

**Summary Information on Commercial Fishing Operations in Puerto Rico from 1969-2001  
and Reporting Rates Needed to Adjust Commercial Landings**

by

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## **Background**

Detailed information regarding commercial fishing activities in Puerto Rico documenting the number of individuals involved and number of vessels in the fishery is lacking until about 1971. Wilcox (1899,1900) reported on the local fisheries and the foreign fishery trade of Puerto Rico. Jarvis (1931) conducted a survey to document the economic and marketing aspects of the Puerto Rican Fisheries and reported detailed information on total catch, and value and described general methods and fishing gear for the most important fishing ports in Puerto Rico. The latter report recommended technological changes that would increase the local fishery production. Records of imported fishery products are more complete for early years (prior to 1930's) than are statistics for local fishery products mainly as the latter were either destroyed or lost. Statistics for imported fishery products were maintained at local business centers or custom-houses where imported fishery products were received as most major fishing ports had a custom house. Wilcox (1899,1900) reported that fishing for a livelihood was not carried on to any large extent and at that time sport fishing was non-existent. Unfortunately scant information exists to document early catch levels.

This document summarizes information on estimates of total numbers of commercial fishers and vessels operating in Puerto Rico and gives data on the sales receipts of fisheries landings reported to the Fisheries Research Laboratory (FRL) of the Puerto Rico, Department of Natural and Environmental Resources (DNER). In addition, the estimated reporting rate (fraction of total fishers reporting to FRL). In 1967 a fishery statistical monitoring program was implemented to monitor the commercial fishery landings of fish and shellfish in Puerto Rico. The program was implemented under the Commercial Fisheries Research and Development Act of 1964 (PL 88-309) to collect data on catches, landings, fisherman and vessels. In 1984 the program was extended to include the collection of biostatistical samples (e.g., length frequencies, biological samples of age and reproductive status). The program is supported currently by the National Marine Fisheries Service (NMFS) through the State/Federal Cooperative and Interjurisdictional fisheries Programs and the DNER.

### **Available Historical Data on Fishing Effort**

Reports from the Puerto Rico DNER, annually submitted to the NOAA, NMFS were reviewed to develop a time series of information regarding the Puerto Rico's commercial fishery. These reports contained summarized information on the following: the number of fisherman reporting annually, number of annual commercial sales tickets reported, number of total fishing vessels by length group, number of gear units and quantity of gear, and estimates of reporting rates of fisherman. In most years through 1996 the FRL has conducted a comprehensive census of the total number of fisherman operating in the fishery, the number of and type of vessels used, and information on the types and quantities of fishing gear in use.

The number of total fisherman and total fishing vessels operating in the commercial fishery of Puerto Rico was available for 1899, 1930 and most years since 1969 (Table 1, Figure 1). Over the period the number of fisherman has varied from 800 fishers to 1,872 reaching a

maximum in 1982. From 1969 to 1980 the total number of fisherman increased by 46 %. No strong trend is obvious after 1982. The total number of vessels has varied from 350 to 1,449 also reaching a maximum in 1982. No strong trend in the number of vessels is apparent after 1982. The annual reports were further reviewed in an attempt to stratify the number of fishing vessels by size to identify the number of vessels engaged in offshore activities directed at deep-water species. From information presented in the annual reports there was some agreement between authors that vessels about 25 feet or greater in length directed fishing effort towards deep water snappers. Identification of vessels by size group was only possible for the earliest years in the data set (Figure 2). Apparently similar information may exist for the later years which could be useful in better understanding fishing operations in Puerto Rico.

Reporting of fishing activities in Puerto Rico has for the most part been on a voluntary basis. Prior to acquisition of Puerto Rico in 1898 by the U.S. catch records under the Spanish regime were retained at the fishing port location by an official port captain who maintained detailed records on total catch, the types of boats in operation (and numbers), value of catch, etc. and apparently these records were lost or destroyed (Wilcox 1899, 1900). Similar detailed information on the local fisheries apparently was not collected between the early 1900's and 1967, except for a few years when individual surveys were done by the U.S. Department of Commerce, Bureau of Fisheries to document imports and identify changes to increase local production. Fishery catches are currently obtained through reports of sales tickets which have been reported by individual fisherman or from fishing cooperatives since about 1967 (the data base includes sales records reported to PR DNER; not all sales have been reported). The number of sales records was available only since 1971 from the annual reports (Table 2, Figure 3). Annually the number of tickets submitted ranged from 16,260 to 38,887 with information missing for 1976-1981 and for 1994-1996. Through the annual censuses conducted by the PR DNER, some information on the number of fisherman not cooperating (i.e., reporting their landings) and the number of fishermen submitting sales records has been collected by fisheries port agents. In general it is felt that the degree of cooperation (i.e., reporting) has increased over the years as reflected in Table 3 and Figure 3 after 1983. Catch reporting rates have been determined by the PR DNER FRL by port agents for use in expanding the level of catch reported on sales records and are shown in Figure 4. Over the period for which information exists to adjust sales tickets, 1971-2002, reporting rates ranged from 0.60 to 0.78.

### **References Cited**

Jarvis, Norman D. The fisheries of Puerto Rico. U.S. Dep. Commerce, Bureau of Fisheries Invest. Rpt. 13:41pp.

Kahn, Richard A. 1948. Economics of production in Puerto Rico. Proceedings of the Gulf and Caribbean Fisheries Institute. Miami Beach, August 1948. 1:34-39.

Wilcox, William A. 1899. Notes on the foreign fishery trade and local fisheries of Porto Rico. [In Investigations of the Aquatic resources and Fisheries of Porto Rico by the U.S. Fish Comm. Steamer Fish Hawk in 1899];pg 1-34..

Wilcox, William A. 1900. The fisheries and fish trade of Porto Rico. [In Investigations of the Aquatic resources and Fisheries of Porto Rico by the U.S. Fish Comm. Steamer Fish Hawk in 1899];pg 27-48.

Table 1. Total number of commercial fishermen and vessels operating in Puerto Rico based on historical documents.

Calendar Year	Total Number of Fishermen in Puerto Rico				Total	Reference	Total Number of Vessels
	Regular	Casual	Part Time	Helper			
1899					800	PR DNR Annual Report	350
1900					756	Cummings	396
1930	600				1403	PR DNR Annual Report	711
1946	1734	922			2656	Kahn 1948	900
1969	376	615			991	PR DNR Annual Report	787
1970						PR DNR Annual Report	
1971	486	508			994	PR DNR Annual Report	811
1972	469	499			968	PR DNR Annual Report	897
1973	640	287			927	PR DNR Annual Report	785
1974	935	247			1182	PR DNR Annual Report	835
1975	1059	171			1230	PR DNR Annual Report	865
1976					1230	Matos 1990	901
1977	1138	230			1368	PR DNR Annual Report	1036
1978	1299	143			1442	PR DNR Annual Report	1073
1979					1442	CFMC Document	1073
1980	913	250	284		1447	PR DNR Annual Report	1089
1981						ND	
1982	1146	359	367		1872	PR DNR Annual Report	1449
1983	871	59	151	334	1415	PR DNR Annual Report	1125
1984					1295	PR DNR Annual Report	
1985					1585	PR DNR Annual Report	
1986					1135	CFMC Document	865
1987					1731	PR DNR Annual Report	882
1988	891	5	320	515	1731	PR DNR Annual Report	1107
1989					1822	CFMC Document	1107
1990	896		200	236	1332	CFMC Document	1005
1991					1219	PR DNR Annual Report	
1992	713		274	168	1155	PR DNR Annual Report	810
1993	782		294	287	1363	PR DNR Annual Report	1084
1994					1380	CFMC Document	
1995	1262		496	201	1959	CFMC Document	1501
1996	1061		496	201	1758	PR DNR Annual Report	1501
1997						ND	
1998						ND	
1999						ND	
2000						ND	
2001						ND	
2002						ND	

Comments: ND = No Data and cells with blanks indicate no information available.

AVERAGE

1386.267

959.4231

Source of Information: PR DNR Annual Reports and as otherwise indicated in the table. Individual reports on file with the NMFS, SEFSC Sustainable Fisheries Division (SFD).

Table 2. Total Number of commercial sales records submitted annually to the PR DNR, FSP and the estimated annual fishermen reporting rate for commercial fishermen in Puerto Rico, 1969 through 2001.

<b>Puerto Rico</b>	<b>Commercial Landings</b>	<b>Total</b>
<b>Calendar</b>	<b># Sales Tickets Reported</b>	<b>Number</b>
<b>Year</b>		<b>Fishermen</b>
<b>1969</b>		<b>991</b>
1970		
1971	36505	994
1972	30551	968
1973	24776	927
1974	24875	1182
1975	25402	1230
1976		1230
1977		1368
1978		1442
1979		1442
1980		1447
1981		
1982	25755	1872
1983	31632	1415
1984	18839	1295
1985	16260	1585
1986	18175	1135
1987	18129	1731
1988	18953	1731
1989	19969	1822
1990	21770	1332
1991		1219
1992	24218	1155
1993	25303	1363
1994		1380
1995		1959
1996		1758
1997	38470	
1998	32839	
1999	35545	
2000	38887	
2001		
2002		

Comments: Blanks indicate no information available.

Source of Information: PR DNR Annual Reports and as otherwise indicated in the table. Individual reports on file with the NMFS, SEFSC Sustainable Fisheries Division (SFD).

Table 3. Summary information on the number of fishermen and reporting rate for the Puerto Rico Commercial fisheries.

Number	Calendar	Reporting	Standard	Cummings	Cummings	Reference	Comment
Fishermen	Year1	Rate	Range	Deviation	Value	Rationale	
	1969						ND
	1970						ND
994	1971						ND
968	1972	0.6			0.6	Not Changed	PR DNR Annual Report
927	1973	0.6			0.6	Not Changed	PR DNR Annual Report
1182	1974	0.6			0.6	Not Changed	PR DNR Annual Report
1230	1975	0.6			0.6	Not Changed	PR DNR Annual Report
1230	1976	0.6			0.6	Not Changed	PR DNR Annual Report
1368	1977	0.6			0.6	Not Changed	PR DNR Annual Report
1442	1978	0.68			0.68	Not Changed	Weiler and Suzrex-Caabro 1980
1442	1979	0.75			0.75	Not Changed	Calderon 1983 (Coop. SF Rpt) and Collazo and Calderon 1988
1447	1980	0.75			0.75	Not Changed	same as above
	1981	0.75			0.75	Not Changed	same as above
1872	1982	0.75			0.75	Not Changed	same as above
1415	1983	0.61			0.61	Not Changed	same as above
1295	1984	0.59	.56 to .61		0.59	Not Changed	Garcia-Moliner 1986
1585	1985	0.56			0.56	Not Changed	Garcia-Moliner 1988
1135	1986	0.75			0.75	Not Changed	Matos-Caraballo and Rivera-Alvarez, 1994.
1731	1987	0.75			0.75	Not Changed	Matos-Caraballo and Rivera-Alvarez, 1994.
1731	1988	0.56		0.19	0.56	Not Changed	Caraballo and Sadovy 1990 Tech. Rpt.
1822	1989	0.51			0.51	Not Changed	No CF factor reported by Matos and Sadovy 1990Matos and Sadovy stated that the CF for 1989 and 1990 were the same as for 1991
1332	1990	0.51			0.51	Not Changed	same as above same as above
1219	1991	0.51		0.16	0.51	Not Changed	Matos and Sadovy 1991
1155	1992	0.6		0.18	0.6	Not Changed	Matos 1993, pg. 5
1363	1993	0.6		0.18	0.6	Not Changed	Matos 1994, pg. 4
1380	1994	0.64		0.11	0.64	Not Changed	PR DNR Annual Report
1959	1995	0.71			0.71	Not Changed	Matos-Caraballo, 1998
1758	1996	0.71			0.71	Not Changed	Matos-Caraballo, 1998
	1997	0.78			0.78	Not Changed	Matos-Caraballo, 1998
	1998	0.78			0.78	Not Changed	Matos 2000 Coop. SF Rpt.
	1999				0.78	1997 value	PR DNR Annual Report

2000	0.57	0.57 Not Changed	Matos 2003, personal communication to J. Bennet and N. Cummings
2001	0.68	0.68 Not Changed	same as above
2002	0.86	0.86 Not Changed	same as above

ND= No Data Found in the literature.

Source of Information: PR DNR Annual Reports and as otherwise indicated in the table. Individual reports on file with the NMFS, SEFSC Sustainable Fisheries Division (SFD).

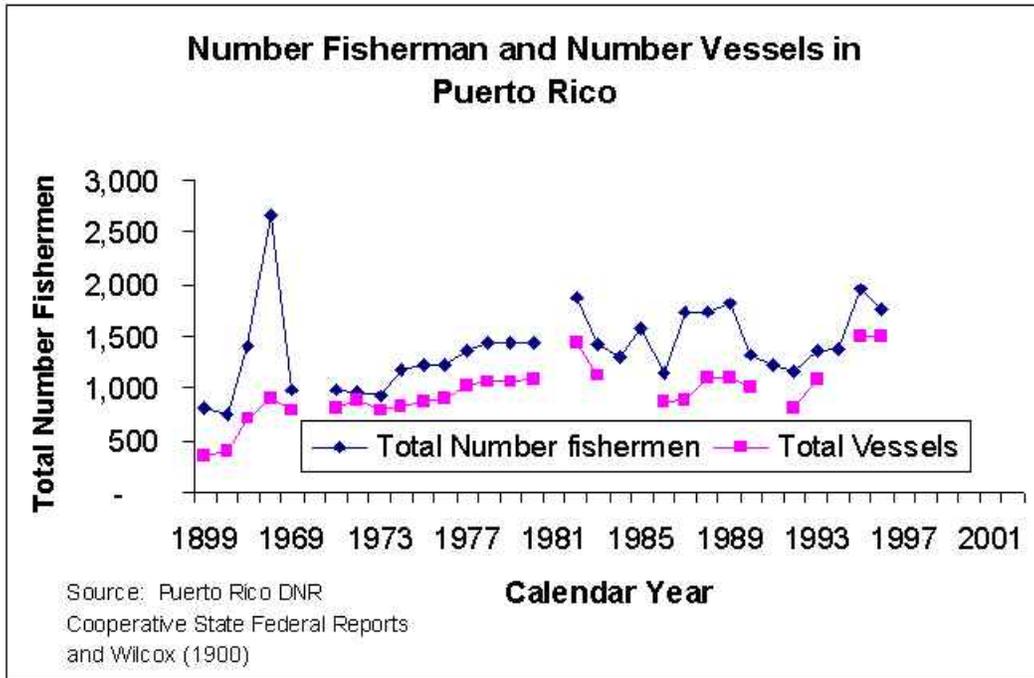


Figure 1. Total number of fishermen and vessels in the Puerto Rico fisheries from 1969-1996.

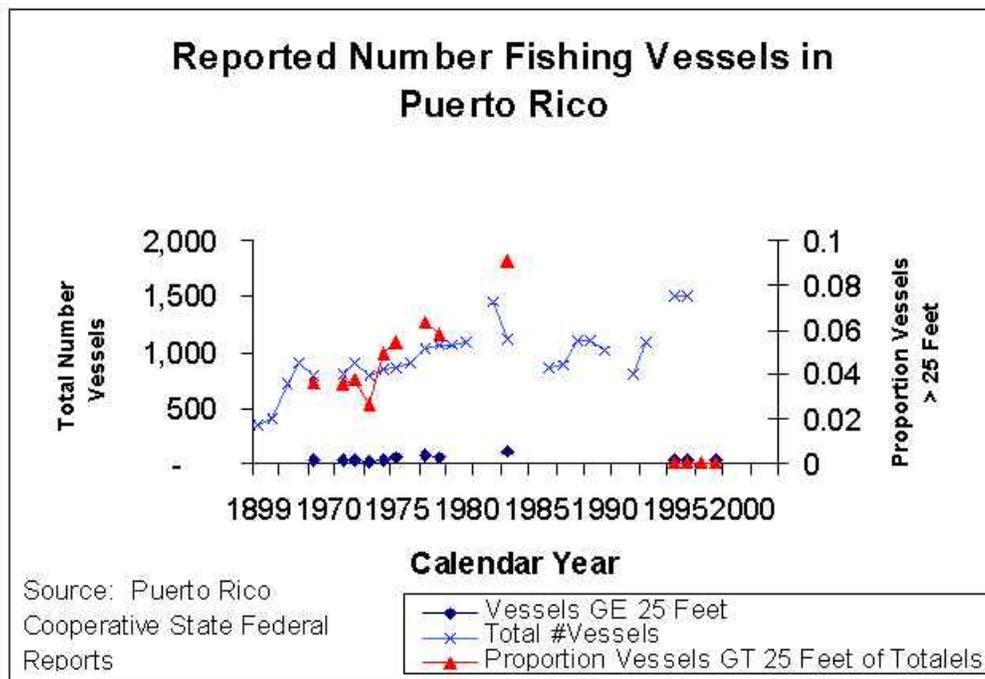


Figure 2. Number of vessels in the Puerto Rico fisheries for two vessel length groups.

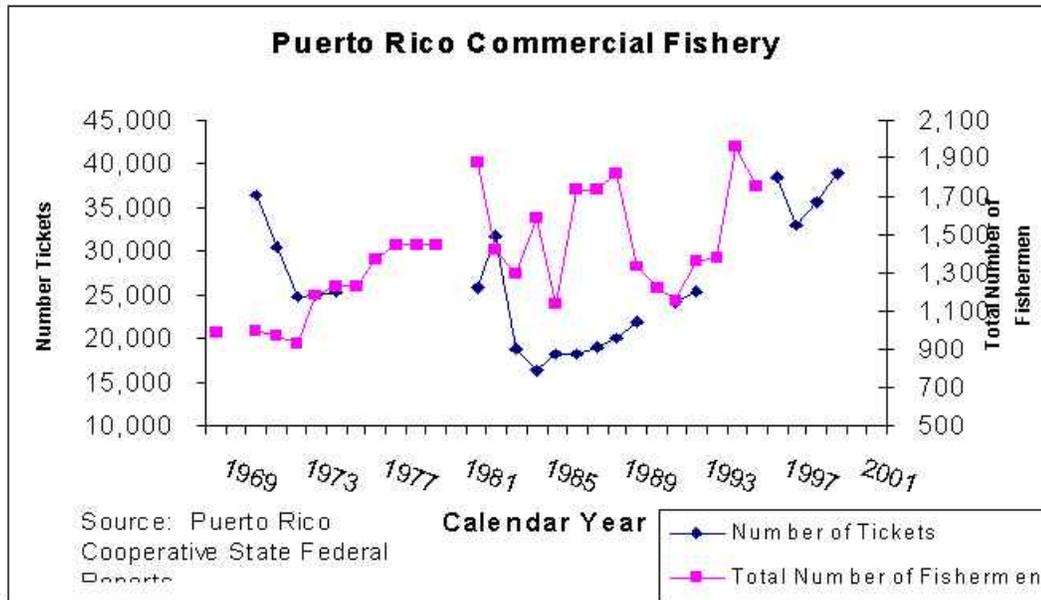


Figure 3. Number of commercial fishing tickets submitted to the Puerto Rico FRL annually and the number of commercial fishermen..

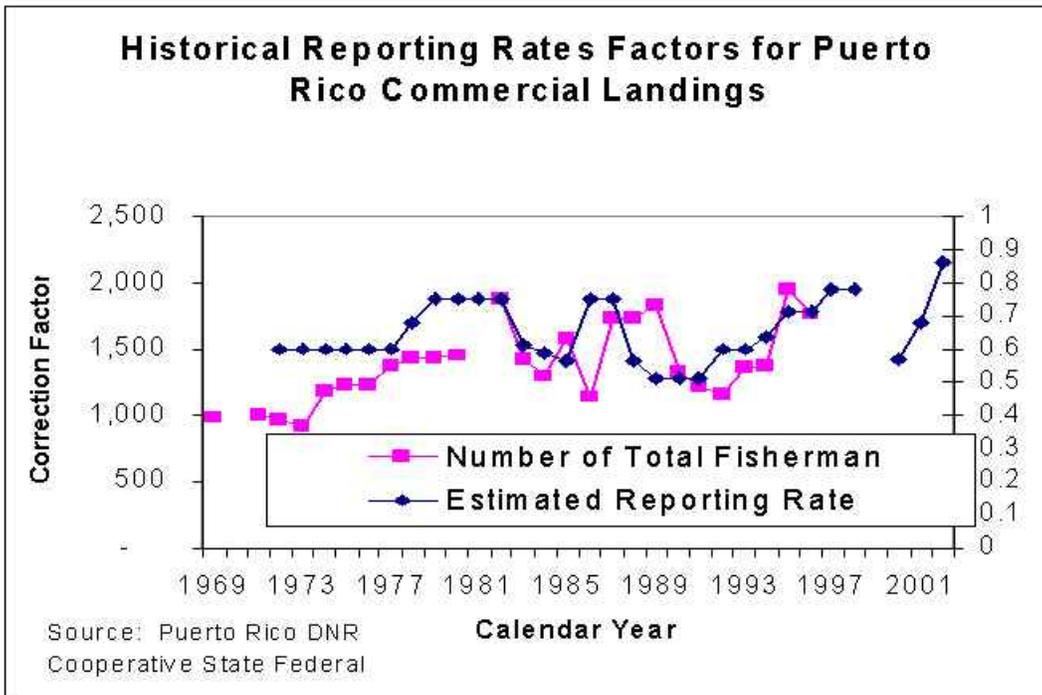


Figure 4. Historical reporting rates for Puerto Rico commercial landings and number of commercial fishermen.