

Summarized reported commercial landings in Puerto Rico from 1969-2001 with specific notes on the Silk Snapper landings category

by

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Background

Commercial fisheries removals have occurred in Puerto Rico since as early as the late 1800's however, detailed records documenting fishing activities, levels of removals, and information on fishing effort is not available prior to the early 1970's. Early investigators reported that fishing for a livelihood was not occurring and that sport fishing was absent in Puerto Rico at least in the early 1900's (Wilcox 1899, 1900, Jarvis 1932). The first scientific investigations by U.S. scientists to Puerto Rico were conducted in 1899, soon after Puerto Rico was acquired from Spain, under the sponsorship of the United States Fish Commission. These early research trips were conducted mainly for the purposes of documenting imported fishery products and carrying out ichthyological surveys (Wilcox 1900 and Evermann and Marsh 1899,1900; Gray 1900 (as cited by USGS 2002)). Nichols (1929) also conducted ichthyological studies in Puerto Rico under the sponsorship of the Puerto Rico government and The New York Academy of Sciences, describing additional species overlooked by earlier researchers. More recent ichthyological surveys were done by Erdman (1956) in 1944-1946 and Randall (1963) in 1958. Some other research excursions took place in Puerto Rico prior to U.S. scientific studies (e.g., Plee in 1820, Gundlach (1881) in 1873 and 1875-76 and Stahl (1883) however these were primarily limited to ichthyological studies (see Anonymous 1969, USGS 2002).

Jarvis (1932), also under the sponsorship of the U.S. Department of Commerce, Bureau of Fisheries, conducted a detailed survey in 1931 of the marketing and economic aspects of the fisheries and was one of the earliest to document Puerto Rico's commercial fishery. Jarvis described fishing methods, number of fishermen and number of boats operating, number of different gear being used (nets, pots, lines, etc.) and provided comprehensive descriptions on the regional differences of Puerto Rico's fisheries.

Jarvis (1932) described in detail the topography of Puerto Rico coasts (Figure 1) and described unique features that possibly affected the local fisheries production and this information is presented in an abridged form here. Off the northern coast of Puerto Rico, the 100- fathom curve occurs offshore 1 to 2 miles along the coast, offshore of which the bottom drops rapidly to depths of 667 to 1,409 fathoms. Commercial fishing along this portion of the coast is conducted very close to the shore. Many months are not conducive to fishing due to adverse weather. The amount of fishable area off the northern coast (i.e., the total area of bottom area from the coastline to the 100 fm curve is about 66,639 hectares. The southern coast (Yeguas Point on the southeast to Cape Rojo on the southwest), also characterized by the bottom dropping deeply within a short distance of the shore, historically has been thought to offer more suitable nearshore habitat than the north coast for the local fisheries. Features that make the southern coast more suitable for fishing operations include less exposure to storms thus the use of fish pots is more conducive on the south coast than on the north, the coastline is somewhat less abrupt in the droppoff, and the presence of cays and sandy beaches on the southern coast where the use of beach seines is possible. The amount of fishable area off the southern coast is about 123,660 hectares. Puerto Rico's fishing area off the western coast, about 124,347 hectares, continues from Point Agujereada on the northwest to Cape Rojo on the southwest. The coast is markedly short in distance, about 1/3 the length of either the northern or southern coast.

The western coast however has historically been the center of major production, at least in part due to the larger amount of total fishable area. The coastline continues some six or so miles offshore at depths of 10-15 fathoms and further offshore good habitat has been reported at depths ranging from 100 to 200 fathoms exist. Also, off the western coast of Puerto Rico lie several banks off where good fishing was reported historically, and the presence of two islands - Desecheo and Mona, 10 miles and 20 miles respectively offshore. The eastern coast continues from Cape San Juan on the north to Point Yeguas on the south, also includes the islands of Vieques and Culebra 14 and 11 miles offshore. The eastern coast fishing grounds, about 269,304 hectares, are rather shallow, not more than about 40 fathoms deep continuing from the coastline to the territorial waters of the Virgin Islands. Jarvis (1932) noted that if one considered the entire area off of Puerto Rico's eastern coast, the U.S. and British Virgin Isles, in addition to Anegada Island, Kingfish and Barracuda Banks, the possible fishable area off Puerto Rico's eastern coast was quite sizable, nearly 1500 square miles thus providing an extensive opportunity for possible increase in fisheries production from this area. The latter objective, evaluating the possibility of increasing production, was apparently a primary objective which lead to some of the early Puerto Rican fisheries descriptions from the late 1890's through the 1930's.

This document provides summarized information on the historical commercial landings in Puerto Rico as provided through published annual reports of the Puerto Rico (PR), Department of Natural Environmental Resources (DNER), Fisheries Research Laboratory (FRL). Prior to 1967 fishery status reports were provided by the Estado Libre Asociado, De Puerto Rico, Department of Agricultura, Laboratorio De Pesqueria Comercial. Since 1967 statistics on commercial fisheries in Puerto Rico have been collected under the Fisheries Statistics Program (FSP) on landings and commercial fisherman activities under the NOAA, NMFS State-Federal Cooperative Statistics Program. Since 1984 the Puerto Rico DNER, FRL, FSP program has also collected data on biostatistical samples from commercial fisheries. In response to a request for scientific information on the status of the deep water snapper fisheries by the Caribbean Fishery Management Council (CFMC), this report provides historical information on the silk snapper commercial landings category and on total reported commercial landings from the published annual reports. This information will be used in developing required analytical databases of commercial landings statistics for analyses by the Deep Water Snapper Southeast Data and Assessment Workshop (SEDAR).

Available Information and Historical Trends

Annual or fishery status reports were available for most years since 1969's for summarizing total reported commercial landings of all fish and shellfish. Some information existed for a few years prior to 1969 (1930, 1946). Total reported commercial landings of all fish and shellfish ranged from 2.0 million pounds (1992) to 7.2 million pounds (1979) and averaged 3.8 million pounds from 1969 through 2000 (Figure 2). Of the total reported fish and shellfish combined landings the percentage of fish landings varied from 70% (1979) to 100 % (1981) of the total commercial landings and averaged 85% over the period. Over the 30 year period, 1971 through 2000, reported commercial landings of the silk snapper category ranged from 115,000

pounds to 546,000 pounds and averaged about 10% of the total reported commercial fish landings in Puerto Rico. Apparently the landings category defined as 'silk snapper' comprises the actual reported landings of several snapper species including silk snapper, blackfin snapper, queen snapper and wenchman until 1997 (Aida Rosario personal communication). Over the period 1971-2000, the total combined fish and shellfish landings show declines beginning around 1979 continuing through 1993. Over the same period of time, 1971-2000, the percentage of fish of the total reported commercial fish and shellfish combined landings remained relatively constant, and the percentage of the silk snapper category landings of the total reported fish landings remained about 10%.

Historical reported commercial landings of combined fish and shellfish by region are shown in Figure 3 and for fish only by region in Figure 4. Reported commercial landings from the west coast were highest over this period, 1971 through 2001, followed by reported landings on the south coast and then the east. The trend of landings by region was consistent over the entire time period, 1971 through 2001 and is not surprising when the amount of total possible fishing area of each region is considered.

Reported commercial landings of silk snapper category by gear and region are shown in Figures 5 and Figure 6 as presented in the annual reports of PR DNER, FRL, FSP. Values were missing from several years. Most of the reported landings of silk snapper were from hand lines and fish pots. Other gears catching silk snapper included beach seines and gillnets but in general these do not comprise a significant amount of the total silk snapper category landed. Over the period, landings from hand lines and fish pots averaged 98 % of the total reported silk snapper landings category. Reported landings of silk snapper category from fish pots and hand lines show a sharp decline from 1983. Landings from the primary gear catching the silk snapper category, hand lines, show more variability than did reported landings from fish pots. The majority of the reported silk snapper category landings occurred on the west coast of Puerto Rico. Landings from 1969 through 1982 showed much more fluctuation than the latter years. Large declines in silk snapper landings occurred in 1983.

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Table 1.

Calendar Year	Thousands of pounds of fish and shellfish and silk snapper category.							
	All*1000	All	Fish *1000	Total Fish	%fish	Silk *1000	Total Silk Pounds	Percent Silk of Total
1930	3080	3080100						
1946			3276	3276000				
1969						115.4	115400	
1970								
1971	3881	3881000	3305	3305000	0.851585	247	247000	0.074735
1972	3681	3681000	3109	3109000	0.844607	388	388000	0.124799
1973	3422	3422000	2916	2916000	0.852133	255	255000	0.087449
1974	3527	3527000	3034	3034000	0.860221	266	266000	0.087673
1975	4010	4010000	3433	3433000	0.85611	478	478000	0.139237
1976								
1977	5077	5077000	4315	4315000	0.849911	369	369000	0.085516
1978	6412	6412000	5511	5511000	0.859482	546	546000	0.099075
1979	7212	7212000	5028	5028000	0.697171			
1980	6668	6668000	5609	5609000	0.841182			
1981	5906	5906000	5144	5144000	0.870979	464	464000	0.090202
1982	5420	5420000	4650	4650000	0.857934	612	612000	0.131613
1983	5806	5806000	4733	4733000	0.815191	396.399	396399	0.083752
1984	3155	3155000	2543	2543000	0.806022	357.235	357235	0.140478
1985	2840	2840000	2302	2302000	0.810563	372.474	372474	0.161805
1986	2665	2665000	2225	2225000	0.834897	391.77	391770	0.176076
1987	2150	2150000	1825	1825000	0.848837	210.111	210111	0.115129
1988	2075	2075000	2075	2075000	1	176.196	176196	0.084914
1989	2305	2305000	2305	2305000	1	247.684	247684	0.107455
1990	2187	2187000	1881	1881000	0.860082	176.822	176822	0.094004
1991								
1992	2045	2045000	1778	1778000	0.869438	208.085	208085	0.117033
1993	2509	2509000	2148	2148000	0.856118	244.26	244260	0.113715
1994								
1995	3709	3709000	3174	3174000	0.855756	363.811	363811	0.114622
1996	3617	3617000	3028	3028000	0.837158	312.535	312535	0.103215
1997	3896	3896000	3317	3317000	0.851386	285.907	285907	0.086194
1998	3503	3503000	2867	2867000	0.818441	278.396	278396	0.097104

1999	3337	3337000	2735	2735000	0.819598	226.008	226008	0.082635
2000	3363	3363000	2743	2743000	0.815641	189.829	189829	0.069205
Table 1 continued								
2001						291.722	291722	
2002								
average		3865851.85		3249370	0.849646			0.106705

Source of information: Puerto Rico DNR, FRL, FSP annual statistical reports. Copies of reports on file with NMFS, SEFSC, SFD

Table 2. Reported commercial landings of fish and shellfish in Puerto Rico, 1969 through 2001, by region.

Calendar Year	Thousands of Pounds											
	North	North	South	South	East	East	West	West	Total	Total	Total	
	All	Shellfish	All	Shellfish	All	Shellfish	All	Shellfish	All	Shellfish	Fish	
1969												
1970												
1971	405	112	446	75	1390	154	1640	235	3881	576	3305	
1972	301	84	431	80	1321	154	1628	254	3681	572	3109	
1973	255	54	556	91	844	102	1767	259	3422	506	2916	
1974	210	33	689	107	604	62	2024	291	3527	493	3034	
1975	335	30	832	124	586	78	2257	345	4010	577	3433	
1976											0	
1977	500	24	1155	171	1114	173	2308	394	5077	762	4315	
1978	656	18	1728	284	1225	219	2803	380	6412	901	5511	
1979	619	130	1975	767	1219	285	3399	1002	7212	2184	5028	
1980	685	50	1487	251	1298	168	3198	590	6668	1059	5609	
1981	547	55	1689	190	903	117	2767	400	5906	762	5144	
1982	501	29	1278	232	700	149	2941	360	5420	770	4650	
1983	417	23	941	202	518	95	3930	753	5806	1073	4733	
1984	327	17	684	140	350	75	1794	380	3155	612	2543	
1985	317	13	603	130	452	105	1468	290	2840	538	2302	
1986	320	13	561	117	443	82	1341	228	2665	440	2225	
1987	351	9	415	82	355	56	1029	178	2150	325	1825	
1988	235		438		342		1060		2075		2075	
1989	198		589		378		1140		2305		2305	
1990	194	8	612	122	283	37	1098	139	2187	306	1881	
1991											0	
1992	312	13	511	123	268	38	954	93	2045	267	1778	
1993	275	12	598	135	388	48	1248	166	2509	361	2148	
1994											0	
1995	559	20	1078	218	686	102	1386	195	3709	535	3174	
1996	384	27	1149	232	677	133	1407	197	3617	589	3028	
1997	481	21	1227	217	730	132	1458	209	3896	579	3317	

1998	437	24	1077	208	619	131	1370	273	3503	636	2867
1999	425	23	1092	215	650	129	1170	235	3337	602	2735

Table 2
Continued

2000	342	16	1302	217	685	177	1034	210	3363	620	2743
2001											
2002											

Source of information: Puerto Rico DNR, FRL, FSP annual statistical reports. Copies of reports on file with NMFS, SEFSC, SFD

Table 3. Silk snapper category landings by gear.

Calendar Year	Reported Silk Snapper Landings in (Thousands of Pounds) by Gear Category													Total
	Beach Seine	Fish Pot	Lobster Pot	Gill Net	Hand Line	Troll Line	Trot Line	Cast Net	Dive and Spear	By Hand	Rod and Reel	Longline	Other	
1971		100316				230084							0	330400
1972		131000				259000							0	390000
1973		82000				172000							0	254000
1974		90000				176000							0	266000
1975		50000				428000							0	478000
1976														
1977		61000				308000							0	369000
1978		84000				462600							0	546600
1979														
1980														
1981														
1982														
1983	1231	291984	0	2348	99969	0	0	153	306			497	956	396488
1984	739	273266	0	2200	80499	0	0	0	531				531	357235
1985	1036	136228	0	3605	231200	0	0	82	0			323	405	372474
1986	450	41916	0	1877	346880	0	1	0	0			637	638	391761
1987	0	39177	0	1665	164496	0	0	200	0			2802	3002	208340
1988	206	26389	0	928	147766	0	0	0	732			175	907	176196
1989	65	39187	0	3752	202602	0	0	0	413			1665	2078	247684
1990	170	29894	0	112	144535	0	0	0	803	1268			2071	176782
1991														
1992	0	55702	0	0	152245	0	0	0	0	0	0	138	138	208085
1993	0	54589	0	0	189292	0	0	0	0	0	0	379	379	244260
1994	0	115717	0	0	220632	0	0	0	0	0	0	1814	1814	338163
1995	0	56136	0	0	306274	0	0	0	0	0	1401	0	1401	363811
1996	0	47827	0	0	264708	0	0	0	0	0	0	0	0	312535
1997	0	47150	0	0	238757	0	0	0	0	0	0	0	0	285907
1998	0	64737	0	0	195402	0	0	0	0	0	0	8257	8257	268396
1999	0	52025	0	0	171054	0	0	0	0	0	0	2929	2929	226008
2000	0	54986	0	0	114610	0	0	0	0	0	0	20233	20233	189829
2001													0	291722

Table 4. Reported commercial landings of the silk snapper category in Puerto Rico by coastal region.

Calendar Year	Reported Silk Snapper Landings in (Thousands of Pounds) by Region					Comments
	North	South	East	West	Total	
1969					115400	
1970						ND
1971	28000	1000	16000	202000	247000	
1972	73000	6000	55000	254000	388000	
1973	61000	20000	21000	153000	255000	
1974	24000	22000	20000	200000	266000	
1975	28000	55000	16000	379000	478000	
1976						ND
1977	47000	73000	18000	231000	369000	
1978	70000	97000	31000	348000	546000	
1979						ND
1980						ND
1981					464000	ND
1982					612000	ND
1983	37394	29451	10198	319356	396399	
1984	34905	32211	8975	281144	357235	
1985	38098	47677	7658	279041	372474	
1986	38138	33139	6775	313718	391770	
1987	29194	23841	10541	146535	210111	
1988	17372	14714	3418	140692	176196	
1989	30418	25114	12304	179848	247684	
1990	21235	11009	4819	139759	176822	
1991						ND
1992	51936	17108	8131	130910	208085	
1993	26642	36586	13227	167805	244260	
1994						ND
1995	64669	27861	23137	248144	363811	ND
1996	44435	35388	18605	214107	312535	ND

1997	45938	23635	9223	207111	285907
1998	44923	51101	11329	171043	278396
1999	45795	25376	13877	140960	226008
2000	33255	25980	13599	116995	189829
2001					291722
2002					ND

Source of information: Puerto Rico DNR, FRL, FSP annual statistical reports. Copies of reports on file with NMFS, SEFSC, SFD

Comments: Blanks = No information available= ND

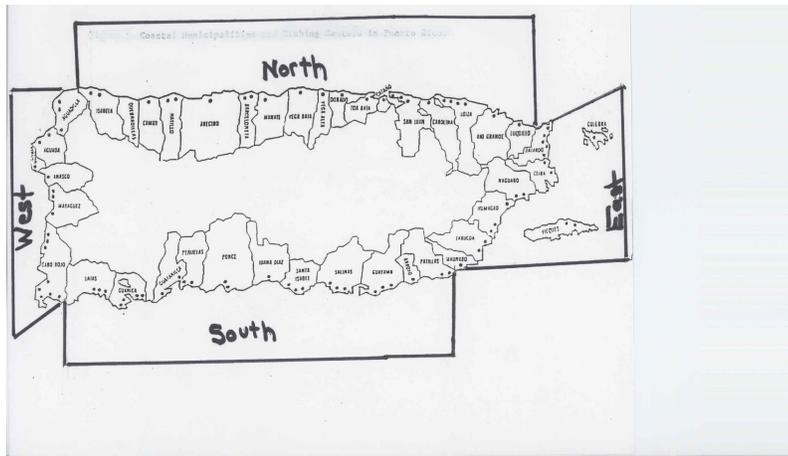


Figure 1. Map of Puerto Rico coastline

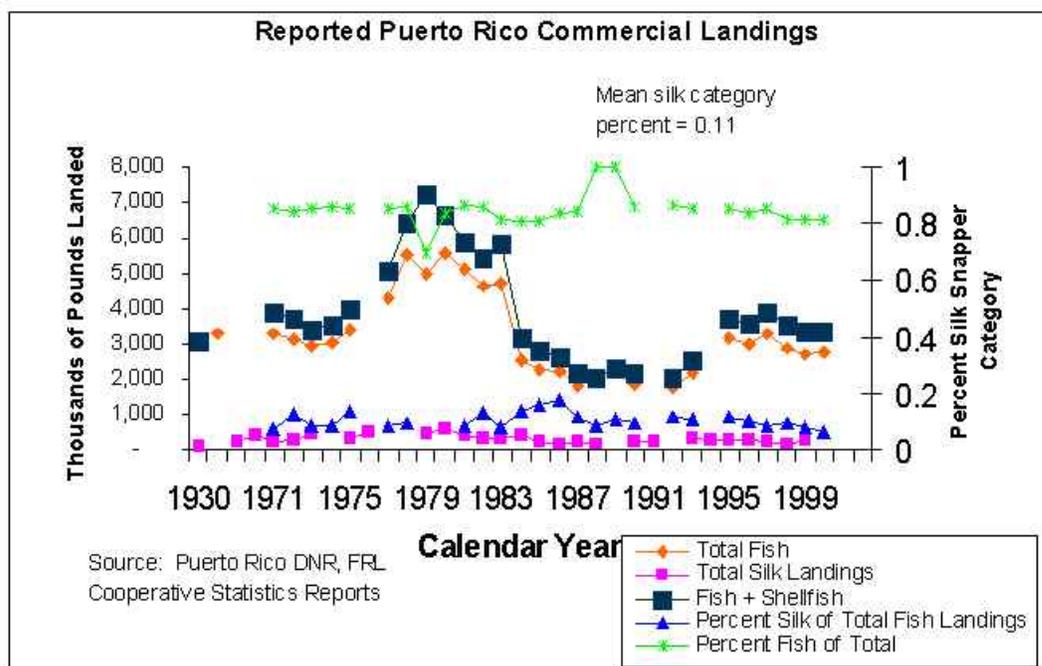


Figure 2. Historical reported commercial landings of fish and shellfish in Puerto Rico, 1930 through 2000.

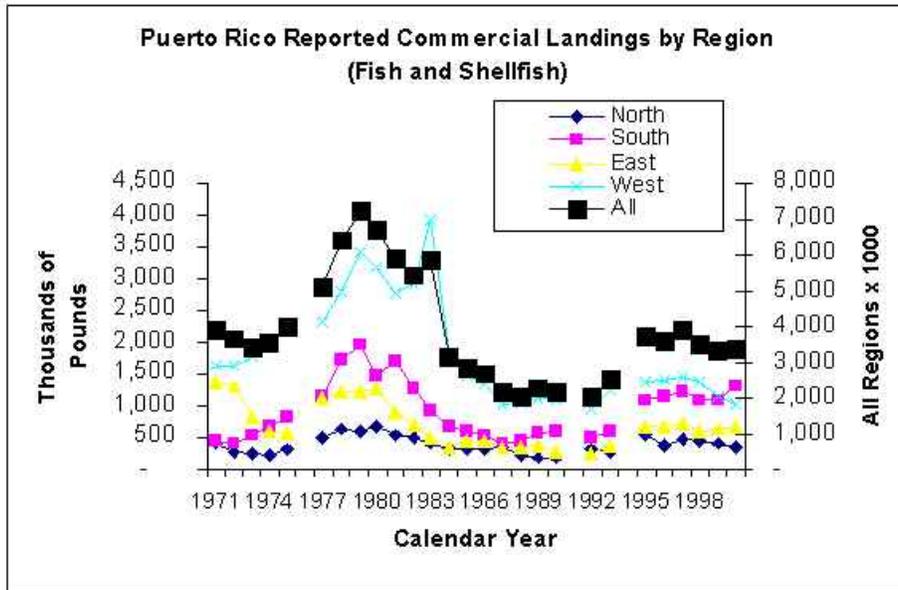


Figure 3.

Historical reported commercial landings of fish and shellfish in Puerto Rico, 1971- 2000, by region.

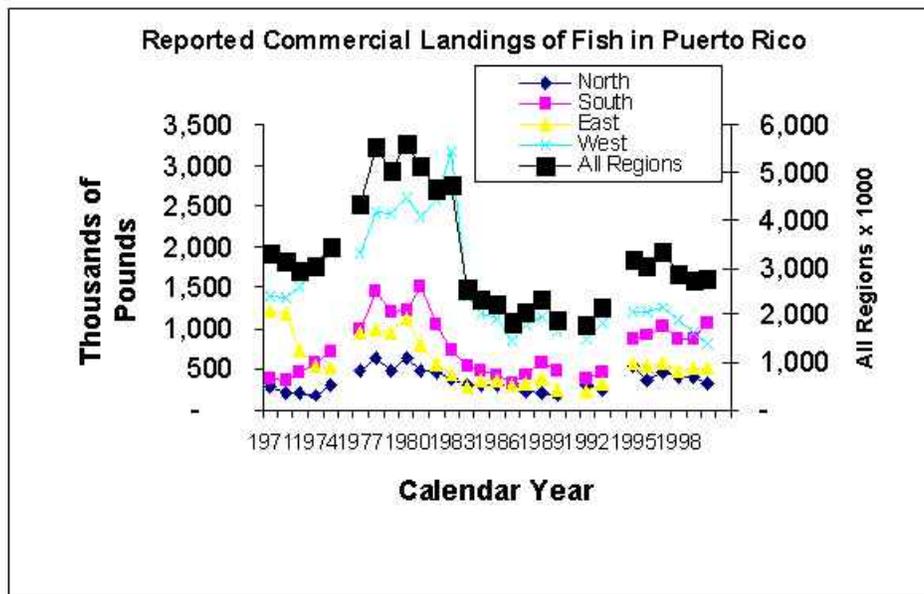


Figure 4. Historical reported commercial landings of fish in Puerto Rico, 1971-2000, by region

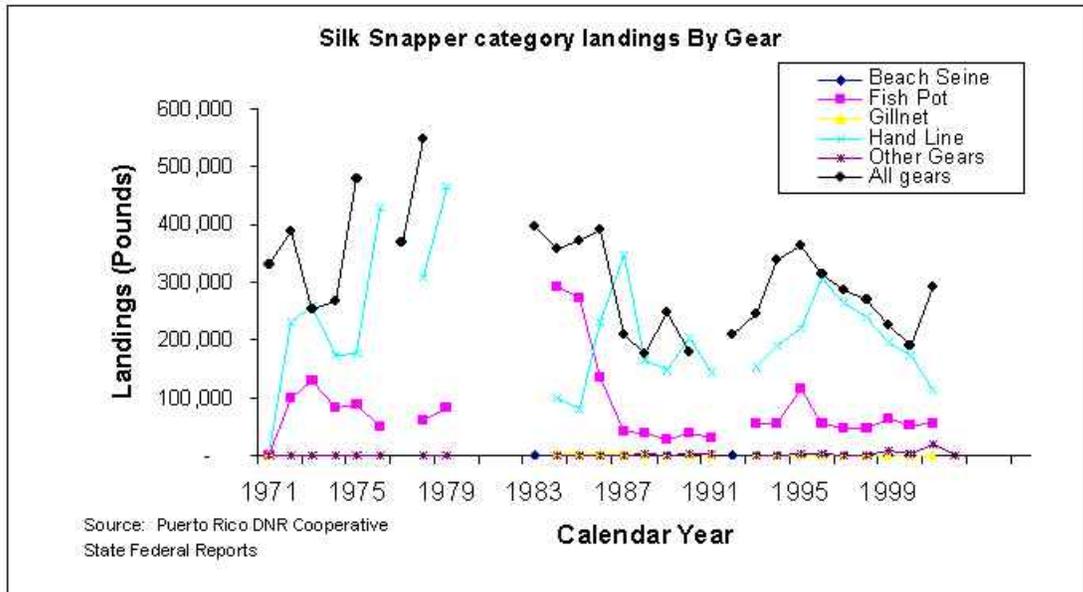
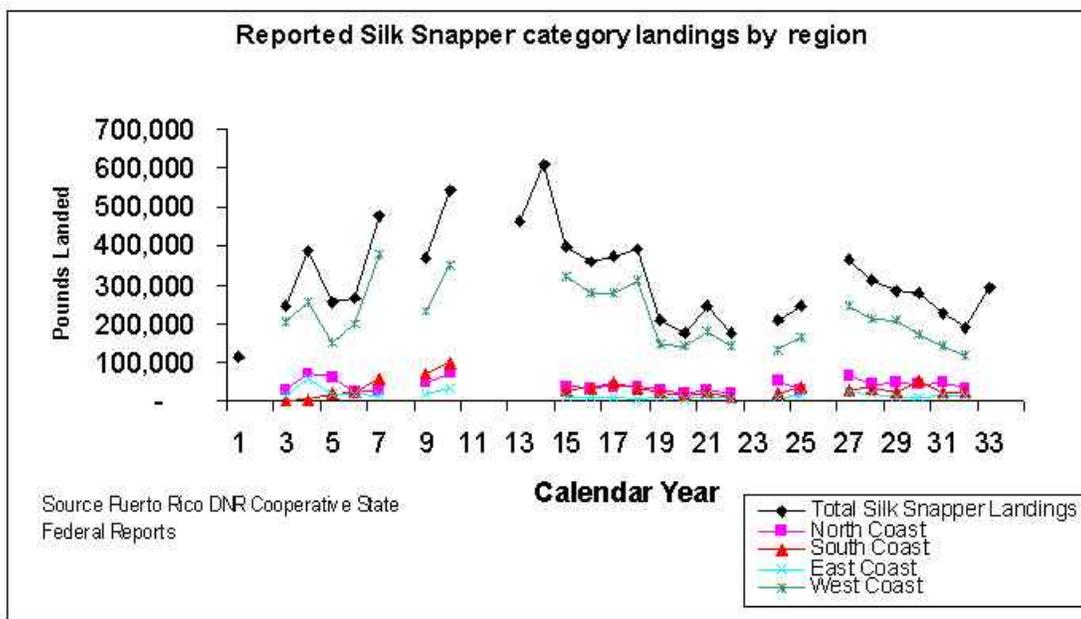


Figure 5. Reported commercial landings of silk snapper by gear, 1971 through 2001.



Reported commercial landings of silk snapper by coastal region, 1969-2001.

Figure 6.