Reconstruction of total marine fisheries catches for Montserrat (1950–2010)[1]

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Abstract

Consistent and reliable island-wide fisheries data collection is a challenge for many Caribbean countries. This report presents the reconstruction of total marine fisheries catches by Montserrat for the 1950-2010 time period, which includes officially reported landings and an estimate for unreported catch from the small-scale fisheries sector. Total domestic fisheries catches for the period 1950-2010, were estimated to be approximately 13,300 tonnes, which is 3 times the official landings of 4,288 t reported to FAO on behalf of Montserrat. Small-scale fisheries play an important role in meeting the dietary demands of locals and visitors alike. More complete time series data on total marine landings will enable fisheries managers to make critical evaluations of fisheries and their supporting resources.

Introduction

Montserrat is a little known island in the Lesser Antilles group in the eastern Caribbean, located between Antigua and Guadeloupe at 16° 45' N 62° 12' W (Figure 1). Montserrat has a land area of 138 km² and an Exclusive Economic Zone (EEZ) of nearly 7,600 km² (www.seaaroundus.org). Montserrat was originally populated by Carib Indians, but by the time Christopher Columbus visited in 1493, the island was uninhabited (Kozleski 2004). Over a century later, in 1632, Montserrat came under British control, when anti-Catholic violence in neighbouring Nevis forced a group of Irish slaves to seek refuge (Kravtchenko and Fergus 2005). African slaves were then shipped in to work the sugar plantations from around the mid 1600s. The island was fought over by the French and the British during the 1700s, but today Montserrat remains a British Overseas Territory in the Caribbean and has a rare mix of Anglo-Irish and African cultures (Kravtchenko and Fergus 2005).

On September 17, 1989, Hurricane Hugo struck, damaging most of the island and its infrastructure (Berke and Wenger 1991). Hurricanes are not the only major environmental disaster impacting the island. Due to volcanic eruptions at the Soufriere Hills Volcano from 1995 until 2010, Montserrat's environment and population have undergone profound transformations (Blouet 2007; Ponteen 2010). In 1995, the Soufriere Hills volcano erupted, causing widespread damage. Half of the residents had to be evacuated to either England, USA, or a neighbouring island such as Antigua and Barbados. The coastline has been re-shaped by the volcano's path and several pyroclastic flows have extended the eastern coastline by approximately 1.6 km (Ponteen 2010). About two-thirds of the island, including the former capital of Plymouth, is uninhabitable. A 2011 census (www.gov.ms) revealed that 4,922 people reside on Montserrat in the remaining habitable land space.

Montserrat has a small economy that is based mainly on agriculture, construction and tourism (Vidaeus 1970). Fisheries (often administered under the Department of Agriculture) are essential to island communities of the Caribbean, and Montserrat is no exception. Montserrat's small-scale, open-access fisheries target primarily reef and pelagic species. The sector is mainly artisanal, with some subsistence practices and a small sports-fishing sector. In the mid-1980s, a total of 200 artisanal fishers

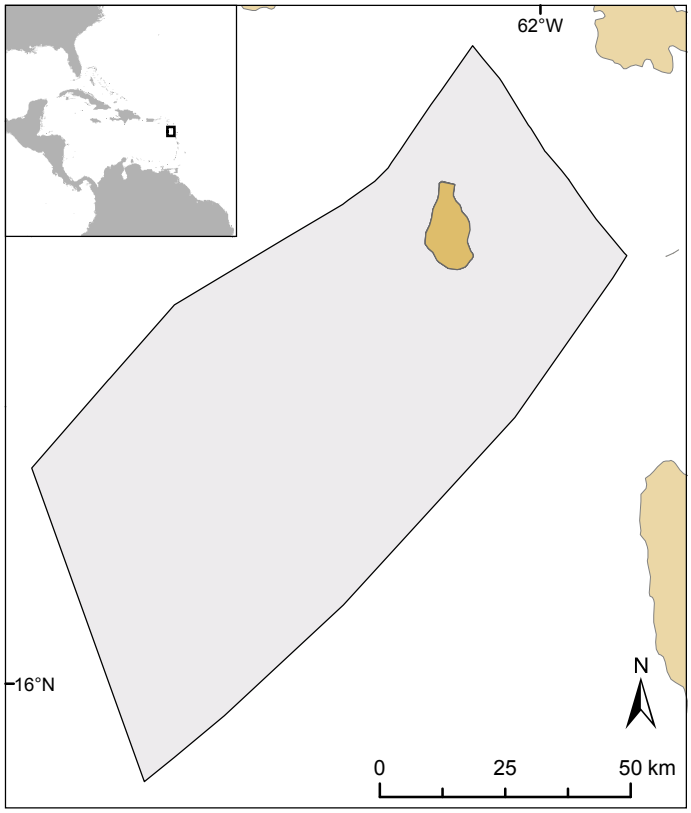

Figure 1. Map of Montserrat and its Exclusive Economic Zone.

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(Goodwin *et al.* 1985) were operating 80 fishing boats (motorised, wooden dories 4-8 m in length; Jeffers 1984). Today, there are 150 fishers operating 38 motorised fishing boats. None of these vessels are registered, although efforts are presently underway to establish a boat registry for the island (Ponteen 2010). Furthermore, foreign fishers, from Guadeloupe and Martinique, are known to be active in the waters of Montserrat (Mahon *et al.* 1988).

Montserrat fishers typically operate on a part-time basis and have alternative livelihoods in sectors such as tourism, agriculture and construction (Vidaeus 1970). Fishers target demersal, reef and pelagic species using a variety of gears including fish pots, beach seines, lines and gillnets (Ponteen 2010). Red hind (*Epinephelus guttatus*) and queen triggerfish (*Balistes vetula*) are two commercially important species landed in Montserrat (CRFM 2010). Needlefish (Belonidae), known locally as "gar", are also important coastal pelagics targeted, along with wahoo (*Acanthocybium solandri*), dolphin fish (*Coryphaena hippurus*), bonito (*Sarda sarda*) and various tunas such as albacore (*Thunnus alalunga*; Ponteen 2010).

As is the case in many Caribbean islands, demand for seafood often exceeds supply on the island, thus Montserrat is heavily reliant on imported seafood products (Vidaeus 1970; Jeffers 1984; Ponteen 2010). Dried salted smoked fish, in particular cod, make up the bulk of historical imports with around 61 t·year^{-1} imported in 1967 and 1968 (Vidaeus 1970). At present, imported frozen fish, crustaceans (i.e., shrimp) and molluscs (i.e., conch), average 46 t·year^{-1} (product weight; Ponteen 2010). Still, despite a heavy reliance on imported seafood, catches from Montserrat's EEZ are an important food source for the island's population of locals and visiting tourists.

Local catches are processed and sold directly by the fishers themselves either on the beach, in the villages (Jeffers 1984), or direct to the hotels and restaurants (Alwyn Ponteen, pers. obs.). There is no middleman and there is no formal fishmarket in Montserrat (the 1995 volcanic eruption destroyed several landing sites and the market in Plymouth). Fishers presently have an informal arrangement with the Port Authority to use their commercial jetty in Carr's Bay for landing their catches (Ponteen 2010). There is no export market for fish caught in Montserrat.

Fisheries data collection in Montserrat began sometime before 1976 (Jeffers 1984). More recently, Montserrat joined the Caribbean Regional Fisheries Mechanism (CRFM) and has been submitting catch and effort data to the CRFM's electronic database, Carafis, since 1997. Collectors monitor the main landing site on weekdays until 4 PM (Alwyn Ponteen, pers. obs.). Due to the inconsistencies in data collection, catch statistics in Montserrat are deficient. These discrepancies have been acknowledged by the Fisheries Division of Montserrat, which is working with CRFM to make improvements to their data collection system. Montserrat did not report any fishery statistics to the FAO for the years between 2003 and 2009 (Luca Garibaldi, pers. comm., FAO), which highlights the need for improved capacity and communication.

A review of all available fisheries literature on Montserrat was undertaken, along with data accessed from the Fisheries Division in order to (1) provide an improved estimate of total marine fisheries catches for Montserrat for the time period 1950-2010, and (2) improve the taxonomic breakdown of the catch.

Methods

The fishing activities in the Montserratian EEZ have been reported by Vidaeus (1970), Giudicelli (1978), Jeffers (1984), Goodwin *et al.* (1985), Mahon *et al.* (1988), Luckhurst and Marshalleck (1995) and Ponteen (2010). Using details on data collection methods from these sources, we estimated unreported catches from the small-scale sector by applying a raising factor to the FAO reported landings data from 1950-2010. Carafis data allowed us to improve on the taxonomic resolution of the reconstructed catches. We also reconstructed the tourist seafood demand, using data on stop-over arrivals combined with seafood consumption rates. Due to a lack of data, no estimate of sport-fishing or foreign fishing was undertaken at the time of this study.

Table 1. Fisheries data collection methods in Montserrat.

Source	Data collection methods
Vidaeus (1970)	Landings recorded daily at 9 sites: Isles Bay, Carr's Bay, Little Bay, Bunkum Bay, Wapping Bay, Plymouth, Kinsale, North Bay, Trant's Bay, South Bay and Old Road
Mahon *et al.* (1988)	Information on catch per trip by species or group is collected at Plymouth
Ponteen (2010)	Data collection is only carried out at the main fishing area (Carr's Bay) and only on weekdays until 4 PM

Local and tourist population

Local population data were taken from Populstat (www.populstat.info), which were available for the majority of the 1950-2010 time period of the study. Linear interpolation was used in years where population data were missing (Figure 2a). Data on the number of stop-over tourists (i.e., travelers who stay on island for more than a day) were available from the Caribbean Tourism Organisation (www.onecaribbean.org/). Data were available from 1980-2008, although it was assumed that tourism began in 1950. Using linear interpolation we derived an entire time series of the number of stop-over tourists visiting Montserrat from 1950-2010 (Figure 2b).

Small-scale catches

Fisheries data collection in Montserrat has fluctuated over the study period 1950-2010 (Table 1). Prior to 1995, Plymouth was the main landing site. However, this area was destroyed by the volcanic eruptions and presently Carr's Bay-Little Bay is the main landing site and the only one monitored routinely (Ponteen 2010). Thus, unreported fisheries catches are expected throughout the time period of the study. Using information on the number of boats at landing sites in Montserrat as surveyed by Mahon *et al.* (1988; Table 2), we derived a ratio of total boats to monitored boats (i.e., 67/24). As the data utilized were collected prior to 1995, Plymouth was still the main landing site at that time and we took it to be the only monitored site. We assumed that the ratio of total boats to monitored boats would be an appropriate representation of the ratio of total catches to reported catches prior to 1989.

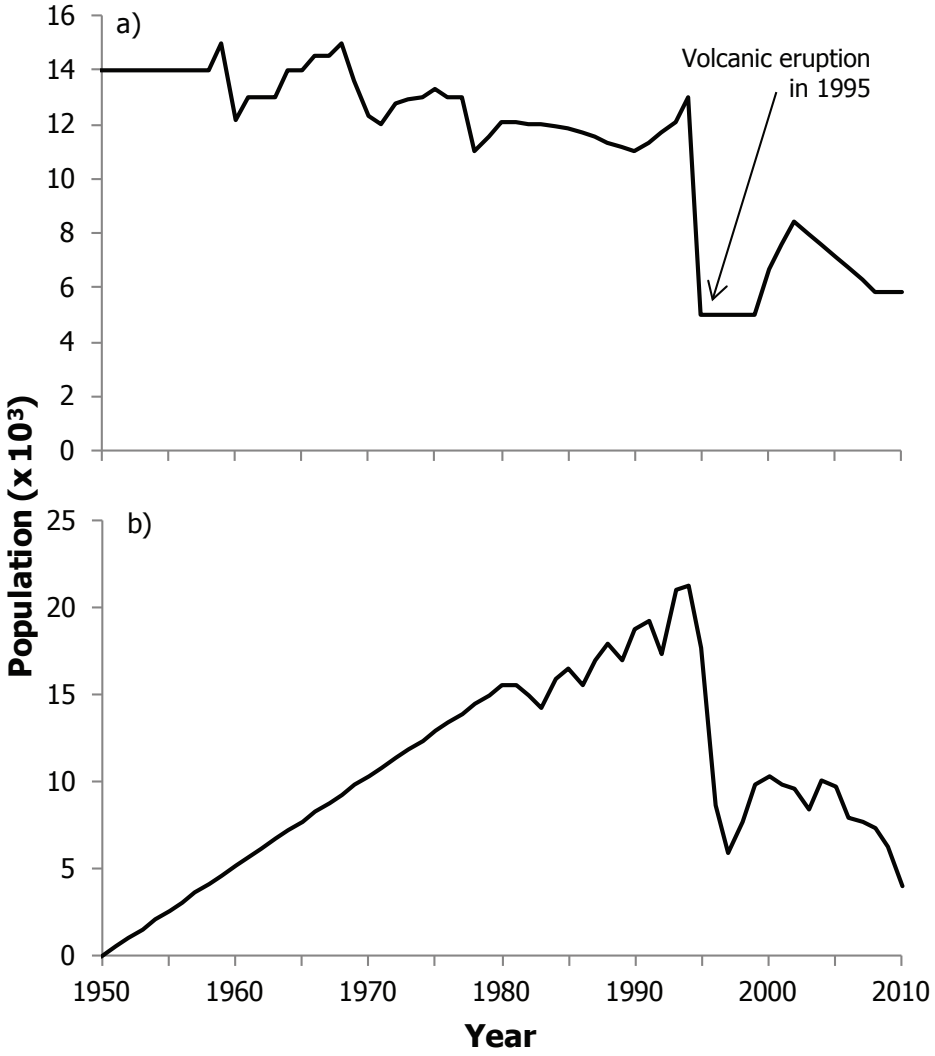

Figure 2. Population statistics of Montserrat, 1950-2010, for (a) total local Montserratian population and (b) stop-over tourist population.

Reported landings for Montserrat were obtained for 1950-2010 from the FAO FishStatJ database (FAO 2012) and for 1997-2011 from the national fisheries division. The two sources of catch data were not comparable in any years, with national data being significantly lower than the FAO reported landings. We had to assume that the FAO had additional information about catches and thus we used the FAO data as our baseline. FAO catch data for Montserrat are essentially flat-lining from 1950-1972 (Figure 3). Thus we considered the more variable data from 1974-1982 as more reliable; and we applied a raising factor of 2.8 (or 67/24, Table 2) to the FAO reported catches for 1974-1982. Combining catch estimates with annual population figures from the corresponding period, we obtained an average *per capita* catch rate of 21 kg·person^{-1}·year^{-1}. Applying this rate constantly to local population data, we derived a complete time series of small-scale catches destined for local consumption in Montserrat for the period 1950-1989.

According to the Montserrat Fisheries Division, catches submitted to CRFM by Montserrat refer only to those landed in Carr's Bay-Little Bay. Meanwhile, two other well-established landing sites exist on the west coast of the island, namely Old Road and Bunkum Bay. It is estimated that around 25% of catches are not recorded since data collectors do not work on the weekends or on weekdays after 4 PM and collectors do not visit Old Road Bay or Bunkum Bay (A. Ponteen, pers. obs.). Thus, for the time period of 1990-2010, we added 25% to FAO reported catches, and estimated total small-scale catches.

We assumed that catches consist of a combination of artisanal and subsistence catches. To assign catches to artisanal and subsistence sectors, it was assumed that in 1950, 80% of catches were from the subsistence sector and 20% were from the artisanal sector. In 2010, 20% of catches were attributed to the subsistence sector and 80% to the artisanal sector. A linear interpolation was done between these two years to derive a complete time-series for the period 1950-2010.

Table 2. Number of boats at landing points in Montserrat, based on Mahon *et al.* (1988).

Landing Area	Total boats
Plymouth	24
Old Road Bay	13
Bunkum Bay	6
Carr's Bay	12
Little Bay	3
German Bay	2
Kinsale	7
Sugar Bay	0
Total	67

Catches satisfying tourist demand

In many parts of the world fishers have regular customers, such as hoteliers and restaurateurs, whom they supply directly with fresh seafood catches. In Montserrat, these catches are often taken directly to the customer without ever passing through a monitored landing site (Alwyn Ponteen, pers. obs.). Therefore, seafood supplying the tourist market was reconstructed separately. Annual tourist population data were combined with data on the average length of stay, which was approximately 7 days according to the Ministry of Tourism. This was taken together with inferences about the frequency of seafood consumption (i.e., one serving of seafood *per* day), and typical serving proportion size (250 g). It was thus determined that tourist seafood demand equals the number of tourists weeks, times the average serving size, times the number of servings per week. In this way, we were able to reconstruct small-scale catches provided directly to the tourist market from 1950 to 2010.

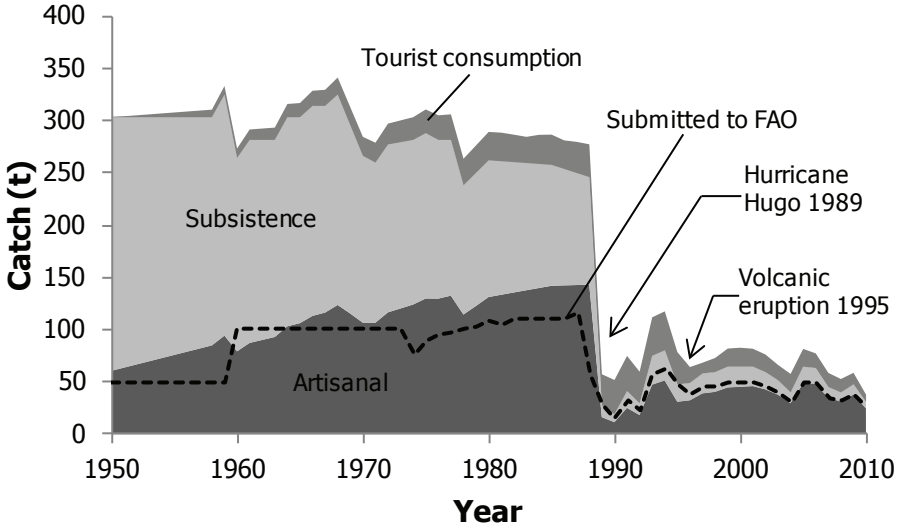

Figure 3. Reconstructed total fisheries catches for Montserrat, 1950-2010, delineating catches for tourist and domestic markets, compared to reported landings submitted to FAO.

Taxonomic composition of catches

Electronic Carafis catch data for Montserrat from 1997-2011 were retrieved and analyzed. Data submitted by Montserrat to the FAO were presented in one taxonomic category, "marine fishes nei", whereas national catch data submitted to CRFM from 1997-2011 provided a breakdown for 160 species from 45 different families. Taking the average proportion of each species from the total catch over the period 1997-2000, we applied this breakdown to the reconstructed catches from 1950-1996. For the 1997-2010 time period, we accepted the annual breakdowns as presented in the Carafis dataset.

Results

Reconstructed catch estimates suggest that landing data submitted to the FAO on behalf of Montserrat are incomplete and lack taxonomic detail. Overall, the 1950-2010 total catch for Montserrat was estimated at 13,263 t, which is 3 times the reported landings supplied to the FAO for the same time period of 4,288 t (Figure 3). Total unreported catches from 1950-2010 were 8,975 t and were on average 147 t·year^{-1}. The drastic decline in catches in 1989 was due to the damage caused by Hurricane Hugo, and again in 1995, when a violent volcanic eruption occurred at Mt. Soufriere Hills. Thus, no obvious unreported catches occurred during these disasters and FAO landings data were accepted for these two years. Catches supplying tourists were estimated at 1,092 t for the period 1950-2010. Average annual catch of 18 t·year^{-1} have supplied this "foreign" sector for the past 6 decades.

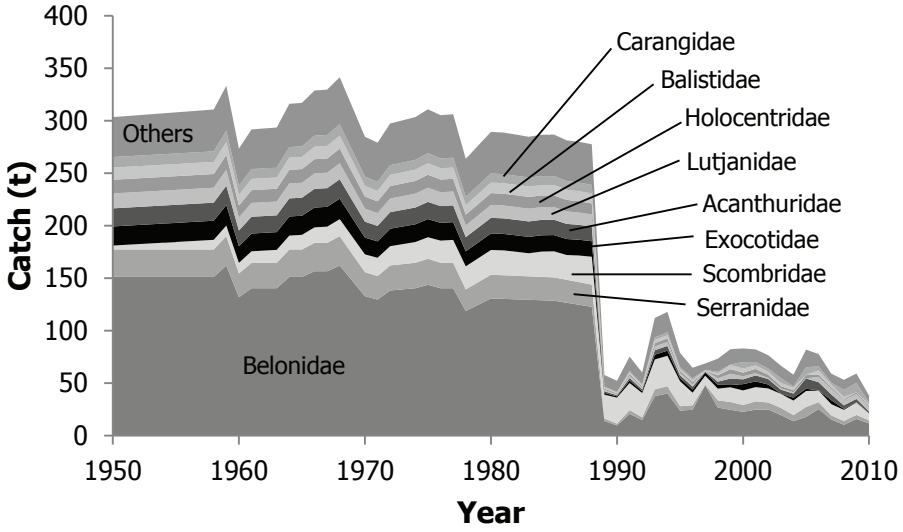

Figure 4. Taxonomic composition of catches for Montserrat, 1950-2010. "Others" contains 36 families of marine species including sharks, lobsters, conch and a miscellaneous marine fishes category.

Montserrat's catches were dominated by pelagic species (Figure 4). Needlefishes (Belonidae; 45%), various scombrids (Scombridae; 7%) as well as flyingfish (Exocotidae; 5%) were important. Reef fish and

demersal species targeted included groupers and hinds (Serranidae; 8%), as well as surgeonfish (Acanthuridae; 5%), such as blue tang (*Acanthurus coeruleus*) and doctorfish (*Acanthurus chirurgus*). Other reef families targeted include snappers (Lutjanidae; 4%), squirrelfishes (Holocentridae; 4%), triggerfishes (Balistidae; 4%) and jacks (Carangidae; 3%). The 'others' category, presented here for simplicity, made up the remaining 14% of catches and consisted of 36 families of marine species, including grunts (Haemulidae), parrotfish (Scaridae), sharks (Carcharhinidae), as well as a miscellaneous marine fish category.

Discussion

National catch data reported by the Montserrat fisheries division (1997-2011) were significantly lower than the data submitted to the FAO on behalf of Montserrat. Given that national catch data are collected only at 1 of 3 main landing sites on the island and that Montserrat had not reported landings to the FAO for the majority of the last decade (2003-2009), we used FAO catch data as a baseline for this study.

Fishing is essential to island communities of the Caribbean, and Montserrat is no exception. Like many Caribbean islands, Montserrat is heavily reliant on imported fish, predominantly salted cod from Canada. Even so, the importance of locally caught marine species has been understated (Vidaeus 1970). Local catches are substantially higher than what is being reported to international agencies, and contribute significantly to the food security of local Montserratians. Our total reconstructed catch for Montserrat's marine fisheries for the period 1950-2010 was estimated to be approximately 15,307 tonnes, which is 3.6 times the official reported landings of 4,288 t as presented by FAO on behalf of Montserrat. The difference can be attributed to underreporting of small-scale fisheries, from the subsistence and artisanal fishing sectors, which is due to the method of data collection that presently only monitors one out of three major landing sites. Island-wide data collection is necessary, and historical data are important for fisheries managers to have a complete picture of the status of fisheries and their supporting resources, and to evaluate whether increases in effort will be counterproductive (Pauly 1998).

Furthermore, the tourism sector generates considerable demand for fresh seafood at hotels and restaurants. This is evident as small-scale catches supplying stop-over tourists totaled 1,092 t for the period 1950-2010. This may seem insignificant; however, it represents 8% of the total reconstructed small-scale catches for the island. Thus, the impact of tourists on small islands with limited local food sources should be something that resource managers consider carefully.

Catches submitted to the FAO on behalf of Montserrat were presented in one highly aggregated category, "marine fishes nei". Reconstructed catches were disaggregated into 45 families, which is a major improvement over the reported data. Whilst Montserrat did submit annual catch data to the FAO in 2010, no taxonomic detail was provided. This may be due to the lack of incentive fisheries managers have to change the method in which they fill out the FAO questionnaires annually.

Both Vidaeus (1970) and Mahon *et al.* (1988) have made reference to some un-quantified element of foreign fishing. However, data on their effort and landings were not available. Therefore, this study focused on domestic catches within the waters of Montserrat. Due to limited catch and effort data, a reconstruction of the sports fishing sector was also not undertaken here. Therefore, total marine extractions from Montserrat waters, are likely higher than the total reconstructed estimates suggested in this study.

Acknowledgements

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Appendix Table A1. FAO landings vs. total reconstructed catch (in tonnes), and catch by sector, for Montserrat, 1950-2010.

Year	FAO landings	Total reconstructed catch	Subsistence	Artisanal[1]
1950	50	303	242.8	61
1951	50	304	239.7	65
1952	50	305	236.7	69
1953	50	306	233.7	73
1954	50	307	230.6	76
1955	50	308	227.6	80
1956	50	309	224.6	84
1957	50	310	221.5	88
1958	50	311	218.5	92
1959	50	333	230.8	102
1960	100	273	185.1	88
1961	100	292	194.4	97
1962	100	293	191.6	101
1963	100	294	188.8	105
1964	100	316	200.3	116
1965	100	317	197.2	120
1966	100	329	201.1	128
1967	100	330	198.0	132
1968	100	341	201.6	140
1969	100	313	180.5	133
1970	100	285	160.0	125
1971	100	279	153.5	126
1972	100	297	160.9	136
1973	100	300	159.4	141
1974	77	303	157.8	146
1975	89	311	158.6	152
1976	95	305	152.2	153
1977	98	306	149.3	157
1978	100	264	124.0	140
1979	102	277	127.7	149
1980	109	289	131.1	158
1981	104	289	128.1	161
1982	111	287	125.1	162
1983	110	285	122.0	163
1984	110	287	119.0	168
1985	110	287	116.1	171
1986	110	281	111.8	170
1987	117	280	107.6	172
1988	58	278	103.4	174
1989	28	58	11.5	46
1990	15	52	7.8	44
1991	32	75	16.2	59
1992	23	60	11.4	49
1993	58	112	27.9	84
1994	62	118	29.0	89
1995	48	79	16.8	62
1996	38	65	16.8	48
1997	45	69	19.3	49
1998	46	73	19.1	54
1999	50	82	20.2	62
2000	50	83	19.5	64
2001	50	82	18.9	63
2002	46	77	16.7	60
2003	40	67	14.0	53
2004	31	58	10.5	48
2005	50	82	16.3	66
2006	49	78	15.3	62
2007	35	59	10.5	49
2008	31	53	8.9	44
2009	37	59	10.1	49
2010	24	38	6.2	32

[1] Artisanal includes those catches caught artisanally for local consumption as well as tourist consumption.

Appendix Table A2. Total reconstructed catch (in tonnes) for Montserrat by major taxa, 1950-2010.

Year	Belonidae	Serranidae	Scombridae	Exocotidae	Acanthuridae	Lutjanidae	Holocentridae	Balistidae	Carangidae	Others[1]
1950	151	26.13	3.7	18.21	17.22	14.22	13.05	11.56	10.05	38.0
1951	151	26.13	4.4	18.21	17.22	14.22	13.05	11.56	10.05	38.3
1952	151	26.13	5.1	18.21	17.22	14.22	13.05	11.56	10.05	38.5
1953	151	26.13	5.8	18.21	17.22	14.22	13.05	11.56	10.05	38.7
1954	151	26.13	6.5	18.21	17.22	14.22	13.05	11.56	10.05	39.0
1955	151	26.13	7.1	18.21	17.22	14.22	13.05	11.56	10.05	39.2
1956	151	26.13	7.8	18.21	17.22	14.22	13.05	11.56	10.05	39.4
1957	151	26.13	8.5	18.21	17.22	14.22	13.05	11.56	10.05	39.6
1958	151	26.13	9.2	18.21	17.22	14.22	13.05	11.56	10.05	39.9
1959	162	27.99	10.1	19.51	18.45	15.24	13.98	12.39	10.77	42.8
1960	132	22.77	10.0	15.87	15.01	12.39	11.37	10.07	8.76	35.4
1961	140	24.26	10.9	16.91	15.99	13.20	12.12	10.73	9.34	37.8
1962	140	24.26	11.6	16.91	15.99	13.20	12.12	10.73	9.34	38.0
1963	140	24.26	12.3	16.91	15.99	13.20	12.12	10.73	9.34	38.3
1964	151	26.13	13.2	18.21	17.22	14.22	13.05	11.56	10.05	41.2
1965	151	26.13	13.9	18.21	17.22	14.22	13.05	11.56	10.05	41.4
1966	157	27.06	14.7	18.86	17.83	14.73	13.51	11.97	10.41	43.0
1967	157	27.06	15.4	18.86	17.83	14.73	13.51	11.97	10.41	43.2
1968	162	27.99	16.2	19.51	18.45	15.24	13.98	12.39	10.77	44.8
1969	147	25.47	16.5	17.76	16.79	13.86	12.72	11.27	9.80	41.4
1970	133	22.95	16.8	16.00	15.13	12.49	11.46	10.16	8.83	37.9
1971	130	22.39	17.4	15.61	14.76	12.19	11.18	9.91	8.62	37.4
1972	138	23.89	18.3	16.65	15.74	13.00	11.93	10.57	9.19	39.8
1973	139	24.07	19.0	16.78	15.87	13.10	12.02	10.65	9.26	40.3
1974	140	24.26	19.7	16.91	15.99	13.20	12.12	10.73	9.34	40.8
1975	144	24.82	20.5	17.30	16.36	13.51	12.40	10.98	9.55	41.8
1976	140	24.26	21.1	16.91	15.99	13.20	12.12	10.73	9.34	41.2
1977	140	24.26	21.8	16.91	15.99	13.20	12.12	10.73	9.34	41.4
1978	119	20.53	21.9	14.31	13.53	11.17	10.25	9.08	7.90	36.2
1979	125	21.55	22.7	15.03	14.21	11.73	10.77	9.54	8.29	37.9
1980	131	22.58	23.6	15.74	14.88	12.29	11.28	9.99	8.69	39.7
1981	130	22.51	23.7	15.69	14.83	12.25	11.24	9.96	8.66	39.6
1982	130	22.43	22.9	15.64	14.78	12.21	11.20	9.93	8.63	39.2
1983	129	22.36	22.0	15.59	14.73	12.17	11.17	9.89	8.60	38.8
1984	129	22.28	24.1	15.53	14.69	12.13	11.13	9.86	8.57	39.4
1985	129	22.21	24.8	15.48	14.64	12.09	11.09	9.83	8.55	39.6
1986	127	21.87	23.6	15.25	14.42	11.90	10.92	9.68	8.42	38.7
1987	125	21.54	25.4	15.01	14.19	11.72	10.76	9.53	8.29	38.8
1988	123	21.20	26.5	14.78	13.97	11.54	10.59	9.38	8.16	38.7
1989	14	2.41	22.7	1.68	1.59	1.31	1.20	1.07	0.93	10.9
1990	10	1.68	24.8	1.17	1.11	0.91	0.84	0.74	0.65	10.6
1991	21	3.58	25.8	2.50	2.36	1.95	1.79	1.58	1.38	13.6
1992	15	2.57	23.1	1.79	1.70	1.40	1.29	1.14	0.99	11.3
1993	38	6.49	28.5	4.53	4.28	3.53	3.24	2.87	2.50	18.6
1994	40	6.94	28.9	4.84	4.57	3.78	3.47	3.07	2.67	19.4
1995	24	4.13	23.8	2.88	2.72	2.25	2.06	1.83	1.59	13.8
1996	25	4.25	12.0	2.97	2.80	2.31	2.12	1.88	1.64	10.0
1997	48	0.82	8.4	3.14	0.71	1.09	0.16	0.00	0.28	6.2
1998	27	6.88	11.2	3.67	2.99	3.16	2.83	1.93	1.58	12.4
1999	25	7.44	14.0	2.17	6.12	4.62	4.41	3.94	0.47	14.5
2000	23	6.55	13.8	5.95	4.60	2.92	3.52	3.87	6.11	13.1
2001	25	7.87	13.6	5.47	5.67	2.17	4.08	3.34	3.22	12.0
2002	25	6.73	13.4	3.72	5.22	0.96	3.17	2.94	2.96	12.7
2003	20	6.81	13.3	0.14	3.90	1.12	2.18	3.08	4.53	11.9
2004	14	5.87	13.8	2.77	3.89	1.26	1.96	2.55	1.01	11.2
2005	18	9.46	15.2	2.19	9.80	0.19	3.00	0.22	7.28	16.8
2006	25	6.53	11.0	0.10	7.87	4.93	2.31	4.09	3.78	11.7
2007	15	4.00	10.7	3.77	5.53	5.47	1.46	2.55	1.68	8.6
2008	10	3.67	10.6	0.93	3.32	5.30	0.97	1.69	6.79	9.6
2009	16	3.92	11.8	0.31	3.12	4.70	1.53	0.05	8.96	8.9
2010	12	2.88	6.5	0.09	1.80	3.94	1.34	1.70	1.42	6.7

[1] Others category includes 36 other taxa.