add relevant criteria					
Explanation for ranking					

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(e.g. relevant documents and publications, including URL where available; relevant data sets, including where these are located; information pertaining to relevant audio/visual material, video, models, etc.)

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