RECONSTRUCTION OF GREEK MARINE FISHERIES LANDINGS: NATIONAL VERSUS FAO STATISTICS[1]

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ABSTRACT

We reconstructed Greek fisheries catches from 1950-2003. The landings data recorded by the National Statistical Service of Greece have been compared with those reported by FAO for 1964-2003. For 1969-2003 we also reconstructed landings derived from rowing boats and coastal boats with engine power <19HP, which are not reported by either dataset. We disaggregated these landings by taxon, based on recent reports of the mean catch per unit of effort of all species caught by different small-scale gears. This allowed estimation of the total Greek marine fisheries landings and comparison with the corresponding FAO data. The reconstructed total landings indicated an average underestimation by 35% (range: 10-65%) of Greek landings based on the reported landings as presented by FAO on behalf of Greece. Except for the taxonomic differences (e.g., the case of *Sardinella aurita*) and the different taxonomic resolution (e.g., the case of *Spicara* spp.), which accounted for several discrepancies between the two datasets, the two datasets also differed for most taxa over the period 1964-1969 and for the years 1997 (FAO landings are overreported) and 1998 (FAO landings are underreported). With respect to catches by individual taxa through time, the two datasets generally agreed for the small pelagics and, to a lesser extent, for demersal taxa. The taxa which accounted for the larger and more consistent difference between the two datasets were the large pelagics (swordfish, bluefin tuna and other tuna-like fishes), which were commonly underreported by the national dataset by a factor of 2 for the years following 1990.

INTRODUCTION

Fisheries statistics offer, among other things, direct or indirect background information for evaluating several ecological aspects of fisheries (e.g., assessing 'fishing down the marine food web': Pauly *et al.*, 1998; primary production required to sustain fisheries: Pauly and Christensen, 1995; Tudela, 2000; mapping fisheries resources: Watson *et al.*, 2001). In addition, long time-series of fisheries landings are also useful for developing short- and long-term forecasting (e.g., Stergiou, 1989; 1991; Stergiou and Christou, 1996; Stergiou *et al.*, 1997a; Lloret *et al.*, 2000; 2001), for defining management zones using multivariate analyses (e.g., Murawski *et al.*, 1983; Stergiou *et al.*, 1997b; Tsikliras and Stergiou, 2007), for defining target species (Stergiou *et al.*, 2003), and for testing various ecological hypotheses (e.g., Watson and Pauly, 2001; Halley and Stergiou, 2005).

Since 1950, world fisheries landings are routinely reported by the Food and Agriculture Organization (FAO) of the United Nations, based on reports provided by member countries (Pauly and MacLean, 2003). FAO publishes the 'Yearbook of Fishery Statistics', which contains the annual landings of fish, crustaceans, molluscs and other aquatic animals/plants. Such data refer to the commercial, industrial and small-scale inland, coastal and oceanic fisheries (excluding recreational or sport fishing). FAO data often suffer from serious drawbacks and biases, thus in order to better reflect reality they must be complemented by specific evaluation studies at the national level. As mandated, FAO has to rely on statistics provided by member countries, even if it is doubtful that these correspond to reality (e.g., Watson and Pauly, 2001). Erroneous or incomplete statistics may systematically distort world fisheries landing trends, whether over-reported (Watson and Pauly, 2001) or underreported (Pauly and Maclean, 2003). The most important bias is that

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FAO statistics do not include: (i) Unreported, Unregulated and Illegal catches (IUU catches), which may reach up to 50% of the total landings (Pitcher *et al.*, 2002), and (ii) discarded by-catches (e.g., Alverson *et al.*, 1994; Pauly *et al.*, 2003; Zeller and Pauly, 2005).

The global fisheries crisis requires changes in management regimes, which should be based on reliable research and evaluation of the existing fisheries statistics (e.g., *Sea Around Us* Project, www.seaaroundus.org). The *Sea Around Us* Project aims to analyze the impacts of fisheries on marine ecosystems, and develop strategies for sustainability of fisheries. Among other goals, the project attempts to correct the FAO data for individual countries based on various sources of each country's statistics, as well as on the knowledge of local experts (e.g., Zeller *et al.*, 2006; 2007).

Within this framework, we compared the national fisheries statistics for Greek waters recorded by the National Statistical Service of Greece (NSSH) with those reported by FAO in order to identify/quantify discrepancies between the two data sources. A discrepancy in the total landings reported between these two sources has only been recently realised (Stergiou *et al.*, 2004). In the present study, we:

a) compared the FAO marine captured production reported for Greece with that reported by NSSH for the period 1964-2003 on a taxon by taxon basis;
b) re-evaluated the taxon groups reported by FAO and NSSH (1964-1981) by revising taxon names and splitting, when necessary, groups into taxa;
c) assembled the national statistics for the small-scale fishery (i.e., landings for rowing boats and boats with engines <19 HP), which are not included in the FAO marine statistics, and allocated these landings to taxa (or groups) using previously published information; and
d) developed a completely reconstructed time series of marine fisheries catches for Greece, from 1950-2003 (i.e., including the landings for rowing boats and boats with engines <19 HP).

Materials and Methods

Data sources

Greek fisheries statistics are collected by four independent organisations (Papaconstantinou, 2002): (a) the National Statistical Service of Greece (NSSH, since 1964, for 16 fishing subareas, Figure 1); (b) the Agricultural Bank (since 1974, from approximately 110 ports); (c) the National Company for the Development of Fisheries (since 1969, from all existing auction sites); and (d) the Ministry of Agriculture (not routinely involved in data collection). Each of these organizations collects and/or processes fisheries data for its own purposes, without co-ordination among organisations. Thus, collected information is overlapping, contradictory, and sometimes leads to confusion (e.g., two or more differing sets of figures for the same variable surveyed). Although NSSH statistical data may suffer from certain biases, which may be higher for inshore fisheries, they are considered the best figures available (Stergiou *et al.*, 1997b; Papaconstantinou, 2002) with respect to: (a) the length of available time-series, (b) spatial and temporal resolution of collected data (covering all Greek waters), (c) the consistency and degree of subjectivity in data collection, and (d) the statistical design. It should be pointed out that the degree of bias cannot be easily estimated. Yet, NSSH records show signs of biological, ecological, oceanographic and technical relevance, and reasonably agree with the results of trawl and echo-surveys conducted in the Greek Seas (Stergiou *et al.*, 1997b). Important in the present context is that the NSSH dataset forms the basis of the Greek data reported to FAO for the vast majority of species.

The landings of the Greek commercial fleets have been routinely recorded since 1964 by the NSSH and are published in yearly bulletins (NSSH, 1967-2005). Landings (and fishing effort) records are derived via questionnaires, which are distributed to a subset of fishing vessels (using a stratified random sampling design). Surveys are conducted by local Customs Authorities. The statistical questionnaire includes the quantity of each main taxon caught on a daily basis for actual periods of activity. Since 1969, the catches of the small-scale coastal boats with engine horsepower <19 HP (i.e., small inshore ring netters, drifters and liners), as well as rowing boats are monitored by a different NSSH branch (Agricultural Statistics of Greece). However, a rough estimate of the total catch of the small-scale coastal fleets is provided in the marine catches bulletin (NSSH, 1967-2005) This estimate for 1970-1994 averages approximately 25,000 $t \cdot year^{-1}$ (range: 20,000 - 30,000 $t \cdot year^{-1}$; Stergiou *et al.*, 1997b). However, this estimate changed for the period following 1995, averaging approximately 55,000 $t \cdot year^{-1}$ (range: 50,400 - 58,800 $t \cdot year^{-1}$), that is 14,000 boats powered with less than 19 HP catching 300-350 $kg \cdot boat^{-1} \cdot month^{-1}$ (NSSH, 1967-2005), possibly following the 1988 census of fishing boats operating in Greek waters (Papaconstantinou, 2002).

The NSSH dataset is divided in two time periods depending on the taxonomic resolution of the species recorded. For the period 1964-1981, separate NSSH statistics are available for 23 taxa (or groups of taxa), while for the years 1982 onwards catch statistics are available for 66 commercially important fish, cephalopod and crustacean taxa. Bivalve species were excluded from our analysis, as a large proportion of the reported values are derived from aquaculture. For a better evaluation of the data, Greek waters have been divided in 16 fishing subareas (Figure 1). Subareas 1 and 2 are outside Greek waters (Atlantic Ocean and North African Mediterranean coast, respectively).

For 1950-1963, Greek landings are available as a total (i.e., freshwater, coastal, Greek seas and overseas) but the percentage of the marine landings of Greek waters during that period was about 65% (Ananiades, 1968). Based on this percentage, we estimated the total Greek marine landings for 1950-1963, but no attempt was made to disaggregate to taxon level. For this period we consider the FAO landings and taxonomic resolution as the valid ones.

The Greek marine captured landings from 1950 to 2003, as reported by FAO, were accessed and downloaded from FAO FishStat (www.fao.org) for comparison.

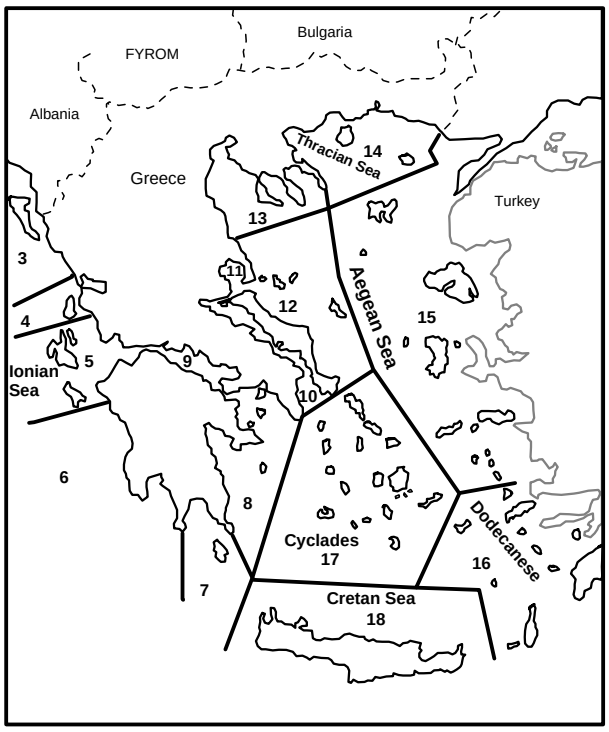

Figure 1. Map of the Greek seas showing the division to 16 fishing sub-areas. Subareas 1 and 2 are outside Greek waters (Atlantic Ocean and North African Mediterranean coast, respectively).

Taxonomic composition

We used the scientific names provided by FAO. The common names reported by the two datasets were kept as originally used. However, a recommended English common name, based on standardized common names as per FishBase (www.fishbase.org) will be suggested to the NSSH for future use.

Spatial and taxonomic disaggregation

Taxonomically highly aggregated landings statistics are problematic for various reasons, as they do not allow the best use of ancillary information, such as species distributions (Close *et al.*, 2006). A large proportion of Greek landings is reported as 'miscellaneous marine fishes' or 'marine fishes n.e.i.' (not elsewhere included), while further taxonomic aggregations exist at the genus and family level. The degree of taxonomic aggregation is not always the same between FAO and NSSH datasets. We tried to split the taxonomically aggregated landings to species level whenever possible. We did this for taxa that were reported by the NSSH as aggregated groups for the 1964-1981 period, but were reported as individual species for the 1982-2003 period, as follows: (a) we calculated the average contribution to the combined landings of each species during 1982-1990, for species that were reported aggregated during 1964-1981, and (b) we split the reported landings of the aggregated group during 1964-1981 using the average percentage per species derived from the 1982-1990 period. We used the average percentage for 1982-1990 as opposed to the 1982-2003 because the nature of Greek fisheries changed considerably after 1990 due to geographic expansion and modernization of the fleet (Anonymous, 2001).

Small-scale coastal fisheries landings

For 1969-2003, neither NSSH nor FAO include landings derived from rowing boats and coastal boats with engine power <19HP (henceforth called small-scale coastal boats). We collected these total landings data (no taxonomic composition data are available) for the period 1975-1999 from Agricultural Statistics of Greece (ASG, 1977-2000). We disaggregated these landings by taxon based on a recent technical report concerning the mean catch per unit of effort (CPUE) of all species caught by different small-scale gears (<10 m; longliners, netters, beach seiners, other gears) in Greek waters for 1996-2000 (Anonymous, 2001). The total small-scale coastal landings (ASG, 1977-2000) varied from a minimum of 16,701 t in 1979 to a maximum of 26,998 t in 1989. We fitted a linear trend to the 1975-1989 landings, and used this time trend to hindcast landings for the period 1970-1974. For the period 1964-1969 the NSSH total marine

landings included those of the small coastal boats (possibly excluding rowing boats). However, the small-scale coastal boat landings as derived here are 2.45 times less than the estimate provided by the NSSH for the period 1995-2003 and 1.1 times less for the period 1975-1994 (see Data Sources). Thus, we multiplied the small-scale coastal boat landings (from ASG) by 2.45 for 1995-2003 and by 1.1. for 1975-1994 before adding these landings to the NSSH recorded figures. This analysis should be considered preliminary and will be refined should more sources and data become available to us.

RESULTS AND DISCUSSION

Total landings

Total NSSH reported landings (i.e., fish, cephalopods and crustaceans) increased from 49,544 t in 1964 to 162,018 t in 1994, and subsequently declined to approximately 85,000 t in 2003 (Figure 2). This trend mirrors general global patterns (Watson and Pauly, 2001). Fish landings, which made up the main part of the total landings, increased exponentially from 47,000 t in 1964 to a peak of 150,000 t in 1994, followed by a sharp decline to 73,000 t in 2003 (Figure 3a). Crustacean landings (Figure 3b) varied around 1,100 t for the period 1964-1985 and increased to about 3,500 t during the remaining period. Cephalopod landings (Figure 3c) also varied around 2,000 t during 1964-1985, increased exponentially to a peak of about 8,000 t in 1995, and declined thereafter. While the distinct peak in 1994 (Figures 2, 3) may be attributable to an internal change in the NSSH data reporting system, it was not possible to verify this through other sources.

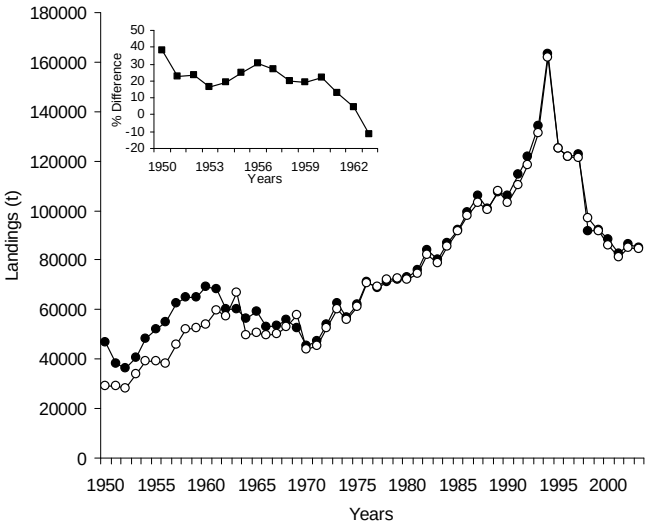

Figure 2. Total annual Greek landings of fishes, crustaceans and cephalopods as reported by the NSSH (open circles) and FAO (solid circles) for 1950-2003. The small insert shows the percentage by which FAO reported catches differ from the national ones during 1950-1963.

The total landings reported by FAO during 1964-2003 (solid circles, Figure 2) followed the same pattern and generally agreed with those of NSSH, implying a relatively good data transfer mechanism between the Greek national level and FAO. This is not true for the 1950-1962 period, when FAO reported higher catches than the national data agency (Figure 2). Thus, FAO reported catches were 5% to 38% higher than the national data, and the percentage difference declined over time (Figure 2 insert). Similarly, FAO landings for fish, crustaceans and cephalopods followed the same pattern and generally agreed with those of NSSH with the exception of cephalopods for 1964-1969 (Figure 3).

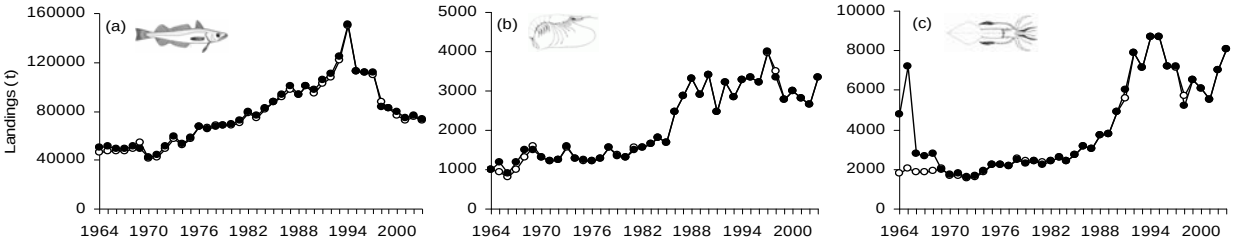

Figure 3. Annual Greek landings of (a) fishes, (b) crustaceans, and (c) cephalopods, as reported by the NSSH (open circles) and FAO (solid circles) for 1964-2003.

The small-scale coastal boat landings for 1975-1999 increased from 22,151 t in 1975 to a maximum of 26,998 t in 1989, thereafter declining to 22,356 t in 1999 (Figure 4). The trend for 1975-1989 was used for the hindcast estimation of landings for the period 1970-1974 (Figure 4). The original and reconstructed FAO and NSSH landings per taxon (1964-2003), as well as the suggested landings per taxon or groups of taxa, including the small-scale coastal boat component are available from the authors.

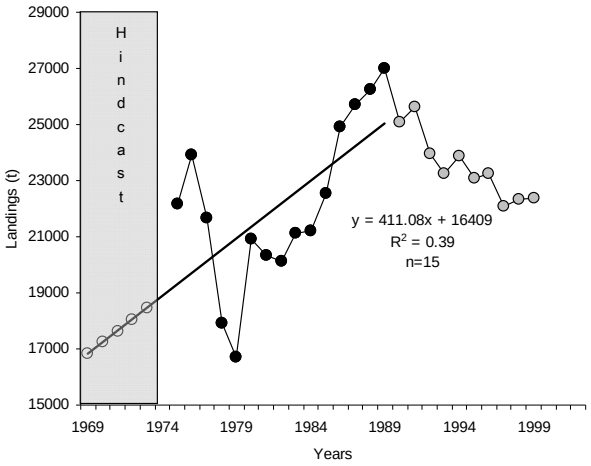

Figure 4. Annual Greek landings of small coastal boats. Data derived from the Agricultural Statistics of Greece yearly bulletins from 1975-1999.

Overall, the reconstructed total NSSH landings (i.e., including rowing boats and boats with engines <19 HP) increased from 49,544 t in 1964 to 188,296 t in 1994, and subsequently declined to approximately 138,000 t in 2003 (Figure 5). NSSH landings are, as expected, higher than the FAO reported data (owing to the inclusion of the small-scale coastal landings in the NSSH dataset). We consider the NSSH reconstructed landings as the best estimate of total landings for the period 1970-2003, and the FAO data as the more accurate for the period 1950-1969.

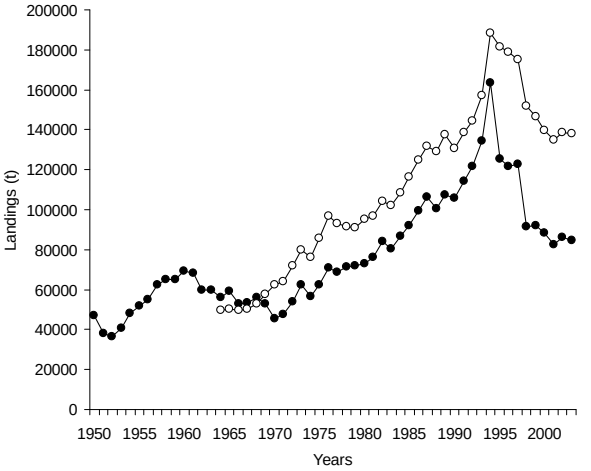

Figure 5. Reconstructed total annual Greek landings of fishes, crustaceans and cephalopods as reported by the NSSH including the small-scale coastal fisheries for 1964-2003 (open circles) and FAO reported landings (solid circles) for 1950-2003.

Taxonomic breakdown

For 1964-1981, NSSH reported groups of taxa that contained two or more species. Most of these individual species do not appear in FAO statistics, instead, FAO reported the entire catch for each group only under the first species of each group mentioned by NSSH. For example, the NSSH reported catches for *Boops boops* and *Sarpa salpa* as one group, while FAO reported the entire catch of this group as *B. boops* (Table 1). In contrast, in only one case does FAO provide landings for two species separately, which are reported as a combined group by NSSH: *Merluccius merluccius* and *Micromesistius poutassou*. We are unable to identify how FAO split the NSSH group catch into species specific data, since NSSH reported only one figure for both species' landings.

A detailed analysis and comparison for every taxon appearing in both datasets is presented in Appendix A1 (end of article), while an overview is given in Table 2. The final reconstructed landings per taxon (including our estimate per species for the small-scale coastal boats) for 1970-2003 are available from the authors.

Despite the common basis of the two datasets, some taxonomic differences were apparent. The greatest differences occurred for the large pelagic fish (swordfish and large scombroids), and larger differences were observed for demersal rather than small pelagic fish.

For the 1964-1969 period, the differences between the two datasets were most probably due to: (a) the fact that for that period the landings of the small-scale coastal boats were taken into account by the NSSH, (b) the different taxonomic aggregation (higher taxonomic resolution by FAO for that period), and (c) rounding effects. The differences between the two datasets were smoothed out since 1982, when the common taxonomic aggregation started, and for 1982-2003, there is a general agreement between the two datasets regarding each taxon landings. For that period, the problem is focused on the individual landings of 1997 and 1998, and large pelagic fish from 1990 onwards. Some individual cases are particularly interesting and mainly concern taxonomic (in terms of resolution and nomenclature) and aggregation discrepancies.

Table 1. Taxonomic grouping and corresponding taxa reported by FAO and NSSH for 1964-1981 and 1982-2003.

FAO	NSSH
1964-1981	
Boops boops	*Boops boops, Sarpa salpa*
Solea solea	*Solea solea, Psetta maxima*
Pagellus erythrinus	*Pagellus erythrinus, Dentex macrophthalmus*
Sarda sarda	*Sarda sarda, Katsuwonus pelamis*
Trachurus mediterraneus	*Trachurus mediterraneus, T. trachurus*
Scorpaenidae	Scorpaenidae, Triglidae, 'gurnards'
Dentex dentex	*Dentex dentex, Pagrus pagrus*
Serranidae	*Epinephelus marginatus, E. alexandrinus, Polyprion americanus*
Mullus spp.	*Mullus barbatus, M. surmuletus*
Merluccius merluccius	*Merluccius merluccius, Micromesistius poutassou*
Micromesistius poutassou	*Merluccius merluccius, Micromesistius poutassou*
1982-2003	
Spicara spp.	*Spicara flexuosa*
	Spicara maena
	Spicara smaris
Mullus spp.	*Mullus barbatus*
	Mullus surmuletus

The round sardinella (*Sardinella aurita*) is one of the most problematic cases in terms of taxonomy and nomenclature. The NSSH landings of *S. aurita* exactly match those of FAO for shads (*Alosa* spp.), the abundance of which is very low in Greek waters (Figure 6). The close taxonomic relationship of the two species suggests that the two datasets refer to the same species and we consider the species' name and the landings of NSSH to be the correct ones. The problem probably arises from the Greek common names of the two species that are often confused. The result is that the Greek fleet appears to have fished almost 2,000 t of shads (*Alosa* spp.) in 2000 instead of round sardinella which is the third most targeted clupeoid species in the Greek Seas, and is mainly caught by purse seiners (Tsikliras, 2004). The twaite shad (*Alosa fallax*) is the only commercially exploited shad species in the Greek Seas, but very low quantities are landed (Anonymous, 2001). Its exploitation is seasonal, confined to spring/early summer, and is performed by the small scale coastal fleet whose landings are not taxonomically disaggregated. Thus, this record clearly refers to *S. aurita*.

Similarly, there is a peculiarity regarding FAO landings of common grey-mullet (*Mugil cephalus*), which include the catches of all seven mugilid species (*M. cephalus*, *M. soiuy, Chelon labrosus*, *Liza aurata*, *L. ramada*, *L. saliens* and *Odeachilus labeo*) inhabiting the Greek Seas. It is difficult for the fishers to distinguish these species - and pointless, as all of them have the same market value. The contribution of each of the seven species to the total landings is impossible to estimate. Thus, fishers usually report all of these species as grey mullets. Hence, FAO's *M. cephalus* refers to all mugilid species, i.e., the NSSH Mugilidae ('common grey mullet') landings.

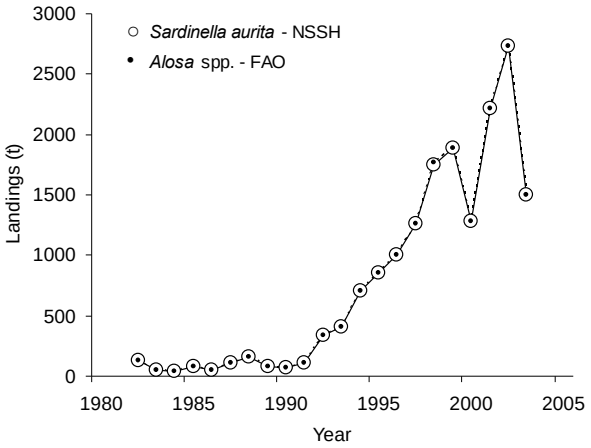

Figure 6. Annual Greek landings of round sardinella (*Sardinella aurita*) as reported by NSSH (open circles), and shads (*Alosa* spp.) as reported by FAO (solid circles) from 1982-2003.

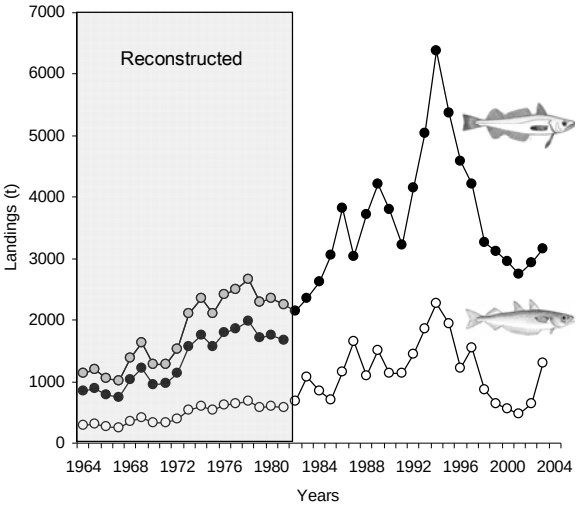

Figure 7. Annual Greek landings of European hake (*Merluccius merluccius*, solid circles) and whiting (*Micromesistius poutassou*, open circles) as recorded by NSSH during 1982-2003, and their backward reconstructed values for 1964-1981 (shaded area) based on their reported combined landings for the same period (grey circles).

A case of different taxonomic resolution between datasets is that of the three species of the genus *Spicara* (*S. smaris*, *S. maena* and *S. flexuosa*). FAO records *Spicara* spp., while NSSH records separate landings for each species. For 1982-2003, the sum of the NSSH landings of the three species exactly matches the FAO landings for *Spicara* spp., and we consider the taxonomic resolution of NSSH the correct ones.

The European hake (*Merluccius merluccius*) is recorded by NSSH since 1982 and by FAO since 1964. For 1964-1981, NSSH landings were aggregated and recorded together with those of blue whiting (*Micromesistius poutassou*) and possibly with those of whiting (*Merlangius merlangus*), which appears separately since 1982 but it does not appear as part of any group in 1964-1981. This NSSH grouping might also include small quantities of the poor cod (*Trisopterus minutus capelanus*). For 1982-2003, landings completely match between the two datasets except for 1997 and 1998. We split the NSSH *M. merluccius* landings for 1964-1981 to landings for each species (*M. merluccius* and *M. poutassou*) based on the average participation of these two species in the total *M. merluccius* and *M. poutassou* NSSH landings during 1982-1990 (Figure 7). We consider these NSSH backwards estimated values as the valid ones.

The large pelagic fishes (Scombridae and Xiphiidae) were the main source of discrepancy between the two datasets. The Atlantic bonito (*Sarda sarda*) is recorded separately by NSSH since 1982, whereas FAO reports it separately since 1964. For 1964-1981 it is recorded by NSSH together with the skipjack tuna (*Katsuwonus pelamis*). For the period 1982-2003, the landings of *S. sarda* agree between the two datasets from 1982 to 1989 and from 1994 to 1997 (Figure 8). For the remaining years, FAO landings are higher. For the period 1964-1981, we split the NSSH *K. pelamis* and *S. sarda* combined landings into landings for each species based on the average contribution of each species to the total combined NSSH landings during 1982-1990. We consider these NSSH backwards estimated values as the valid ones.

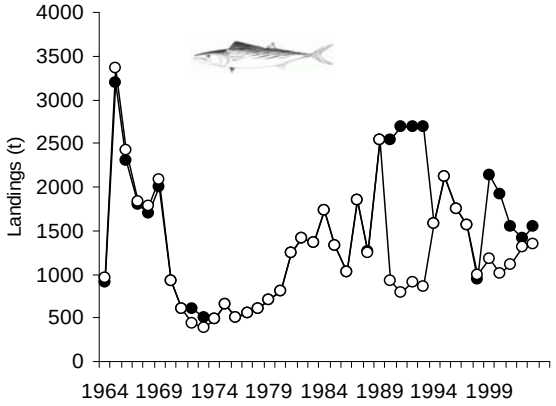

Figure 8. Annual Greek landings of the Atlantic bonito (*Sarda sarda*) as reported by FAO (solid circles) and NSSH (open circles) for 1964-2003.

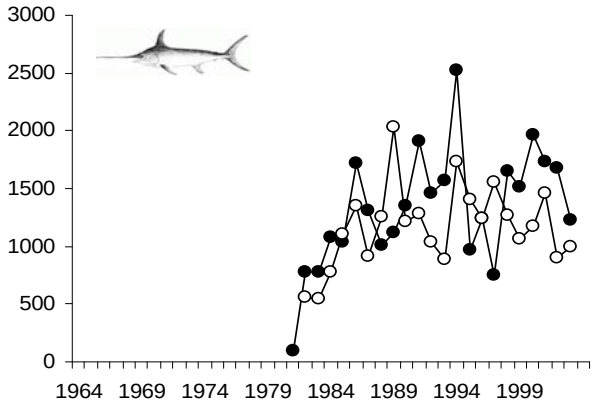

Figure 9. Annual Greek landings of swordfish (*Xiphias gladius*) as reported by FAO (solid circles) for 1981-2003 and by NSSH (open circles) for 1982-2003.

Table 2. FAO scientific and common names, NSSH greek and english common names, dates from which taxa start to be reported by each source, and our suggested scientific name of taxa based on the analysis presented in this report.

	Scientific name	Common english name as reported by		Greek name	Reported since		Suggested	Reconstructed
		FAO	NSSH		FAO	NSSH		
1	*Alosa* spp.	Shads nei			1982		*Sardinella aurita*	1982-2003
2	*Anguilla anguilla*	European eel	Eel	Χέλια	1982	1982	*Anguilla anguilla*	
3	*Auxis rochei, A. thazzard*	Frigate Bullet tunas			1981		*Auxis rochei, A. thazzard*	
4	*Belone belone*	Garfish	Garfish	Ζαργάνες	1964-1969, 1982	1982	*Belone belone*	
5	*Boops boops*	Bogue	Bogue	Γόπες	1964	1982*	*Boops boops*	1964-1981
6	-	-	Gurnard	Βραστόψαρα		1982	Marine fishes nei	1964-1981
7	*Conger conger*	European conger			1994		Marine fishes nei	
8	*Dentex dentex*	Common dentex	Dog's teeth	Συναγρίδες	1964	1982*	*Dentex dentex*	1964-1981
9	*Dentex macrophthalmus*	Large-eye dentex	Large eyed dog's teeth	Μπαλάδες	1982	1982*	*Dentex macrophthalmus*	1964-1981
10	*Dicentrarchus labrax*	European seabass	Bass	Λαβράκια	1964-1969, 1982	1982	*Dicentrarchus labrax*	
11	*Diplodus annularis*		Couch's seabream	Σπάροι		1982	*Diplodus annularis*	1982-2003
12	*Diplodus sargus sargus*	White seabream	White bream	Σαργοί	1982	1982	*Diplodus sargus sargus*	
13	*Engraulis encrasicolus*	European anchovy	Anchovy	Γαύροι	1964	1964	*Engraulis encrasicolus*	
14	*Epinephelus marginatus*	Dusky grouper	Grouper	Ροφοί	1985	1982*	*Epinephelus marginatus*	1964-1981
15	*Epinephelus* spp.	Groupers nei			1964			
16	*Epinephelus alexandrinus*		Dusky sea perch	Σφυρίδες		1982*	*Epinephelus alexandrinus*	1964-1981
17	*Euthynnus alletteratus*	Little tunny (=Atl black Skipj)			2002			
18	*Helicolenus dactylopterus*		Snapper	Κοκκινόψαρα		1982		
19	*Katsowonus pelamis*	Skipjack tuna	Skipjack	Ρίκια	2003	1982*	*Katsowonus pelamis*	1964-1981
20	*Lophius piscatorius*	Angler (=monk)			1982		*Lophius* spp.	
21	*Lophius* spp.		Anglerfish	Πεσκανδρίτσες		1982	*Lophius* spp.	
22	*Merlangius merlangus*	Whiting	Daouki	Νταούκια	2002	1982	*Merlangius merlangus*	
23	*Merluccius merluccius*	European hake	Hake	Βακαλάοι	1964	1982*	*Merluccius merluccius*	1964-1981
24	*Micromesistius poutassou*	Blue whiting (=Poutassou)	Couch's whiting	Προσφυγάκια	1964	1982*	*Micromesistius poutassou*	1964-1981
25	*Mugil cephalus*	Flathead greymullet			1964		Mugilidae	
26	Mugilidae		Common grey mullet	Κέφαλοι		1964	Mugilidae	
27	*Mullus barbatus*		Goatfish	Κουτσομούρες		1982*	*Mullus barbatus*	1964-1981
28	*Mullus surmuletus*	Surmulet	Red mullet	Μπαρμπούνια	1982	1982*	*Mullus surmuletus*	1964-1981
29	*Mullus* spp.	Surmulets (=Red mullets) nei			1964	1964-1981	*Mullus barbatus*	
30	*Mustelus* spp.	Smooth hounds nei	Blackmouthed godfish	Γαλέοι	1982	1982	*Mustelus* spp.	
31	*Oblada melanura*	Saddled seabream	Blackbream	Μελανούρια	1982	1982	*Oblada melanura*	
32	Osteichthyes	Marine fishes nei	Others	Διάφορα ψάρια	1964	1964	Osteichthyes	
33	*Pagellus erythrinus*		Redbream	Λιθρίνια		1982*	*Pagellus erythrinus*	1964-1981
34	*Pagellus* spp.	Pandoras nei			1964		*Pagellus erythrinus*	
35	*Pagrus pagrus*	Red porgy	Common sea bream	Φαγγριά	1982	1982*	*Pagrus pagrus*	1964-1981
36	*Pagrus* spp.	Pargo breams nei			1964		*Diplodus annularis*	
37	*Polyprion americanus*		Stone bass	Βλάχοι		1982*	*Polyprion americanus*	1964-1981
38	*Pomatomus saltatrix*	Bluefish	Bluefish	Γοφάρια	1966-1969, 1982	1982	*Pomatomus saltatrix*	
39	*Psetta maxima*	Turbot	Brill	Καλκάνια	1982	1982*	*Psetta maxima*	1964-1981
40	*Raja clavata*	Thornback ray	Thornback ray	Βάτοι	2003	1982	*Raja clavata*	
41	*Raja* spp.	Raja rays nei	Rassa	Ράσσες	1964-1969, 1982	1982	*Raja* spp.	
42	Rhinobatidae	Guitarfishes etc nei	Guitarfish	Ρινόβατοι	1982	1982	Rhinobatidae	
43	*Sarda sarda*	Atlantic bonito	Bonito	Παλαμίδες	1964	1982*	*Sarda sarda*	1964-1981
44	*Sardina pilchardus*	European pilchard (=Sardine)	Pilchard	Σαρδέλες	1964	1964	*Sardina pilchardus*	
45	*Sardinella aurita*		Gilt sardine	Φρίσσες		1982	*Sardinella aurita*	
46	*Sarpa salpa*	Salema	Goldline	Σάλπες	1982	1982*	*Sarpa salpa*	1964-1981
47	*Scomber japonicus*	Chub mackerel	Chub mackerel	Κολιοί	1964	1964	*Scomber japonicus*	
48	*Scomber scombrus*	Atlantic mackerel	Mackerel	Σκουμπριά	1964-1969, 1982	1982	*Scomber scombrus*	
49	Scombroidei	Tuna-like fishes nei			1982			
50	Scorpaenidae	Scorpionfishes nei	Scorpion fish	Σκορπιοί	1964	1964	Scorpaenidae	1964-1981
51	*Seriola dumerili*	Greater amberjack	Yellowtail	Μαγιάτικα	1982	1982	*Seriola dumerili*	
52	*Serranus* spp.		Comber	Χάνοι		1982	*Serranus* spp.	
53	Serranidae	Groupers, seabasses nei			1964	1964-1981		
54	*Solea solea*	Common sole	Sole	Γλώσσες	1964	1982*	*Solea solea*	
55	*Sparus aurata*	Gilthead seabream	Red sea bream	Τσιπούρες	1964-1969, 1982	1982	*Sparus aurata*	
56	*Spicara flexuosa*		Blotched pickerel	Τσέρουλες		1982*	*Spicara flexuosa*	1964-1981
57	*Spicara maena*		Blotched pickerel	Μένουλες		1982*	*Spicara maena*	1964-1981
58	*Spicara smaris*		Pickerel	Μαρίδες		1982*	*Spicara smaris*	1964-1981
59	*Spicara* spp.	Picarels nei			1964	1964-1981		
60	*Spondyliosoma cantharus*	Black seabream	Black seabream	Σκαθάρια	1964	1964	*Spondyliosoma cantharus*	
61	*Sprattus sprattus*	European sprat	Sprat	Παπαλίνες	1982	1982	*Sprattus sprattus*	
62	Squalidae	Dogfish sharks nei	Dogfish	Σκυλόψαρα	1964-1969, 1982	1982	Squalidae	
63	*Thunnus alalunga*	Albacore			1986			
64	*Thunnus thynnus*	Atlantic bluefin tuna			1964-1969, 1985			
65	*Trachurus mediterraneus*	Mediterranean horse mackerel	Horse mackerel	Σαυρίδια	1964	1982	*Trachurus mediterraneus*	1964-1981
66	*Trachurus trachurus*	Atlantic horse mackerel	Jack mackerel	Σαμπανοί	1982	1982	*Trachurus trachurus*	1964-1981
67	*Trachurus* spp.					1964-1981		
68	Triglidae	Gurnards, searobins nei	Tubfish	Καπόνια	1982	1982*	Triglidae	1964-1981
69	*Umbrina cirrosa*	Shi drum	Croaker	Μυλοκόπια	1964-1969, 1982	1982	*Umbrina cirrosa*	
70	*Xiphias gladius*	Swordfish	Swordfish	Ξιφίες	1981	1982	*Xiphias gladius*	
71	*Zeus faber*	John dory	John dory	Χριστόψαρα	1982	1982	*Zeus faber*	
72	-	-	Tune fish	Τόννοι		1982		
	Cephalopods							
73	Loliginidae, Ommastrepidae	Various squids nei	Flying squid	Θράψαλα	1970	1964	Loliginidae, Ommastrepidae	
74	*Loligo* spp.	Common squids nei	Common squid	Καλαμάρια	1972	1964	*Loligo* spp.	
75	Octopodidae	Octopuses etc nei	Poulp	Μοσκιοί	1970	1982	Octopodidae	
76	*Sepia officinalis*	Common cuttlefish	Cuttle fish	Σουπιές	1964	1964	*Sepia officinalis*	
77	*Octopus vulgaris*	Common octopus	Octapus	Χταπόδια	1982	1964	*Octopus vulgaris*	
	Crustacueans							
78	*Hommarus gammarus*	European lobster	Lobster	Αστακοί	1982	1982		
79	*Penaeus kerathurus*	Caramote prawn	Common prawn	Γαρίδες (γάμπαρη)	1982	1964	*Penaeus kerathurus*	
80	Natantia	Natantian decapods nei	Shrimp(common)	Γαρίδες (λοιπές)	1964	1982		
81	*Carcinus aestuarii*	Mediterranean shore crab	Crab	Καβούρια	1982	1982		
82	*Nephrops norvegicus*	Norway lobster	Crayfish	Καραβίδες	1964	1982	*Nephrops norvegicus*	
83	-	-	other crustacean	Διάφορα καρκινοειδή		1964-1981		

* See also Table 1

The northern bluefin tuna (*Thunnus thynnus*) is recorded by FAO for 1964-1969 and then again since 1985. It has never been separately recorded by NSSH. As for most scombroids (except *S. sarda* and *K. pelamis*) we consider the FAO landings as the likely correct ones, as they are derived from a different and supposedly reliable source, i.e., the International Commission for the Conservation of Atlantic Tuna (ICCAT). Similarly, the swordfish (*Xiphias gladius*) is recorded by FAO since 1981 and by NSSH since 1982. In general, FAO *X. gladius* landings are higher (differences reach up to 787 t in 2000) indicating the difference in data sources. No difference was observed only in 1996 (Figure 9). As with the other large pelagic taxa, such as the tunas and tuna-like fishes, FAO's source of data for the landings of *X. gladius* is not the NSSH, but ICCAT.

Despite the common basis of the two datasets, the biggest differences seem to relate to the large pelagic fish (Figure 10). Indeed, the landings of the five large scombroid taxa (i.e., tunas, albacore, bonito, swordfish) are the main source of difference for the 1982-2003 period (Figures 8, 9, 10). This discrepancy first appeared in 1990. As mentioned above, the discrepancy arises from the fact that, at least for *Thunnus thynnus*, *T. alalunga* and *Xiphias gladius*, FAO landings are derived via ICCAT. It seems that the national authorities may mask the landings of these species by including part of the landings in 'others' (i.e., marine fishes n.e.i.) and by reporting about half of the likely true landings. Indeed, total FAO landings for large pelagic fish were 1.5-2 times higher than those reported by the NSSH for 1990-2000, except for 1998 (Figure 10). Thus, we consider the FAO reported landings for *T. thynnus*, *T. alalunga Euthynnus alletteratus* and *X. gladius* as the likely more correct data (see Appendix 1), while the NSSH landings are valid only for *Sarda sarda* and *Katsuwonus pelamis*.

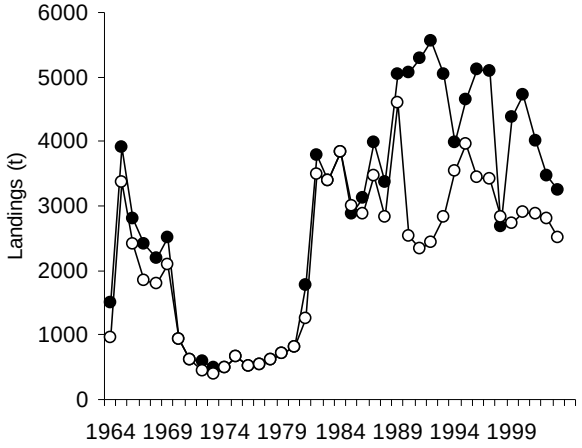

Figure 10. Annual Greek landings of all tuna and tuna like fishes (*Thunnus thynnus*, *T. alalunga* and *Euthynnus alletteratus*) combined (but excluding *Katsuwonus pelamis* and *Sarda sarda*) as reported by FAO (solid circles) and NSSH (open circles) from 1964-2003.

The years 1997 and 1998 were the most problematic in terms of comparing individual taxa as almost none agreed between the two datasets. In 1997, the majority of the FAO landings were slightly greater than the equivalent NSSH data, while in 1998, almost all individual FAO records were 10-15% lower than those of the NSSH. The 1997 discrepancy can be explained by a correction that was applied on the number of boats appearing in the statistical bulletin of the NSSH a year later. The Greek 1997 landings were probably corrected only in the NSSH bulletin but not in the FAO yearbook.

Our reconstructed estimates will be useful for re-evaluating the state of Greek fisheries and data reporting. The reconstruction of Greek landings is a dynamic process which will be continued in the future.

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APPENDIX

Taxonomic comparison between data sources

Fishes

Alosa spp.: It is reported only by FAO since 1982. It is one of the most problematic cases in terms of taxonomy. The FAO landings for *Alosa* spp., the abundance of which is very low in Greek waters, exactly match those of NSSH for *Sardinella aurita* (except for 1997 when FAO landings are overreported by 5 t and for 1998 when FAO landings are underreported by 25 t). The close taxonomic relationship of the two species and the match of the reported figures suggest that the two datasets refer to the same species. **We consider the NSSH species' name and the landings to be the valid ones, i.e., the FAO landings for *Alosa* spp. refer to *S. aurita*.**

Anguilla anguilla: It is reported by NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 1998 when FAO landings are underreported by 6 t. **We consider the NSSH landings as the valid ones.**

Auxis rochei, A. thazzard: The landings of these species are reported as a group only by FAO since 1981. These species have never been reported by the NSSH. For 1983-1984 the FAO *Auxis rochei, A. thazzard* landings exactly match those of the NSSH for 'tune-like fishes'. **Although the FAO landings are constant and mysteriously rounded to 1400 t for 1985-1997, we consider those as the valid ones**.

Belone belone: It is reported by NSSH since 1982, whereas by FAO it is also reported for 1964-1969 (being constant and rounded to either 100 or 200 t) and then again from 1982. Landings completely match between the two datasets for all years except for 1997 and 1998 (i.e., FAO landings are over-reported in 1997 by 3 t and underreported in 1998 by 19 t). **We consider the NSSH landings as the valid ones and that the FAO landings for 1964-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Boops boops: It is reported by FAO since 1964 and by NSSH since 1982. FAO landings for 1964-1969 are rounded between 2600 and 3600 t. NSSH landings for 1964-1981 are reported together with *Sarpa salpa* and, during this period, landings generally agree between the two datasets but do not completely match (maximum difference recorded in 1969: FAO landings are underreported by 488 t). From 1970 onwards, the two datasets generally agree with only small differences, except for 1971 (FAO landings are overreported by 211 t). Since 1982, the two datasets completely agree with two exceptions: FAO landings are overreported in 1998 by 227 t and underreported in 1997 by 28 t. We split the NSSH *B. boops* landings for 1964-1981 to landings for each species (*B. boops* and *S. salpa*) based on the average participation of these two species to the total *B. boops* and *S. salpa* NSSH landings during 1982-1990 (see also entry for *S. salpa*). **We consider these backwards estimated NSSH landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Conger conger: It is reported by FAO since 1994 and has never been reported by the NSSH. FAO landings perfectly match those of the NSSH for 'gurnard' (see entry for Gurnard). Despite the taxonomic distance, we assume that both datasets refer to the same species, which is not *C. conger*. **We consider adding those to 'marine fishes nei'.**

Gurnard: It is reported by NSSH since 1982 and has never been reported by FAO. The NSSH landings refer to scorpaenid, triglid, serranid species (it may also include other species of low commercial interest) added together. NSSH landings for 1964-1981 are reported together with Scorpaenidae ('scorpion fishes') and Triglidae ('tubfish'). For 1982-1993 the sum of 'gurnard' and Triglidae of NSSH make up the exact value of FAO's Triglidae ('gurnards, searobins nei'). We split the NSSH Scorpaenidae landings for 1964-1981 to landings for each species (Scorpaenidae, Triglidae and 'gurnards') based on the average participation of these three species to the total Scorpaenidae, Triglidae and 'gurnards' NSSH landings during 1982-1990 (see also entry for Scorpaenidae and Triglidae). **We consider these backwards estimated landings as the valid ones and that the NSSH 'gurnards' landings should be added to the marine fishes nei because they refer to more than three species many of which may not be gurnards.**

Dentex dentex: It is separately reported by NSSH since 1982 and by FAO since 1964. FAO landings for 1964-1969 are rounded to 400, 600 or 700 t. For 1964-1981, NSSH landings are reported together with *Pagrus pagrus*. FAO landings are slightly overreported for the period 1964-1976 (differences range between 3 and 179 t), except for 1969 when FAO landings are underreported by 192 t. For the 1982-2003 period, the FAO and NSSH landings match except for 1998 (i.e., FAO landings are underreported by 23 t). We split the NSSH *D. dentex* landings for 1964-1981 to landings for each species (*D. dentex* and *P. pagrus*) based on the average participation of these two species to the total *D. dentex* and *P. pagrus* NSSH landings during 1982-1990 (see also entry for *P. pagrus*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Dentex macrophthalmus: It is reported by NSSH (and FAO) since 1982. For 1964-1981, NSSH landings are reported together with *Pagellus erythrinus*. No differences exist between the two datasets for the 1982-2002 period, with two exceptions: FAO landings are overreported in 1997 by 7 t and underreported in 1998 by 82 t. We split the NSSH *P. erythrinus* landings for 1964-1981 to landings for each species (*D. macrophthalmus* and *P. erythrinus*) based on the average participation of these two species to the total *D. macrophthalmus* and *P. erythrinus* NSSH landings during 1982-1990 (see also entry for *P. erythrinus*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Dicentrarchus labrax: It is reported by NSSH since 1982 whereas by FAO it is also reported for 1964-1969 (being constant and rounded to either 400 or 500 t) and then again for 1982. FAO landings are overreported in 1997 by 3 t and underreported in 1982, 1983 and 1998 by 11, 20 and 40 t respectively. Otherwise the two datasets completely match for 1982-2003. **We consider the NSSH landings as the valid ones and that the FAO landings for 1964-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Diplodus annularis: It is reported by NSSH since 1982. It has never been reported by FAO. However, for 1982-2003, the NSSH landings of *D. annularis* match those of FAO for *Pagrus* spp., which are recorded since 1964. We consider the FAO landings for *Pagrus* spp. are misreported and refer to *D. annularis*. In this case, In this case, the problem probably arises from the English common name of *D. annularis* ('couch's seabream') which is used by the NSSH. FAO landings are overreported in 1995 by 2 t and in 1997 by 3 t and underreported in 1998 by 47 t. **We consider the NSSH taxonomy and landings as the valid ones, i.e., the FAO landings for *Pagrus* spp. refer to *D. annularis*.**

Diplodus sargus: It is reported by the NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 1997 and 1998 (i.e. FAO landings are over-reported in 1997 by 3 t and underreported in 1998 by 45 t). **We consider the NSSH landings as the valid ones.**

Engraulis encrasicolus: It is reported by NSSH (and FAO) since 1964. Slight differences are observed for the 1964-1969 period when FAO landings are rounded between 4300 and 7300 t. FAO landings are overreported in 1964 by 614 t, in 1965 by 112 t, in 1967 by 38 t, and in 1968 by 71 t, and underreported in 1966 by 53 t, in 1969 by 535 t, and in 1998 by 432 t. As the *E. encrasicolus* is the species with the highest landings in the Greek Seas, which may exceed 24 000 t per year (1987), the above differences are insignificant. **We consider the NSSH landings as the valid ones.**

Epinephelus marginatus: It is reported by NSSH since 1982 and by FAO since 1985. For 1964-1981, NSSH *E. marginatus* landings are reported together with *Epinephelus alexandrinus* and *Polyprion americanus* as Serranidae. The close taxonomic relationship and the summation of the landings of *E. marginatus* with those of *Epinephelus* spp. indicate that for the years 1982, 1983 and 1984, the FAO landings of the latter species included those of the former. After their separation, in 1985, the FAO landings of *E. marginatus* are underreported only in 1998 by 10 t. We split the NSSH Serranidae landings for 1964-1981 to landings for each species (*E. marginatus*, *E. alexandrinus* and *P. americanus*) based on the average participation of these three species to the total *E. marginatus*, *E. alexandrinus* and *P. americanu* (=Serranidae) NSSH landings during 1982-1990 (see also entries for *E. alexandrinus* and *P. americanus*). **We consider these backwards NSSH estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Epinephelus spp: It is reported by FAO since 1964 and has never been reported by NSSH. FAO landings for 1964-1969 are constant and rounded to 300, 500, 600 or 1000 t. For 1982-1984, the *Epinephelus* spp. landings include those of *E. marginatus* (see entry for *E. marginatus*). Since 1985, the FAO landings for *Epinephelus* spp. are recorded separately and completely match those of NSSH for *Epinephelus alexandrinus* except for 1998 (i.e., FAO are underreported by 5 t). **Thus, we consider that the FAO *Epinephelus* spp. refers to the NSSH *E. alexandrinus*.**

Epinephelus alexandrinus: It is reported by NSSH since 1982 and has never been reported by FAO. For 1964-1981, NSSH *E. alexandrinus* landings are reported together with *Epinephelus marginatus* and *Polyprion americanus* as Serranidae. For 1985-2003, the NSSH landings for *E. alexandrinus* completely match those of FAO for *Epinephelus* spp. except for 1998 (i.e., FAO are underreported by 5 t). Thus, we consider that the NSSH *E. alexandrinus* refers to the FAO *Epinephelus* spp. We split the NSSH Serranidae landings for 1964-1981 to landings for each species (*E. marginatus*, *E. alexandrinus* and *P. americanus*) based on the average participation of these three species to the total *E. marginatus*, *E. alexandrinus* and *P. americanus* (=Serranidae) NSSH landings during 1982-1990 (see also entries for *E. marginatus* and *P. americanus*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Euthynnus alletteratus: It is reported by FAO since 2002 and has never been reported by NSSH. **We consider the FAO landings as the valid ones.**

Helicolenus dactylopterus: It is reported by NSSH since 1982 and has never been reported by FAO. Between 1982 and 1994, the 'various fishes' plus *Merlangius merlangus* and *Helicolenus dactylopterus* of NSSH equal the 'marine fishes nei' of FAO, except for 1986 (FAO higher by 37 t). **We consider the NSSH landings as the valid ones.**

Katsuwonus pelamis: It is reported by NSSH since 1982 and by FAO since 2003. NSSH landings for 1964-1981 are reported together with *Sarda sarda*. The NSSH landings of *K. pelamis* match those of FAO for Scombroidei ('Tuna-like fishes nei') for the period 1982-1989. Due to the close taxonomic relationship and the perfect match of the landings we assume that 'Scombroidei' refers to *K. pelamis*, at least for the period 1982-1989. We split the NSSH *K. pelamis* and *S. sarda* combined landings for 1964-1981 to landings for each species (*K. pelamis* and *S. sarda*) based on the average participation of these two species to the total *K. pelamis* and *S. sarda* NSSH landings during 1982-1990 (see also entry for *S. sarda*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Lophius piscatorius: It is reported by FAO since 1982 and has never been reported by NSSH. We consider that the FAO landings for *L. piscatorius* also include those of the other anglerfish inhabiting Greek waters, *L. budegassa* (see entry for *Lophius* spp.). **Thus, we consider that the valid name is *Lophius* spp. and that the NSSH landings are the correct ones.**

Lophius spp.: It is reported by NSSH since 1982 and has never been reported by FAO. The NSSH landings refer to the combined landings of *Lophius piscatorius* and *L. budegassa*, which are not sold separately in the Greek fish markets. No differences exist between the NSSH landings for *Lophius* spp. and the FAO landings for *L. piscatorius* for the period 1982-2003, with two exceptions: FAO landings are over-reported in 1997 by 18 t and underreported in 1998 by 27 t. **Despite the lower taxonomic resolution, we consider the species grouping of NSSH as the valid one (see entry for *L. piscatorius*).**

Merlangius merlangus: It is reported by NSSH since 1982 and by FAO since 2002. Between 1982 and 1994, the 'various fishes' plus *M. merlangus* and *Helicolenus dactylopterus* of NSSH equal the 'marine fishes nei' of FAO, except for 1986 (FAO higher by 37 t). **We consider the NSSH landings as the valid ones.**

Merluccius merluccius: It is reported by NSSH since 1982 and by FAO since 1964. FAO landings for 1964-1969 are rounded between 700 and 1400 t. For 1964-1981, NSSH landings were reported together with *Micromesistius poutassou* and possibly with *Merlangius merlangus* (which appears separately since 1982 but it does not appear as part of any group in 1964-1981) or small quantities of *Trisopterus minutus capelanus* (which never appear after 1981). Hence, for 1964-1981, NSSH landings are overreported and the difference refers to the landings of *M. poutassou*. For the period 1982-2003, landings completely match

between the two datasets except for 1997 and 1998 (i.e. FAO landings are over-reported in 1997 by 30 t and underreported in 1998 by 226 t). We split the NSSH *M. merluccius* landings for 1964-1981 to landings for each species (*M. merluccius* and *M. poutassou*) based on the average participation of these two species to the total *M. merluccius* and *M. poutassou* NSSH landings during 1982-1990 (see entry for *M. poutassou*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Micromesistius poutassou: It is reported by NSSH since 1982 and by FAO since 1964. FAO landings for 1964-1969 are rounded between 200 and 400 t. For 1964-1981, NSSH landings were reported together with *Merluccius merluccius* and possibly with *Merlangius merlangus* (which appears separately since 1982) or small quantities of *Trisopterus minutus capelanus* (which never appear after 1981). Hence, for 1964-1981, the FAO landings of *M. poutassou* equal the difference of the NSSH and FAO landings for *M. merluccius*. For 1982-2003, landings completely match between the two datasets except for 1997 and 1998 (i.e., FAO landings are over-reported in 1997 by 12 t and underreported in 1998 by 16 t). We split the NSSH *M. merluccius* landings for 1964-1981 to landings for each species (*M. merluccius* and *M. poutassou*) based on the average participation of these two species to the total *M. merluccius* and *M. poutassou* NSSH landings during 1982-1990 (see entry for *M. merluccius*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Mugil cephalus: It is reported by FAO since 1964 and has never been reported by NSSH. FAO landings for 1964-1969 are rounded between 800 and 1200 t. There is a peculiarity regarding this species since the FAO landings most probably include the catches of all seven mugilid species (*M. cephalus*, *M. soiuy, Chelon labrosus*, *Liza aurata*, *L. ramada*, *L. saliens* and *Odeachilus labeo*) inhabiting Greek seas. It is difficult for the fishers to distinguish these species - and pointless, as all of them have quite the same market value. The contribution of each of the seven species to the total production is impossible to be estimated. Thus, fishers usually report all of these species as grey-mullets. Hence, the *M. cephalus* FAO landings refer to all mugilid species i.e. the NSSH Mugilidae ('common grey mullet') landings (see entry for Mugilidae). When compared to the NSSH Mugilidae landings, the FAO *M. cephalus* landings are overreported for the period 1964-1968 by about 150 t each year, in 1978, 1979 and 1981 by *ca.* 200 t and in 1997 by 19 t. FAO landings are underreported only in 1998 by 290 t. **We consider the NSSH taxonomic level as the valid one, i.e., FAO *Mugil cephalus* refers to NSSH Mugilidae.**

Mugilidae: It is reported by NSSH since 1964 and has never been reported by FAO. The landings include the catches of all seven mugilid species inhabiting Greek Seas (see entry for *Mugil cephalus*). Because of the close taxonomic relationship and the similarity of the landing figures, the NSSH Mugilidae landings refer to the FAO landings for *M. cephalus*. **Despite the lower taxonomic resolution, we consider the NSSH landings as the valid ones.**

Mullus barbatus: It is reported separately by NSSH since 1982 and together with *M. surmuletus* for 1964-1981. It is not reported by FAO. Since there is no other *Mullus* species in Greek waters and because of the close taxonomic relationship we conclude that these figures refer to the FAO landings for *Mullus* spp. For 1982 and 1983, the reported landings of NSSH for *M. barbatus* match those of FAO for *M. surmuletus* and the reported landings of NSSH for *M. surmuletus* match those of FAO for *Mullus spp.* In 1984, FAO reported only *M. surmuletus* but the landings referred to the added landings of *M. barbatus* and *M. surmuletus* as reported by the NSSH. As from 1985, these species have been reported separately and correctly (following the NSSH landings) regarding the common and scientific names. For the period 1985-2003, landings completely match between the two datasets except for 1997 and 1998 (i.e. FAO landings are over-reported in 1997 by 32 t and underreported in 1998 by 73 t). We split the NSSH *Mullus barbatus* and *M. surmuletus* landings for 1964-1981 to landings for each species (*M. barbatus* and *M. surmuletus*) based on the average participation of these two species to the total *Mullus barbatus* and *M. surmuletus* NSSH landings during 1982-1990 (see also entry for *M. surmuletus*). **We consider these backwards NSSH estimated landings as the valid ones for 1964-1981 and the NSSH landings and taxonomy as the valid ones for 1982-2003.**

Mullus surmuletus: It is reported separately by NSSH since 1982 and together with *M. barbatus* for 1964-1981. It is reported by FAO since 1982 and together with *Mullus* spp. for 1964-1981. For 1982 and 1983, the reported landings of NSSH for *M. barbatus* match those of FAO for *M. surmuletus* and the reported landings of NSSH for *M. surmuletus* match those of FAO for *Mullus spp.* In 1984, FAO reported only *M. surmuletus* but the landings referred to the added landings of *M. barbatus* and *M. surmuletus* as reported by the NSSH. As from 1985, these species have been reported separately and correctly (following the NSSH landings) regarding the common and scientific names. For the period 1985-2003, landings completely match between the two datasets except for 1997 and 1998 (i.e. FAO landings are over-reported in 1997 by 32 t and underreported in 1998 by 73 t). We split the NSSH *Mullus barbatus* and *M. surmuletus* landings for 1964-1981 to landings for each species (*M. barbatus* and *M. surmuletus*) based on the average participation of these two species to the total *Mullus barbatus* and *M. surmuletus* NSSH landings during 1982-1990 (see also entry for *M. barbatus*). **We consider these backwards NSSH estimated landings as the valid ones for 1964-1981 and the NSSH landings and taxonomy as the valid ones for 1982-2003.**

Mullus spp.: It is reported by NSSH for 1964-1981 and by FAO since 1964. FAO landings for 1964-1969 are rounded between 1500 and 3000 t. NSSH landings for 1964-1981 refer to the sum of *Mullus barbatus* and *M. surmuletus* landings, which are reported separately since 1982. Hence, FAO landings for 1964-1981 refer to the same thing, i.e., the combined *M. barbatus* and *M. surmuletus* landings. **As from 1982, we consider that the FAO landings for *Mullus* spp. refer to the NSSH landings for *M. barbatus* (see entries for *M. barbatus* and *M. surmuletus*).**

Mustelus spp.: It is reported by NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 1997, 1998 and 2000 (i.e. FAO landings are over-reported in 1997 by 2 t and in 2000 by 40 t and are underreported in 1998 by 25 t). **We consider the NSSH landings as the valid ones.**

Oblada melanura: It is reported by NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 1998 when FAO landings are underreported by 33 t. **We consider the NSSH landings as the valid ones.**

Osteichthyes: It is reported by NSSH (and FAO) since 1964. FAO landings for 1964-1969 are rounded between 800 and 4300 t. NSSH records 'various fishes' with no indication whether teleosts or chondrichthyans, while FAO records 'marine fishes nei' which refers to osteichthyes (=teleost fishes). Landings do not completely match between the two datasets. For the period 1964-1969, the differences between them were enormous reaching over 5000 t in favour of the NSSH. This was probably due to

the higher taxonomic resolution of FAO for that period. Between 1982 and 1994, the 'various fishes' plus *Merlangius merlangus* and *Helicolenus dactylopterus* of NSSH equal the 'marine fishes n.e.i.' of FAO, except for 1986 (FAO higher by 37 t).

Pagellus erythrinus: It is reported by NSSH since 1982 and has never been reported by FAO. For 1964-1981, NSSH landings of *P. erythrinus* were reported together with *Dentex macrophthalmus*. The comparison of NSSH landings for *P. erythrinus* with FAO landings for *Pagellus* spp. indicates that both figures refer to the same species, at least for the period after 1977. We consider the taxonomy of the NSSH landings to be the correct one for 1982-2003 indicating that the FAO landings refer to *P. erythrinus*. The two datasets differ for 1964-1976, with FAO landings generally being overreported by about 100 t per year (except for 1969 when FAO landings were underreported by 70 t). For the period 1977-2003, the FAO landings are overreported in 1997 by 9 t and underreported in 1998 by 44 t. We split the NSSH *P. erythrinus* landings for 1964-1981 to landings for each species (*D. macrophthalmus* and *P. erythrinus*) based on the average participation of these two species to the total *D. macrophthalmus* and *P. erythrinus* NSSH landings during 1982-1990 (see entry for *D. macrophthalmus*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings and taxonomy as the valid ones for 1982-2003.**

Pagellus spp.: It is reported since 1964 by FAO and has never been reported by NSSH. For 1964-1969 FAO landings were rounded to 800, 900 or 1000 t. For the period after 1977, the FAO landings for *Pagellus* spp. refer to *P. erythrinus* (see entry for *P. erythrinus*). The higher, by about 100 t per year (except for 1969 when FAO landings were underreported by 70 t), FAO landings for *Pagellus* spp. for 1964-1976, suggest that they might have also included those for *Dentex macrophthalmus*. For the period 1977-2003, the FAO landings for *Pagellus* spp. completely match those of NSSH for *P. erythrinus* but are overreported in 1997 by 9 t and underreported in 1998 by 44 t. **We consider that the FAO landings for *Pagellus* spp. refer to those of NSSH for *P. erythrinus*.**

Pagrus pagrus: It is reported separately by NSSH (and FAO) since 1982. For 1964-1981, NSSH landings are reported together with *Dentex dentex*. For 1982-2003, landings completely match between the two datasets for all years except for 1986, 1997 and 1998 (i.e. FAO landings are over-reported in 1986 by 6 t, and in 1997 by 3 t and are underreported in 1998 by 43 t). We split the NSSH *D. dentex* landings for 1964-1981 to landings for each species (*D. dentex* and *P. pagrus*) based on the average participation of these two species to the total *D. dentex* and *P. pagrus* NSSH landings during 1982-1990(see entry for *D. dentex*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Pagrus spp.: It is reported by FAO since 1964 and has never been reported by NSSH. For 1964-1969 FAO landings were rounded to either 900 or 1000 t. **Because of the similar landings and despite the taxonomic distance, we conclude that the FAO landings for *Pagrus* spp. refer to the NSSH landings for *Diplodus annularis* (see entry for *D. annularis*).**

Polyprion americanus: It is reported separately by NSSH since 1982 and has never been reported by FAO. For 1964-1981, NSSH landings are reported together with *Epinephelus marginatus* and *E. alexandrinus* as Serranidae. We split the NSSH Serranidae landings for 1964-1981 to landings for each species (*E. marginatus E. alexandrinus* and *P. americanus*) based on the average participation of these three species to the total *E. marginatus E. alexandrinus* and *P. americanus* (=Serranidae) NSSH landings during 1982-1990 (see also entry for *E. marginatus* and *E. alexandrinus*). **We consider the NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Pomatomus saltatrix: It is reported by NSSH since 1982 whereas by FAO it is also reported for 1966-1969 (being constant and rounded to 100 t) and then again for 1982. For 1982-2003, landings completely match between the two datasets except for 1998 (i.e. FAO landings are underreported by 15 t). **We consider the NSSH landings as the correct ones and that the FAO landings for 1966-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Psetta maxima: It is reported by NSSH (and FAO) since 1982. For 1964-1981, NSSH landings are reported together with *Solea solea*. Landings completely match between the two datasets for all years. We split the NSSH *S. solea* landings for 1964-1981 to landings for each species (*S. solea* and *P. maxima*) based on the average participation of these two species to the total *S. solea* and *P. maxima* NSSH landings during 1982-1990 (see also entry for *S. solea*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Raja clavata: It is reported by NSSH since 1982 and by FAO since 2003. The NSSH distinguishes *R. clavata* from the rest of the rays, while the FAO landings include all rays (*Raja* spp.) under a single landing value at least until 2002. The summation of *R. clavata* and other *Raja* spp. landings of NSSH exactly matches the *Raja* spp. landings of FAO except for 1997 (FAO landings are overreported by 10 t) and 1998 (FAO landings are underreported by 21 t). **We consider the NSSH landings and taxonomy as the valid ones.**

Raja spp.: It is reported by NSSH since 1982 whereas by FAO it is also reported for 1964-1969 and then again from 1982. For 1964-1969, FAO landings are rounded to either 700 or 900 t. The summation of *R. clavata* and other *Raja* spp. landings of NSSH exactly matches the *Raja* spp. landings of FAO except for 1997 (FAO landings are overreported by 10 t) and 1998 (FAO landings are underreported by 21 t) (see entry for *Raja clavata*). **We consider the NSSH landings and taxonomy as the valid ones and that the FAO landings for 1964-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Rhinobatidae: It is reported by NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 2000 when FAO landings are overreported by 20 t. **We consider the NSSH landings as the valid ones.**

Sarda sarda: It is reported separately by NSSH since 1982 whereas by FAO since 1964. For 1964-1969, FAO landings are rounded between 900 and 3200 t. For 1964-1981 it is reported by NSSH together with *Katsuwonus pelamis*. For 1982-2003, no differences are reported between the two datasets between 1982 and 1989 and between 1994 and 1997. For the remaining years, FAO landings are overreported in 1990 (1607 t), 1991 (1896 t), 1992 (1788 t), 1993 (1826 t), 1999 (963 t) and 2000 (900 t). We split the NSSH *K. pelamis* and *S. sarda* combined landings for 1964-1981 to landings for each species (*K. pelamis* and *S. sarda*) based on the average participation of these two species to the total *K. pelamis* and *S. sarda* NSSH landings during 1982-

1990 (see also entry for *K. pelamis*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Sardina pilchardus: It is reported by NSSH (and FAO) since 1964. For 1964-1969, FAO landings are rounded between 9000 and 13000 t. Landings completely match between the two datasets for all years except for the period 1964-1968 when FAO landings are slightly over-reported and for 1969 and 1998 when FAO landings are underreported by 1615 and 750 t respectively. **We consider the NSSH landings as the valid ones.**

Sardinella aurita: It is one of the most problematic cases in terms of taxonomy. It is reported by NSSH since 1982 and has never been reported by FAO. However, the NSSH landings of *S. aurita* exactly match (except for 1997 when FAO landings are overreported by 5 t and 1998 when FAO landings are underreported by 25 t) those of FAO for *Alosa* spp., the abundance of which is very low in Greek waters. The close taxonomic relationship of the two species suggests that the two datasets refer to the same species and we consider the species' name and the landings of NSSH to be the correct ones (see entry for *Alosa* spp.). The problem probably arises from the Greek common names of the two species that are often confused. The result is that the Greek fleet appears to have fished almost 2000 t of shads (*Alosa* spp.) in 2000 instead of round sardinella (*S. aurita*) which is the third most targeted clupeoid species in the Greek Seas, mainly fished by purse seiners. The twaite shad, *Alosa fallax* is the only commercially exploited shad species in the Greek seas, but very low quantities are landed. Its exploitation is seasonal, confined to spring/early summer, and is performed by the small scale coastal fleet whose landings are not taxonomically disaggregated (see materials and methods). Thus, this record clearly refers to *S. aurita*. **We consider the NSSH landings as the valid ones.**

Sarpa salpa: It is reported by NSSH (and FAO) since 1982. For 1964-1981, it was reported by the NSSH together with *Boops boops*. For 1982-2003, landings completely match between the two datasets for all years except for 1997 and 1998 (i.e. FAO landings are overreported in 1997 by 6 t and underreported in 1998 by 43 t). We split the NSSH *B. boops* landings for 1964-1981 to landings for each species (*B. boops* and *S. salpa*) based on the average participation of these two species to the total *B. boops* and *S. salpa* NSSH landings during 1982-1990 (see also entry for *B. boops*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Scomber japonicus: It is reported by NSSH (and FAO) since 1964. For 1964-1969 FAO landings were rounded to 500, 900, 1000 and 1500 t. Records generally agree for 1964-1978 with small differences which mainly refer to the 1964-1969 period (reaching up to 233 t in favour of FAO for 1964). For 1980-1987 differences fluctuated between 810 and 1845 t always in favour of FAO. From 1988 onwards, datasets differed only in 1998 (FAO landings are underreported by 59 t). **We consider the NSSH landings as the valid ones.**

Scomber scombrus: It is reported by NSSH since 1982 whereas by FAO it is also reported for 1964-1969 and then again from 1982. For 1964-1969 the FAO landings were rounded to 200, 300, 400 and 500 t. Landings completely match between the two datasets for all years except for 1998 when FAO landings are underreported by 9 t. **We consider the NSSH landings as the correct ones and that the FAO landings for 1964-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Scombroidei: It is reported by FAO since 1982. The FAO landings match those of *K. pelamis* reported by the NSSH for 1982-1989 (see entry for *K. pelamis*). Due to the close taxonomic relationship and the perfect match of the landings **we assume that Scombroidei refers to *K. pelamis* at least for 1982-1989.**

Scorpaenidae: It is reported by NSSH (and FAO) since 1964. NSSH landings for 1964-1981 are reported together with 'gurnard' and Triglidae ('tubfish'). For 1964-1969, FAO landings were rounded between 800 and 1300 t. Landings generally match between the two datasets with FAO landings being slightly over-reported for the period 1964-1981. The differences, which reach up to 510 t for 1965, smoothed out gradually. For 1982-2003, FAO landings are overreported in 1997 (by 4 t) and underreported in 1998 (by 64 t). We split the NSSH Scorpaenidae landings for 1964-1981 to landings for each species (Scorpaenidae, Triglidae and 'gurnards') based on the average participation of these three species to the total Scorpaenidae, Triglidae and 'gurnards' NSSH landings during 1982-1990 (see also entry for 'gurnards' and Triglidae). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Seriola dumerili: It is reported by NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 1998 when FAO landings are underreported by 13 t. **We consider the NSSH landings as the valid ones.**

Serranus spp.: It is reported by NSSH since 1982 and has never been reported by FAO. The NSSH landings refer mainly to *Serranus cabrilla* and *S. scriba*. **We consider these NSSH landings as the valid ones.**

Serranidae: It is reported by FAO since 1964 and by NSSH for 1964-1981. The NSSH landings for 1964-1981 refer to *Epinephelus marginatus*, *E. alexandrinus* and *Polyprion americanus*. For 1964-1969, FAO landings were rounded between 100 and 200 t. For 1970-1981 FAO landings were lower than 0.5 t. We split the NSSH Serranidae landings for 1964-1981 to landings for each species (*E. marginatus*, *E. alexandrinus* and *P. americanus*) based on the average participation of these three species to the total *E. marginatus*, *E. alexandrinus* and *P. americanus* (=Serranidae) NSSH landings during 1982-1990 (see also entry for *E. marginatus* and *E. alexandrinus*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Solea solea: It is reported separately by NSSH since 1982 and by FAO since 1964. NSSH landings for 1964-1981 are reported together with *Psetta maxima* ('brill'). For 1964-1969, FAO landings were rounded between 500 and 1000 t. Landings generally match between the two datasets for all years. However, FAO landings are overreported for the period 1964-1969 with differences reaching up to 625 t (1965). For 1970-1981 the two datasets were very similar (except for 1978 and 1979 when underreported by FAO) but never exactly matched each other. For 1982-2003, landings completely match between the two datasets except for 1997 and 1998 (i.e., FAO landings were over-reported in 1997 by 12 t and underreported in 1998 by 85 t). We split the NSSH *S. solea* landings for 1964-1981 to landings for each species (*S. solea* and *P. maxima*) based on the average participation of these two species to the total *S. solea* and *P. maxima* NSSH landings during 1982-1990 (see entry for *P. maxima*). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Sparus aurata: It is reported by NSSH since 1982 whereas by FAO it is also reported for 1964-1969 and then again from 1982. For 1964-1969 FAO landings were constant and rounded to 200 t. Landings completely match between the two datasets for all years except for 1998 when FAO landings are underreported by 17 t. **We consider the NSSH landings as the correct ones and that the FAO landings for 1964-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Spicara flexuosa: It is reported by NSSH since 1982 and has never been reported by FAO. For 1964-1981 NSSH landings are reported together with *S. maena* and *S. smaris*. For 1982-2003, the sum of the NSSH landings of *S. flexuosa* with *S. maena* and *S. smaris* completely matches the FAO landings of *Spicara* spp. except for 1997 and 1998 (i.e. FAO landings are over-reported by 57 t in 1997 and underreported by 210 t in 1998). We split the NSSH *Spicara* spp. landings for 1964-1981 to landings for each species based on the average participation of these three species to the total *Spicara* NSSH landings during 1982-1990. **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings and taxonomy as the valid ones for 1982-2003.**

Spicara smaris: It is reported by NSSH since 1982 and has never been reported by FAO. For 1964-1981 NSSH landings are reported together with *S. flexuosa* and *S. maena*. For 1982-2003, the sum of the NSSH landings of *S. smaris* with *S. maena* and *S. flexuosa* completely matches the FAO landings of *Spicara* spp. except for 1997 and 1998 (i.e. FAO landings are over-reported by 57 t in 1997 and underreported by 210 t in 1998). We split the NSSH *Spicara* spp. landings for 1964-1981 to landings for each species based on the average participation of these three species to the total *Spicara* NSSH landings during 1982-1990. **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings and taxonomy as the valid ones for 1982-2003.**

Spicara maena: It is reported by NSSH since 1982 and has never been reported by FAO. For 1964-1981 NSSH landings are reported together with *S. flexuosa* and *S. smaris*. For 1982-2003, the sum of the NSSH landings of *S. maena* with *S. smaris* and *S. flexuosa* completely matches the FAO landings of *Spicara* spp. except for 1997 and 1998 (i.e. FAO landings are over-reported by 57 t in 1997 and underreported by 210 t in 1998). We split the NSSH *Spicara* spp. landings for 1964-1981 to landings for each species based on the average participation of these three species to the total *Spicara* NSSH landings during 1982-1990. **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings and taxonomy as the valid ones for 1982-2003.**

Spicara spp.: It is reported by NSSH for 1964-1981 and by FAO since 1964. For 1964-1969 FAO landings were rounded between 8500 and 9800 t. For 1964-1981, the FAO landings were always less than the NSSH ones, with differences reaching up to 1300 t. Those differences smoothed out gradually. From 1982 onwards, while FAO continued to report *Spicara* spp., NSSH started to report separate landings for the three different species (*S. smaris*, *S. maena* and *S. flexuosa*). For 1982-2003, the sum of the NSSH landings of these three species completely matches the FAO landings of *Spicara* spp. except for 1997 and 1998 (i.e. FAO landings are over-reported by 57 t in 1997 and underreported by 210 t in 1998). We consider the taxonomic resolution of NSSH the correct one (see also entries for *S. smaris*, *S. maena* and *S. flexuosa*). We split the NSSH *Spicara* spp. landings for 1964-1981 to landings for each species based on the average participation of these three species to the total *Spicara* NSSH landings during 1982-1990. **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings and taxonomy as the valid ones for 1982-2003.**

Spondyliosoma cantharus: It is reported by NSSH (and FAO) since 1964. Landings generally match between the two datasets for all years except for 1964-1968 when FAO landings are rounded to 300, 400 and 600 t and overreported (differences ranging between 25 and 430 t) and for 1969, 1970, 1971, 1978, 1979 and 1998 when FAO landings are underreported by 173, 106, 111, 30, 10 and 31 t respectively. **We consider the NSSH landings as the valid ones.**

Sprattus sprattus: It is reported by NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 1998 when FAO landings are underreported by 3 t. **We consider the NSSH landings as the valid ones.**

Squalidae: It is reported by NSSH since 1982 whereas by FAO it is also reported for 1964-1969 and then again from 1982. For 1964-1969, FAO landings are rounded to 200 and 300 t. Landings completely match between the two datasets for all years except for 1997 and 1998 (i.e. FAO landings are over-reported in 1997 by 11 t and underreported in 1998 by 30 t). **We consider the NSSH landings as the valid ones and that the FAO landings for 1964-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Thunnus alalunga: It is reported by FAO since 1986 and has never been separately recorded by NSSH. **Although the FAO landings are constant and mysteriously rounded to 500 t for 1986-1993, we consider those as the valid ones.**

Thunnus thynnus: It is reported by FAO for 1964-1969 and then again since 1985. It has never been separately reported by NSSH. For 1964-1969 FAO landings were rounded between 500 and 700 t. **We consider the FAO landings as the valid ones.**

Trachurus mediterraneus: It is reported by NSSH since 1982 and by FAO since 1964. For 1964-1981 the NSSH landings are reported together with *Trachurus trachurus*. The close taxonomic relationship with *T. trachurus* and the landings of the two species indicate that, for 1964-1981, the FAO landings report *T. mediterraneus* but refer to both species. Similarly, for the same period, the NSSH landings report *Trachurus* spp. but again refer to both species. As from 1982, the two species are separately recorded. For 1982-2000, the FAO landings are overreported in 1996 by 5 t and 1997 by 33 t and underreported in 1998 by 172 t. We split the NSSH *Trachurus* spp. landings for the period prior to 1982 to landings for each species based on the average participation of these two species to the total *Trachurus* NSSH landings during 1982-1990, **and we consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Trachurus trachurus: It is reported separately by NSSH (and FAO) since 1982. For 1964-1981 NSSH landings are reported together with *Trachurus mediterraneus*. The close taxonomic relationship with *T. mediterraneus* and the values of the landings of the two species indicate that, for 1964-1981, the landings of NSSH report *T. trachurus* but refer to both species. As from 1982, the two species are separately recorded. For 1982-2003, the FAO landings are overreported in 1997 by 19 t and underreported in 1998 by 10 t. We split the NSSH *Trachurus* spp. landings for the period prior to 1982 to landings for each species based on the average participation of these two species to the total *Trachurus* NSSH landings during 1982-1990, **and we consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Trachurus spp.: It is reported by NSSH for 1964-1981 and has never been reported by FAO. NSSH landings refer to *Trachurus trachurus* and *T. mediterraneus* and are very similar to FAO landings for *T. mediterraneus*. As from 1982, both FAO and NSSH started to report the separate landings for the two different species (*Trachurus mediterraneus* and *T. trachurus*). We split the NSSH *Trachurus* spp. landings for the period prior to 1982 to landings for each species based on the average participation of these two species to the total *Trachurus* NSSH landings during 1982-1990, **and we consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Triglidae: It is reported by NSSH (and FAO) since 1982. NSSH landings for 1964-1981 are reported together with 'gurnards' and Scorpaenidae ('scorpion fish'). Until 1993, the values of NSSH make up those of FAO when added with those of 'gurnards'. From then onwards Triglidae exactly match between the two datasets, except for 1997 (FAO landings are overreported by 4 t) and 1998 (FAO landings are underreported by 8 t). We split the NSSH Scorpaenidae landings for 1964-1981 to landings for each species (Scorpaenidae, Triglidae and 'gurnards') based on the average participation of these three species to the total Scorpaenidae, Triglidae and 'gurnards' NSSH landings during 1982-1990 (see also entry for 'gurnards' and Scorpaenidae). **We consider these NSSH backwards estimated landings as the valid ones for 1964-1981 and the NSSH landings as the valid ones for 1982-2003.**

Umbrina cirrosa: It is reported by NSSH since 1982 whereas by FAO it is also reported for 1964-1969 and then again from 1982. For 1964-1969, FAO landings are rounded to 100, 600 and 700 t. Landings completely match between the two datasets for all years except for 1998 when FAO landings are underreported by 4 t. **We consider the NSSH landings as the valid ones and that the FAO landings for 1964-1969 should be added to the FAO Osteichthyes ('marine fishes nei').**

Xiphias gladius: It is reported by FAO since 1981 and by NSSH since 1982. In general, FAO landings are overreported (differences reach up to 787 t in 2000). FAO landings are underreported only for 1985 (by 74 t), 1988 (by 243 t), 1989 (by 911 t), 1995 (by 428 t) and 1997 (by 803 t). No difference was observed only in 1996. **We consider the FAO landings as the valid ones.**

Zeus faber: It is reported by NSSH (and FAO) since 1982. Landings completely match between the two datasets for all years except for 1997 and 1998 (i.e. FAO landings are over-reported in 1997 by 3 t and underreported in 1998 by 11 t). **We consider the NSSH landings as the valid ones.**

Tuna: It is reported by NSSH since 1982 and has never been reported by FAO. Because of the low taxonomic resolution we consider the FAO records for individual tuna and tuna like fishes as the correct ones. **For all tuna and tuna like fishes (except for *Sarda sarda* and *Katsuwonus pelamis*), we consider the FAO landings as the valid ones.**

Cephalopods

Loliginidae, Ommastrepidae: It is reported by the NSSH since 1964 and by FAO since 1970. For 1970 and 1971 FAO's values were higher as they included the landings of *Loligo* sp. (its separate records started in 1972). As from 1972 the two datasets are exactly the same except for 1997 (FAO landings are overreported by 4 t) and 1998 (underreported by 4 t). **We consider the NSSH landings as the valid ones.**

Loligo spp.: It is reported by the NSSH since 1964 and by FAO since 1972. FAO landings are slightly overreported for 1972-1976, 1981 and 1997 and underreported in 1998 (by 16 t). **We consider the NSSH landings as the valid ones.**

Octopodidae: It is reported by FAO since 1970 and by the NSSH since 1982. The landings of FAO for 1970-1981 match those of NSSH for *Octopus vulgaris* and are generally overreported. **We consider the NSSH landings as the valid ones.**

Sepia officinalis: It is reported since 1964. For 1964-1969 FAO landings seemed to have included all the cephalopods recorded by the NSSH and still were twice higher. As from 1970, the two datasets were very close. From 1970-1977, FAO landings were slightly higher and from 1978-1981 those of the NSSH were slightly higher. Since 1982, landings are exactly the same except for 1998 (FAO landings are underreported by 271 t). **We consider the NSSH landings as the valid ones.**

Octopus vulgaris: It is reported by the NSSH since 1964 and by FAO since 1982. As from then the two datasets are exactly the same except for 1998 (FAO landings are underreported by 196 t). **We consider the NSSH landings as the valid ones.**

Crustaceans

Hommarus gammarus: It is reported by the NSSH (and FAO) since 1982. FAO landings are underreported in 1998 by 24 t. Despite the agreement between the two datasets, we conclude that they refer to the landings of two species: *H. gammarus* and *Palinurus elephas*. The latter has never been recorded by the NSSH or FAO. **We consider that the NSSH and FAO landings refer to both *H. gammarus* and *Palinurus elephas*.**

Penaeus kerathurus: It is reported by the NSSH (and FAO) since 1982. FAO landings are overreported in 1997 by 28 t and underreported in 1998 by 38 t. **We consider the NSSH landings as the valid ones.**

Natantia: It is reported by the NSSH and by FAO since 1964. As from 1970, the two datasets generally agree except for 1978, 1979 and 1981 (FAO landings are underreported by about 40 t). Since 1982 FAO landings are overreported in 1997 by 21 t and underreported in 1998 by 78 t. The majority of 'Natantia' landings refer to the *Parapeneus longirostris*. **We consider the NSSH landings as the valid ones.**

Carcinus aestuarii: It is reported by the NSSH and by FAO since 1982. FAO landings are underreported in 1998 by 9 t. **We consider the NSSH landings as the valid ones.**

Nephrops norvegicus: It is reported since 1964 by FAO and by the NSSH as 'other'. The two datasets generally agree from 1970 except for 1998 (FAO landings are underreported by 15 t). **We consider the NSSH landings as the valid ones.**