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Title: A review on Tuna and Tuna-like species in Iran & Present status of Gillnet Billfish fishery

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Abstract

Iran (Islamic Republic of) fishing grounds in Northern and southern waters of the country are located in the Caspian Sea and Persian Gulf and Oman Sea. Fishery for tuna and tuna-like species is a major component in large pelagic fisheries in Iran and one of the most important activities in the Persian Gulf, Oman Sea and offshore waters. The long Iranian coastline about 193 port and landing places and about 143 thousand fishermen individuals which are directly engaged in fishing activities and Around 12 thousand fishing crafts consist of fishing boats, Dhows and vessels using different fisheries including: Gillnet, Purse seine Trolling, Trawl and Wire-trap which are engaged in fishing operation according to a time schedule during different fishing seasons in the coastal and offshore waters. Gillnet and purse seine are two main fishing methods used by Iranian vessels to target large pelagic species (especially tuna and tuna-like) in the IOTC area competency and also some of small boats used trolling in coastal fisheries. Gillnet is the dominant gear in all areas. Majority of the production come from the Gillnet coastal and offshore waters. More Billfish's are caught as incidental catch in offshore waters targeting other species. In terms of area, more Billfishes are caught in northwestern areas.

Total annual species production in 2014 was equivalent to 946,500 Mt, of which around 575500 Mt attributed to capture fisheries. The share of large pelagic species is about 267 thousand Mt of which 249 thousand Mt are belongs to Tuna and Tuna-like species in the Indian Ocean areas. Those catch with 73.7% (196,689 Mt) of Tunas, 11.5% (30505 Mt) of Seerfish, 8.0% (21,468 Mt) of Billfish, 2.8% (7,552 Mt) different species of shark and 4% (10734 Mt) other species.

Introduction:

There are three categories of fisheries activities in Iran consist of the southern fishery, the northern fishery and inland fishery and aquaculture. As statistics shows level of aquatics production in 2000 was 425000 Mt and in 2014 increased to 946,500 Mt, which can be distributed as 57% (535860 Mt) of the total catch and production contributed to the country fishing activities in the Persian Gulf, Oman Sea and offshore waters, about 4%(39640) of production from northern water (Caspian Sea) and 39%(371000) through inland water and aquaculture.

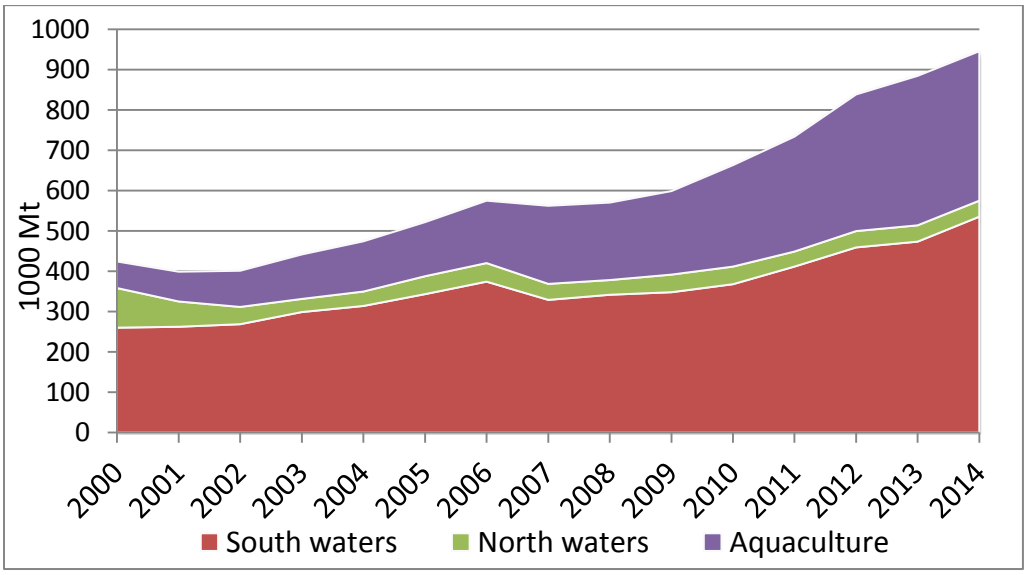


Figure.1 Historical Catch & production in the country

Fishery for tuna and tuna-like species is a major component in large pelagic fisheries in southern of the country and one of the most important activities in the Persian Gulf & Oman Sea are located between the longitude of 48° 30' North to 61° 25' East.

Total catch production in the southern water in 2014 is equal to 536000 Mt which include large pelagic, small pelagic, demersal, shrimp and lantern fishes (Myctophids). Major catch is allocated to large pelagic with 279000 Mt (52 % of total catch) in the coastal and offshore.Figure1.2 Shows catch quantity of different aquatic species groups.

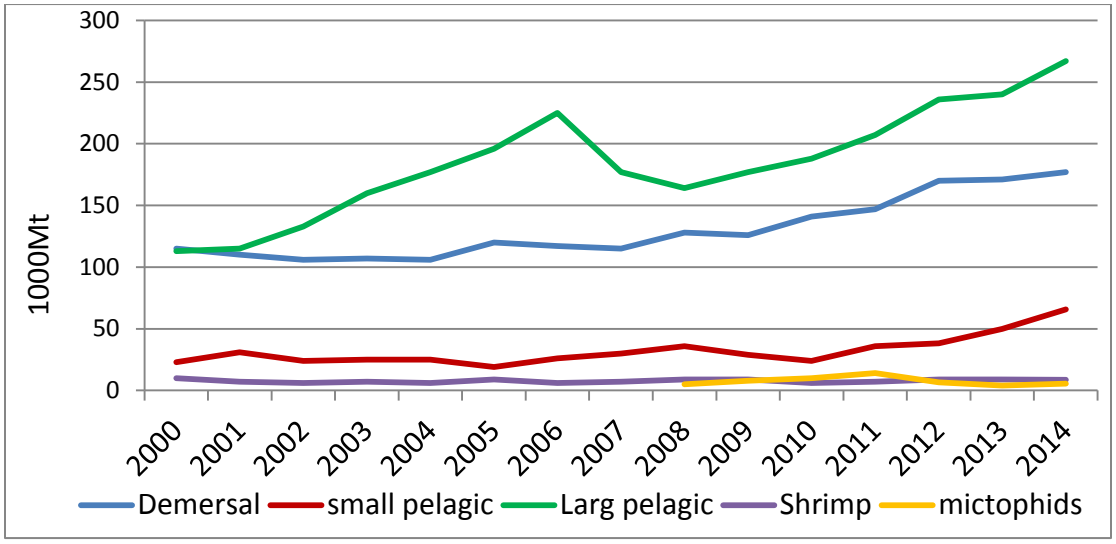


Figure.2 Historical catches quantity of different aquatic species group in the southern waters

Fishing gear and fleet structure:

Industrial and semi-industrial fishing fleets owned by private enterprises carry out almost all fisheries in the coastal and offshore water. The main fishing gears used include gillnet, purse seine, wire traps (local name: gargoor), longline, shrimp trawl, angling and beach seine and some other traditional forms, such as set nets.

Iran Fisheries and exploitation of aquatic animals in the Oman Sea and Persian Gulf is carried out by a fishing fleet including about 6764 fishing crafts are engaged in large pelagic species, Of this total volume of vessels, about 1220 are active in Tuna and Tuna like fishing in the Oman Sea and offshore waters.

Iran Fisheries has a well-established large pelagic fishery. Fishing operates in coastal and offshore as well as beyond EEZ in high seas. In 2014, There are about 6764 fishing crafts were engaged in large pelagic species, of which five Purse seiners more the 1000GT, 1207 gillnet Dhows of less than 50 GT, 485 gillnet Dhows of 51< GT< 100, 275gillnet Dhows of more than 100 GT, 3655 gillnet boats and 1134 Trolling boats of less than 3GT which have Out board engine, operate one day fishing in coastal waters,

where less than 30 km of the coast while Artisanal vessels (Dhows) with GT> 30 t around 15-30 m LOA and industrial purse- seiners with GT> 1000 t generally operate multiday fishing in the offshore and beyond EEZ in the IOTC area. Following figure shows that the highest gillnet fishing pressure occurs within the Islamic Republic of Iran's EEZ and within 30 Km of the coast.

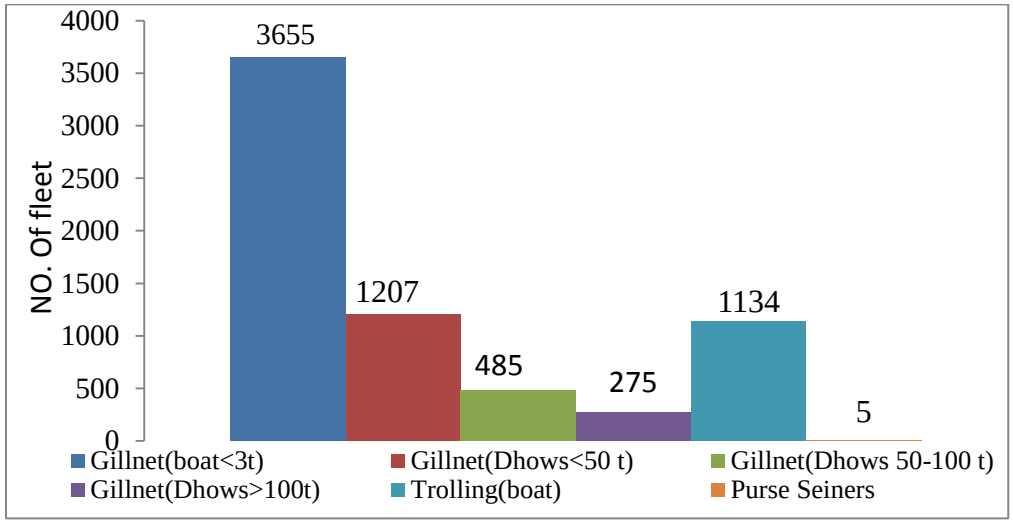


Figure 1: Iranian fishing active vessels in Southern waters by gear type and size in 2014

Figure 2.2 shows types of fishing vessels in Iran operate for tuna and tuna like Species: (a) Small boat (b) Dhows and (c) Purse seiners,

***(a)** Small boat*

(b) *Artisanal vessel (Dhow)*

(C) Purse seiners

Data collection system:

Fish landed were sampled at 43 basic landing sites scattered along the coast in southern coastal waters Consist of 10 landing sites in KHOZESTAN Province, 8 landing in BUSHEHR Province, 20 landing sites in HORMOZGAN Province and 5 landing sites SISTAN-BLUCHESTAN Province in the alongside the Persian Gulf and Oman Sea coastlines, and port samplers permanently stay on landing sites which they collect the data and fill out the forms, and also collect length/weight frequency data.

Following Map shows of landing sites distribution in the southern coastlines. Catch and Effort data were collected in all the above sites by stratified random sampling by the samplers, in this way, 10% of total fishing crafts for different vessel classes of fishing dhows and boats are picked out randomly and their fishing data will be registered. Tuna and Tuna-like species are mainly comprised of 6 tuna species, 2 seerfish species and 5 billfish species which are identified in the large pelagic categories. Landing surveys are undertaken to obtain data on catches in the artisanal fisheries.

Map of Landing sites distribution in the southern coastlines

Catch and Effort (By Gear and Species):

Catch and effort and biological data of the coastal and offshore large pelagic fishery are collected at the 43 fish landing sites and recorded in the capture fishery data collection system routinely.

Figure.1 shows the historical Catch by gear type reported for the all fleet. In 2014 total catch for purse seine, Gillnet and trolling was estimated 5794 Mt, 252700Mt and 8414 Mt respectively. Gillnet with 94.7% of Catch is the dominant fishing gear followed by Purse seiners 2.1%, and around 3.2% comes from Trolling vessels.

Figure.2 and figure 3 shows historical catch quantity of tuna and tuna-like species in the IOTC areas. In 2014 total yearly catch was 249000 Mt, of which about 135000 Mt from coastal waters and the rest (115000 Mt) belongs to offshore fishery. During 2004 and 2006 the amount of catch from offshore fishery were exceeded the coastal waters catch (Figure.4). But in 2007 due to the piracy and insecurity related to this issue, the trend has completely reversed. For example, from 2001 onwards but during 2007- 2014 the volume of catch quantity for tuna and tuna-like species has increased in the coastal area fishing grounds, which was caused by the phenomenon of piracy.

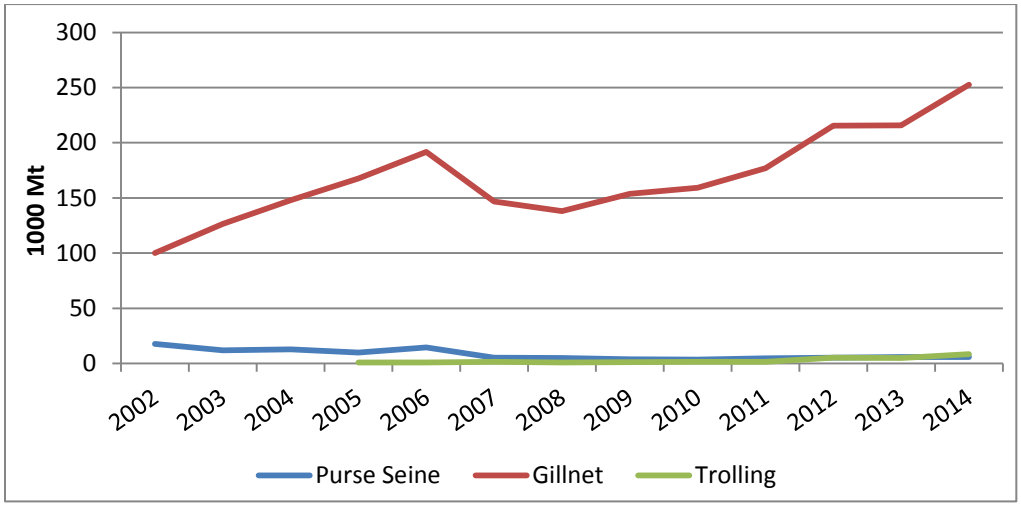


Figure1.Historical Catch by Gear Type

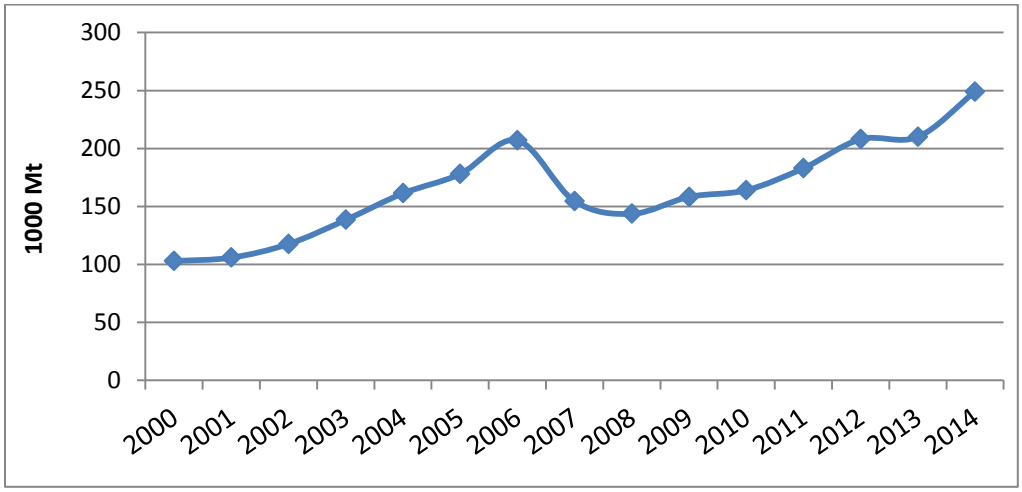


Figure2. Historical catch quantity of Tuna&Tunalike Species in the IOTC Area

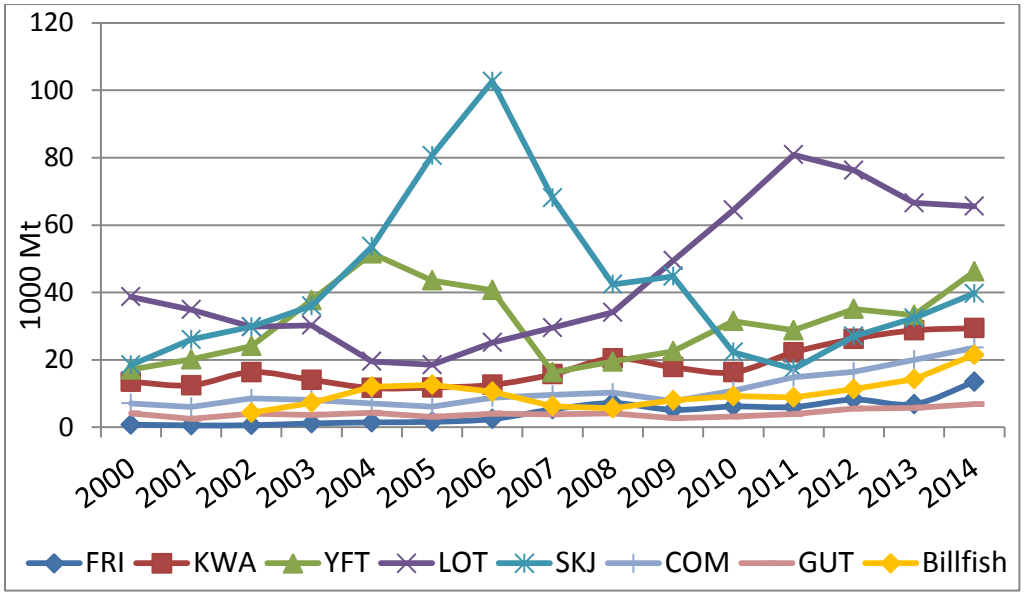
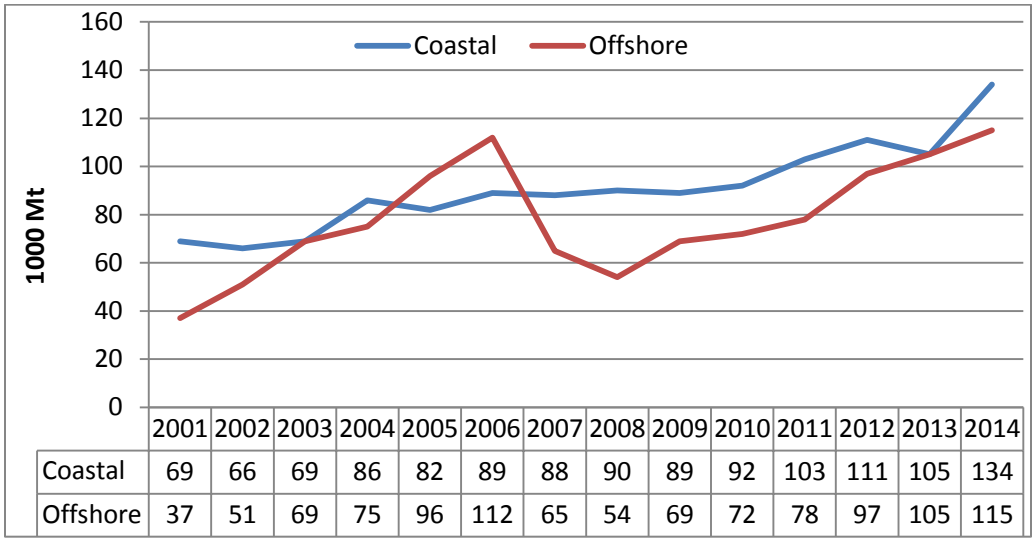


Figure3. Historical Catch quantity of tuna and tuna-like species reported for the all fleet

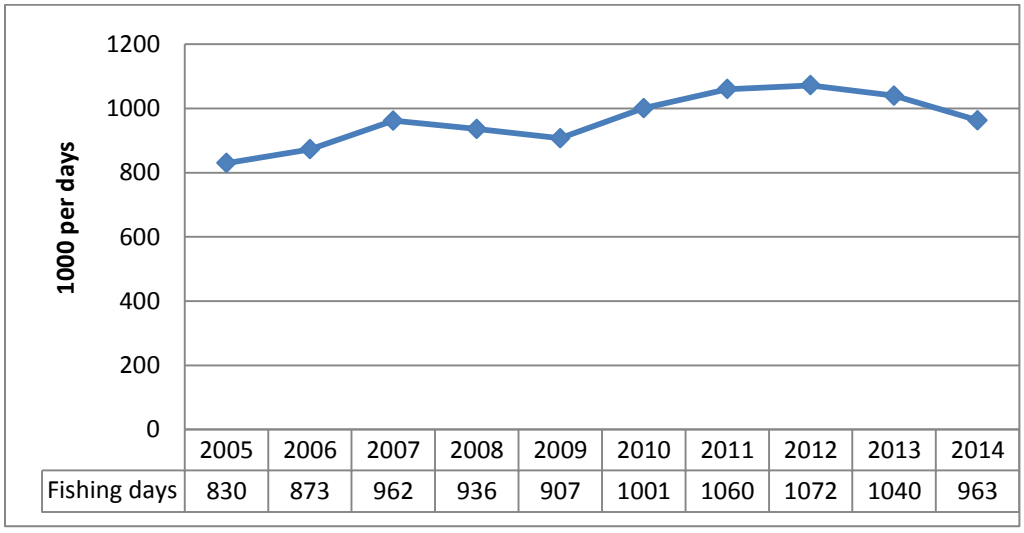


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Coastal	69	66	69	86	82	89	88	90	89	92	103	111	105	134
Offshore	37	51	69	75	96	112	65	54	69	72	78	97	105	115

Figure4. Historical catch quantity of coastal and offshore waters

Fishing effort:

Figure1.Shows the fishing effort for large pelagic species for the all fleet consists of purse seine, gillnetter and trolling. In 2014, for tuna and tuna-like catches around 9624720 days fishing efforts was Carried out, of which 805200 days was operated by Gillnet, 1080 days by purse seine and 156190 days done by trolling fisheries(Figure.2).



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Fishing days	830	873	962	936	907	1001	1060	1072	1040	963

Figure 1.Trend of large pelagic species fishing effort by all fleet

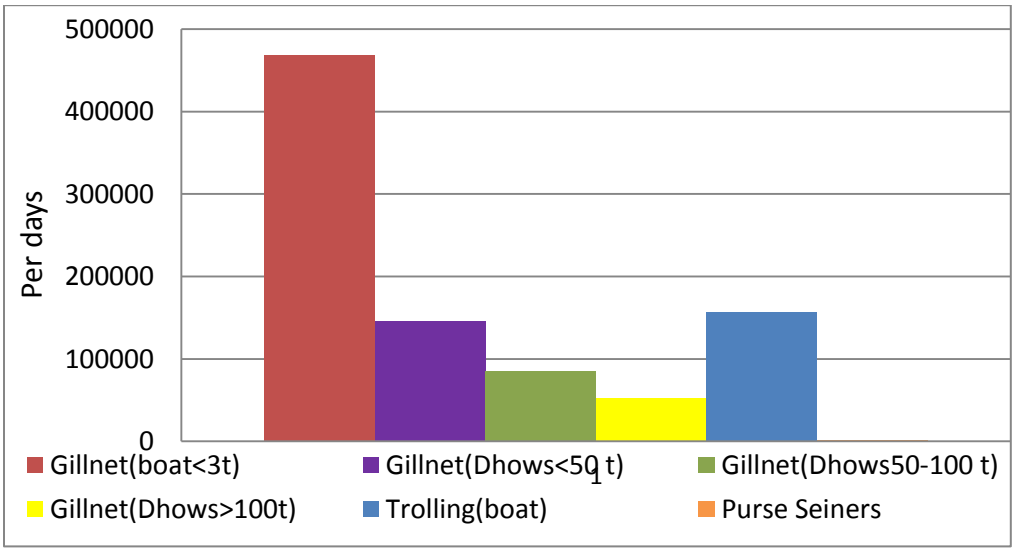
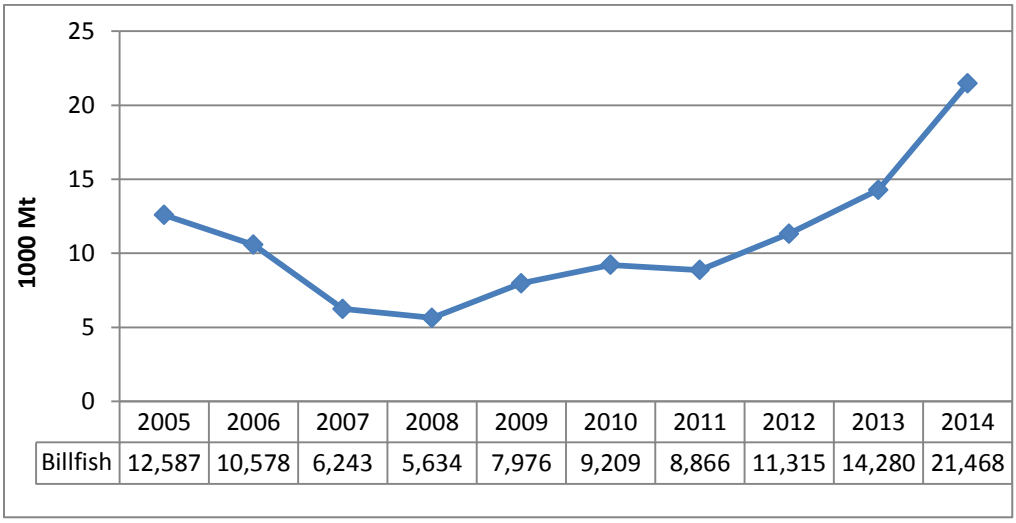


Figure 2.fishing effort for large pelagic species by different vessel categories in2014

Billfish catches:

Although billfish are not normally targeted species, they are very common in offshore gillnet catch are considered as by-catch species. As mention above billfish annual production is estimated to be about 21468 Mt, of which about 24.6% from Persian Gulf and Oman sea and about 75.4% belongs to offshore fishery. Figure.1 showing a trend of landing of billfish are steadily increasing in the previous years. Reason for increased catch is not clear, could be due to increased statistical recordings, species misidentification. Iran has recently started collected information about landings of billfish which reveals that Indo-Pacific sailfish catch with 11607 Mt is the most dominating species of billfish found followed by black marlin with 6181Mt, blue marlin 1738 Mt, Swordfish 1134 Mt and striped marlin is the rarest of all the billfishes which is seldom caught by large pelagic gillnetters.



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Billfish	12,587	10,578	6,243	5,634	7,976	9,209	8,866	11,315	14,280	21,468

Figure1: Annual trend catches of billfish in 2005-2014

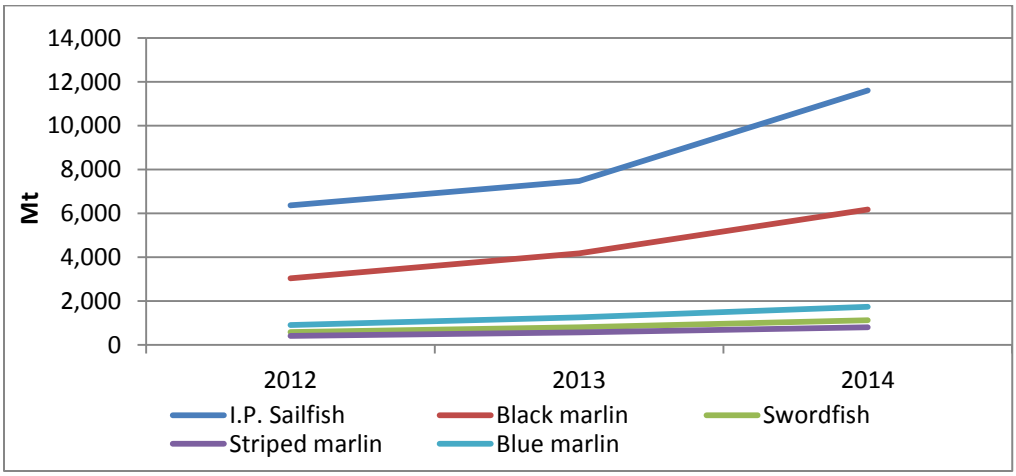


Figure25 landing billfish during 2012-2014

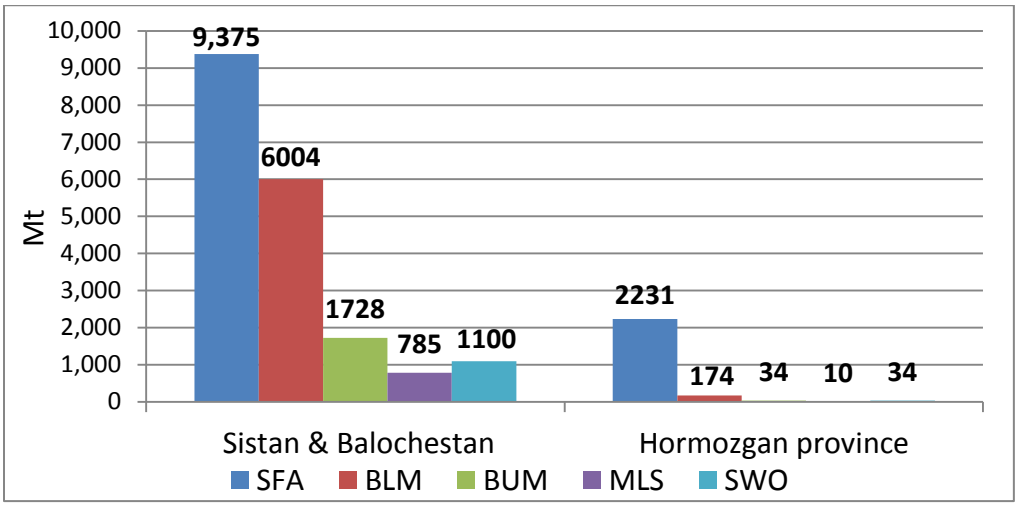


Figure3: Composition of Billfish landing by province in 2014

Seasonal variation of billfish:

Following figure shown the seasonality of catch component of billfish. Billfish clearly show bimodal seasonality, with a peak at the before and end of monsoon season (June, July and August) in Oman Sea, a huge No. of fishing vessels are alongside and thus tuna and tuna like species catch will decrease during this period.

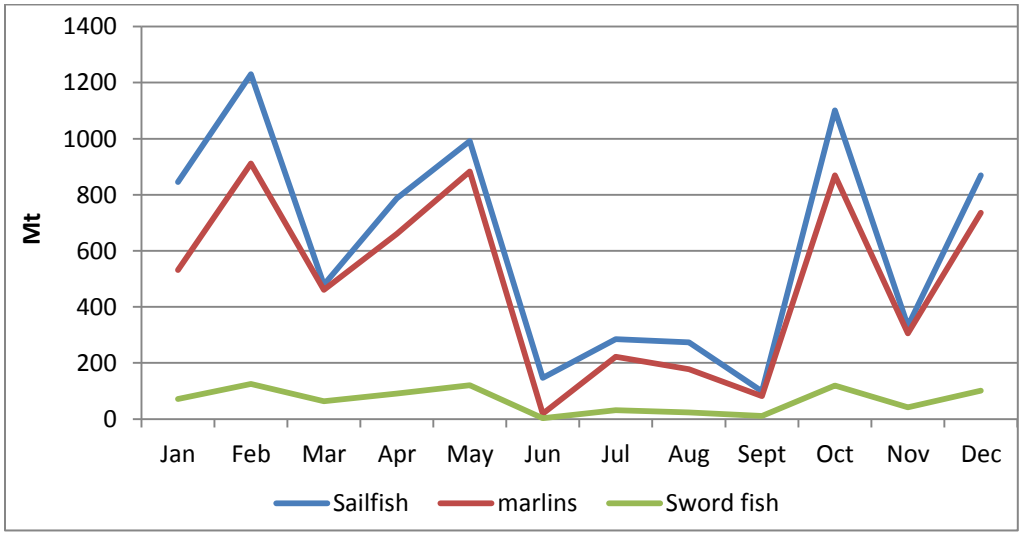


Figure 1: Seasonal variation of billfish catches in 2014

Actions taken for improvements of working party on Billfish:

Iran has taken various actions to implement the working party on billfish and Scientific Committee recommendations. During recent years many efforts have been made in our country in the field of tuna fishery, which how to fulfill the IOTC regulations and adapting it with national implementing condition and complying with the IOTC approvals. We are attempting to solve the remained defects and comply fully with IOTC resolution and regulations, but our fishing fleet is a small scale fleet and some regulations are very hard to follow in compare to those countries with industrial fleet and few vessels.

In 2012- 2014, Iran fishery is improving data collection system by completing of AMAR software to meet IOTC demanded outputs with a suitable reporting for tuna fishery and billfish. IFO implemented the training courses for port samplers and Identification cards for billfish has been translated to Persian and distributed among port samplers and fishing vessels Captains to enhance the validity of identifying the billfish.
During an extension services program, Iran Fisheries Organization (IFO) has prepared some training courses and extension brochures and posters regarding to by catch. Also we have tried to train some crews of fishing vessels to prepare our information requirements base on IOTC regulations via observer reports.

References:

Iran Fisheries Statistics yearbooks 2000-2014

Data Collection System and Data Processing Method in Iran