

ESTIMATING TOTAL FISH EXTRACTIONS IN THE UNITED ARAB EMIRATES: 1950-2010¹

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ABSTRACT

The United Arab Emirates (UAE) is an Arab country located along the southwestern coast of the Persian Gulf, and with a small coastline along the Gulf of Oman. Its fisheries are all small-scale in nature, with catches increasing steadily until 1999, after which they started to decline. Due to reliance on a market-sampling program for their estimation, which does not differentiate between locally caught and imported catch, the UAE is thought to systematically over-report its catches. Following the reconstruction approach, the UAE's domestic catches in the Persian Gulf were re-estimated using all available peer-reviewed and grey literature sources for quantitative and/or qualitative information on sectors missing from or misreported to statistics presented by the FAO on behalf of the UAE. Overall, the figures reported to the FAO from 1950-2010 over-estimate actual domestic catches by an average of 51% annually (47% overall) when compared to reconstructed totals, despite the reconstruction accounting for subsistence and recreational catches that are entirely missed by market-sampling. On the resource side, introduced fisheries management measures are encouraging, but not sufficient given the scale of the country's overfishing problem.

INTRODUCTION

The United Arab Emirates (UAE) has coasts on both the southern Persian Gulf and the northern Gulf of Oman (Figure 1). The country is a federation of 7 Emirates with shared administrative and political power between the federal government and the various Emirates. One of the Emirates (Fujairah) has its coastline only in the Gulf of Oman, where substantial catches may be taken (Pearson *et al.* 1998), but which are not considered here. Another Emirate (Sharjah) has a coastline both in the Persian Gulf and along the Gulf of Oman, but the latter is very small and is also not considered here. In 1962, Abu Dhabi became the first of the emirates to export oil, transforming the country's economy and infrastructure. Today, its oil reserves are ranked the 6th largest in the world (OPEC 2012).

Prior to the discovery of oil in the 1950s, pearl diving was the basis of the country's economy. The First World War, the economic depression in the late 1920s, and the development of cultured pearls in Japan led to the sector's demise.

The fisheries of UAE are all small-scale in nature, with the vast majority taking place in the Emirate of Abu Dhabi, which is reported to comprise over 60% of the country's marine area (Morgan 2004). Fishers employ two distinct fishing vessel types: fibreglass *tarads* and traditional wooden *dhow*s. The *tarads* are typically 6-8m in length and equipped with 1-2 outboard engines, allowing a crew of 1-4 people to fish for 6-8 hours at a time (Grandcourt *et al.* 2002). *Dhow*s, on the other hand, range from 12-22 m and are equipped with inboard diesel engines and insulated cool boxes, allowing the crew of 4-6 people to fish for 3-5 days at a time. Like other Gulf countries, vessels are owned by UAE nationals, while the majority of workers on the vessels are migrant labourers from India, Bangladesh and Iran.

The UAE's fisheries are multi-gear and multi-species, with over 100 species occurring in the catch (Grandcourt *et al.* 2010). The majority of fish species caught belong to the families Serranidae, Lethrinidae, Lujanidae, Haemulidae, Sparidae, Carangidae and

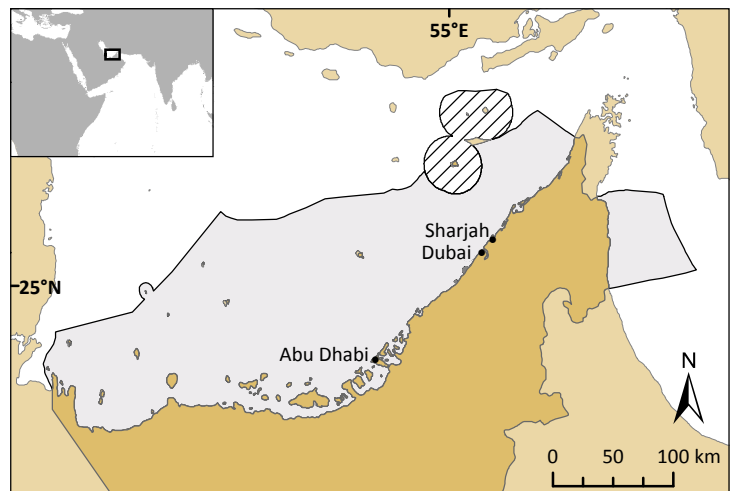


Figure 1. Map of the United Arab Emirates (UAE), showing the extent of its EEZ in grey (including the area contested with Iran; stripped area). The three capital cities of the major Emirates of Abu Dhabi, Dubai and Sharjah are also shown.

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Mugilidae. The main fishing gear is a dome-shaped wire trap called a *gargoor*, but hand-lines, intertidal weirs (*hadrah*), trolling, gillnets, and encircling nets are also used (Grandcourt *et al.* 2002). Though fisheries are of minor importance to the UAE's economy, they are valued for the recreational opportunities they provide, for their contributions to food security, and as a part of the country's cultural heritage.

Fish are landed at one of over 30 designated landing sites along the Gulf coast, principally in Abu Dhabi, Dubai, and Sharjah. Most landing sites also have facilities for storing, auctioning, wholesale and retailing the catch. Some of the larger sites also have processing facilities for wholesale and retail markets. Imported fish (from Oman) is sold in the markets alongside locally caught fish, which does not allow for differentiation of domestic from imported seafood through market-only surveys.

Until 2004, a market survey program (which includes imports) was used to estimate catches, inevitably yielding inflated figures for truly domestic catches. Surveys performed by the Environmental Research and Wildlife Development Agency (ERDWA) compared reported and estimated catches for 2000, and found that, while estimated domestic landings were 20,000 tonnes, reported landings (as estimated from the market survey) were 110,000 tonnes (Grandcourt *et al.* 2003).

Morgan (2004) reports that both commercial and non-commercial fish stocks have declined significantly over the past 25 years (some by as much as 90%) as a result of overfishing and extensive coastal development. As a result, the number of registered fishing vessels has decreased, from 7,700 in 1998 to 5,191 in 2002 (Morgan 2004). A law requiring a UAE national to be physically present on the vessels during fishing operations has also contributed to the reduction in registered vessels (Morgan 2004).

Illegal fishing is common and likely encouraged by low enforcement of management rules. In particular, the use of driftnets for pelagic fishes such as Spanish mackerel (Morgan 2004; Barakat 2012), as well as shark fishing during the closed season (Moore 2012; Simpson 2012) are widespread.

The UAE was revealed to be the fifth largest exporter of shark fins to the Hong Kong market (Fowler *et al.* 2005; Moore 2012), despite a shark-finning ban. However, it is thought that the majority of these fins are re-exported from shark catches made in Oman (Moore *et al.* 2012). Catch statistics reported by the FAO on behalf of the UAE show steadily increasing shark catches from 1989-2008, followed by a drastic decline in 2009 (presumably due to the finning ban). This, however, is likely to be an underestimate because enforcement is weak, and sharks that are finned at sea and/or fished during the January-April closed season remain unreported.

METHODS

This contribution follows catch reconstruction methods as previously outlined by other studies (e.g., Zeller *et al.* 2006; Zeller *et al.* 2007; Le Manach *et al.* 2012).

Although issues with over-reporting are acknowledged by the FAO (Morgan 2004), no efforts appear to have been made by the relevant reporting agency in the UAE to improve data reporting. Morgan (2004) estimates that catches for 2000 were over-reported by 90,000 t, while Luca Garibalidi (FAO, pers. comm.) thinks that this over-reporting figure is "too high". Therefore, in the absence of better data, reported catches were adjusted using the median of 20,000 t (Morgan's estimate of domestic catches) and 110,000 t (FAO data) as an anchor point for domestic reported catches, and all reported catches were decreased by 40%. These adjusted catches were used as the new baseline of reported landings for the analysis.

Using Google Earth, Al-Abdulrazzak & Pauly (2013) estimate 95 ± 1 *hadrah* were operating in the UAE in 2005, generating an annual catch of $1,292 \pm 381$ t. The UAE reports half that amount (i.e., 600 t) for the same year. Since the number of *hadrah* is not known to have substantially fluctuated in the last five decades, the reported *hadrah* catch for 2005 (600 t) was adjusted to the estimated catch ($1,292 \text{ t}\cdot\text{year}^{-1}$) for all years. Species composition was estimated from data supplied by the Abu Dhabi Environmental Agency (S. Hartmann, pers. comm.).

To estimate illegal driftnet catches, an approach developed for Qatar was followed (see Qatar, Al-Abdulrazzak, this volume). To estimate annual total catch per vessel, the number of registered fishing vessels from 1998 (start of records) to 2010 was obtained from the UAE's Ministry of Environment and Water database. For the years without these records, the average number of registered vessels was used. It was assumed that 10% take part in illegal drift-netting (Table 1). As in the case of Qatar, it was estimated that vessels deploying driftnets were catching 20% more than they would legally (i.e., when deploying *gargoor* traps from their boats instead of illegal driftnets). The annual total catch per illegal fishing vessel (Table 1) was multiplied by the estimated number of participating vessels, to create a time series of illegal catch from 1989 (the start of the driftnet ban) to 2010.

The UAE has a growing recreational fishery, and although (free) recreational fishing licenses are required in Dubai and Abu Dhabi, no data on the number of participants or quantity of catches exist (Morgan 2004). Therefore, to estimate this sector, methods originally developed for Kuwait were used: it was assumed that recreational fishing began in 1960, a 0.12% participation rate was applied to the total population from 1960-2010 to obtain a time series of recreational fishers, and a conservative catch rate estimate of $1 \text{ kg}\cdot\text{trip}^{-1}$, along with 104 fishing trips per

person per year was used to calculate total recreational catch (see Kuwait, Al-Abdulrazzak, this volume). UAE's recreational fishers target Spanish mackerel, tuna, sailfish and demersal species (Bishop 2002; Morgan 2004) and this species composition was applied in equal ratios to disaggregate the recreational catch.

The telosts *Lethrinus borbonicus*, *Lethrinus microdon*, *Pomacanthus maculosus*, and *Scolopsis taeniata* are caught as incidental and generally discarded bycatch by *gargoor* targeting emperors, groupers, jacks, and sweetlips (Morgan 2004; Grandcourt *et al.* 2010). Weizhong *et al.* (2012) estimate *gargoor* discard rates to be 2.56%, and this figure was used to extrapolate total discards for the fishery. The species composition was applied in equal ratios among the above species.

Despite the UAE's high GDP, subsistence fishing occurs by the industry's foreign labourers. Foreign fishers make up 0.0046% of the country's total population, and it was assumed that fishers take home an average of 5 kg of fish per week, starting with the oil boom in 1960 until 2010. Because these take home catches are made up of less desirable species (which lack a targeted fishery), the ratios from species discarded from the *gargoor* fishery was applied.

Table 1. Parameters used for estimating illegal driftnet fishery.

| Year | Number of participating vessels | Annual illegal catch per vessel (t) | Annual catch (t) |
|------|---------------------------------|-------------------------------------|------------------|
| 1989 | 564 | 20 | 11,280 |
| 1990 | 564 | 20 | 11,280 |
| 1991 | 564 | 20 | 11,280 |
| 1992 | 564 | 20 | 11,280 |
| 1993 | 564 | 20 | 11,280 |
| 1994 | 564 | 20 | 11,280 |
| 1995 | 564 | 20 | 11,280 |
| 1996 | 564 | 20 | 11,280 |
| 1997 | 564 | 20 | 11,178 |
| 1998 | 770 | 18 | 13,762 |
| 1999 | 619 | 23 | 14,106 |
| 2000 | 469 | 27 | 12,648 |
| 2001 | 459 | 29 | 13,500 |
| 2002 | 519 | 23 | 11,701 |
| 2003 | 505 | 23 | 11,411 |
| 2004 | 556 | 19 | 10,793 |
| 2005 | 557 | 19 | 10,401 |
| 2006 | 557 | 18 | 9,892 |
| 2007 | 557 | 17 | 9,388 |
| 2008 | 557 | 16 | 8,880 |
| 2009 | 605 | 15 | 9,294 |
| 2010 | 605 | 16 | 9,538 |

RESULTS AND DISCUSSION

Fisheries landings as reported by FAO show steady increases from 12,000 t·year⁻¹ in 1950 to 43,001 t·year⁻¹ in 1973, followed by a dramatic increase to 67,800 t·year⁻¹ in 1974. Catches continue to increase steadily until their peak of 117,607 t·year⁻¹ in 1999, before declining to 79,610 t·year⁻¹ by 2010 (Figure 2a; Appendix Table A1). However, adjusted reported landings (i.e., domestic) increased from 7,200 t·year⁻¹ in 1950 to a peak of 70,600 t·year⁻¹ in 1999 before declining to 47,800 t·year⁻¹ by 2010 (Figure 2a).

Total reconstructed catches are annually, on average, 34% less than landings reported by FAO on behalf of the UAE (32% overall), but are 11% higher (annual average) than the adjusted reported domestic landings (14% overall; Figure 2a). Reconstructed total catches increase gradually from 7,920 t·year⁻¹ in 1950 to a peak of 86,200 t·year⁻¹ in 1999, followed by a decline to 55,400 t·year⁻¹ in 2008. Catches in 2010 have increased again to 59,500 t·year⁻¹.

For the 1950-2010 time period, artisanal catches accounted for 99.5% of the total reconstructed catch, while the subsistence and recreational sectors contributed 0.05% and 0.45%, respectively (Figure 2a). Estimated discards were low and accounted for 0.6% of the total catch.

The main taxa caught in the UAE are *Scomberomorus commerson* (15%) and Lethrinidae (11%), followed by *Sardinella* spp. (8%), *Stolephorus* spp. (7%), Serranidae (7%), and Carangidae (7%; Figure 2b; Appendix Table A2).

Overfishing is of particular concern for the *Scomberomorus commerson* fishery, as recruitment failure has been associated with increased fishing pressure (Grandcourt *et al.* 2005). In the neighbouring Gulf of Oman, there has been a 10-fold decrease in the yields of this species in recent years (Grandcourt *et al.* 2005).

Despite declining landings, fisheries management in the UAE remains rudimentary. At the national level, the Ministry of Agriculture and Fisheries (MAF) regulates fisheries management, but some legislative authority for policy development exists on a regional scale within component Emirates. Fisheries Regulation Committees (which comprise the MAF), fisher cooperatives, municipalities, and the Coast Guard exist in each Emirate, and address regional fisheries policy and enforcement. However, due to a lack of consensus on overarching national fisheries planning goals, differing and inconsistent decisions (or no decisions at all) are often the outcome. The coordination of the various federal and regional managing bodies into a single comprehensive and consistent national fisheries policy may prove to be the greatest challenge (Morgan 2004).

The UAE has only recently introduced fisheries management legislation and therefore, there remain significant gaps, both legislatively and managerially. Like Qatar (Qatar, Al-Abdulrazzak, this volume), UAE management practices rely on input rather than output controls. Marine protected areas, closed seasons for some migratory pelagic fish, and escape gaps in *gargoor* are the most important fisheries management measures. Until recently, the only restrictions on commercial fishing were bans on trawling and driftnets. However, in 2003, Abu Dhabi began to set limits on

the number of *gargoor* fish traps. No gear restrictions have been applied in other Emirates to date. Enforcement is also problematic as it is limited by the fisheries-specific training of the Coast Guard staff, the lack of strategic protocol, and the traditional right of appeal for misdemeanours to ministers and sheikhs. As a result, many fisheries prosecutions are never pursued and regulations are often ignored.

Stakeholder participation in fisheries policy development takes place in the form of traditional discussions, often directly with senior government figures. While these often result in compromised solutions, stakeholder participation is limited to UAE nationals only, who are the vessel owners, but are not necessarily actively engaged in fishing activities (Morgan 2004).

Compounding the fisheries crisis is the rapid development and urbanization of coastal areas in the UAE, which is expected to have pervasive and lasting effects on Gulf ecosystems. For example, in 2002, Dubai commenced construction on a series of large scale artificial island-lagoon complexes along the entire coast of the Emirate (Sale *et al.* 2011). Because of the construction's proximity to coral reefs, the sedimentation buried coral reefs (Sheppard *et al.* 2010; Sale *et al.* 2011), thus affecting fish habitat.

The re-estimated catches account for missing sectors including recreational and subsistence catches, as well as discards, illegal catches, and over-reporting errors. Thus, the reconstructed time series may better reflect the catches extracted from the Persian Gulf by the UAE's fisheries from 1950-2010 than the officially reported statistics. While the reconstructed catches are entirely dependent on the assumptions made by this study and despite the considerable data uncertainties associated with the estimates, they seem preferable to the alternative of assuming 'zero' catch for sectors lacking quantitative data.

Finally, it may be noted that it would be appropriate, in subsequent analyses, to reconstruct the UAE's catches along the Gulf of Oman coast, and in the process, to revisit the assumption that these catches did not enter the fisheries statistics considered here.

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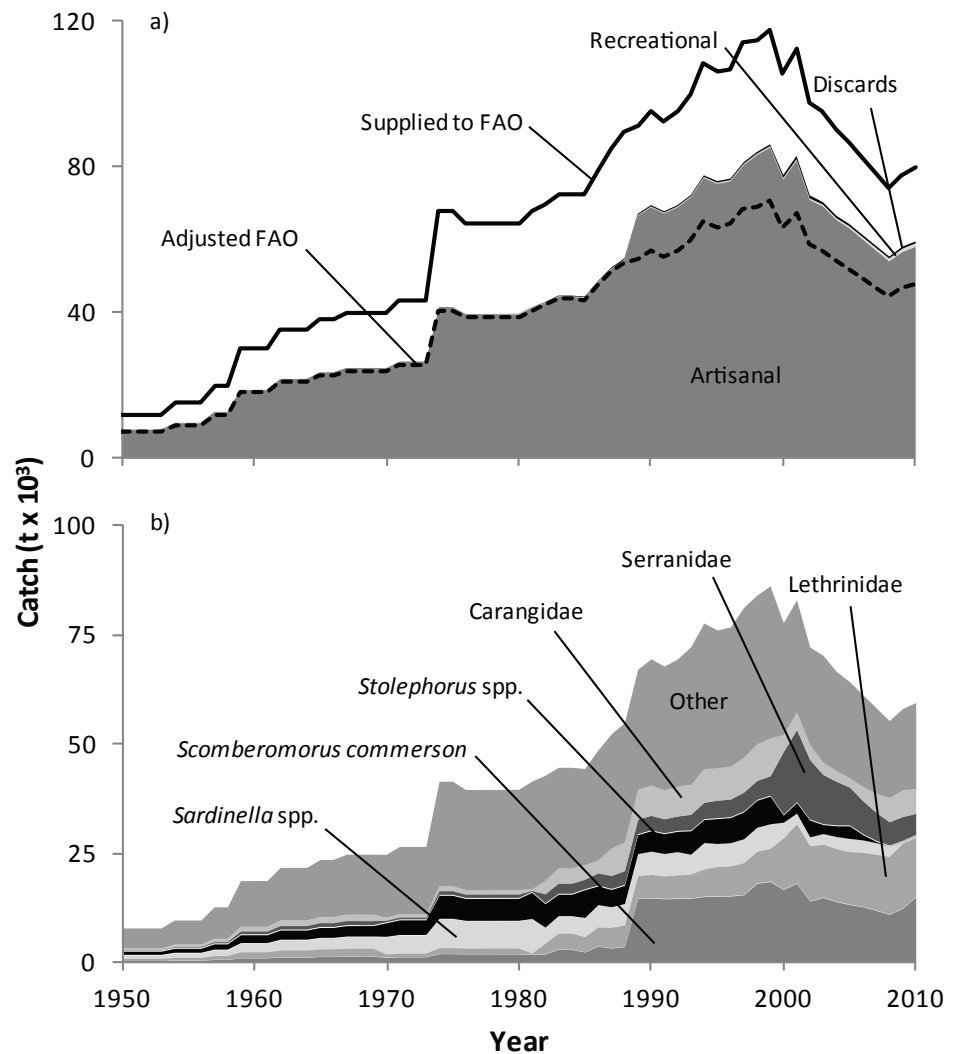


Figure 2. Total reconstructed catch for the United Arab Emirates by a) sector (with the solid line representing the landings data transmitted to FAO and the dashed line the 'adjusted FAO data'); and b) major taxa, 1950-2010. Note that subsistence catches were included in the sector graph (a) but are not visible (too small). Recreational catches are the light coloured area and discards the darker line on top.

REFERENCES

- Al-Abdulrazzak D and Pauly D (2013) Managing fisheries from space: Google Earth improves estimates of distant fish catches. *ICES Journal of Marine Science*, doi.10.1093/icesjms/fst178.
- Barakat N (2012) Greedy fishermen use illegal nets. *Gulf News*, edition of March 25 2012. Available at: <http://gulfnews.com/news/gulf/uae/environment/greedy-fishermen-use-illegal-nets-1.999210> [Accessed: January 17, 2013].
- Fowler SL, Cavanagh RD, Camhi M, Burgess GH, Cailliet GM, Fordham SV, Simpfendorfer CA and Musick JA (2005) Sharks, rays and chimaeras: the status of the chondrichthyan fishes. *International Union for the Conservation of Nature (IUCN)*, Gland, Switzerland and Cambridge, UK. x + 461 p.
- Grandcourt E, Al Abdessalaam TZ, Francis F and Al Shamsi A (2010) Age-based life history parameters and status assessments of by-catch species (*Lethrinus borbonicus*, *Lethrinus microdon*, *Pomacanthus maculosus* and *Scolopsis taeniatus*) in the southern Arabian Gulf. *Journal of Applied Ichthyology* 26(3): 381-389.
- Grandcourt E, Francis F, Al-Shamsi A, Al- Ali K and Al-Ali S (2002) Annual fisheries statistics for Abu Dhabi Emirate 2001. *Marine Environmental Research Center*, Abu Dhabi., UAE. 94 p.
- Grandcourt E, Francis F, Al Shamsi A, Al Ali K and Al Ali S (2003) Stock assessment and biology of key species in the demersal fisheries of the Emirate of Abu Dhabi. *Environmental Research and Wildlife Development Agency*.
- Grandcourt EM, Abdessalaam TZA, Francis F and Shamsi ATA (2005) Preliminary assessment of the biology and fishery for the narrow-barred Spanish mackerel, *Scomberomorus commerson* (Lacépède, 1800), in the southern Arabian Gulf. *Fisheries Research* 76(2): 277-290.
- Le Manach F, Gough C, Harris A, Humber F, Harper S and Zeller D (2012) Unreported fishing, hungry people and political turmoil: the recipe for a food security crisis in Madagascar? *Marine Policy* 36(1): 218-225.
- Moore ABM (2012) Elasmobranchs of the Persian (Arabian) Gulf: ecology, human aspects and research priorities for their improved management. *Reviews in Fish Biology and Fisheries* 22(1): 35-61.
- Moore ABM, McCarthy ID, Carvalho GR and Peirce R (2012) Species, sex, size and male maturity composition of previously unreported elasmobranch landings in Kuwait, Qatar and Abu Dhabi Emirate. *Journal of Fish Biology* 80(5): 1619-1642.
- Morgan G (2004) Country review: United Arab Emirates. pp. 327-335. *In: De Young C (ed.), Review of the state of world marine capture fisheries management: Indian Ocean. FAO Fisheries Technical Paper 488. Food and Agriculture Organization of the United Nations (FAO), Rome.*
- Pearson WH, Al-Ghais SM, Neff JM, Brandt J, Wellman K and Green T (1998) Assessment of damages to commercial fisheries and marine environment of Fujairah, United Arab Emirates, resulting from the Seki oil spill of March 1994: a case study. *Yale School of Forestry and Environmental Studies Bulletin* 103: 407-428.
- Sale PF, Feary DA, Burt JA, Bauman AG, Cavalcante GH, Drouillard KG, Kjerfve B, Marquis E, Trick CG, Usseglio P and Van Lavieren H (2011) The growing need for sustainable ecological management of marine communities of the Persian Gulf. *AMBIO* 40(1): 4-17.
- Sheppard C, Al-Husiani M, Al-Jamali F, Al-Yamani F, Baldwin R, Bishop J, Benzoni F, Dutrieux E, Dulvy NK, Durvasula SRV, Jones DA, Loughland R, Medio D, Nithyanandan M, Pilling GM, Polikarpov I, Price ARG, Purkis S, Riegl B, Saburova M, Samimi-Namin K, Taylor O, Wilson S and Zainal K (2010) The Gulf: a young sea in decline. *Marine Pollution Bulletin* 60(1): 13-38.
- Simpson C (2012) Fishermen defy UAE ban on shark hunting. *The National* edition of October 11 2012. Available at: <http://www.thenational.ae/news/uae-news/environment/fishermen-defy-uae-ban-on-shark-hunting> [Accessed: January 17, 2013].
- Weizhong C, Al-Baz A, Bishop J and Al-Husaini M (2012) Field experiments to improve the efficacy of gargoor (fish trap) fishery in Kuwait's waters. *Chinese Journal of Oceanology and Limnology* 30(3): 535-546.
- Zeller D, Booth S, Craig P and Pauly D (2006) Reconstruction of coral reef fisheries catches in American Samoa, 1950-2002. *Coral Reefs* 25(1): 144-152.
- Zeller D, Booth S, Davis G and Pauly D (2007) Re-estimation of small-scale fishery catches for US flag-associated island areas in the western Pacific: the last 50 years. *Fishery Bulletin* 105(2): 266-277.

Appendix Table A1. FAO landings vs. total reconstructed catch (t) for the UAE, 1950-2010, as well as catch by sector.

| Year | FAO landings ^a | Total reconstructed catch | Artisanal | Subsistence | Recreational | Discards |
|------|---------------------------|---------------------------|-----------|-------------|--------------|----------|
| 1950 | 7,200 | 7,900 | 7,900 | 0 | 0 | 25 |
| 1951 | 7,200 | 7,900 | 7,900 | 0 | 0 | 25 |
| 1952 | 7,200 | 7,900 | 7,900 | 0 | 0 | 25 |
| 1953 | 7,200 | 7,900 | 7,900 | 0 | 0 | 25 |
| 1954 | 9,000 | 9,700 | 9,700 | 0 | 0 | 31 |
| 1955 | 9,000 | 9,700 | 9,700 | 0 | 0 | 31 |
| 1956 | 9,000 | 9,700 | 9,700 | 0 | 0 | 31 |
| 1957 | 12,000 | 12,700 | 12,700 | 0 | 0 | 40 |
| 1958 | 12,000 | 12,700 | 12,700 | 0 | 0 | 40 |
| 1959 | 18,000 | 18,800 | 18,700 | 0 | 0 | 60 |
| 1960 | 18,000 | 18,800 | 18,700 | 1 | 11 | 60 |
| 1961 | 18,000 | 18,800 | 18,700 | 1 | 12 | 60 |
| 1962 | 21,000 | 21,800 | 21,700 | 1 | 14 | 71 |
| 1963 | 21,000 | 21,800 | 21,700 | 1 | 15 | 71 |
| 1964 | 21,000 | 21,800 | 21,700 | 2 | 17 | 71 |
| 1965 | 22,800 | 23,600 | 23,500 | 2 | 18 | 75 |
| 1966 | 22,800 | 23,600 | 23,500 | 2 | 20 | 75 |
| 1967 | 24,000 | 24,800 | 24,700 | 2 | 21 | 80 |
| 1968 | 24,000 | 24,800 | 24,700 | 2 | 23 | 80 |
| 1969 | 24,000 | 24,800 | 24,700 | 2 | 25 | 80 |
| 1970 | 24,001 | 24,800 | 24,700 | 3 | 29 | 40 |
| 1971 | 25,801 | 26,600 | 26,500 | 3 | 34 | 43 |
| 1972 | 25,801 | 26,600 | 26,500 | 4 | 40 | 43 |
| 1973 | 25,801 | 26,600 | 26,500 | 5 | 48 | 43 |
| 1974 | 40,680 | 41,500 | 41,400 | 5 | 57 | 68 |
| 1975 | 40,680 | 41,500 | 41,400 | 6 | 67 | 68 |
| 1976 | 38,760 | 39,600 | 39,500 | 7 | 78 | 65 |
| 1977 | 38,760 | 39,600 | 39,500 | 9 | 90 | 65 |
| 1978 | 38,760 | 39,600 | 39,500 | 10 | 103 | 65 |
| 1979 | 38,760 | 39,600 | 39,500 | 11 | 116 | 65 |
| 1980 | 38,760 | 39,700 | 39,500 | 12 | 127 | 65 |
| 1981 | 40,656 | 41,500 | 41,300 | 13 | 136 | 27 |
| 1982 | 41,853 | 42,900 | 42,500 | 14 | 144 | 158 |
| 1983 | 43,630 | 44,700 | 44,300 | 15 | 152 | 195 |
| 1984 | 43,630 | 44,700 | 44,300 | 15 | 160 | 195 |
| 1985 | 43,356 | 44,400 | 44,000 | 16 | 168 | 184 |
| 1986 | 47,593 | 48,700 | 48,300 | 17 | 178 | 205 |
| 1987 | 51,146 | 52,400 | 51,800 | 18 | 189 | 305 |
| 1988 | 53,700 | 54,900 | 54,400 | 19 | 201 | 320 |
| 1989 | 54,696 | 67,100 | 66,600 | 20 | 213 | 330 |
| 1990 | 57,077 | 69,500 | 68,900 | 22 | 226 | 337 |
| 1991 | 55,402 | 67,900 | 67,300 | 23 | 238 | 324 |
| 1992 | 57,028 | 69,500 | 68,900 | 24 | 251 | 334 |
| 1993 | 59,760 | 72,300 | 71,600 | 25 | 265 | 348 |
| 1994 | 65,160 | 77,700 | 77,000 | 27 | 279 | 383 |
| 1995 | 63,530 | 76,100 | 75,400 | 28 | 293 | 409 |
| 1996 | 64,200 | 76,800 | 76,100 | 30 | 309 | 413 |
| 1997 | 68,615 | 81,300 | 80,500 | 31 | 326 | 442 |
| 1998 | 68,843 | 84,100 | 83,300 | 33 | 344 | 443 |
| 1999 | 70,564 | 86,200 | 85,400 | 35 | 362 | 454 |
| 2000 | 63,274 | 77,800 | 76,600 | 36 | 379 | 783 |
| 2001 | 67,537 | 83,000 | 81,700 | 38 | 393 | 889 |
| 2002 | 58,544 | 72,200 | 70,900 | 39 | 406 | 817 |
| 2003 | 57,090 | 70,300 | 69,200 | 41 | 424 | 683 |
| 2004 | 54,000 | 66,600 | 65,500 | 44 | 457 | 649 |
| 2005 | 52,041 | 64,300 | 63,100 | 49 | 508 | 614 |
| 2006 | 49,500 | 61,300 | 60,100 | 56 | 582 | 583 |
| 2007 | 46,980 | 58,400 | 57,100 | 65 | 675 | 551 |
| 2008 | 44,445 | 55,400 | 54,000 | 74 | 775 | 521 |
| 2009 | 46,623 | 58,100 | 56,600 | 83 | 866 | 583 |
| 2010 | 47,766 | 59,500 | 58,000 | 90 | 937 | 522 |

^a Adjusted FAO data that were used as a baseline.

Appendix Table A2. Total reconstructed catch (t) for UAE by major taxa, 1950-2010.

| Year | <i>Scomberomorus commerson</i> | Lethrinidae | <i>Sardinella</i> spp. | <i>Stolephorus</i> spp. | Serranidae | Carangidae | Other ^a |
|------|--------------------------------|-------------|------------------------|-------------------------|------------|------------|--------------------|
| 1950 | 420 | 600 | 780 | 720 | 360 | 420 | 4,620 |
| 1951 | 420 | 600 | 780 | 720 | 360 | 420 | 4,620 |
| 1952 | 420 | 600 | 780 | 720 | 360 | 420 | 4,620 |
| 1953 | 420 | 600 | 780 | 720 | 360 | 420 | 4,620 |
| 1954 | 540 | 720 | 1,020 | 900 | 480 | 540 | 5,520 |
| 1955 | 540 | 720 | 1,020 | 900 | 480 | 540 | 5,520 |
| 1956 | 540 | 720 | 1,020 | 900 | 480 | 540 | 5,520 |
| 1957 | 720 | 960 | 1,320 | 1,200 | 600 | 720 | 7,210 |
| 1958 | 720 | 960 | 1,320 | 1,200 | 600 | 720 | 7,210 |
| 1959 | 1,080 | 1,440 | 1,980 | 1,800 | 900 | 1,080 | 10,470 |
| 1960 | 1,080 | 1,440 | 1,980 | 1,800 | 900 | 1,080 | 10,480 |
| 1961 | 1,080 | 1,440 | 1,980 | 1,800 | 900 | 1,080 | 10,480 |
| 1962 | 1,260 | 1,680 | 2,340 | 2,100 | 1,080 | 1,260 | 12,050 |
| 1963 | 1,260 | 1,680 | 2,340 | 2,100 | 1,080 | 1,260 | 12,060 |
| 1964 | 1,260 | 1,680 | 2,340 | 2,100 | 1,080 | 1,260 | 12,060 |
| 1965 | 1,380 | 1,800 | 2,520 | 2,280 | 1,140 | 1,380 | 13,080 |
| 1966 | 1,380 | 1,800 | 2,520 | 2,280 | 1,140 | 1,380 | 13,080 |
| 1967 | 1,450 | 1,920 | 2,640 | 2,400 | 1,200 | 1,440 | 13,750 |
| 1968 | 1,450 | 1,920 | 2,640 | 2,400 | 1,200 | 1,440 | 13,750 |
| 1969 | 1,450 | 1,920 | 2,640 | 2,400 | 1,200 | 1,440 | 13,750 |
| 1970 | 1,210 | 840 | 3,900 | 3,120 | 600 | 720 | 14,380 |
| 1971 | 1,330 | 900 | 4,140 | 3,360 | 660 | 780 | 15,400 |
| 1972 | 1,330 | 900 | 4,140 | 3,360 | 660 | 780 | 15,410 |
| 1973 | 1,330 | 900 | 4,140 | 3,360 | 660 | 780 | 15,420 |
| 1974 | 2,050 | 1,440 | 6,600 | 5,280 | 1,020 | 1,140 | 23,970 |
| 1975 | 2,060 | 1,440 | 6,600 | 5,280 | 1,020 | 1,140 | 23,980 |
| 1976 | 2,000 | 1,380 | 6,240 | 5,040 | 960 | 1,080 | 22,900 |
| 1977 | 2,000 | 1,380 | 6,240 | 5,040 | 960 | 1,080 | 22,910 |
| 1978 | 2,010 | 1,380 | 6,240 | 5,040 | 960 | 1,080 | 22,920 |
| 1979 | 2,010 | 1,380 | 6,240 | 5,040 | 960 | 1,080 | 22,930 |
| 1980 | 2,010 | 1,380 | 6,240 | 5,040 | 960 | 1,080 | 22,940 |
| 1981 | 1,870 | 380 | 7,800 | 6,000 | 400 | 380 | 24,690 |
| 1982 | 1,970 | 2,540 | 3,540 | 5,400 | 2,230 | 3,110 | 24,060 |
| 1983 | 3,040 | 3,760 | 3,900 | 4,920 | 2,470 | 3,620 | 22,970 |
| 1984 | 3,040 | 3,760 | 3,900 | 4,920 | 2,470 | 3,620 | 22,980 |
| 1985 | 2,440 | 3,550 | 4,270 | 6,410 | 2,330 | 3,420 | 21,990 |
| 1986 | 3,750 | 4,440 | 5,040 | 4,300 | 2,910 | 3,080 | 25,170 |
| 1987 | 3,350 | 4,770 | 4,620 | 3,980 | 3,130 | 6,370 | 26,140 |
| 1988 | 3,650 | 5,000 | 4,840 | 4,180 | 3,280 | 6,670 | 27,320 |
| 1989 | 14,790 | 5,100 | 5,080 | 4,380 | 3,360 | 7,000 | 27,420 |
| 1990 | 14,790 | 5,400 | 5,340 | 4,680 | 3,360 | 7,060 | 28,900 |
| 1991 | 14,610 | 5,220 | 5,180 | 4,540 | 3,240 | 6,800 | 28,280 |
| 1992 | 14,710 | 5,380 | 5,330 | 4,670 | 3,340 | 7,000 | 29,070 |
| 1993 | 14,720 | 5,560 | 4,540 | 5,380 | 3,600 | 7,020 | 31,440 |
| 1994 | 15,130 | 6,310 | 6,070 | 5,280 | 3,800 | 7,830 | 33,300 |
| 1995 | 15,200 | 6,800 | 5,300 | 5,720 | 4,020 | 7,580 | 31,510 |
| 1996 | 15,250 | 6,870 | 5,360 | 5,780 | 4,060 | 7,660 | 31,840 |
| 1997 | 15,530 | 7,350 | 5,520 | 6,180 | 4,340 | 8,150 | 34,230 |
| 1998 | 18,130 | 7,370 | 5,540 | 6,200 | 4,350 | 8,530 | 34,000 |
| 1999 | 18,580 | 7,550 | 5,710 | 6,350 | 4,460 | 8,760 | 34,790 |
| 2000 | 16,730 | 11,790 | 3,680 | 1,640 | 14,430 | 4,000 | 25,540 |
| 2001 | 18,190 | 13,570 | 2,520 | 2,420 | 16,610 | 4,120 | 25,620 |
| 2002 | 14,100 | 12,630 | 2,100 | 3,840 | 13,700 | 3,550 | 22,280 |
| 2003 | 14,910 | 12,190 | 2,480 | 2,070 | 11,290 | 2,930 | 24,470 |
| 2004 | 13,960 | 12,120 | 2,820 | 2,460 | 10,020 | 2,580 | 22,670 |
| 2005 | 13,290 | 12,070 | 3,110 | 2,890 | 8,710 | 2,260 | 21,990 |
| 2006 | 12,800 | 12,450 | 2,880 | 1,200 | 7,620 | 3,360 | 21,000 |
| 2007 | 11,960 | 12,840 | 2,700 | 300 | 6,480 | 4,560 | 19,510 |
| 2008 | 11,060 | 13,220 | 2,440 | 0 | 5,390 | 5,680 | 17,590 |
| 2009 | 12,430 | 14,880 | 500 | 0 | 5,490 | 6,290 | 18,550 |
| 2010 | 15,020 | 13,650 | 490 | 0 | 4,870 | 5,840 | 19,670 |

^a Others category includes 41 additional taxonomic groups.