V. Main Benthic Biocoenoses

Bottom communities are classified according to biotope (Zernov, 1913; Zenkevich, 1963; Bacescu et al., 1991; Marinov, 1990) or species-dominants or edificators (Konstantinov, 1979; Kiseleva, 1981). It is the latter criterion which has been used below, as it is believed that the description of communities more fully illustrates the adaptation of species and their populations to changing environmental conditions.

The quantitative development of dominant species may indicate a zone in the biotope with a characteristic community. The main location of the community is where the dominant species has a maximum density index compared with other areas. The index is calculated according to the formula $\sqrt{bp}$, where b is the biomass in $g.m^{-2}$ and p is the frequency in percent.

Today there is no consensus of opinion as to the number of bottom communities either on the Ukrainian shelf or in the Black Sea as a whole. This may be explained by the spatial heterogeneity of the distribution of different communities and a considerable diversity of environmental conditions.

The differences in environmental conditions in the benthos on the northwestern and Crimean shelves (from Cape Tarkhankut to Kerch Strait) result in the biocoenoses having significantly different species compositions and quantitative characteristics. The main reasons for this are the diverse thermohalinity, amplitudes of temperature and variations in salinity. Fig. 17 gives a detailed description of the communities on the northwestern shelf and Fig. 17a a description of communities on the Crimean shelf. The communities have been named after their dominant species.

The *Modiolus phaseolinus* Biocoenosis

Modiolus phaseolinus is a bivalve mollusc living at depths of 55-125 m on silty sediments called phaseolina sediments. In terms of depth it is the lowest biocoenosis on the Black Sea northwestern shelf

The community comprises 31 taxa. Its density (D) varies from 24-2,170 $ind.m^{-2}$ of phaseolina and its biomass (B) from 3-230 $g.m^{-2}$. The mass species of the biocoenosis are: *Amphiura stepanovi* (D = 8-210 $ind.m^{-2}$, B = 0.1-0.8 $g.m^{-2}$), *Mytilus galloprovincialis* (D = 4-290 $ind.m^{-2}$, B = 32.4-122.0 $g.m^{-2}$), and *Prionospio cirrifera* (D = 4-50 $ind.m^{-2}$, B = 0.01-0.04 $g.m^{-2}$).

The biocoenosis of the Crimean shelf comprises 85 taxa (D = 80-3,320 $ind.m^{-2}$, B = 1.7-147.5 $g.m^{-2}$). The mass species are: *Amphiura stepanovi* (D = 20-120 $ind.m^{-2}$, B = 0.3-2.0 $g.m^{-2}$) and *Terebellides stroemi* (D = 40-200 $ind.m^{-2}$, B=0.7-2.7 $g.m^{-2}$).

Particularly in its upper levels, the phaseolina biocoenosis serves as a feeding ground for large adult species of some benthic fish, including the great sturgeon, turbot and whiting (Vinogradov, 1959; Zaitsev, personal observations underwater in 1985).

The Polychaeta *Terebellides stroemi* Biocoenosis

The Polychaeta *Terebellides stroemi* biocoenosis has been observed at depths of 50-100 m on exclusively silty sediments near the shelf west and southeast of Crimea. Sergeeva reported 27 taxa. The density of the *Terebellides stroemi* biocoenosis varied from 36-384 ind.m-2 and its biomass from 0.2-17.6 g.m^{-2}). The mass species were: *Nephthys hombergii* (D = 8-100 ind.m^{-2}, B = 0.1-1.7 g.m^{-2}), *Aricidea claudiae* (D = 4-76 ind.m^{-2}, B = 0.002-0.03 g.m^{-2}), *Oligochaeta sp.* (D = 4-8 ind.m^{-2}, B = 0.002-0.008 g.m^{-2}), *Iphinoe maeotica* (D = 4-20 ind.m^{-2}, B = 0.004-0.024 g.m^{-2}) and *Amphiura stepanovi* (D = 4-40 ind.m^{-2}, B = 0.03-0.43 g.m^{-2}). The mass species sometimes also include the bivalve mollusc *Abra nitida milachewichi.*

The Polychaeta *Melinna palmata* Biocoenosis

The Polychaeta *Melinna palmata* biocoenosis is composed of the polychaete *M. palmata.* This biocoenosis is widespread on the northwestern shelf. It is located at a depth of 12-35 m on silty and silty-sandy sediments. The average density and biomass of the macrozoobenthos is 290 ind.m^{-2} and 30 g.m^{-2} respectively. The dominant species, *M. palmata,* accounts for 19-27% of the total biomass of the community (Zambriborsch et al., 1973). The biocoenosis includes 47 animal species. The mass species are: *N. hombergii, Nereis diversicolor, Ampelisca diadema* and *Abra nitida milachewichi.*

Sturgeons winter in the melinna sediment zone to the south of Odessa bank, the so-called "starred sturgeon hole", where they feed on the melinna (Vinogradov, 1959). Since the 1980s there has been an increase in the area covered by the biocoenoses in Karkinitsky Bay (Zolotarev, Povchun, 1986; Zolotarev et al., 1991).

The mollusc *Gouldia minima* Biocoenosis

The biocoenosis of the bivalve mollusc *G. minima* occupies small areas on silty-sandy sediments of the Crimean Shelf at depths of 20-50 m. Up to 106 species have been recorded (Kiseleva, 1981). The density and biomass of *G. minima* in the biocoenosis are 90-180 ind.m^{-2} and 7.5-12.0 g.m^{-2} respectively. The mass species are: the bivalve mollusc *Lucinella divaricata* (D = 12-150 ind.m^{-2}, B = 0.03-0.60 g.m^{-2}); and the gastropod *Tritia reticulata* (D = 7-14 ind.m^{-2}, B = 3.0-5.5 g.m^{-2}) (N. Sergeeva, personal communication).

The mollusc *Venus gallina* Biocoenosis

The mollusc *Venus gallina* biocoenosis is found on sandy sediments mostly on the Crimean Shelf, and at depths of 7-30 m on the northwestern shelf in Karkinitsky Bay.

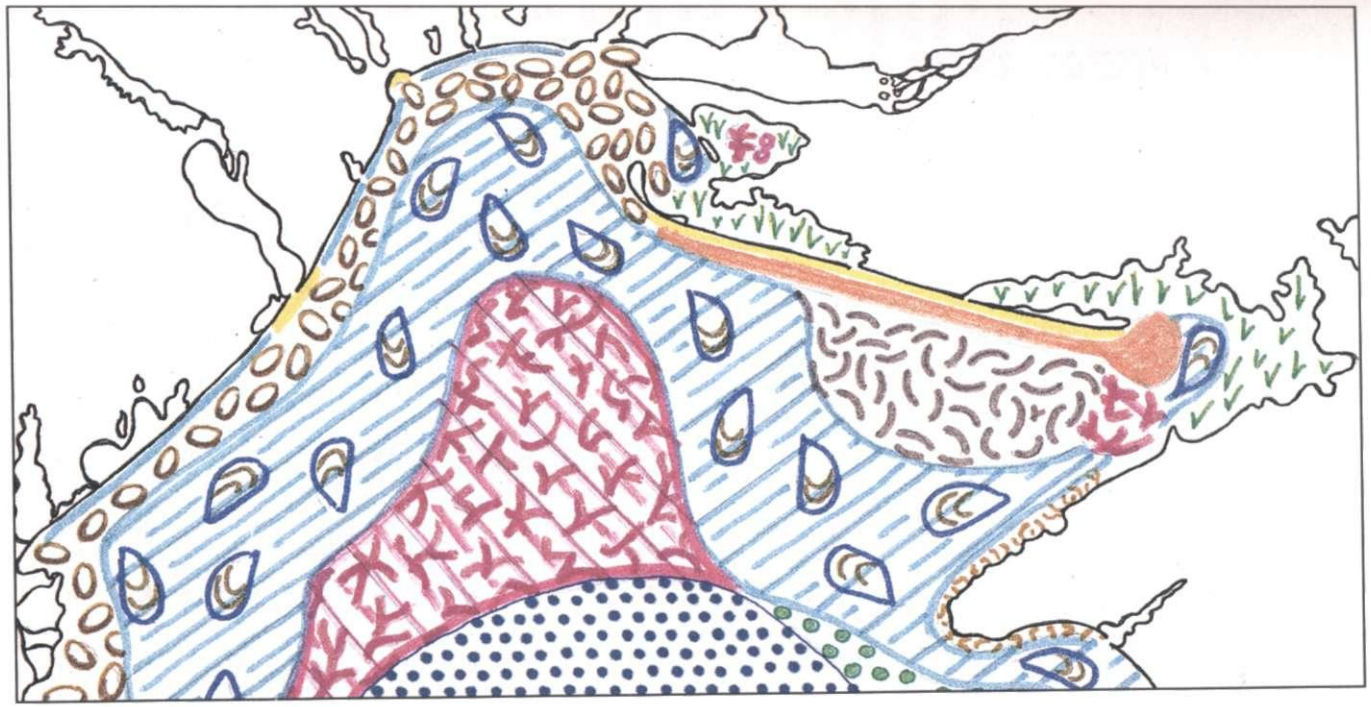
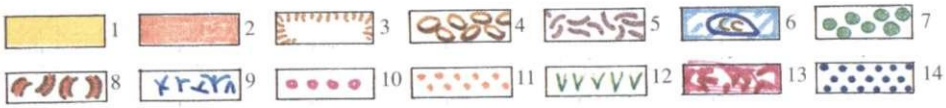


Fig. 17 Benthis biocoenoses of the Ukrainian shelf of the Black Sea (northwestern part). Conventional signs in Fig. 17a.



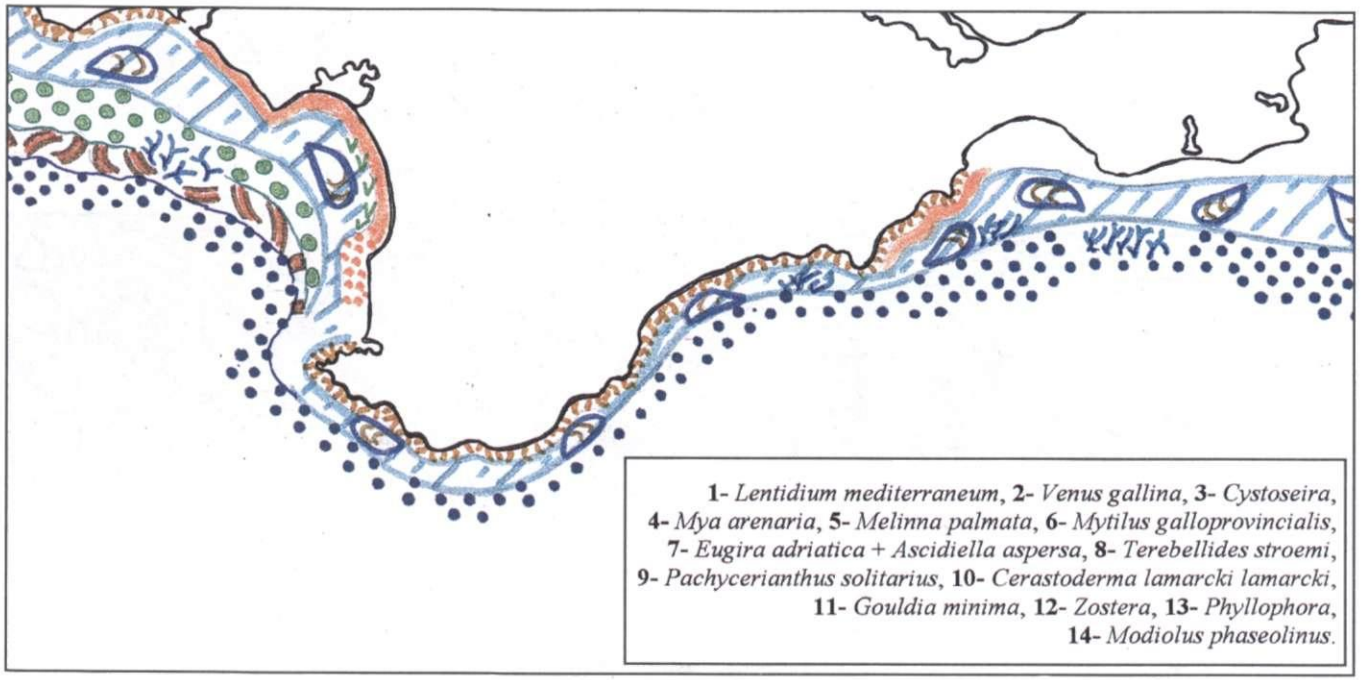
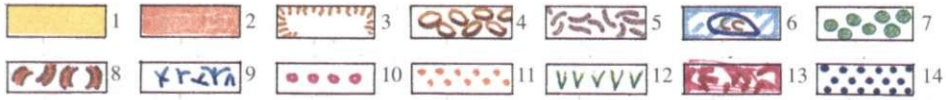


Fig. 17a Benthis biocoenoses of the Ukrainian shelf of the Black Sea. (Crimean shelf)



Crimean shelf

The density and biomass of *V. gallina* in the biocoenosis are 90-400 ind.m^{-2} and 27-1010 g.m-2 respectively. The mass species are: the bivalve molluscs *Gouldia minima* (D = 130-390 ind.m^{-2}, B = 6.5-24.0 g.m^{-2}) and *Spisula subtruncata* (N = 8-165 ind.m^{-2}, B = 1.3-24.0 g.m^{-2}) (N. Sergeeva). There are 140 species (Kiseleva, 1981)

The high populations of polychaetes and small molluscs provide food for fish such as the striped mullet, the gurnard and some goby species.

Northwestern shelf

The density and biomass of *V. gallina* in the biocoenosis are 10-800 ind.m^{-2} and 8-1000 g.m-2 respectively. The total number of macrozoobenthos species in the community is 5-7. The mass species are: ophyura *Amphiura stepanovi* (D = 8-210 ind.m^{-2}, B = 0.1-1.8 g.m^{-2}), *Mytilus galloprovincialis* (D = 4-290 ind.m^{-2}, B = 32-122 g.m^{-2}), the polychaeta *Prionospio cirrifera* (D = 4-50 ind.m^{-2}, B = 0.1-0.04 g.m^{-}) and the sponge *Spongia sp.* (B = 0.2-1.4 g.m^{-2}).

The mussel *Mytilus galloprovincialis* Biocoenosis

The dominant species is the bivalve mollusc *M. galloprovincialis,* which is the most widespread mussel in the Black Sea macrozoobenthos and plays an important role in the functioning of the shelf ecosystem. It is distributed across wide areas at depths from the spray zone to 55 m, inhabiting natural (silts, sands, shells, rocks) and artificial substrates (concrete, metal, synthetic materials).

On the Crimean shelf its density and biomass are 50-1,500 ind.m^{-2} and 115-3,100 g.m^{-2}) respectively (Sergeeva). On the northwestern shelf the figures are D = 10-54,000 ind.m^{-2} and B = 1-18,000 g.m^{-2} respectively (Sinegub). Particularly high densities have been observed on the anthropogenic substrates elevated above the bottom. On concrete shoreline reinforcements in Odessa Bay the average density and biomass of mussels were 14,200 ind.m^{-2} and 18.9 kg.m^{-2}. (maximum D = 17,200 ind.m^{-2} and B = 36.2 kg.m^{-2}) (Alexandrov, 1991). Even higher indices were discovered in Karkinitsky Bay on the supports of marine stationary platforms used for extracting gas. The average density and biomass were 15,500 ind.m^{-2} and 28.3 kg.m^{-2} (maximum D = 30,750 ind.m^{-2} and B = 65.3 kg.m^{-2} (Zolotarev et al.).

On the northwestern shelf the mass species of the biocoenosis are: the bivalve mollusc *Mya arenaria* (D = 10-2,400 ind.m^{-2}, B = 0.3-890 g.m^{-2}), the barnacle *Balanus improvisus* (D = 10-2,000 ind.m^{-2}, B = 0.3-220.0 g.m^{-2}), the polychaetes *Nereis succinea* (D = 10-1,600 ind.m^{-2}, B = 0.2-75.0 g.m^{-2}), *Polydora ciliata limicola* (D = 10-1200 ind.m^{-2}, B = 0.1-1.0 g.m^{-2}), *Prionopsio cirrifera* (D = 10-5,000 ind.m^{-2}, B = 0.1-5.2 g.m^{-2}). A total of 84 species of macrozoobenthos have been recorded.

On the Crimean shelf the mass species are: the mollusc *Modiolus adriaticus* (D = 30-130 ind.m^{-2}, B = 34.6-96.2 g.m^{-2}) and the polychaete *Terebellides stroemi* (D = 31-142 ind.m^{-2}, B = 1.3-13.3 g.m^{-2}). The biocoenosis consists of 105 animal species.

The mollusc biocoenosis plays an important role in providing food resources to benthic feeding fish, including turbots, flounders gobies and sturgeons. The predatory mollusc Rapana thomasiana is frequently encountered, particularly on the Crimean Shelf.

The mollusc *Mya arenaria* Biocoenosis

The bivalve mollusc *Mya arenaria* biocoenosis can be found on sandy and silty-sandy sediments at depths of 1-16 m (Zambriborsch et al., 1979), sometimes at 26 m (Ivanov, 1973), mainly dispersing in fresh waters.

M. arenaria was first recorded in the Black Sea in 1966 (Beshevli, Kalyagin, 1967). It squeezed out the aborigenic biocoenosis of the bivalve mollusc *Lentidium mediterraneum.* It is now most widespread in the estuarine regions of the northwestern Black Sea.

The density and biomass of *M. arenaria* varies in the range of 600-33,600 ind.nr and 240-2400 g.m^{-2}. The dominant species accounts for an average of 80% of the total (Kiseleva, 1988), rising to 96% in the river runoff regions such as the Danube-Dnester interfluve (Chichkin, Medinets, 1994).

I. Sinegub identified 76 macrozoobenthos species. The main species are the polychaetes *Nereis succinea* (D = 10-2,100 ind.m^{-2}, B = 0.01-60.0 g.m^{-2}) and the Polydora *ciliata limicola* (D = 10-1800 ind.m^{-2}, B = 0.01 -0.67 g.m^{-2}).

The *M. arenaria* biocoenosis has been observed in marine bays (e.g. in the central part of Tendrovsky Bay). According to D. Chernyakov, it is encountered at depths of 8-IO m in the biotope of silty limestone. It includes 12 macrozoobenthos. The average density and biomass are 3,000 ind.m-2 and 38 g.m-2 respectively.

The mollusc *Lentidium mediterraneum* Biocoenosis

The dominant species *L. mediterraneum (=Corbulomia maeotica)* is encountered on sandy sediments in shallow waters (from the spray zone to 20 m) mostly in the freshened areas of the northwestern shelf.

Up to 30 individuals of 1-3 mm barnacles encrust the shells of one *Lentidium.* The total volume of barnacles may exceed the volume of the mollusc by a factor of five or more, which in summer results in mass stranding of the molluscs on the shore.

The density and biomass of *L. mediterraneum* vary in the range of 5,000-145,000 ind.m-2 and 60-90 g.m^{-2} (Grinbart, 1949; Zakutsky, 1963, Kiseleva, 1981, Sinegub, 1993). The biomass of the dominant species accounts for 79-98% of the entire community (Kiseleva, 1981, Sinegub, 1993). Up to 30 macrozoobenthos species have been recorded in the biocoenosis.

In the fresh water areas of the northwestern shelf (e.g. Odessa Bay) the mass species are: the mollusc *Cerastoderma glaucum* (D = 80-90 ind.m^{-2}, B = 0.3-27.3 g.m^{-2}), the

amphipod *Ampelisca diadema* (D = 960-1760 ind.m^{-2}, B = 2-4 g.m^{-2}), the polychaeta *Nereis succinea* (D = 70-120 ind.m^{-2}, B = 1-2 g.m^{-2}) and the cumacean *Iphinoe maeotica* (D = 30-110 ind.m^{-2}, B = 0.02-0. lOg.m^{-2}) grow. In the saline areas (e.g. Karkinitsky Bay) the mass species are: the gastropod mollusc *Hydrobia ventrosa* (D = 7,000 ind.m^{-2}, B = 10-20 g.m^{-2}), the polychaete *Nephthys hombergii* (D = 40 ind.m^{-2}, B = 3-5 g.m^{-2}) and the bivalve mollusc *Spisula subtruncata* (D = 50 ind.m^{-2}, B=3-5 g.m^{-2}). Ten macrozoobenthos species were found in freshened waters and 40 species in saline waters.

The *L. mediterraneum* biocoenosis is an important feeding ground for fish (Bacesco et al., 1957). Since the introduction of *M. arenaria* into the Black Sea the best examples of the *I. mediterraneum* biocoenosis have been in Odessa Bay (up to 5 km^{2}) and in near estuarine areas (Sinegub, 1993).

The alga ***Phyllophora*** Biocoenosis

The alga *Phyllophora* biocoenosis is mostly concentrated on silty-shelly sediments over an area of about 15,000 km^{2} (at a depth of 20-60 m) known as Zernov's Phyllophora Field. The dominant species is the red algae P. nervosa. The same biocoenosis can also be found in the central part of Egorlitsky Bay, in the eastern part of Karkinitsky Bay (small phyllophora field) over an area of 150 km^{2} (at a depth of 10-20 m). Accumulations of this seaweed have been observed in the coastal waters of the Tarkhankut peninsula and from Donuzlav Lake to Evpatorijsky Lake.

The total standing crops of algae are: 200,000 t in Zernov's Phyllophora Field; 180,000 t in the small phyllophora field; and 40,000 t opposite west Crimea. In addition to the dominant species there are three other species of phyllophora: *P. brodieri, P. pseudoceranoides* and *P. trallii* (Kalugina-Gutnik, 1979). There are 118 species of invertebrates in the phyllophora (Vinogradov, Zakutsky, 1967) and 47 species of fish (Vinogradov, 1067). The mass macrozoobenthos species in Zernov's Phyllophora Field are: the bivalve molluscs *Mytilus galloprovincialis* (D = 380 ind.m^{-2}, B = 210 g.m^{-2}), *Mytilaster lineatus* (D = 6 ind.m^{-2}, B = 210 g.m^{-2}), the gastropod *Rissoa parva* (D = 10 ind.m^{-2}, B = 0.2 g.m^{-2}), the barnacle *Balanus improvisus* (D = 7 ind.m^{-2}, B = 0.2 g.m^{-2}), the polychaeta *Nereis succinea* (D = 52 ind.m^{-2}, B = 3.1 g.m^{-2}) (T. Mikhailova).

In Egorlitsky Bay the mass species of the Phyllophora biocoenosis are: the bivalve mollusc *Mytilaster lineatus* (D = 11,000 ind.m^{-2}, B = 600 g.m^{-2}), the polychaetes *Nereis zonata* (D = 1,400 ind.m^{-2}, B = 21 g.m^{-2}), *Platynereis dumerilii* (D = 1,200 ind.m^{-2}, B = 11 g.m^{-2}) (D. Chernyakov, personal communication). The characteristic macrozoobenthos species are: *Bittium reticulatum, Harmothoe imbricata, Balanus improvisus* and *Synisoma capito.*

A commercial standing crop of *Phyllophora* is currently available only in the small phyllophora field in Karkinitsky Bay. In 1993 it totaled 182,000 t, while the recommended harvest did not exceed 9,000 t. From Donuzlav Lake to the city of Evpatoria the standing crop is estimated at 40,000 t with a permissible harvest of 4,000 t (Bryantsev, 1994).

The seagrass ***Zostera*** Biocoenosis

The dominant species of the *Zostera* biocoenosis are *Zostera marina* and *Z. noltii* (a total of 5 species of the genus Zostera). The biocoenosis can be found on silty-sandy sediments at depths of 0.2 to 12 m. It forms dense growths in bays and limans.

The distribution of Zostera in coastal areas has declined in recent years as the result of anthropogenic influences, especially on the northwestern shelf and in the bays of Crimea. An exception is the Kerch Strait, where hydrological-hydrochemical conditions remain favourable for the development of sea weeds. The average biomass of *Zostera* was 5,058 g.m^{-2}, and its density 433 ind.m^{-2}. In other areas of the Ukrainian shelf the *Zostera* biomass and abundance varied from 750-4,000 g.m^{-2} and 260-800 ind.m^{-2} respectively (Milchakova, personal communication). There are 17-40 species of algae in the Zostera biocoenosis, which account for from 1 to 30% of the phytocoenosis biomass. The dominant species are: *Viva rigida, Chaetomorpha chlorotica, Ectocarpus confervoides, Laurencia obtusa* and *Gracilaria verrucosa* (Kalugina-Gutnik, 1974; Milchanova, 1988). The total number of macrozoobenthos species varies from 24 in the kut part of Karkinitsky Bay (northwestern shelf) to 70 in Kazachey Bay near Sevastopol (CS). In the freshened area of the northwestern shelf the biocoenosis contains the crabs Macropipus holsatus and Rhithropanopeus harrisi tridentata and the prawns Palaemon adspersus and P. elegans. In the shallow water of the east of Tendrovsky Bay, which is where *Zostera* occurs in the greatest quantities, the mass species in the biocoenosis are: the molluscs *Abra ovata* (D = 1,100-10500 ind.m-2, B = 50-200 g.m-2) and *Hydrobiidae* (D = 2850-19,100 ind.m-2, B = 13-90 g.m-2). There are 36 species in the biocoenosis. The total density and biomass are 6,300-20,700 ind.m-2 and 100-260 g.m-2 respectively (D. Chernyakov, personal communication). The mass species of the biocoenosis on the Crimean shelf are: the gastropod molluscs *Mohrensterniaparva* (B = 4 g.m^{-2}), *Bittium reticulatum* (B = 60 g.m^{-2}), and the bivalve mollusc *Mytilaster lineatus* (B = 500 g.m^{-2}). The fish of the Syngnathidae family are characteristic of this biocoenosis.

The alga ***Cystoseira*** Biocoenosis

The dominant species in the *Cystoseira* biocoenosis is the brown alga *Cystoseira barbata,* which develops on rocky substrates from the spray zone to a depth of 15 m. The C. *barbata* biocoenosis once occupied the entire rocky coast of Ukraine but today occurs only on the Crimean Shelf and possibly near Zmeiny island (Solyanik, 1959).

The mass species are: the molluscs *Mytilaster lineatus* (D = 50-6,800 ind.m^{-2}, B = 200-690 g.m^{-2}) and *Rissoa splendida;* the amphipods *Amphythoe vaillanti* and *Caprella acantifera;* and the polychaetes *Grubea clavata.* The average density and biomass of the macrozoobenthos in the biocoenosis are 13,000-35,000 ind.m^{-2} and 370-960 g.m^{-2} respectively. A total of 23 species were recorded in the biocoenosis on the Crimean shelf, including representatives of the ichthyofauna of the Labridae family and the blue damselftsh *Chromis chromis.* The epiphython of *Cystoseira* is described in detail by E. Makkaveeva (1979). Other common species include: the polychaetes Nereis succinea,

Nephthys hombergii and *Terebellides stroemi;* the molluscs *Mytilaster lineatus, Cerastoderma glaucum, Irus irus, Polititapes aurea, Donacilla cornea* and *Pilar rudis.* There are a few biocoenoses where rare species predominate, such as *Amphioxus (Branchiostoma) lanceolata,* which colonized coarse "amphioxus" sand near Cape Foros (Crimean shelf), the hydroid *Pachycerianthus solitarius,* and the ascidians *Eugyra adriatica* and *Ascidiella aspersa.* The distribution of the main benthic biocoenoses on the Ukrainian shelf is given in Fig. 17.

VI. Marine Wetlands

The Ukrainian coast of the Black Sea and the Azov Sea is rich in different kinds of wetlands, marine, brackish-water and freshwater. Some of them are large: e.g. Eastern Sivash (165,000 ha); Karkinitsky Bay and Dzharylgach Bay (87,000 ha); and Tendrovsky Bay (38,000 ha). Others are small in area: e.g. Krivaya Bay and Krivoi Peninsula (1400 ha); the seaside from Chernomorsk to Cape Uret in the Crimea (9,600 ha). There are a total of 19 marine wetlands in Ukraine (Fig. 18), of which 11 are in the Black Sea and eight in the Azov Sea. The total area of these wetlands is approximately 635,000 ha.

In addition to their ecological important the wetlands of the Black Sea basin also provide valuable goods and services for local people. These include: flood control, the retention of pollutants and sediments, support for commercial fisheries, recreational potential and the provision of important habitats for wildlife, including many endangered species. The main geological, morphometrical and ecological characteristics are shown in Annex I, Table 11. The threatened species of plants and birds and the protected areas in the Ukrainian marine wetlands are shown in Tables 22-23-24.

Table **22.** Rare plants of the Ukrainian marine wetlands

Species of plants	**Category of protection**	**№ of wetland***
Utysopogon gryilus	I	1, 2, 9, 1U
Ctadium mariscus	II	1,2,10
Damasonium alisma	I	15
Elitrigia stipifolia	II	15,18
Epibctcb is palustris	III	1,7
Eremogone cephalotes	II	5,6
Mursitea quaarifolia	I	1,2
Leucojum aestivum		1,7
Glanium flavum	I	16
Orchis palustris	II	1,7,10
Trapa natans	II	1,2,5,7
Sal v in i a natans		1,2,5,7
Aldrovanda vesiulosa	III	1.2,5,7

* name of wetland see legend Fig. 18

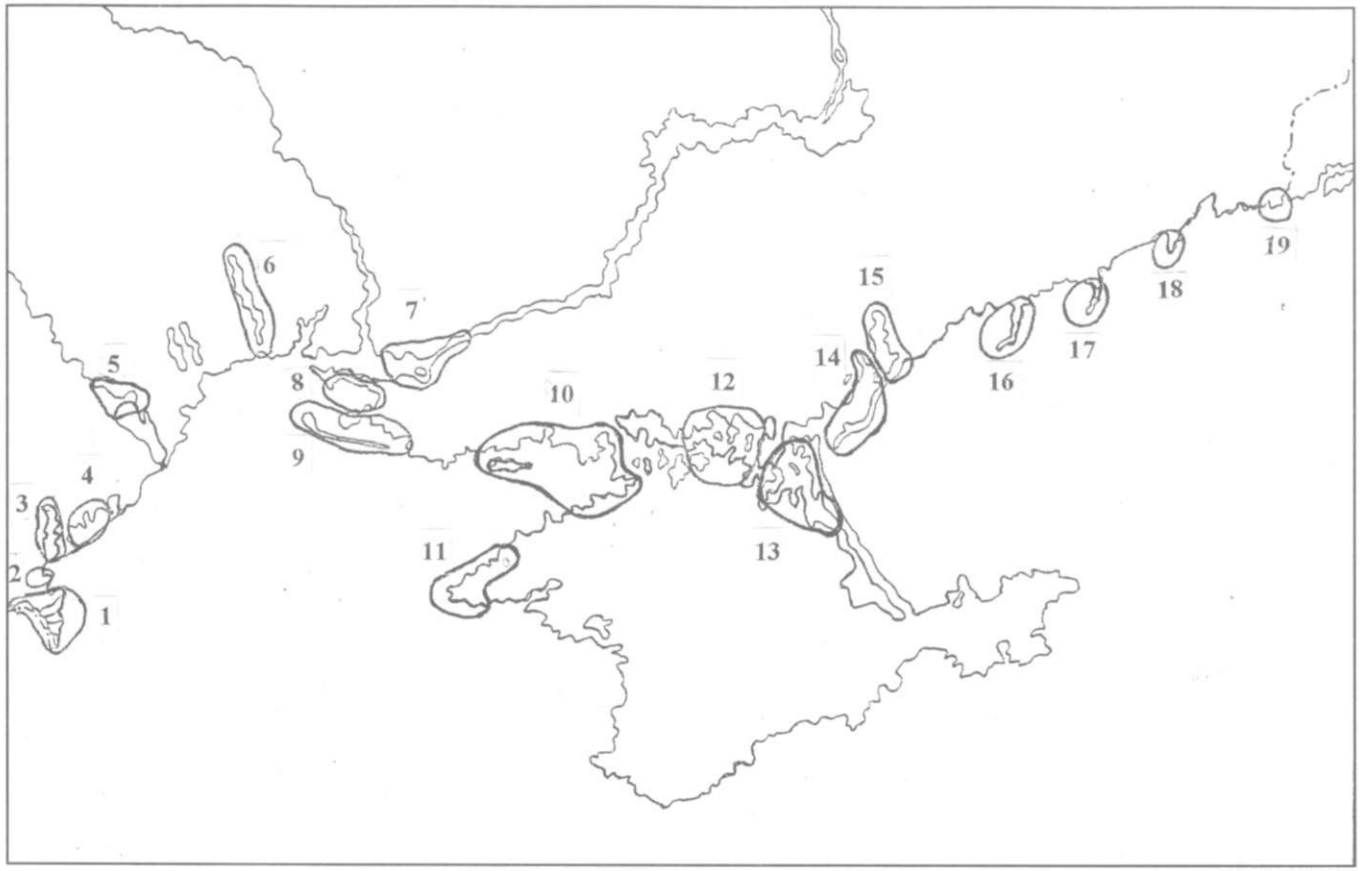


Fig. 18 Ukrainian major coastal wetland areas in the Black Sea and the Sea of Azov.

Table 23. Rare species of birds breeding in Ukrainian marine wetlands

Species of Birds	Wetlands* (pairs of breeding birds)	Wetlands* (number of individuals during seasonal accumulations)
Pelecanus onocrotalus	-	1(2,100); 3(2,000); 4(120); 5(500); 8(45); 9(30)
Pelecanus crispus	1(3)	1(25); 5 (800)
Phalacrocorax aristotelis	11 (350-500)	
Phalacrocorax pygmeus	1(700); 5 (20)	1(1 300)
Platalea leucorodia	1(800); 2 (350); 5 (20)	
Plegadis falcinellus	1(300); 5 (300-2,000); 6 (200); 13 (500)	
Egretta alba	2 (400); 5 (300); 7 (350-700); 10 (200-700); 13 (500); 15 (10); 16 (120); 17 (70); 18 (9-20); 19 (8-15)	6 (900); 18 (100); 19 (260)
Egretta garzetta	10 (500-970); 13 (500); 17 (40)	9 (76,000)
Ciconia ciconia	1(7)	
Ciconia nigra	-	1(10); 5(130); 9(10)
Grus grus		1(100); 8-9(300); 13 (2,000); 12 (100-300)
Anthropoides virgo		4 (10); 8-9(30)
Otis tarda		1(10); 8 (10)
Branta ruficolis	—	1-3-4 (2,000)
Casarca ferruginea	1(?)	1 (60); 8 (10)
Somateria mollissima	8 (700)	
Aythya ferina	2 (1,800); 3 (170)	3 (18,000); 6 (5,000); 7 (6,000); 8 (25,000-40,000); 9 (60,000); 10 (7,900)
Aythya niroca	1(130); 5(20)	1(100); 5 (50)

Netta rufina	2 (400)	12-13 (3,000)
Tadorna tadorna	6 (70); 10(70)	12-13 (12,000)
Pandion halia¸tus	-	1(5); 5(5); 9(2-3)
Haliaeëtus albicilla	1(?)	1(8); 3-4(14); 8-9(55)
Charadrius alexandrinus	4(30); 6(35)	
Charadrius dubius	6(15)	
Himantopus himantopus	1(15); 4(80-90); 5(5); 6(10); 13(600-800); 14(20); 15(250); 17(10-26)	
Recurvirostra avoseta	4(100); 6(100); 9(250); 13(500-600); 14(60); 15(50-250)	4(1,300); 13(50)
Haemotopus ostralegus	1(5)	
Numenius phaeopus		1(600)
Glareola pratincola	3(60); 4(60); 8-9(50-60); 16-17-18-19(200);	
Glareola nordnanni	8-9(4-25);	
Larus ichthyaëtus	12(115-245); 13(360)	10(300)
Larus genei	6(10); 9(6,800-37,450); 10(300); 12(1,000 -1,300); 13(850)	12-13(200)
Larus melanocephalus	6(120); 12(2,000); 13(450)	
Apus melba	11(10)	

* name of wetland see legend Fig. 18

Table 24. Protected areas of Ukrainian marine wetlands

N° of wetland	Existing protected territories
1	Part of wetland (9,000 ha) — in the state reserve "Dunajskije Plavni"
2	—
3	—
4	—
5	Part of the territory — in the game reserve "Urochische Dnestrovskije Plavni"; Liman — the Game Reserve of the Military Society of Fishermen and Hunters (MSFH)
6	Two Ornithological Game Reserves in the Lower ("Tiligulskaja Peresyp", "Nizovje Tiligulskogo Limana"("Lower Tiligulski Liman"); the hunting economy of the Society of Fishermen and Hunters (SFH) — in the Upper Liman
7	Ichthyological Game Reserve "Krasnaja Hatka"; some of SFH and MSFH
8	Greater part — in the State Biosphere Reserve "Chernomorski"
9	In the State Biosphere Reserve "Chernomorski"
10	Reserve "Lebjazije Ostrova" ("Swan's Islands"); Kolonchakskije Islands — in the Game Reserve
11	Game Reserve
12	—
13	—
14	Fedotova Peninsula and the Upper Liman — Game Reserves
15	One hydrological protected area; three Ornithological Game Reserves — "Altashirski", "Rodionovski", "Stepanovskaja Kosa"("Stepanovskaja Peninsula")
16	Game Reserve
17	State Game Reserve
18	Game Reserve
19	Ornithological Game Reserve "Krivokoski Liman"; State Nature Memorial "Krivaja Kosa" ("Curved Peninsula")