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RECONSTRUCTION OF MARINE FISHERIES CATCHES FOR MADEIRA ISLAND, PORTUGAL FROM 1950-2010

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ABSTRACT

The reconstruction of total marine fisheries catches for the islands of Madeira for 1950-2010 added estimates of unreported subsistence and recreational catches, as well as discards to the reported commercial fisheries landings obtained from official statistics. While there are suggestions that commercial fisheries (e.g. black-scabbard fish fishery) also produce unreported catches, we were not able to estimate these at this point. Total estimated fisheries catches taken by Madeira from the Madeiran EEZ were around 460,000 tonnes for the 1950-2010 period, increasing from around 2,300 t in 1950 to a peak of 15,000 t in 1995, before declining to around 5,400 t by 2010. Estimated total catches were 16% higher than the approximately 395,000 tonnes reported in official statistics.

INTRODUCTION

The Portuguese Autonomous Region of Madeira consists of four islands (Madeira, Ponta Santos, and the Desertas and Savage islands), of which only the first two are inhabited, with Madeira proper as the largest island. They are located to the northwest of Africa and are surrounded by deep water. The Madeira Island group is surrounded by an Exclusive Economic Zone (EEZ) of nearly 454,500 km² (Figure 1). The waters around the Madeira Islands (henceforth: Madeira) are extremely deep and have very low productivity, which sets limit for potential catch. It is also the reason why the main exploited species consist of deep water fishes, the black scabbard fish (*Aphanopus carbo*) and large pelagics, notably bigeye (*Thunnus obesus*) and skipjack (*Katsuwonus pelamis*) tunas.

After the Carnation Revolution of 1974 in Portugal, Madeira was granted political autonomy in 1976. Madeira has benefited from steady growth and development since Portugal joined the European Union in 1986, and tourism is now one of the leading industries in Madeira¹.

According to Iborra Martin (2008), fishing accounts for only 1% of Madeira's employment and 0.7% of GDP; however, fish products account for 36% of the total exports from Madeira. The fishery is predominantly artisanal, with an increasing recreational component. The fishing fleet consists of 450+ vessels, of which most are old, and around 75% of them have a length of up to 6 m (Iborra Martin 2008). This fleet relies predominantly on black scabbard fish, a species caught at depth of 800 – 1200 m and representing a quarter of the current Madeiran catch, as well as several tuna species such as bigeye and skipjack, the latter also supporting a large tourist-based recreational fishery (game fishing). Game fishing has been present in the waters of Madeira since the early 1950s, but began to grow rapidly in the early 1970s (Graca 2009).

This contribution presents a preliminary reconstruction of the total catch of Madeiran (domestic) fisheries from 1950 to 2010, disaggregated by major species and by fishery type, i.e., industrial, artisanal, subsistence and recreational, accounting for discards and some other sources of unreported catches.

¹ <http://www.madeira24.com/english/info/history/history.htm> [Accessed: July 15, 2013]

METHODS

Official statistics (reported commercial landings)

Most of the Madeiran EEZ is located within Food and Agriculture Organization (FAO) Statistical Area 34, with the exception of a small northernmost part, which lies within Area 27 (Figure 1). As Madeira is a Portuguese territory, catches from the Madeiran fleet are not distinguished from those of mainland Portugal and the Azores in the statistics reported by the FAO. Therefore, official catch statistics for the Madeiran fleets had to be compiled from various sources. The “Portuguese Fisheries Statistics from the Continent and Adjacent Islands” (Anon. 1950-1980) contained landings data for 1950-1980², while the Regional Directorate of Statistics Madeira (Anon. 2013) had landings data from 1976-2010. For the overlapping period (1976-1980), the former source was used since data were disaggregated to a finer level (34 species and 3 general groups).

When available, information from research papers was used to improve the official statistics. Carvalho *et al.* (1983), Gouveia and Amorim (1999), Gouveia and Amorim (2000) and Gouveia *et al.* (2001) provided annual catches of tunas and billfishes (*Thunnus obesus*, *T. alalunga*, *T. thynnus*, *T. albacares*, *Katsuwonus pelamis*, *Sarda sarda*, *Euthynnus alletteratus*, *Auxis thazard thazard* and *Xiphias gladius*) from 1950-2010. We used the catch proportions of each species to break down the reported and unreported catch (i.e., the difference between the official landings and the presented catches from the papers). The black-scabbard fish landings data presented by Reis *et al.* (2011) was used for 1966. The landings of two mackerel species (*Trachurus picturatus* and *Scomber scombrus*) for 1966 were individually estimated by interpolation between 1965 and 1967.

We assumed that all officially reported landings are commercial in nature. For the purpose of the *Sea Around Us* database, we treated tuna, billfishes and black-scabbard fish catches as ‘industrial’ due to deep or pelagic nature of these fishes, but are aware that these are essentially ‘artisanal’ or ‘semi-artisanal’ in terms of vessel size.³ The rest of the landings (including all smaller species) are assumed to be artisanal in nature and caught in near-shore coastal waters around Madeira.

Unreported catches

The major commercial fishery for black-scabbard fish is thought to produce catches that do not enter the official data system of landings. At this point, we have not been able to estimate this unreported black-scabbard catch (but see section on discards below).

Unreported commercial tuna and mackerel catches

Carvalho *et al.* (1983), Gouveia and Amorim (1999), Gouveia and Amorim (2000) and Gouveia *et al.* (2001) provided the annual catches of tunas and billfishes from 1950-2010, which were higher than the reported official statistics. Additionally, the ‘mixed mackerel’ catches (*Trachurus picturatus* and *Scomber scombrus*) from 1965-1984 presented by Bettencourt Caldeira de Sena Carvalho (1985) were higher than the reported landings. Here, we assumed these differences were unreported catches. We used the tuna and mackerel proportion of the reported landings to taxonomically disaggregate the unreported tuna and mackerel catches.

Pole-and-line tuna fishery: baitfish requirements

The pole and line tuna fishing industry on the Madeira Islands uses live bait to target large pelagic fishes such as bigeye and skipjack tunas. Baitfish is normally captured by the tuna vessels themselves with small purse seines or lift nets and consists of small pelagic fishes such as blue jack mackerels (*Trachurus picturatus*) (Morato 2012). However, there were no readily available baitfish catch data for the Madeiran

² The Official statistics for 1966 were not available, and data were interpolated.

³ The *Sea Around Us* database definitions allows only ‘industrial’ (i.e., large-scale) catches to be allocated to deeper or offshore pelagic waters, while small-scale catches are allocated to inshore, shallow-water areas.

tuna fishing industry. Thus, the estimated tuna to baitfish catches for the Azorean tuna fishing industry presented by Pham *et al.* (2013) was used to derive the estimate of Madeiran baitfish catches. About 5% of the total tuna landings were the amount of baitfish required for tuna fishing over the period 1950-2010. The baitfish species composition is very different in Azores (Morato 2012) and Madeira, therefore we assumed a 50/50 split between *Trachurus picturatus* and *Scomber colias*.

Unreported artisanal catches for shallow and deep water species

A bottom longline and handline fishery are said to occur around Madeira Island; however, very limited information is found in the literature. It comprises a multi-species fishery targeting a large number of demersal species with high commercial value. Although important, no information is available to estimate the unreported catch of this fleet.

Subsistence catches

Subsistence fisheries are the non-commercial portion of the small-scale marine fisheries. Catches from this sector are neither recorded nor reported. Thus, subsistence catch data were not readily available. Here, we estimated catches for this sector based on Azorean subsistence catch estimate, presented by Pham *et al.* (2013) with some additional assumptions. Since both Madeira and Azores are comprised of small islands, we assumed that their inhabitants have been able to access the coast easily and have been involved in marine subsistence fishing since 1950. Additionally, since the population size and trend over the period 1950-2010 of Madeira and Azores were similar, we assumed that both would be similar in subsistence rates.

To calculate the annual subsistence rate, the estimated annual subsistence catches of Azores were divided by the human population of the Azores (www.populstat.info; www.ine.pt). Linear interpolation between census years was used to derive a complete time series of population data. The derived subsistence rates were applied to the Madeiran human population, which were calculated in a similar way to Azores population, to estimate the annual subsistence catches of Madeira from 1950-2010 (Table 1). The species proportions of official artisanal landings were used to taxonomically disaggregate these subsistence catches from 1950-2010.

Recreational catches

Recreational fisheries contribute, similar to subsistence fishery, to the non-commercial portion of the small-scale marine fisheries, but recreational fishers do not depend on their catches to meet their seafood demand, instead are rather pleasure driven. We assumed that recreational fishing is performed by both locals and tourists. The recreational fishing by tourists is mostly big game fishing and is described below. The recreational catches were neither recorded nor reported; thus, catch data were not readily available. We estimated catches for this sector based on Azorean recreational catch estimates presented by Pham *et al.* (2013). The method to calculate the recreational catches of Madeira is similar to that used for the subsistence catches described above, i.e., using population data (Table 1).

Big game fishing

Since the 1950s, game fishing has been present in the waters of Madeira; however, it was growing slowly until the early 1970s when the number of tourists started to rise (Graca 2009). Main targets are largely blue marlins (*Makaira nigricans*), but also swordfish (*Xiphias gladius*), bigeye tuna, bonito (*Sarda sarda*), barracuda (*Sphyraena sphyraena*), hammerhead shark (*Sphyrna corona*), blue shark (*Prionace glauca*), and bluefin (*Thunnus thynnus*), yellowfin (*Thunnus albacares*) and albacore tuna (*Thunnus alalunga*).⁴ While billfishes are not retained due to a catch and release policy, some of the other species are kept for consumption since some big game fishing chapters offer 'cook your catch'.⁵ Although there were estimates of big game fishing catches in the Azores (Pham *et al.* 2013), there was insufficient and not

⁴ <http://www.madeira-web.com/PagesUK/flowers-fruit-fish.html> [Accessed: July 17, 2013]

⁵ <http://www.casa-velha.com/en/game-fishing.html> [Accessed: July 15, 2013]

readily available information to estimate the total catches by this fishing activity in Madeira. Thus, we assumed that catches of big game fishing that were retained for consumption were negligible.

Discards

We define discards as catches that are caught by fishing boats and thrown back into the sea because of their non-edible nature or low commercial value. We assumed that there would be discards from industrial fishing vessels targeting tunas and black scabbardfish in Madeira; however, no discards were estimated for tuna catches in this study, as Atlantic wide discarding in the tuna fishery is being assessed separately by *Sea Around Us*. Discards of black scabbardfish fishery were estimated based on a 2.2% discard percentage in weight and relative percentage of discarded species, by number, presented by Bordalo-Machado *et al.* (2009). Since we were able to obtain only one discard rate (2.2%), we assumed that the discard rate of the black scabbardfish fishery in Madeira would be constant over time and was applied to the reported black scabbardfish catches from 1950-2010. As the species composition was only available by percentage of number of fish caught, as opposed to weight, we used this information to estimate an assumed breakdown by weight. Percentage composition by weight was derived for the top taxa in discard numbers; the remaining percentage of discards was assigned to miscellaneous marine fish in order to account for the uncertainty in our estimate of the composition. Annual discards are presented in Table 2, with the assumed species composition presented in Table 3, which was derived from information presented by Bordalo-Machado *et al.* (2009).

RESULTS

Official statistics (reported commercial landings)

The total commercial fisheries landings reported in official statistics for Madeira for the period 1950-2010 were around 395,000 t (86% of the total catch), and varied between a minimum of around 2,000 t in 1950 to a maximum of approximately 14,000 t in 1995 (Figure 2). Tuna and black scabbardfish have always been the major industrial fishery component in the Madeiran EEZ, with an overall contribution ranging between a minimum of 34% of the total reported landings in 1980, up to 90% in 1995. The artisanal fishery has also been an important seafood supplier, especially between 1979 and 1987, where it represented more than half of total Madeiran reported landings.

Unreported catch

Total unreported catch for the 1950-2010 was 64,700 t (14% of total catch; Figure 3). Unreported catch amounts varied from 400 t·year⁻¹ to 1,930 t·year⁻¹ (Figure 3). The total unreported landings (tunas, mackerels, subsistence, recreational, and bait catches) and discards of black scabbardfish fishery contributed close to 13% and 1% of the total reconstructed catches, respectively.

Unreported commercial tuna and mackerel catches

The total unreported tuna (industrial) and mackerel (artisanal) landings from 1950-2010 were 8,750 t and 4,490 t, and 14% and 7% of the total unreported catches of Madeira, respectively (Figure 3). Unreported tuna landings were considered only between 1950 and 1996, and varied from less than 1 t·year⁻¹ to 700 t·year⁻¹. The unreported mackerel landings were available only between 1965 and 1984, and varied from 5 t·year⁻¹ to 900 t·year⁻¹.

Pole-and-line tuna fishery: baitfish requirements

The total unreported baitfish catches for pole-and-line tuna fishery from 1950-2010 were 8,920 t, contributing 14% of the total unreported catches of Madeira (Figure 3). The baitfish catches increased from around 40 t in 1950, peaked at around 450 t in 1995, then decreased to around 90 t in 2010. The baitfish catches were made up of blue jack mackerel (*Trachurus picturatus*) and Atlantic chub mackerel (*Scomber colias*).

Subsistence catches

The subsistence catches for Madeira from 1950-2010 were estimated at 19,700 t, representing 30% of the total unreported catches or 4% of the total reconstructed catches of Madeira (Figure 3 and 4). Subsistence catches increased rapidly from 330 t in 1950 to a peak of 650 t by 1957, decreased to 90 t in 2000, then increased again to 135 t·year⁻¹ in the late 2000s. The subsistence catches were dominated by blue jack mackerel (38%) and Atlantic mackerel (*Scomber scombrus*, 30%).

Recreational catches

The recreational catches from 1950-2010 were estimated at 20,200 t, presenting 31% of the total unreported catches or 4% of the total reconstructed catches of Madeira (Figure 3 and 4). Recreational catches gradually increased from 20 t in 1950 to 550 t·year⁻¹ in the late 1980s, and then fluctuated between 280 t·year⁻¹ to 530 t·year⁻¹ for 1991-2010. The recreational catches were all 'miscellaneous marine fishes'.

Discards

The discards of the black scabbardfish fishery from 1950-2010 were estimated at 2,700 t, contributing around 4% of the total unreported catches of Madeira within its EEZ (Figure 3). The discards varied between 12 t·year⁻¹ and 100 t·year⁻¹, and were dominated by lantern sharks (Etmopteridae, 65%) and Baird's slickhead (*Alepocephalus bairdii*, 12%; Table 3).

Total reconstructed catches

The total reconstructed catches estimated for the Madeiran fisheries within its EEZ were around 460,000 t, adding 16% to the official landing statistics of approximately 395,000 tonnes. Total reconstructed catches increased from 2,500 t·year⁻¹ in the early 1950s to a first peak of almost 8,000 t in 1977, followed by a decline to 4,700 t in 1981. Catches then increased to a second peak of 15,000 t in 1995 before declining and stabilizing at 7,800 t·year⁻¹ from 1999-2009, and then declining once more to 5,400 t in 2010. The contribution of the industrial, artisanal, subsistence and recreational sectors towards total reconstructed catches were 67%, 24%, 4% and 4%, respectively (Figure 4; Appendix Table A1).

The reconstructed catch was dominated by black scabbardfish (26%), bigeye tuna (25%), blue jack mackerel (12%), skipjack tuna (11%), and Atlantic mackerel (10%; Figure 5; Appendix Table A2).

DISCUSSION

The total reconstructed marine catch for the Madeiran EEZ waters for the period 1950–2010 was estimated at 460,000 tonnes, which was 16% greater than the reported landings in official statistics of 395,000 tonnes. This low added percentage is due to the limited amount of literature available on Madeiran fisheries, which restricted the catch reconstruction. This also required us to rely extensively on data from the neighboring Portuguese archipelago, Azores, for each IUU fishery components (e.g., baitfish for pole-and-line tuna fishery, subsistence, and recreational). Many improvements could be made and we suggest researchers to work towards optimizing historical catch estimates for all fishery components. For example, estimates of by-catch and unreported target landings in the black scabbard fish fisheries, baitfish in the tuna pole-and-line fisheries, or unreported recreational fishery catches, especially from the big game fishing fleet could be improved upon by developing observer programs or obtaining survey data on the number of tourists coming to the islands for big game fishing, number of trips and retained catches.

As the most dominant species in the total reconstructed catches, black scabbardfish is the most important resource exploited in the Madeira archipelago since the 19th century, and an important part of the diet of Madeiran people. Their annual landings increased since the 1980s (Figure 5) as the vertical drop-lines were replaced by horizontal drifting long-lines (Reis *et al.* 2011). However, catches have shown a distinct decline in recent years, which may be a sign of concern.

Tuna have also been an important resource in Madeira, with bigeye tuna and skipjack tuna contributing 25% and 11% of the total reconstructed catches from 1950-2010, respectively. Since they make up such a large percentage of catch, the trends during 1950-1970s, and the 1980s are largely due to these species. The low value in the 1980s was due to limited availability of tuna stocks in local waters, not reflecting their overall abundance (ICCAT 2000). Also, the decrease in the number of fishers engaging in the tuna fishery in the 1980s, who switched to non-tuna fisheries, could have been a cause or result of the trend.

ACKNOWLEDGMENTS

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Table 1. Subsistence and recreational catches (t) of Madeira islands calculated using the subsistence and recreational *per capita* catch rates estimated from the Azores (Pham *et al.* in press).

Year	<u>Azores</u>		Population	<u>Madeira</u>	
	Subsistence (t·person ⁻¹ ·year ⁻¹)	Recreational (t·person ⁻¹ ·year ⁻¹)		Subsistence (t)	Recreational (t)
1950	0.0012	0.0001	267,000	329	22
1960	0.0014	0.0003	268,900	378	94
1970	0.0015	0.0011	251,100	376	280
1980	0.0015	0.0017	252,645	388	441
1990	0.0012	0.0022	253,160	315	565
2000	0.0004	0.0012	245,830	88	288
2010	0.0005	0.0016	265,645	127	425

Table 2. Discards of the black scabbardfish fishery in Madeira from 1950-2010.

Year	Reported landings (t)	Discards (t)
1950	512	12
1960	1,146	26
1970	953	21
1980	1,153	26
1990	2,857	64
2000	4,203	95
2010	1,860	42

Table 3. Taxonomic composition applied to the discards of black scabbardfish fishery. Percentage data derived through assumption-based consideration of Bordalo-Machado *et al.* (2009).

Scientific Name	Common Name	Discard (%)
<i>Alepocephalus bairdii</i>	Baird's slickhead	12
<i>Etmopterus</i>	Lantern sharks	65
Anguilliformes	Eels and morays	8
Marine fishes nei	Marine fishes	14

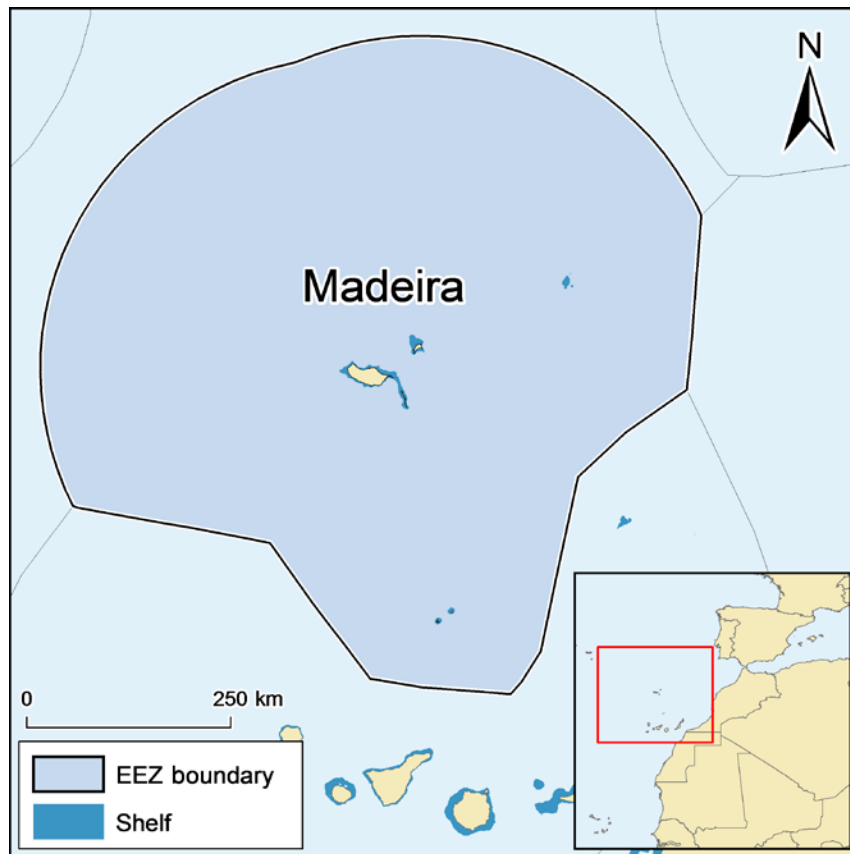


Figure 1. Map of Madeira and its Exclusive Economic Zone (EEZ).

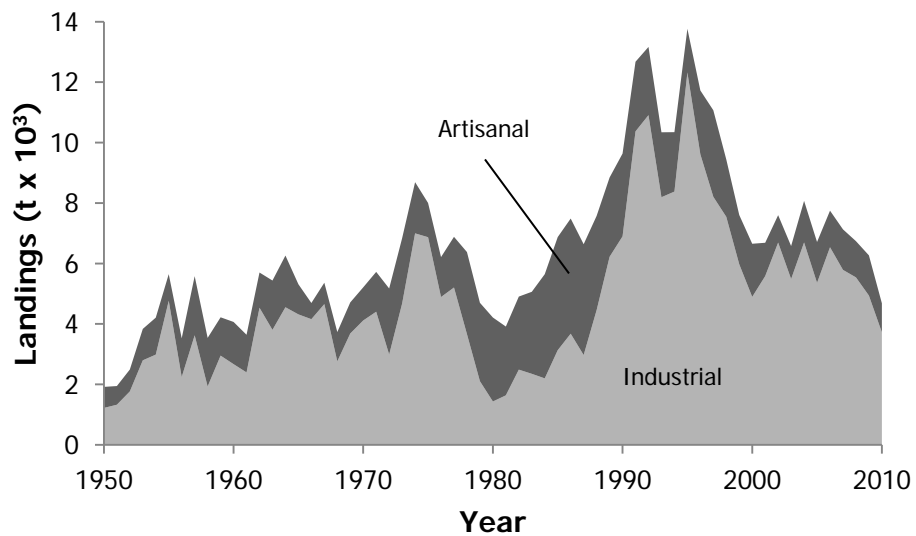


Figure 2. Commercial landings of Madeira within its EEZ reported in official statistics from 1950-2010. Industrial landings include tunas and black scabbardfishes.

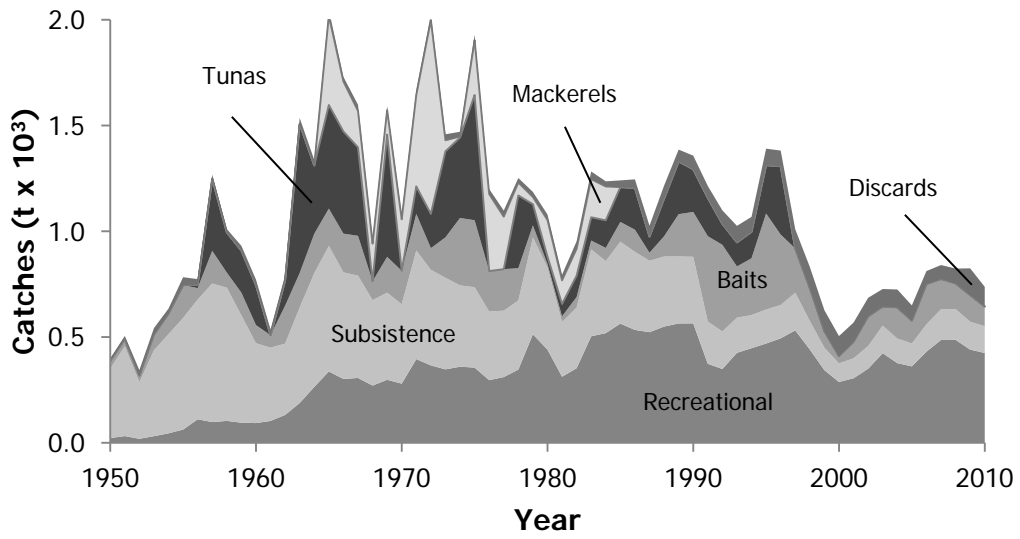


Figure 3. The IUU and discards of Madeira within its EEZ from 1950-2010.

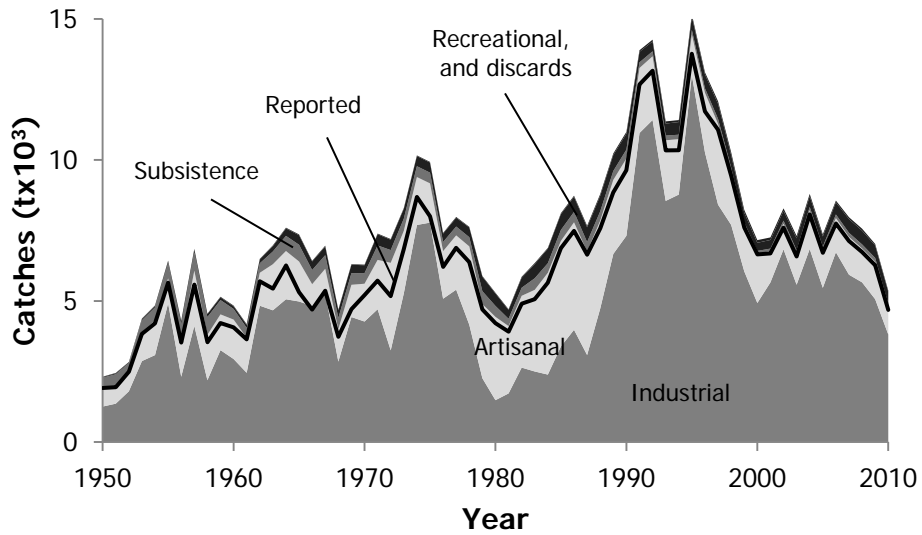


Figure 4. The total reconstructed catches of Madeira within its EEZ by sectors with reported landings from 1950-2010 overlaid as solid line.

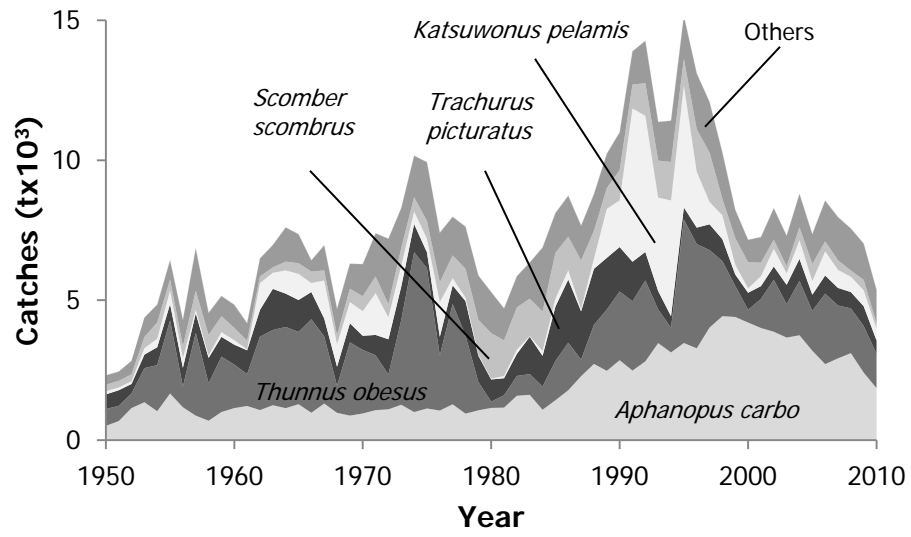


Figure 5. The total reconstructed catches of Madeira within its EEZ, 1950-2010, by major taxa. 'Others' consist of 48 additional taxonomic entities.

Appendix Table A1. FAO landings vs reconstructed total catch (in tonnes), and catch by sector with discards shown separately for the Madeiran EEZ, 1950-2010.

Year	FAO landings	Reconstructed total catch	Industrial	Artisanal	Subsistence	Recreational	Discards
1950	1,916	2,320	1,260	696	329	22	12
1951	1,944	2,450	1,360	618	425	32	15
1952	2,491	2,840	1,800	725	268	19	26
1953	3,835	4,380	2,870	1,040	406	32	31
1954	4,208	4,840	3,080	1,224	469	45	23
1955	5,648	6,430	4,920	882	528	63	38
1956	3,524	4,300	2,310	1,281	566	111	26
1957	5,581	6,850	4,120	1,957	655	98	20
1958	3,538	4,550	2,190	1,608	630	104	16
1959	4,219	5,150	3,260	1,268	507	95	23
1960	4,066	4,840	2,940	1,397	378	94	26
1961	3,641	4,180	2,450	1,246	347	104	27
1962	5,701	6,490	4,830	1,167	337	132	24
1963	5,436	6,970	4,670	1,633	452	188	28
1964	6,263	7,600	5,060	1,711	537	265	26
1965	5,313	7,360	4,980	1,418	594	337	29
1966	4,693	6,420	4,820	772	504	302	22
1967	5,363	6,960	5,260	878	484	307	29
1968	3,731	4,690	2,850	1,148	404	271	22
1969	4,712	6,300	4,430	1,144	412	298	20
1970	5,211	6,290	4,270	1,340	376	280	21
1971	5,722	7,390	4,710	1,750	513	396	24
1972	5,173	7,200	3,250	3,103	452	366	25
1973	6,837	8,300	5,270	2,214	433	347	28
1974	8,691	10,160	7,700	1,699	384	360	23
1975	8,003	9,930	7,780	1,392	380	356	25
1976	6,212	7,410	5,080	1,686	324	297	24
1977	6,882	7,980	5,400	1,925	314	311	29
1978	6,378	7,630	4,160	2,777	326	346	21
1979	4,699	5,890	2,260	2,629	458	513	24
1980	4,212	5,290	1,480	2,952	388	441	26
1981	3,913	4,710	1,720	2,388	259	313	26
1982	4,905	5,860	2,640	2,545	286	353	36
1983	5,063	6,350	2,500	2,894	411	504	36
1984	5,646	6,880	2,390	3,608	341	519	24
1985	6,874	8,110	3,390	3,744	387	564	32
1986	7,487	8,730	3,980	3,811	369	534	40
1987	6,638	7,660	3,080	3,668	338	523	51
1988	7,575	8,790	4,730	3,118	331	550	61
1989	8,845	10,230	6,670	2,624	317	565	56
1990	9,638	11,000	7,310	2,740	315	565	64
1991	12,677	13,890	10,960	2,305	200	374	56
1992	13,167	14,270	11,420	2,258	177	349	63
1993	10,342	11,370	8,550	2,149	166	426	78
1994	10,346	11,410	8,770	1,966	157	447	71
1995	13,767	15,160	13,000	1,445	161	470	78
1996	11,726	13,110	10,270	2,113	158	494	74
1997	11,071	12,080	8,420	2,864	178	532	91
1998	9,442	10,270	7,700	1,898	135	441	100
1999	7,605	8,230	6,050	1,631	106	344	99
2000	6,653	7,160	4,930	1,759	88	288	95
2001	6,686	7,250	5,660	1,104	94	306	90
2002	7,599	8,280	6,830	907	107	350	87
2003	6,578	7,300	5,580	1,092	130	424	82
2004	8,072	8,800	6,840	1,376	116	377	84
2005	6,711	7,360	5,470	1,352	108	362	72
2006	7,748	8,560	6,730	1,210	129	431	61
2007	7,129	7,970	5,930	1,341	145	486	66
2008	6,739	7,560	5,660	1,199	146	487	70
2009	6,269	7,020	5,060	1,331	132	441	54
2010	4,683	5,370	3,810	963	127	425	42

Appendix Table A2. Reconstructed total catch (in tonnes) by major taxa for Madeira, 1950-2010. 'Others' contain 49 additional taxonomic categories.

Year	<i>Aphanopus carbo</i>	<i>Thunnus obesus</i>	<i>Trachurus picturatus</i>	<i>Katsuwonus pelamis</i>	<i>Scomber scombrus</i>	Others
1950	512	598	526	111	233	336
1951	681	545	557	101	233	332
1952	1,147	522	340	97	248	482
1953	1,356	1,217	484	225	402	693
1954	1,034	1,646	640	304	578	641
1955	1,667	2,615	577	483	395	694
1956	1,175	739	671	345	425	942
1957	878	2,958	697	129	678	1,509
1958	695	1,340	905	86	734	789
1959	1,006	1,977	709	167	566	726
1960	1,146	1,554	713	158	444	823
1961	1,221	1,139	850	34	309	624
1962	1,075	2,621	960	958	238	641
1963	1,249	2,686	1,471	573	195	798
1964	1,144	2,901	1,191	830	311	1,224
1965	1,284	2,583	1,141	933	383	1,036
1966	980	3,337	976	321	408	402
1967	1,308	2,396	643	1,359	359	896
1968	977	969	677	802	324	946
1969	878	2,615	683	758	477	894
1970	953	2,273	504	879	533	1,148
1971	1,073	1,959	728	1,491	596	1,543
1972	1,102	1,244	1,260	781	470	2,340
1973	1,264	3,031	1,197	750	628	1,427
1974	1,004	5,708	1,009	446	516	1,479
1975	1,132	5,008	569	491	629	2,103
1976	1,059	1,964	669	1,243	709	1,768
1977	1,281	3,583	665	255	816	1,380
1978	949	2,791	1,228	129	1,024	1,509
1979	1,066	1,015	939	39	1,243	1,584
1980	1,153	224	791	30	1,625	1,469
1981	1,163	439	612	77	1,276	1,141
1982	1,587	708	791	152	1,508	1,113
1983	1,620	741	1,333	21	1,340	1,291
1984	1,086	831	1,096	174	1,404	2,291
1985	1,426	1,403	1,944	285	1,633	1,423
1986	1,782	1,699	2,259	329	1,204	1,460
1987	2,287	593	1,723	79	1,740	1,243
1988	2,724	1,395	2,003	357	1,001	1,310
1989	2,477	2,189	1,848	1,751	741	1,226
1990	2,857	2,455	1,588	1,666	1,078	1,352
1991	2,486	2,475	1,415	5,475	854	1,187
1992	2,814	2,891	1,020	4,862	1,166	1,513
1993	3,468	1,200	661	3,336	1,323	1,380
1994	3,135	881	412	4,136	1,377	1,474
1995	3,471	4,412	432	4,357	953	1,533
1996	3,282	3,723	589	2,000	1,513	2,001
1997	4,024	2,767	922	797	1,767	1,805
1998	4,430	1,964	785	852	586	1,656
1999	4,402	1,107	408	345	959	1,010
2000	4,203	455	609	155	935	801
2001	4,008	1,036	460	354	484	912
2002	3,873	1,856	475	634	323	1,123
2003	3,665	1,198	688	409	254	1,090
2004	3,748	1,941	786	663	466	1,192
2005	3,195	1,425	578	486	614	1,063
2006	2,717	2,516	652	859	360	1,457
2007	2,922	1,887	630	644	342	1,544
2008	3,109	1,600	582	546	224	1,502
2009	2,413	1,662	711	568	371	1,296
2010	1,860	1,225	477	418	195	1,195