

3.12.6 Deep-water Fisheries Resources south of 63°N

1. Background

In some parts of the north-east Atlantic where the continental shelf is narrow, such as off Portugal (including Madeira and the Azores), there are traditional fisheries, for example for black scabbardfish (*Aphanopus carbo*) and red (=blackspot) seabream (*Pagellus bogaraveo*), which have been exploiting deep-water species for many years. Other traditional species are ling, blue ling and tusk which have supported large fisheries in wide areas for several decades. The existence of other potentially exploitable stocks in the ICES area has been known since the 1960s and 1970s. However, with the exception of a fishery for species such as roundnose grenadier (*Coryphaenoides rupestris*) in international waters there was little interest from the fishing industry in exploiting stocks within EEZs.

Since the 1980s, dwindling resources on the continental shelves of the North Atlantic have encouraged the development of fisheries in deeper waters. There has been a tendency for fisheries for species such as anglerfish and Greenland halibut to extend into deeper waters and new fisheries have developed to target the new deep-water species that have been found there.

Deep-water species such as the argentine or greater silver smelt (*Argentina silus*) and roundnose grenadier (*Coryphaenoides rupestris*) which were previously by-catch species are now being targeted within the ICES area. Orange roughy (*Hoplostethus atlanticus*) is now a target species.

It is of concern that the landings statistics that are available may not reflect the true scale of the recent fishing activity in waters outside the national EEZs. While there has been increasing research activity in deep-water it is also of concern that fisheries on deep-water species have developed rapidly and that the resources which they exploit are generally especially vulnerable to overfishing. Also within the ICES area species/stocks have been depleted before appropriate management measures have been implemented.

2. The species

The term deep-water was defined to include waters of depths greater than 400 m. The following were identified as some of the most important deep-water species.

DEEP-WATER SPECIES LIST

<i>Alepocephalus bairdii</i>	Baird's smoothhead
<i>Aphanopus carbo</i>	Black scabbardfish
<i>Argentina silus</i>	Argentine, greater silver smelt
<i>Beryx splendens</i>	Golden eye perch
<i>Beryx decadactylus</i>	Red bream, alfonsino
<i>Brosme brosme</i>	Tusk
<i>Chimaera monstrosa</i>	Rabbitfish
<i>Coryphaenoides rupestris</i>	Roundnose grenadier
<i>Epigonus telescopus</i>	Big eye, deep-water cardinal fish
<i>Helicolenus dactylopterus</i>	Bluemouth
<i>Hoplostethus atlanticus</i>	Orange roughy
<i>Hoplostethus mediterraneus</i>	Silver roughy
<i>Lepidopus caudatus</i>	Silver scabbardfish
<i>Macrourus berglax</i>	Roughhead grenadier
<i>Molva molva</i>	Ling
<i>Molva dypterygia</i>	Blue ling
<i>Mora moro</i>	Mora
<i>Pagellus bogaraveo</i>	Red (=blackspot) seabream
<i>Phycis blennoides</i>	Greater forkbeard
<i>Polyprion americanus</i>	Wreckfish
<i>Trachyrhynchus trachyrhynchus</i>	Roughnose grenadier
	Sharks, various
<i>Chaecon (Geryon) affinis</i>	Deep-water red crab
<i>Aristeomorpha foliacea</i>	Giant red shrimp

The main shark species caught in deep-water fisheries are:

<i>Centrophorus granulosus</i>	Gulper shark
<i>Centrophorus squamosus</i>	Leafscale gulper shark
<i>Centroscyllium fabricii</i>	Black dogfish
<i>Centroscymnus coelolepis</i>	Portuguese dogfish

<i>Centroscymnus crepidater</i>	Longnose velvet dogfish
<i>Dalatias licha</i>	Kitefin shark
<i>Deania calcea</i>	Birdbeak dogfish
<i>Etmopterus princeps</i>	Great lantern shark
<i>Etmopterus spinax</i>	Velvetbelly
<i>Scymnodon ringens</i>	Knifetooth dogfish

Advice on some other species, which might be considered as deep-water species, is already provided elsewhere in the ACFM report:

<i>Micromesistius poutassou</i>	Blue whiting
<i>Reinhardtius hippoglossoides</i>	Greenland halibut
<i>Sebastes</i> spp	Redfish

In addition, there are other species which have been fished on the continental shelf but whose distribution extends into deeper waters. This group includes hake (*Merluccius merluccius*), anglerfish (*Lophius* spp.) megrim (*Lepidorhombus* spp.) and conger (*Conger conger*) and recent years have seen an extension of fishing into deeper waters for these species in ICES Sub-areas VI, VII, VIII, and IX. Advice is provided on these species elsewhere in the ACFM report.

The shark species caught in deep waters will not be dealt with in the present report. Research is ongoing and results are expected to be available in 2002.

3. Descriptions of Deep-Water Fisheries by Sub-area

In ICES Sub-area II there are directed longline fisheries for ling and tusk. Bottom and pelagic trawl fisheries target argentine (*Argentina silus*) and there is a minor fjord fishery for roundnose grenadier. Roughhead grenadier are taken as by-catch in the trawl, gillnet and longline fisheries for Greenland halibut and redfish.

In ICES Sub-area III there is a targeted trawl fishery for roundnose grenadier and argentine. These species are also a by-catch of the *Pandalus* fishery, and probably only a minor part of this by-catch is landed.

In ICES Sub-area IV there is a by-catch of argentine from the industrial trawl fishery. A longline fishery targets tusk and ling with roughhead grenadier as a by-catch. Some deep-water species are landed as a by-catch in the trawl fisheries targeting anglerfish and Greenland halibut.

In ICES Sub-area V there are trawl fisheries which target blue ling, redfish, argentine and occasionally orange roughy. By-catch species are typically roundnose grenadier, roughhead grenadier, black scabbardfish, anglerfish, bluemouth (*Helicolenus dactylopterus*), mora (*Mora moro*), greater forkbeard (*Phycis blennoides*), argentine, deep-water cardinal fish (*Epigonus telescopus*) and rabbit fish (*Chimaera monstrosa*). There are traditional longline fisheries for

ling and tusk and these species are also by-catches in trawl and gillnet fisheries. There are also targeted trawl and gill net fisheries for Greenland halibut and anglerfish which have a deep-water by-catch of for example deep-water red crab (*Chaceon affinis*). There have also been trap fisheries for the deep-water red crab.

In ICES Sub-areas VI and VII there are directed trawl fisheries for blue ling, roundnose grenadier, orange roughy, black scabbard fish and the deepwater sharks *Centroscymnus coelolepis* and *Centrophorus squamosus*. By-catch species include bluemouth, mora, greater forkbeard, argentine, deep-water cardinal fish and chimareids of which *Chimaera monstrosa* is the most important. In some years there are considerable by-catches of argentine in the blue whiting fishery and the argentine has been targeted in some years. There are directed longline fisheries for ling and tusk and also for hake often with deep-water sharks as a by-catch. There are targeted fisheries for sharks in Sub-areas VI and VII and a gill net fishery in Sub-area VII for ling.

In ICES Sub-area VIII there is a longline fishery which mainly targets greater forkbeard. There are also some trawl fisheries targeting species such as hake, megrim, angler fish and *Nephrops* which have a by-catch of deep-water species. These include *Molva* spp., forkbeard (*Phycis phycis*), greater forkbeard, red seabream (*Pagellus bogaraveo*), conger eel (*Conger conger*), bluemouth, wreckfish (*Polyprion americanus*) and *Beryx* spp.

In ICES Sub-area IX some deep-water species are a by-catch of the trawl fisheries for crustaceans. Typical species are bluemouth, greater forkbeard, conger eel, blackmouth dogfish (*Galeus melastomus*), kitefin shark (*Dalatias licha*) and gulper shark (*Centrophorus squamosus*). There is a directed longline fishery for black scabbardfish with a by-catch of the Portuguese dogfish (*Centroscymnus coelolepis*). There is also a artisanal longline (Voracera) fishery for red seabream.

In ICES Sub-area X the main fisheries are by handline and longline and the main species landed are red

seabream, wreckfish, conger eel, bluemouth, golden eye perch (*Beryx splendens*) and alfonsino (*Beryx decadactylus*). At present the catches of kitefin shark (*Dalatias licha*) are made by the longline and handline deep-water vessels and can be considered as accidental. There are no vessels at present catching this species using gillnets. In 1998 and 1999 two commercial longliners from Madeira targetted black scabbardfish in this Sub-area. In 1998 and 1999 some commercial fishing experiments targeting deep-water crustaceans species (deep water crabs and shrimps), were also undertaken. There are trawl fisheries for golden eye perch, orange roughy, cardinal fish, black scabbardfish and wreckfish.

In ICES Sub-area XII there are trawl fisheries on the Mid Atlantic Ridge for orange roughy and black scabbard fish. There is also a targeted roundnose grenadier fishery on the Mid Atlantic Ridge and a multi-species trawl fishery on Hatton Bank.

In ICES Sub-area XIV there are trawl and longline fisheries for Greenland halibut and redfish that have by-catches of roundnose grenadier, roughhead grenadier and tusk.

4. Landings data

The data provided on landings for all areas and by ICES Sub-areas and Divisions for all deep-water species including blue ling, ling and tusk, are given in Figures 3.12.6.1–10. The data were compiled from the database of statistics officially reported to ICES, national data supplied by study group members and some published data. The data for 1999 are provisional. Landings for roughhead grenadier, sharks (various), silver scabbardfish (*Lepidopus caudatus*) smoothheads (Alepocephalidae) and wreckfish (*Polyprion americanus*) by ICES Sub-areas and country are given in Tables 3.12.6.1–6.

5. Assessment

Very few time series based on the regular sampling of commercial landings exist. Basic statistics on catches and effort are of poor quality and in some cases lacking. There is often insufficient information on the general biology of these species, in particular on age and growth, seasonal behaviour, migration, and stock discrimination. New data on landings, discards and biological parameters relevant to assessment have been collected as part of the EC FAIR Deep-fisheries Project (95/655).

Although the necessary data are improving for certain stocks, the possibilities for traditional age-structured assessments only exist for a few stocks. Assessments using some alternative methodologies such as De Lury constant recruitment models and Schaefer production models continued to be used. In some cases these have

been used to assess the state of the stocks in relation to precautionary reference points. CPUE analyses continue to be important for monitoring the status of stocks.

For many stocks, CPUE are the only supplementary data available but in some fisheries where the exploitation has changed to different areas, such data are unreliable as indicators of stock abundance. There is a strong need for exploring all possible methods of monitoring the stocks. There is experience from outside the ICES region (e.g. acoustic and egg surveys) which should be considered.

Developments in acoustic survey techniques may lead to biomass estimates for some species. In the shorter term the use of trawl surveys may be the best method for monitoring some of these stocks.

There is substantial experience with developing deep-water fisheries outside the ICES region. ICES has also drawn on global experience in evaluating status and trends in deep sea species, and in formulating advice consistent with the precautionary approach.

6. Management considerations

Experience shows that deep-sea stocks can be depleted very quickly and that recovery will be slow. These populations generally have a high proportion of old fish, their fecundities are low, and regeneration and growth are so slow that stock numbers do not increase in the depleted areas in the short or medium term.

The unusual body shape of many deep-water fish combined with a high age/length at maturity often means that there can be a high fishing mortality of immature fish. The survival rates of discards and of fish encountering gears and escaping are unknown, but many species are expected to be very vulnerable to injury, and therefore would be expected to die even if they escaped through meshes. Some species, such as blue ling, orange roughy, red sea bream and alfonsinos aggregate in shoals, often associated with seamounts, and can provide high catch rates once the shoals are located. Localized sub-units of the population can be quickly depleted by fisheries, even within a single season. Sub units of some species (e.g. red sea bream, blue ling and orange roughy) are known to have collapsed in some ICES areas.

It is evident that high catch rates can be maintained by moving from one concentration to another and progressively depleting the stock. Furthermore, many deep-water fisheries are on mixtures of species, making it difficult, to manage the component species individually.

Fisheries for deep-water species are developing in areas inside and outside national jurisdictions. As a result

exploitation is increasing on a number of species, as fishing extends into deeper waters or new areas, but the actual exploitation rates are unknown. Moreover, in some recently developed fisheries, information is being withheld for commercial reasons. The quantities recorded are not well estimated, and some landings are reported in grouped categories because of difficulties in separating species. In many cases significant proportions of the catch are discarded at sea and not recorded. All these factors make it difficult to determine which level of exploitation is sustainable.

The Code of Conduct for Responsible Fishing 7.5.4 (and the UN Agreement on Straddling Stocks 6) states:

“In the case of new or exploratory fisheries, States should (shall) adopt as soon as possible cautious conservation and management measures, including, inter alia, catch limits and effort limits. Such measures should (shall) remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment should (shall) be implemented. The latter measures should (shall), if appropriate, allow for the gradual development of the fisheries.”

Fisheries on deep-water species often develop and expand before sufficient information is available on which to base management advice. **Consistent with a precautionary approach, fishing should not be allowed to expand faster than the acquisition of information necessary to provide a basis for sustainable exploitation. There have been some improvements in recent years in data acquisition for**

some stocks while for others it has deteriorated. A comprehensive data collection system is urgently required, and research on all stocks should be increased to provide the data necessary for assessment.

Continued fishing without biological data collection is not consistent with a precautionary approach. ICES recognised that NEAFC has established a reporting scheme providing catch statistics by detailed areas. **ICES recommends that where such schemes do not already exist, provision should be made for reporting landings to ICES at the species level for all species, including sharks. Provision should be retained, or made, for reporting at genus and higher grouped levels to allow for reports of landings which have not been sorted to the species level.** In this context the use of a hierarchical system of reporting should be encouraged.

ICES further recommends that improvements should be made in reporting landings from international waters by some states.

Management advice: Most exploited deep-water species are, at present, considered to be harvested outside safe biological limits. ICES recommends immediate reduction in these fisheries unless they can be shown to be sustainable. New fisheries should be permitted only when they expand very slowly, and are accompanied by programs to collect data which allow evaluation of stock status.

Source of information: Report of the Study Group on the Biology and Assessment of Deep-Sea Fisheries Resources, February 2000 (ICES CM 2000/ACFM:08).

Table 3.12.6.1 **Roughhead grenadier (*Macrourus berglax*). Study**
 Group estimates of landings (tonnes).

ROUGHHEAD GRENADIER (*Macrourus berglax*) I and II

Year	Germany	Norway	TOTAL
1988			0
1989			0
1990	9	580	589
1991		829	829
1992		424	424
1993		136	136
1994			0
1995			0
1996			0
1997		17	17
1998		55	55
1999			

ROUGHHEAD GRENADIER (*Macrourus berglax*) III and IV

Year	France	Norway	TOTAL
1988		0	0
1989		0	0
1990		0	0
1991		0	0
1992		7	7
1993		0	0
1994			0
1995			0
1996			0
1997	36		36
1998			
1999			

ROUGHHEAD GRENADIER (*Macrourus berglax*) Va

Year	Iceland	TOTAL
1988		0
1989		0
1990		0
1991		0
1992		0
1993		0
1994		0
1995		0
1996	15	15
1997	4	4
1998		
1999		

Table 3.12.6.1 continued

ROUGHHEAD GRENADIER (*Macrourus berglax*) XIV

Year	Greenland	Norway	TOTAL
1988		0	0
1989		0	0
1990		0	0
1991		0	0
1992		0	0
1993	18	34	52
1994	5		5
1995	2		2
1996			0
1997			0
1998		6	6
1999		14	14

Table 3.12.6.2 **Sharks various.** Study Group estimates of landings (tonnes).

Sharks various in I and II including Greenland shark

Year	Russia/USSR	France	Total
1988	37		37
1989	15		15
1990	0	1	1
1991	0		0
1992	0		0
1993	0		0
1994	0		0
1995	0		0
1996	0		0
1997	0		0
1998	0		0
1999	0		0

Sharks various in III and IV possibly including some deepwater species

Year	France*	Germany	UK (Eng)	UK (Scot)	Total
1988	1	0	4	0	5
1989	0	0	2	14	16
1990	9	0	1	10	20
1991	3	5	4	5	17
1992	132	0	2	5	139
1993	51	4	2	6	63
1994	86	2	3	8	99
1995	30	1	2	6	39
1996	43	2	3	8	56
1997	3	2	68	18	91
1998	44	6	1	13	64
1999	34				34

* exclusively *C. squamosus* and *C. coelelepis*

Sharks various in Va including Greenland shark and other deepwater species

Year	Iceland*	Germany	Total
1988	0		0
1989	31		31
1990	54		54
1991	58		58
1992	70		70
1993	39		39
1994	42		42
1995	45		45
1996	65		65
1997	70		70
1998		1	1
1999			0

* includes Greenland shark

Table 3.12.6.2 continued

Sharks various in Vb including deepwater species

Year	Faroese	France**	Germany	UK (Eng)	Total
1990		140			140
1991	3	75			81
1992	36	121		5	162
1993	376	90	2	9	477
1994		149	43		192
1995		262			262
1996		348	31	1	380
1997		261	27	20	308
1998	79*	354			433
1999		284	1		285

* *C. coelolepis* exclusively

** *C. coelolepis* and *C. squamosus* exclusively

Sharks various in VI and VII including deepwater species

Year	Faroese	France*	Germany	Spain	Norway	UK(E+W)	UK(Scot)	Total
1988				66	0	19	0	85
1989					0	32	8	40
1990		302			0	38	5	345
1991		1184			0	201	53	1438
1992	3	2802			0	503	133	3441
1993		3426	124		0	821	447	4818
1994		3609	395		0	742	727	5473
1995		3417	2		0	1315	782	5516
1996		3284	276		0	1345	555	5460
1997		2984	66	152	0	2721	301	6224
1998		2567	65	645	0	1812	501	5590
1999		1939	189	199	13	1403	n/a	3743

* French landings figures given here are for *C. squamosus* and *C. coelolepis* exclusively.

Sharks various in VIII and IX including deepwater species

Year	Portugal*	Spain	France***	UK (E&W)	UK (Scot)	Total
1988		3545				3545
1989		1789				1789
1990		N/a				0
1991		2850				2850
1992		3740	12	0	0	3752
1993			10		0	10
1994			9		4	13
1995			0	32	7	39
1996			0	25	0	25
1997		1059**	1	20		1080
1998		1811**	0			1811
1999		476**	0			476

*Detailed information on Portuguese landings in IXa given below

**Preliminary

****C. coelolepis* and *C. squamosus* exclusively

Table 3.12.6.2 continued

Shark landings by Portugal in IXa

Year	<i>G. melastomus</i>	<i>C. granulosus</i>	<i>C. squamosus</i>	<i>D. licha</i>	<i>C. coelolepis</i>	Total
1988	21	995	560	149	n/a	1725
1989	17	1027	507	57	n/a	1608
1990	17	1056	475	7	n/a	1555
1991	17	577	420	12	n/a	1026
1992	16	683	421	11	n/a	1131
1993	20	555	338	11	n/a	924
1994	37	169	577	11	n/a	794
1995	29	193	544	7	784	1557
1996	35	122	411	4	757	1329
1997	29	188	356	4	841	1418
1998	22	147	357	6	840	1372
1999	23	92	428	6	544	1093

Sharks various in X including some deepwater species

Year	Portugal	Spain	Total
1988	549		549
1989	560	1583	2143
1990	602		602
1991	896	2072	2968
1992	761	2719	3480
1993	592	n/a	592
1994	n/a	n/a	0
1995	925	n/a	925
1996	901	n/a	901
1997	829	n/a	829
1998	957	n/a	957
1999	n/a	n/a	

Landings of *C. squamosus* and *D. licha* in X by the Azores

Year	<i>C. squamosus</i>	<i>D. licha</i>	Total
1988		549	549
1989		560	560
1990		602	602
1991		896	896
1992		761	761
1993		591	591
1994		309	309
1995		321	321
1996		216	216
1997		30	30
1998	4	34	38
1999	8	31	39

Table 3.12.6.2 continued

Sharks various in XII including deepwater species

Year	Spain	France*	Total
1988			
1989			
1990			
1991		1	1
1992		2	2
1993		6	6
1994		8	8
1995		139	139
1996		147	147
1997		32	32
1998	1050**	56	1106
1999	1018**	45	1063

**C. coelolepis* and *C. squamosus* exclusively

**Preliminary

Landings of *C. squamosus* and *C. coelolepis* at Madeira

Year	<i>C. squamosus</i>	<i>C. coelolepis</i>	Total
1990	22		22
1991	10		10
1992	31		31
1993	14	16	30
1994	5	15	20
1995	27	1	29
1996	14	0	14
1997	17		17
1998	28		28
1999	20		20

Sharks various in XIVb possibly including some deepwater species

Year	Germany	Total
1997	9	9
1998	15	15
1999		

Table 3.12.6.3 Silver Scabbardfish. (*Lepidopus caudatus*) Study Group estimates of landings (tonnes).

SILVER SCABBARDFISH (*Lepidopus caudatus*) VI and VII

Year	Germany	TOTAL
1988		0
1989		0
1990		0
1991		0
1992		0
1993	2	2
1994		0
1995		0
1996		0
1997		
1998		
1999		

SILVER SCABBARDFISH (*Lepidopus caudatus*) VIII and IX

Year	Portugal	Russia/USSR	TOTAL
1988	2666		2666
1989	1385		1385
1990	547	37	584
1991	808		808
1992	1264	110	1374
1993	2397		2397
1994	1054		1054
1995	5672		5672
1996	1237		1237
1997	1725		1723
1998	966		966
1999	3058		3058

SILVER SCABBARDFISH (*Lepidopus caudatus*) X

Year	Latvia	Portugal	TOTAL
1988		70	70
1989		91	91
1990		120	120
1991		166	166
1992	1905	255	2160
1993	1458	264	1722
1994		373	373
1995	8	781	789
1996		815	815
1997		1115	1115
1998		1186	1186
1999		86	86

Table 3.12.6.3 continued

SILVER SCABBARDFISH (*Lepidopus caudatus*) XII

Country	Russia/USSR	TOTAL
1988		0
1989	102	102
1990	20	20
1991		0
1992		0
1993	19	19
1994		
1995		
1996		
1997		
1998		
1999		

Table 3.12.6.4 Smoothheads (*Alepocephalidae*). Study Group estimates of landings (tonnes)

SMOOTHHEAD (*Alepocephalus* spp.) Va

Year	Iceland	TOTAL
1988		0
1989		0
1990		0
1991		0
1992	10	10
1993	3	3
1994	1	1
1995	1	1
1996	0	0
1997	+	0
1998		0
1999		0

SMOOTHHEAD (*Alepocephalus* spp.) XII

Year	Spain	TOTAL
1988		0
1989		0
1990		0
1991		0
1992		0
1993		0
1994		0
1995		0
1996	230	230
1997	3692	3692
1999	4643	4643
1999	6549	6549

Table 3.12.6.5 Wreckfish (*Polyprion americanus*). Study Group estimates of landings (tonnes).**WRECKFISH (*Polyprion americanus*) VI and VII**

Year	France	Spain	TOTAL
1988	7		7
1989	0		0
1990	2		2
1991	10		10
1992	15		15
1993	0		0
1994			0
1995			0
1996	4	79	83
1997			
1998		12	
1999*		5	

WRECKFISH (*Polyprion americanus*) VIII and IX

Year	France	Portugal	Spain	UK (EW)	TOTAL
1988	1	188	9		198
1989	1	283	0		284
1990	2	161	0		163
1991	3	191	0		194
1992	1	268	0		269
1993	0	338	0		338
1994		406	3		409
1995		372	19	2	393
1996	3	214	69	8	294
1997		170	44		214
1998		164	63		227
1999*		137	7		144

WRECKFISH (*Polyprion americanus*) X

Year	France	Portugal	Norway	TOTAL
1988	0	191	0	191
1989	0	235	0	235
1990	0	224	0	224
1991	0	170	0	170
1992	3	234	0	237
1993	0	308	3	311
1994		428		428
1995		240		240
1996		240		240
1997		177		177
1998		139		139
1999*		133		133

* Preliminary

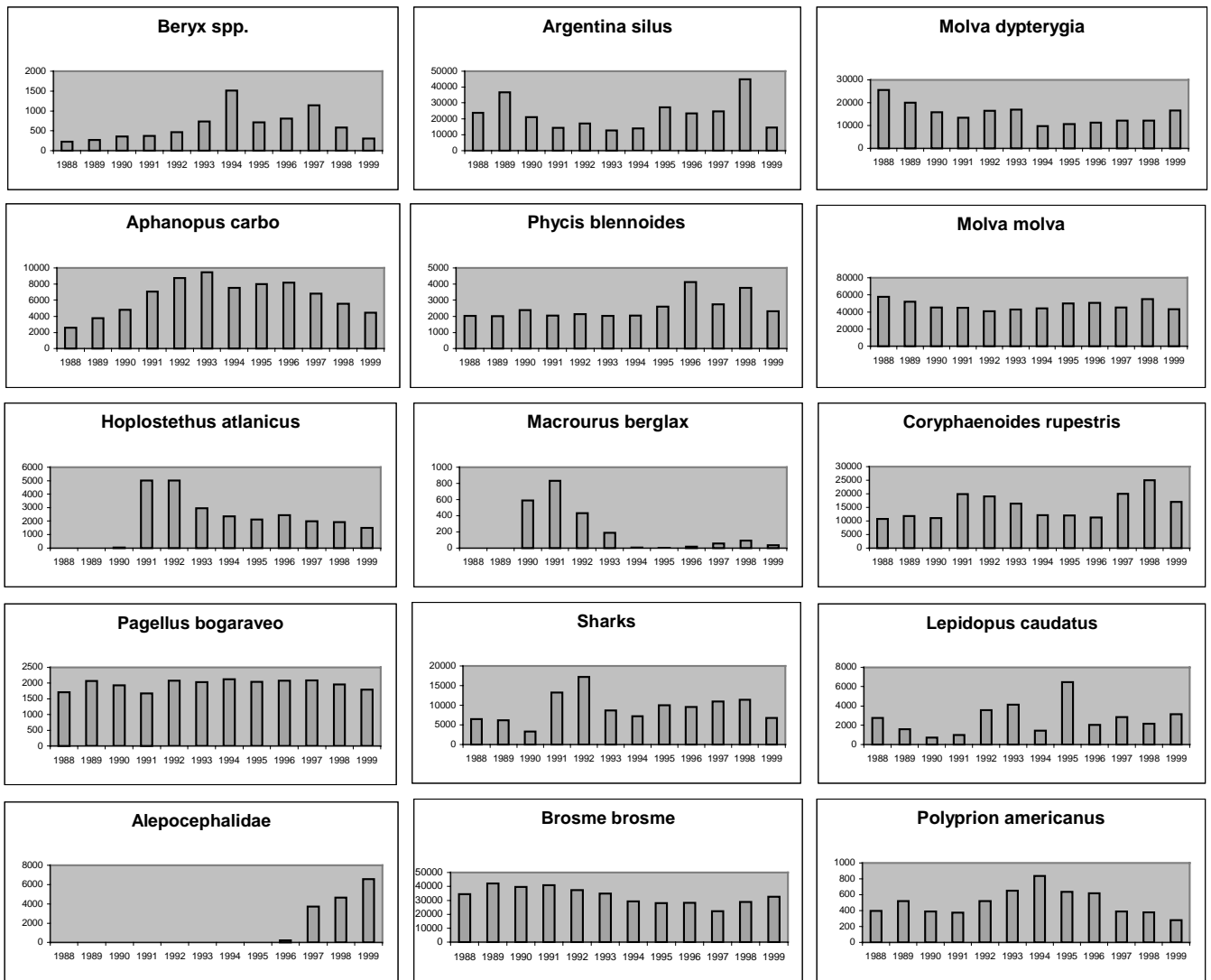


Figure 3.12.6.1 Estimated landings (tonnes) of deep-water species in all areas combined.

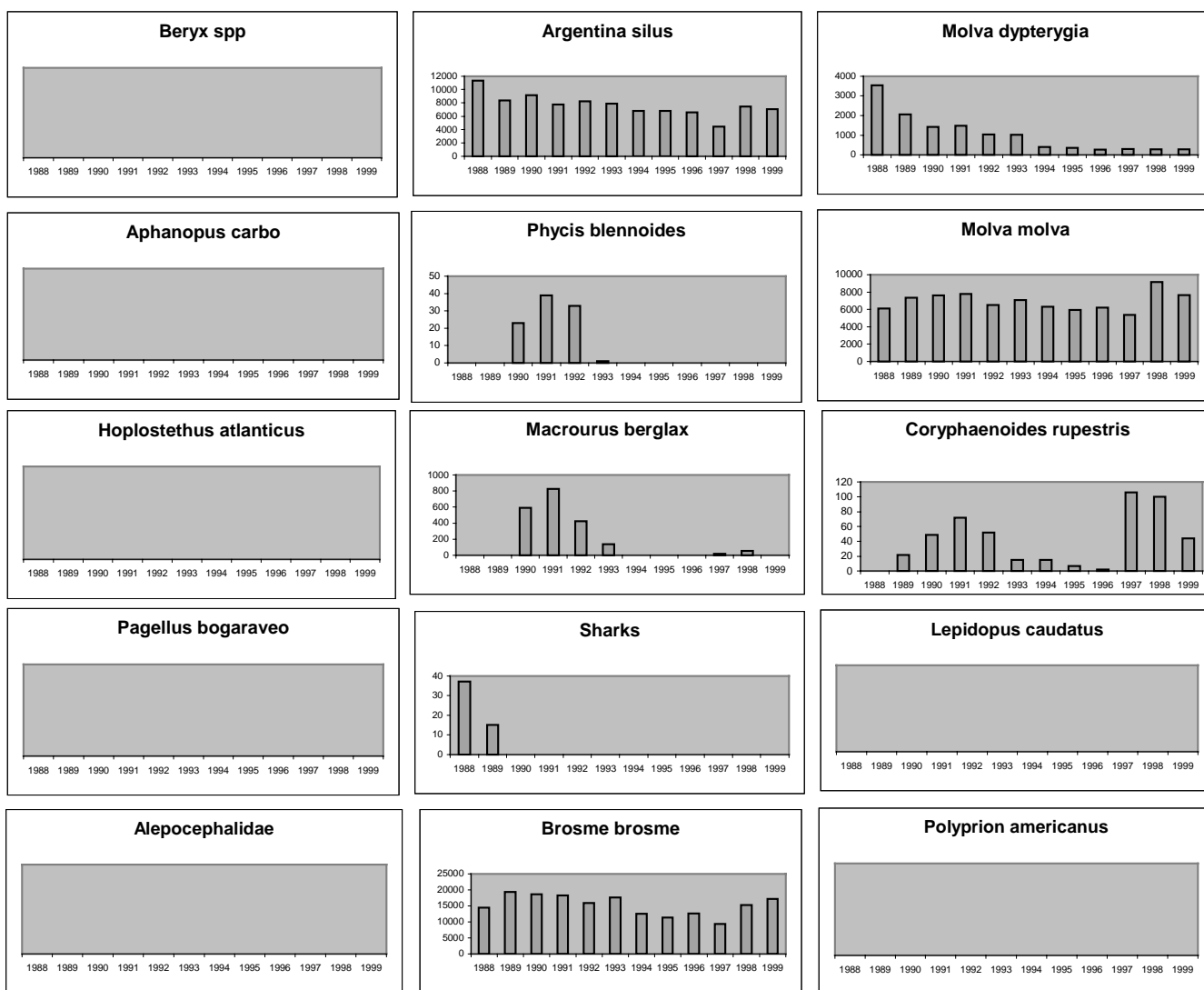


Figure 3.12.6.2 Estimated landings (tonnes) of deep-water species in I and II.

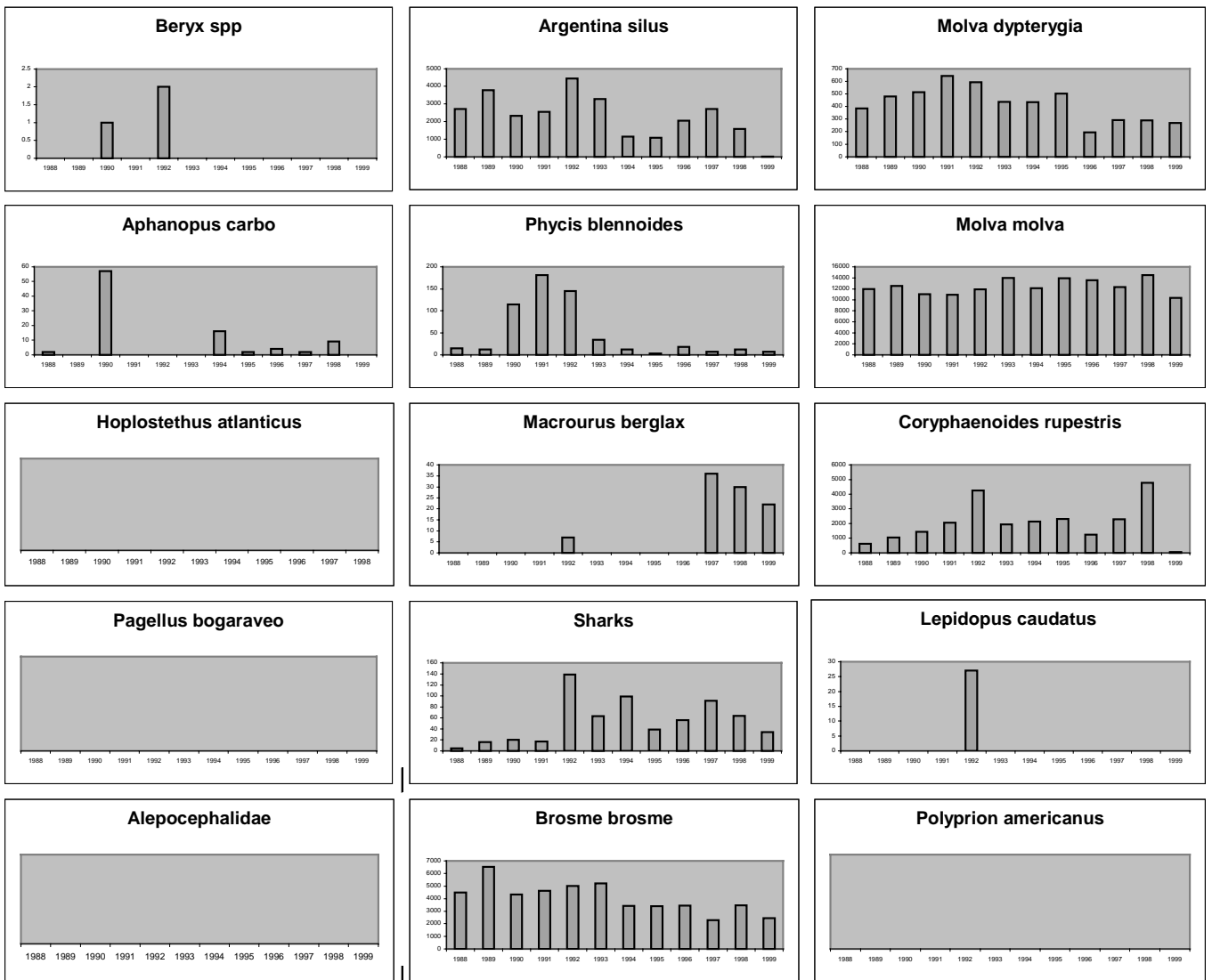


Figure 3.12.6.3 Estimated landings (tonnes) of deep-water species in III and IV.

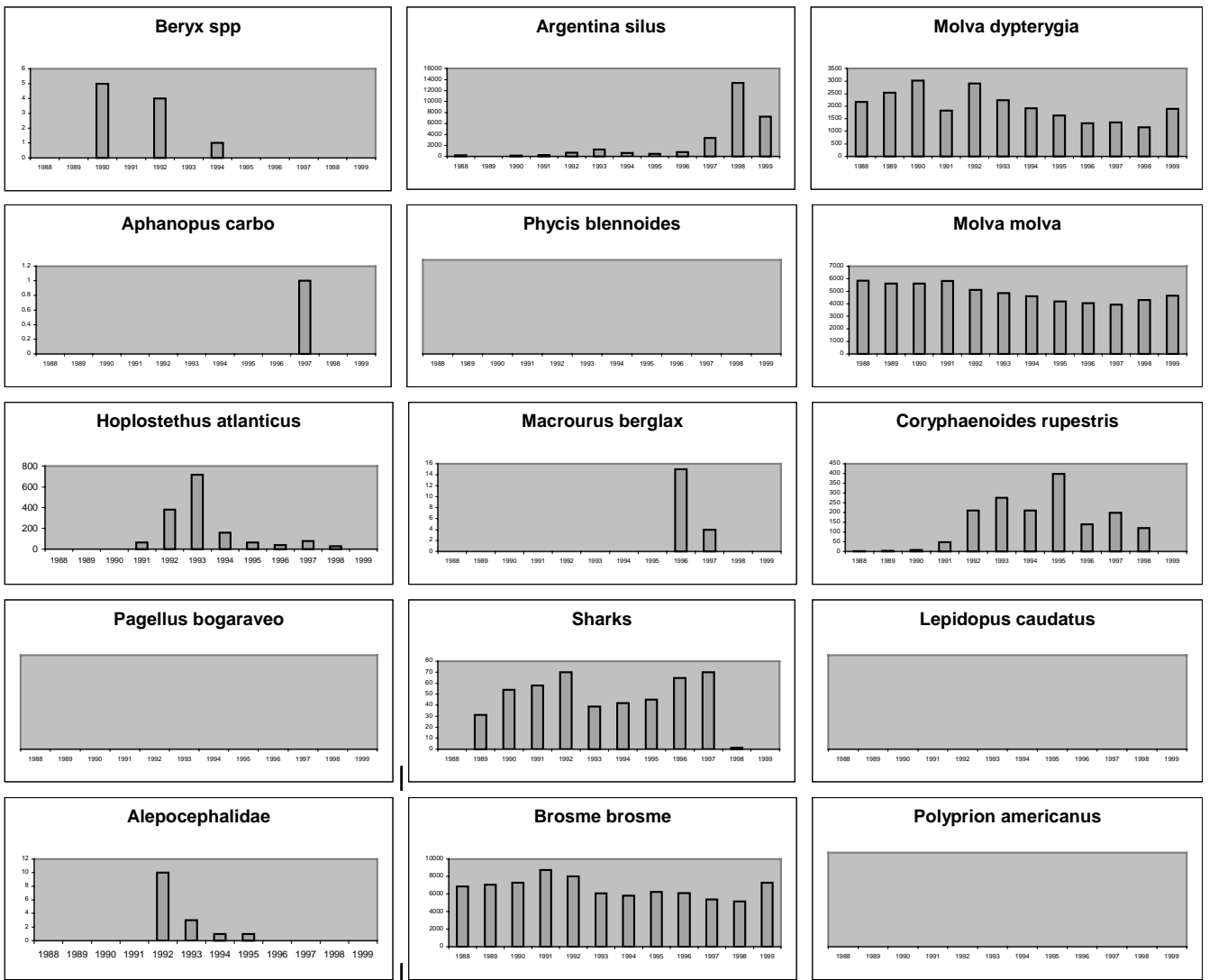


Figure 3.12.6.4 Estimated landings (tonnes) of deep-water species in Va.

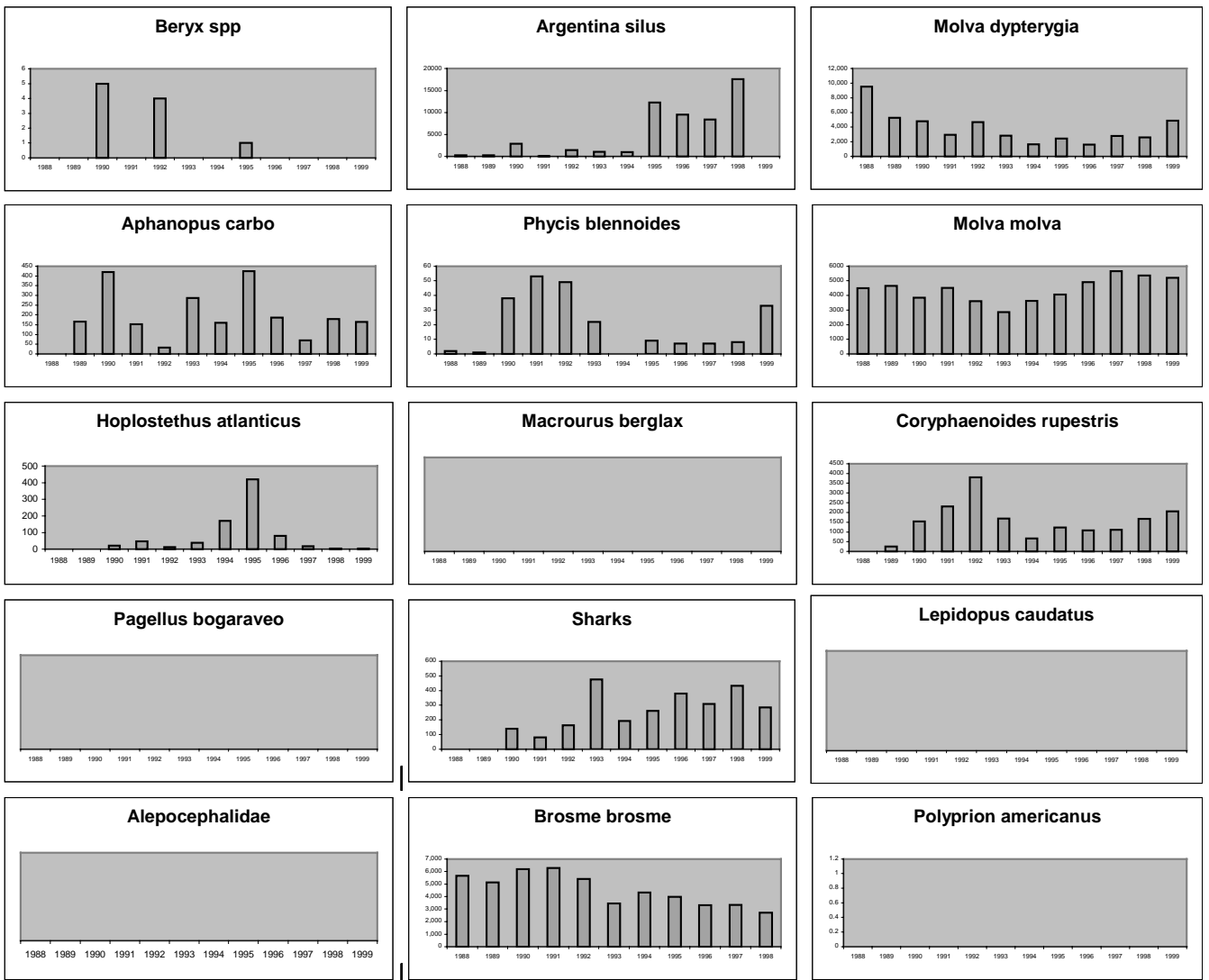


Figure 3.12.6.5 Estimated landings (tonnes) of deep-water species in Vb.

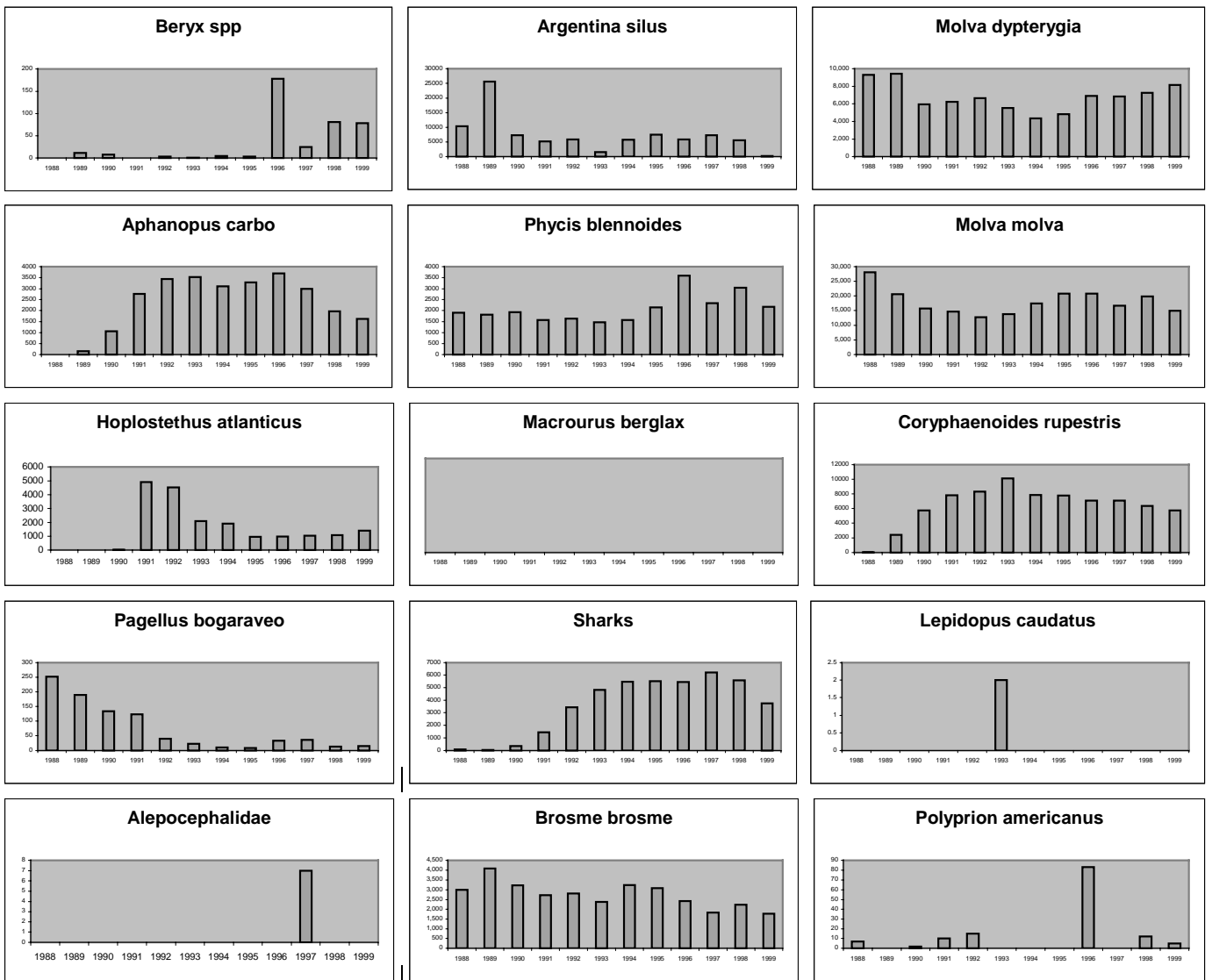


Figure 3.12.6.6 Estimated landings (tonnes) of deep-water species in VI and VII.

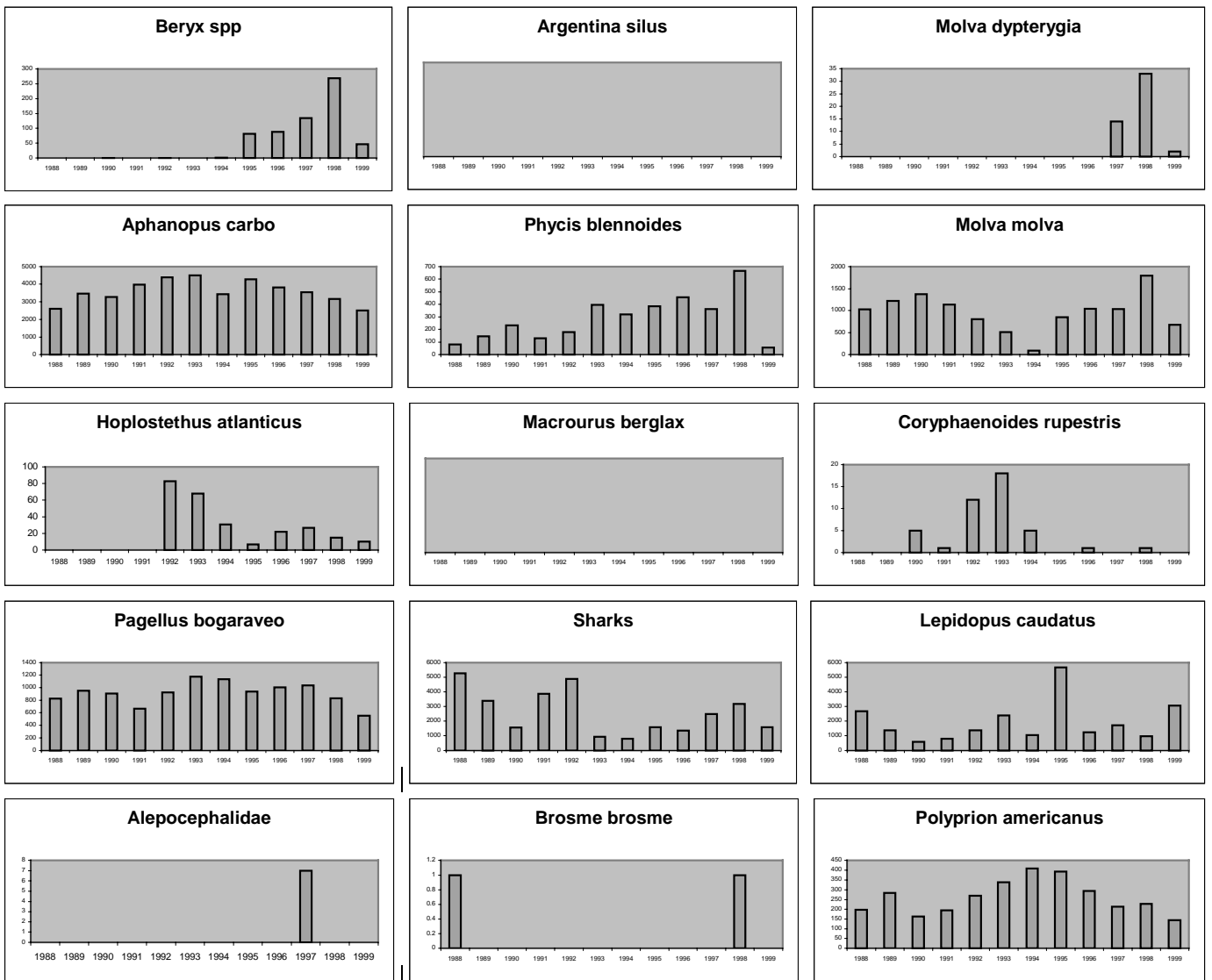


Figure 3.12.6.7 Estimated landings of deep-water species in VII and IX.

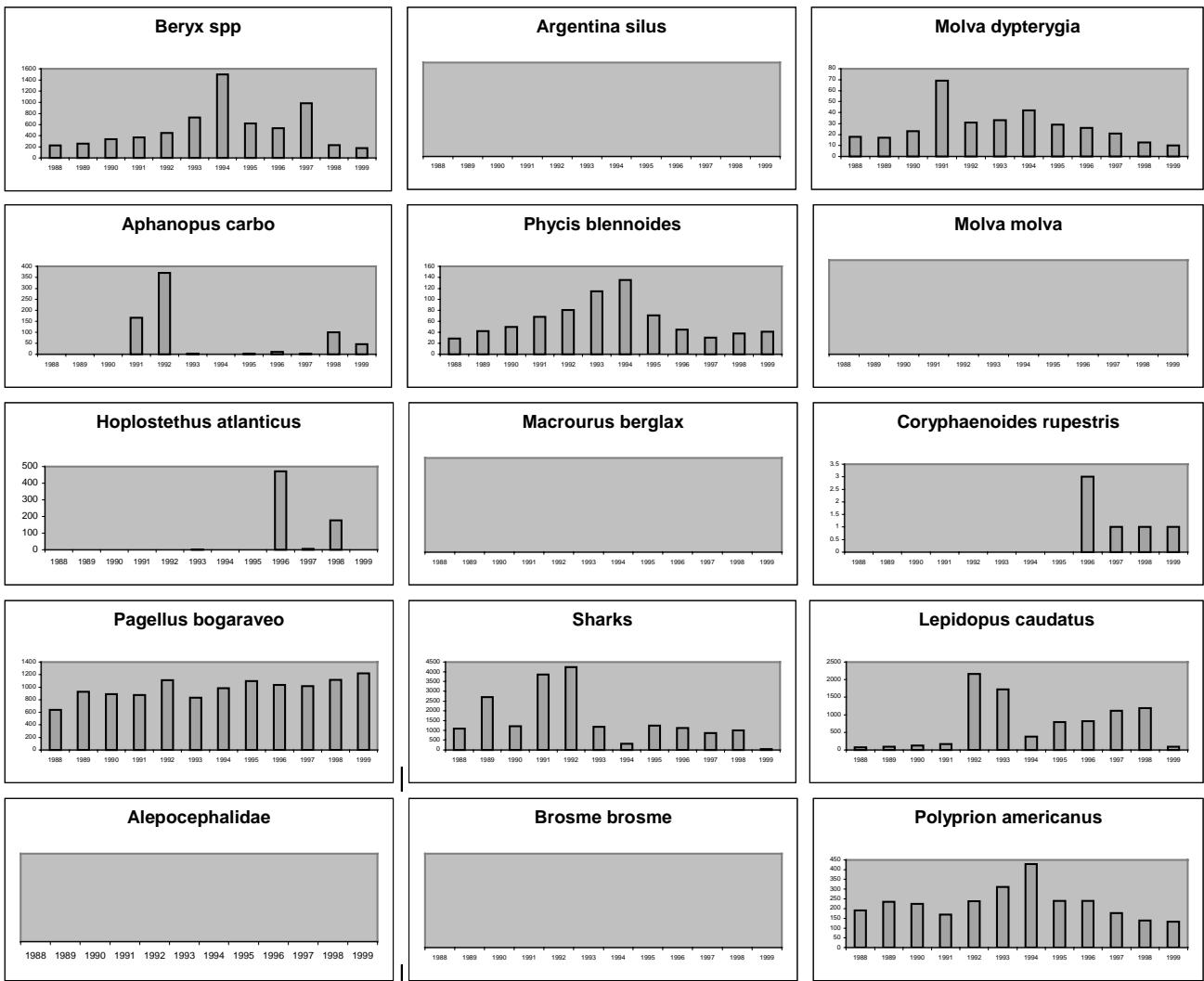


Figure 3.12.6.8 Estimated landings (tonnes) of deep-water species in X.

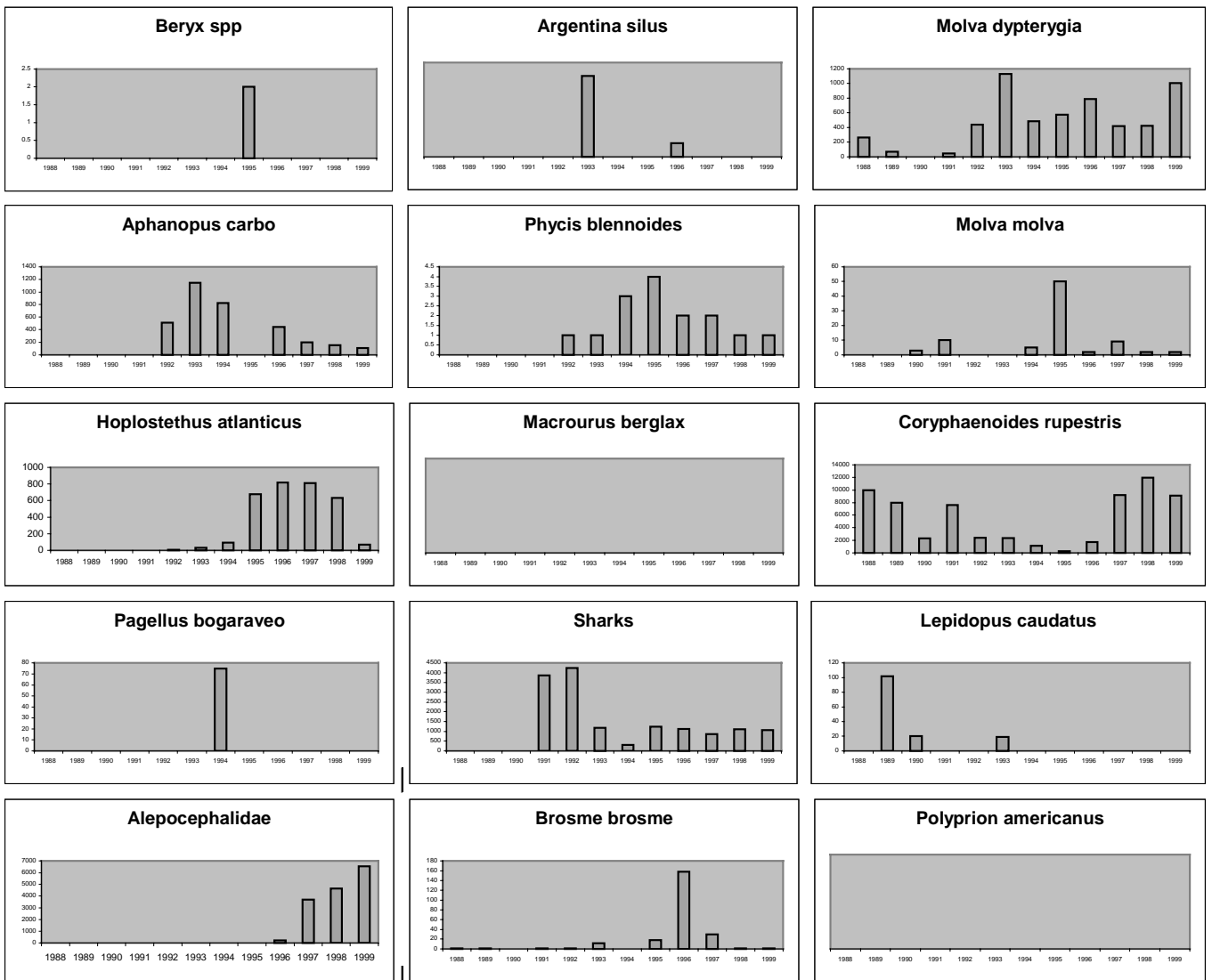


Figure 3.12.6.9 Estimated landings (tonnes) of deep-water species in XII.

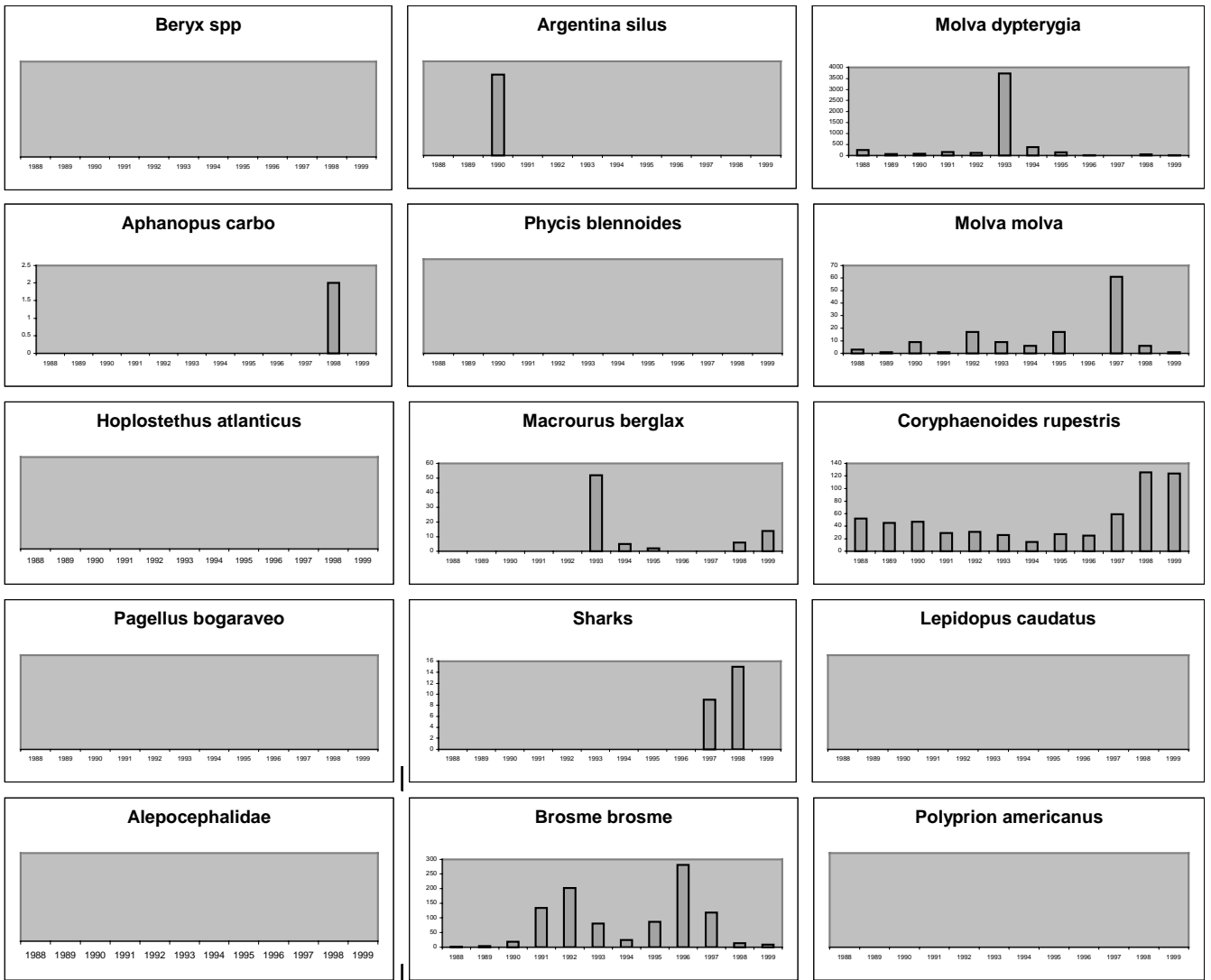


Figure 3.12.6.10 Estimated landings (tonnes) of deep-water species in XIV.