The Impact of Habitat changes on the Mesopotamian Marshlands Fishery from 2003 to 2018

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Abstract. This article demonstrates how deliberate and unintended interventions can have a disastrous impact on a once flourishing ecosystem. Iraq’s southern marshlands were historically the richest inland fishing ground in the Middle East and Southwest Asia. During the 1960s, fish catches in the marshes consisted of only native species, but decisions by the government to drain the marshlands in the 1990s had cataclysmic results. By 2006, fish catches were largely exotic species. In 2018, the catches in all three marshes were dominated by exotic tilapia and carp species and one of the three marshes was shifting from a freshwater to an estuarine ecosystem. Some native species are dangerously dwindling in number, and others have disappeared entirely. Key reasons for the change include the introduction and spread of exotic species, deterioration of water quality and quantity due to upstream withdrawals, and illegal fishing methods. Many native fish species were rare or very rare in 2018, although they had been fished frequently in 2006, especially in Huwaizah and central marshes. East Hammar marsh differs from the other two for the presence of four migratory marine species that were not seen in 2006 and were becoming very common in 2018.

1. Introduction
The Mesopotamian marshlands of Iraq and Iran, historically the richest wetlands in the Middle East and Southwest Asia, were a refuge for riverine, anadromous, and coastal marine fish and shrimp due to their high biological productivity [1][2]. In Iraq, the marshlands and their Marsh Arab inhabitants came under targeted and sustained attack by the Saddam Hussein’s regime from 1990 to 2003. The result of this ecological and cultural disaster was the desiccation of 93 percent of the original area of Iraq marshlands, the near elimination of their unique flora and fauna, and the forced physical displacement of the indigenous population [3][4].

For the past half a century, capturing fishing was the major source of livelihood for the marsh dwellers, along with water buffalo breeding [5]. In 1990, FAO estimated that the total Iraqi inland fish catch was 23,600 tons, with over 60 percent coming from the marshes [6][7][8]. However, since 1990, the marshlands have faced many threats such as the construction of new hydrological projects in the upper reaches of the Euphrates and Tigris rivers, the expansion of agriculture and the consequent widespread soil salinity, and an increase in oil and gas exploration. After the 2003 invasion, international and local efforts in the marshes resulted in a 58 percent restoration to the 1972 level [9].

Under these drastically changing conditions, the fish assemblages of marshlands fishery can be divided into three distinct periods. The first was the extended native species period, when the catch consisted primarily of Cyprinidae. The second, beginning in the 1980s, was marked by the introduction of exotic carp species and dominated by common carp (Cyprinus carpio) and Prussian carp (Carassius auratus). The third and final period began with the restoration of marshes in 2003 and the introduction of three
exotic African tilapia varieties. It is also marked more recently by saltwater intrusion from the Arabian Gulf and the appearance of marine forms, previously unseen.

- First Period: Native Species (until the late 1960s). Catches were mainly common in native fish species, including bunni (*Arabibarbus sharpeyi*), khatan (*Luciobarbus xanthopterus*), hemri (*Carasobarbus luteus*), and shabout (*A. grypus*). Of these, the most marketable were the largest, khattan and shabout. Both are migratory whitefish. The two medium-sized species, bunni and hemri, are more endemic to the marshes and are greyfish or blackfish species (UNEP 2001). Another in the catch was the smaller Khishni (*Planiliza abu*), consumed mostly by poor people. Both of the two migratory Cyprinids were captured in the marshes, especially in the Central and Huwaizah marshes and were used for the traditional Iraqi specialty cuisine (*masgouff*).

- Second Period: Carp Invasion (1968-2003). The exotic carp period started with the introduction of the common carp (*Cyprinus carpio*) to promote fish farming in 1968. It spread widely into the marshes, out-competing the native barbus species with its fast growth, abundant spawning, and non-selective feeding (Hussain 1995). By the time of the invasion in 2003, fish catches were dominated by only three species: Common carp (*Cyprinus carpio*) and Prussian carp (*Carassius auratus*) and the Mesopotamian catfish or juri (*Silurus triostegus*). Fishermen in Huwaizah and eastern Central marshes claimed that their catches were over 60 percent catfish. In the western Central marshes, the exotic carp species were about 80 percent of the catches, while catfish were 15 to 30 percent. Highly valued fish, including bunni and shabut, were rarely in the catch [10][11] Catch composition in the marshes changed radically in the nineties due to the diversion of freshwater flow, as part of the master plan to drain and dry the marshes.

Furthermore, two carp species, the silver carp (*Hypophthalmichthys molitrix*) and the grass carp (*Ctenopharyngodon idella*), were introduced for farming in 1985. Both require a strong flood pulse to stimulate their synchronous spawning behavior, and neither had a significantly presence in the wild marsh stocks [12] Prussian carp were first observed in the Shatt Al Arab river in 1995. By 2006, only exotic carp species were still common in the marshes, with small catches of bunni were seen in central marshes, small numbers particularly in the East Hammar marsh [13].

- Third Period: Reflooding, Exotic Species, and Marine Forms (2003-present). The was characterized by the introduction and spread of, first recorded in 2007 in the Euphrates River and then invade the central marshes in 2009, followed by occupation of all the southern marshes. The catch was mainly formed of three species of tilapia (*Oreochromis aureus, O.niotricus, Coptodon zillii*). Carp species coming in second rank and few native species individuals third. During the period of drastically reduced government intervention and regulation, there was a serious deterioration in water quality and quantity and extensive use of illegal fishing methods. More recently, significantly less freshwater is reaching the marshes due to withdrawals upstream. As result, there has be saltwater intrusion from the Arabian Gulf and the migration of marine forms, including the now dominant shrimp (*Metapeanus affinis*).

2. Shifts in Fish Species

Data for this article are drawn from two extended field research efforts in the marshlands of Iraq. The first was from 2004 to 2006, under the U.S. Agency for International Development project, Iraq Marshlands Restoration Program, with major participation by the University of Basrah. The second was a twelve-month effort from 2018 to 2019, which was an impact assessment that explored the sustainability of the original project. As funded by DAI, the University of Basra had the main responsibility for data collection and analysis. During both efforts, the team made frequent visits to sites in the three marshes in Iraq’s south: Hammar, Central, and Huwaizah.
A comparison of the commercial fish catches in the three marshes in 2006 and 2018 reveals a number of troubling differences. The most important being an overall reduction in the presence of native species over the past twelve years, with the likelihood of their disappearing entirely in the near future. In addition, many fewer kinds of fish were seen. In 2018, exotic African tilapia dominated the fish catch, followed by exotic carp species. Many native fish species were rare or very rare in southern marshes, while other commercially valued species disappear, although few small individuals had been observed in catch in Huwaizah marsh in 2018.

The fish catch in the three marshes is dominated by African exotic species, mostly Nile tilapia followed by red belly tilapia; both species were “accidentally” introduced in 2005-2006. These exotic species can better tolerate the marshes’ harsh environment than the native species. They spread rapidly to invade marshes. The two species are now the major populations in marshlands commercial fishing at East Hammar marsh. An additional four migratory species – estuarine mullet (very common), hilsa shad (common), yellow fin sea bream (common), and migratory shrimp (very common) – invaded the marsh and were not collected in 2006 but were common or very common in 2018.

In Huwaizah marsh, of the 11 different native and exotic fish species observed in 2006, only six were recorded in 2018. Of those six, five are still commonly found. However, the most important fish commercially in the marshlands – bunni (*Mesopotamichthys sharpeyi*) – decreased from rare to very rare in 12 years (Table 2). Historically, Huwaizah marsh was an important source of freshwater fisheries, but currently fish catches contain only fingerlings or young exotic *C. aruatus* and native *Leuciscus vorax*. No large or moderately sized fish were seen, most likely due the sharp reduction in water level and common illegal fishing methods.

At Central marsh’s main landing site in 2018, the total catch of about 60 kilograms was a mixture of native and exotic species during a 24-hour fishing period. All of the catch was small fish averaging about a one year old. The fish catch mainly included native species, like *L. vorax, P. abu,* and *Carasobarbus luteus*. The rest was Prussian carp (*Carassius aruatus*), and few *C. aruatus* common carp (*Cyprinus carpio*). At Al Chebayish, the catch was roughly six to seven hours of active fishing time, using a fixed gill net weighed about 25 kilograms. The day catch was predominately of exotic species of tilapia (*Oreochromis aureus, O. niloticus, Coptodon zillii*), Prussian carp (*C. aruatus*), and common carp (*Cyprinus carpio*), with few native species and about two kilograms of Khishni (*P. abu*), which previously been the most dominant fish species in the marshes, only one individual of bunni (*M. sharpeyi*) and another one of shilik (*L. vorax*) were collected.

East Hammar marsh was unique among the marshes with the occurrence of estuarine/marine species. In 2006, they were only occasionally caught, but far more common now are estuarine mullet (*L. subviridis*), hilsa shad (*Temudosa ilda*), yellow fin sea bream (*Acanthopagrus arabicus*), and migratory shrimp (*Metapeanus affinis*). The recent sharp increase in water salinity has encouraged the migration of estuarine and marine fish and shrimp from the Arabian Gulf. Today, exotic and marine forms dominate the catch (Table 3).

In addition, visits to the fish markets in Basra and local towns confirm the radical shift in fish for sale of 12 years. By 2018, of the thirteen species of fish for sale, the three most prevalent fish for sale were the grass, common carp, and silver carp, followed by tilapia, and all were exotic and farmed, and the common variety was both farmed domestically or imported from Iran. The annual catch for each commercial fish species for sale in the Basrah fish market, showed steady increase in tilapia catch over the last six years from 69 to 381 kilograms. Common carp increased from 2011 toward 2015, but there was a drop in the two succeeding years coinciding with increase of East Hammar marsh salinity. The annual catches of the other species held mostly even, with small annual fluctuations. comparison of fish sale at Basrah main fish market during 14 year time span, indicated the absence of commercially valued native species like shaboot
(A. grypus), indicating that valued species had disappeared from the market. It was already very rare in 2006 (see Table 5).

3. Analysis

There are four primary reasons for the deterioration of the Mesopotamian marshlands fishery. The first was the invasion of African exotic tilapia species that have out-competed the native species for available food resources. The exotic tilapia can better tolerate poor water quality, including saline water, poor oxygen conditions, and low water levels. Marsh fishermen are now facing severe economic problems because these exotic species fetch a much lower price in the local fish market than native fish. Nor are the exotic fish favored by the local population [14, 15]. The consequence is that the south, which was once the major source of fish for the country, is now a major importer of fish farmed elsewhere in Iraq and, even more so, from Iran.

The second reason is the degraded water quality and quantity in the marshes [16], tied to an increase in water salinity, lower oxygen, higher temperature, and pH concentrations, leading to the decimation of native species and favoring African exotic species [15][17][18]. This deterioration has endangered the viability of the phytoplankton and zooplankton communities with the shift from a freshwater to estuarine habitat. The result has been a disastrous alteration in food item availability [15][19]. Thus, there has been a noticeable reduction in the biodiversity of benthic communities, disrupting the basic food chains.

The Tigris and Euphrates rivers are no longer feeding the marshlands. The increase of water salinity in East Hammar from the penetration of Arabian Gulf water through the Shatt al Arab changed the nature and composition of the fishery, with the migration of marine species. Two shrimp species and fish that were never observed in the marsh are now increasingly common. The change is reflected also in population changes in phytoplankton, zooplankton, and macrobenthic species. Aquatic plants are more resilient and able to tolerate higher levels of salinity.

The third is the absence of natural enemies and diseases in Iraq marshes, which might otherwise have pushed back against the exotic species. A more dangerous threat has come from government actions, which destabilized the environment and the population over decades, from the wanton drainage of the area in the 1990s to the current upstream withdrawals. The fourth is the unregulated and indiscriminate use of illegal fishing methods by Marsh Arabs, including poisons, electrical fishing, and small openings in mesh nets that capture young fish. As a result, fish catches are overrepresented with immature and barely mature fish, driving down both the fish population and the income of the local population.

4. Conclusions

This examination of changes in the Mesopotamian marshlands fishery is a textbook case of the impact of reckless and harmful human interventions in a historically flourishing ecosystem. The genocidal actions by a wanton government, the thoughtless introduction of invasive species, the unsparing decisions about upstream water withdrawals, and the illegal actions of end users have effectively and fundamentally changed the Mesopotamian marshlands. It is probably too late to reverse the course entirely. However, immediate actions to allocate Tigris and Euphrates waters and more active regulating may help to mitigate this ecosystem catastrophe.
Table 1: Fish and Shrimp Seen in Marsh

| Marsh      | Species seen in both 2006 and 2018 | Seen in 2006 but not in 2018 | Fish and shrimp species seen in 2018 |
|------------|-----------------------------------|-----------------------------|--------------------------------------|
|            |                                   | Very Rare | Rare | Common | Very Common | Total |
| Huwaizah   | 6 of 11                           | 0         | 1    | 2      | 6           | 2     | 11     |
| Central    | 6 of 15                           | 6         | 1    | 3      | 3           | 2     | 9      |
| East Hammar| 7 of 19                           | 6         | 1    | 2      | 4           | 6     | 13     |

Table 2: Commercial Fish Species Seen in Huwaizah Marsh in 2006 and 2018

| Family     | Name                        | Origin  | Maximum length (cm) | Seen in May 2006 | Seen in 2018 | Ecological Status 2018 | Feeding Ecology |
|------------|-----------------------------|---------|---------------------|------------------|-------------|-------------------------|----------------|
| Cyprinidae | Carasobarbus luteus         | Hemri   | 30                  | ●                | ●           | Common                 | Omnivore        |
| Cyprinidae | Mesopotamichthys sharpeyi  | Bunni   | 60                  | ●                | ●           | Very rare               | Herbivore       |
| Cyprinidae | Leuciscus varas             | Shiliq  | 55                  | ●                | ●           | Common                 | Carnivore       |
| Cyprinidae | Carassius aruanthus         | Buj buj | Exotic introduced in 1995 | 20 | ● | ● | Common | Omnivore |
| Cyprinidae | Ctenopharyngodon idella     | Ushby   | Exotic introduced in 1985 | 70 | ● | Not seen (Rare) | Herbivore |
| Cyprinidae | Cyprinus carpio             | Carp or Samty | Exotic introduced in 1968 | 70 | ● | ● | Common | Omnivore |
| Cyprinodontidae | Aphanius diopar | Batreikh | Native | 5 | ● | Not seen (Rare) | Carnivore |
| Mugilidae  | Planiliza abu               | Freshwater mallet | Khishni | Native | 15 | ● | ● | Common | Detritivore |
| Siluridae  | Silurus triostegus          | Juri    | Native | 70 | ● | ● | Common | Carnivore |
| Cichlidae  | Oreochromis niloticus       | Shank shatt | Exotic introduced 2005-2006 | 23 | ● | Very common | Herbivore |
| Cichlidae  | Coptodon zillii             | Belti   | Exotic introduced 2005-2006 | 18 | ● | Very common | Herbivore |
Table 3: Commercial Fish and Shrimp Species Seen in East Hammar Marsh in 2006 and 2018

| Family          | Scientific | Common            | Origin   | Maximum Size (cm) | Seen in May 2006 | Seen in 2018 | Ecological Status 2018 | Feeding Ecology |
|-----------------|------------|-------------------|----------|-------------------|------------------|--------------|------------------------|----------------|
| Cyprinidae      | Alburnus sellal | Sellal bleak | Samnan  | Native            | 15               | Not seen | Not seen | Omnivore |
| Cyprinidae      | Alburnus caerulesus | Tigris bleak | Samnan  | Native            | 15               | Not seen | Not seen | Omnivore |
| Cyprinidae      | Leuciscus vorax | Tigris asp  | Shilig   | Native            | 60               | Rare        | Rare       | Carnivore |
| Cyprinidae      | Arabibarbus grypus | Shabout | Samnan  | Native            | 90               | Not seen | Very rare | Omnivore |
| Cyprinidae      | Carasobarbus luteus | Yellow barbel | Bunni    | Native            | 30               | Rare       | Rare       | Omnivore |
| Cyprinidae      | Mesopotamichthys sharpeyi | Yellowfin barbell | Qattan   | Native            | 90               | Not seen | Very rare | Carnivore |
| Cyprinidae      | Carassius araratus | Prussian carp | Buj buj  | Introduced in 1995 | 20              | Common    | Common    | Omnivore |
| Cyprinidae      | Ctenopharyngodon idella | Grass carp | Usbhy    | Introduced in 1985 | 70               | Not seen | Rare in 2006 | Herbivore |
| Cyprinidae      | Cyprinus carpio | Common carp  | Carp or Samty | Introduced in 1968 | 70              | Common    | Common    | Omnivore |
| Cyprinodontidae | Aphanias dispar | Pupfish      | Batreikh | Native            | 5                | Not seen | Not seen | Carnivore |
| Mugilidae       | Planiliza abu | Freshwater mullet | Khishni  | Native            | 15               | Common    | Common    | Detritivore |
| Siluridae       | Silurus triostegus | Mesopotamian catfish | Jurishni | Native            | 70               | Common    | Common    | Carnivore |
| Cichlidae       | Oreochromis niloticus | Nile tilapia | Shank shatt | Exotic accidently introduced 2005-2006 | 23 | Very common | Herbivore |
| Cichlidae       | Coptodon zilli | Redbelly tilapia | Baltic | Exotic accidently introduced 2005-2006 | 18 | Very common | Herbivore |
| Mugilidae       | Liza subviridis | Estuarine Mulletis | Byeah bahrree | Migratory | 22 | Very common | Detritivore |
| Clupeidae       | Tenaclora lisha | Hilsa shad | Shour    | Migratory         | 35               | Common    | Common    | Omnivore |
| Sparidae        | Acanthopagrus arabicus | Yellowfin Snapper | Shank | Migratory         | 30               | Common    | Common    | Carnivore |
| Penaeidae       | Metapenaeus affinis | Migratory Shrimp | Abu nearra | Migratory | 10 | Very common | Omnivore |
Table 4: Commercial Fish Species Seen in Central Marsh (Al Chebayish marsh) in 2006 and 2018

| Family     | Scientific Name | Common Name | Iraqi Arabic | Origin   | Maximum Size (cm) | Seen in May 2006 | Seen in 2018 | Ecological Status 2018 | Feeding Ecology |
|------------|-----------------|-------------|--------------|----------|-------------------|------------------|--------------|------------------------|----------------|
| Cyprinidae | *Alburnus sellal* | Sellal bleak | Samnan | Native | 15                | ●                | ●            | Common in 2006          | Omnivore        |
| Cyprinidae | *Alburnus caeruleus* | Tigris bleak | Samnan | Native | 15                | ●                | ●            | Common in 2006          | Omnivore        |
| Cyprinidae | *Leuciscus vorax* | Tigris asp | Shiliq | Native | 60                | ● ●            | ●            | Rare                   | carnivore       |
| Cyprinidae | *Arabibarbus grypus* | Shabout | Shabot | Native | 90                | ●                | ●            | Rare in 2006            | Omnivore        |
| Cyprinidae | *Carasobarbus luteus* | Yellow barbel | Henri | Native | 30                | ● ●            | ●            | Rare                   | Omnivore        |
| Cyprinidae | *Mesopotamichthys sharpeyi* | Yellow barbel | Bunni | Native | 60                | ● ●            | ●            | Very rare               | Herbivore       |
| Cyprinidae | *Luciobarbus santhopterus* | Yellowfin barbel | Qattan | Native | 90                | ●                | ●            | Very rare in 2006       | Carnivore       |
| Cyprinidae | *Carassius aruanus* | Prussian carp | Buj buj | Accidentally introduced in 1995 | 20 | ● ● | Common | Omnivore |
| Cyprinidae | *Ctenopharyngodon idella* | Grass carp | Ushby | Introduced in 1985 | 70 | ● | Rare in 2006 | Herbivore |
| Cyprinidae | *Cyprinus carpio* | Common carp | Carp or Samty | Introduced in 1968 | 70 | ● ● | Common | Omnivore |
| Cyprinodontidae | *Aphanius dispar* | Pupfish | Batreikh | Native | 5 | ● | Not seen Rare | Carnivore |
| Mugilidae | *Plinaliza abu* | Freshwater mullet | Qishni | Native | 15 | ● ● | Common | detritivore |
| Siluridae | *Sihurus triostegus* | Mesopotamian catfish | Juri | Native | 70 | | | Common | Carnivore |
| Cichlidae | *Oreochromis niloticus* | Nile tilapia | Shank shatt | Exotic accidentally introduced 2005-2006 | 23 | | | Very common | Herbivore |
| Cichlidae | *Coptodon zillii* | Redbelly tilapia | Baltic | Exotic with accidental intro 2005-2006 | 18 | | | Very common | Herbivore |
Table 4: Commercial Fish Species Seen in Central Marsh (Al Chebayish marsh) in 2006 and 2018.

| Family       | Scientific Name | Common Name          | Iraqi Arabic | Maximum Size (cm) | Seen in May 2006 | Seen in 2018 | Ecological Status 2018 | Feeding Ecology |
|--------------|----------------|----------------------|--------------|-------------------|-----------------|--------------|------------------------|----------------|------------------|
| Cyprinidae   | *Alburnus sellal* | Sellal bleak         | Samnan       | 15                | ●                | ●            | Rare in 2006            | Omnivore       |
|              | *Alburnus caeruleus* | Tigris bleak        | Samnan       | 15                | ●                | ●            | Rare in 2006            | Omnivore       |
|              | *Leuciscus vorax* | Tigris asp           | Shiliq       | 60                | ● ●              | ● ●          | Rare in 2006            | Carnivore      |
|              | *Arabibarbus gryps* | Shabout              | Shabot       | 90                | ● ●              | ● ●          | Rare in 2006            | Omnivore       |
|              | *Carasobarbus luteus* | Yellow barbel       | Hemri        | 30                | ● ●              | ● ●          | Rare                   | Omnivore       |
|              | *Mesopotaminichthys sharpeyi* | Yellow barbel | Bunni        | 60                | ● ●              | ● ●          | Very rare               | Herbivore      |
|              | *Luciobarbus santhopterus* | Yellowfin barbel | Qattan       | 90                | ● ●              | ● ●          | Rare in 2006            | Carnivore      |
|              | *Carassius auratus* | Prussian carp        | Buj buj      | Accidentally introduced in 1995 | 20 | ● ● | Common | Omnivore |
|              | *Ctenopharyngodon Idella* | Grass carp         | Usbby        | Introduced in 1985 | 70 | ● | Rare in 2006 | Herbivore |
|              | *Cyprinus carpio* | Common carp          | Carp or Samty | Introduced in 1968 | 70 | ● ● | Common | Omnivore |
|              | *Aphanius dispar* | Pupfish              | Batreikh     | Native            | 5              | ● ● | Not seen | Rare | Carnivore |
| Mugilidae    | *Plinaliza abu* | Freshwater mullet    | Qishni       | Native            | 15             | ● ● | Common | detritivore |
| Siluridae    | *Silurus triostegus* | Mesopotamian catfish | Juri        | Native            | 70             | ● | Common | Carnivore |
| Cichlidae    | *Oreochromis niloticus* | Nile tilapia       | Shank shatt  | Exotic accidentally introduced 2005-2006 | 23 | ● | Very common | Herbivore |
|              | *Coptodon zillii* | Redbelly tilapia    | Baltic       | Exotic with accidental intro 2005-2006 | 18 | ● | Very common | Herbivore |
### Table 5: A Comparison of Fish Species for Sale in the Basra Market in February 2004, May 2006 and October 2018

| Common Name / Arabic Name | Scientific Name | Length (cm) | Price (ID/kg) | Length (cm) | Price (ID/kg) | Length (cm) | Price (ID/kg) | Origin          |
|---------------------------|-----------------|-------------|---------------|-------------|---------------|-------------|---------------|----------------|
|                           |                 | February 2004 |               | May 2006    |               | September 2018 |               |                |
| Silver carp               | Hypophthalmichthys molitrix | 25-40 | 1500-2000 | 25-60 | 2500-3000 | 20-40 | 3500-4000 | 3, Exotic Farmed |
| Grass carp / Ushby        | Ctenopharyngodon Idella | 30-50 | 3500 | 30-60 | 3500-4000 | 20-50 | 4000-5000 | 1, Exotic Farmed |
| Common carp / Samty       | Cyprinus carpio | 10-40 | 2500 | 10-50 | 3000-3500 | 20-45 | 4000-5000 | 2, Exotic Farmed |
| (Locally caught)          |                 |            |               |            |               |            |               |                |
| Yellow barbel / Bunni     | Mesopotamichthys sharpeyi | 20-35 | 6000 | 20-55 | 6000-6500 | 18-30 | 7000-9000 | 5, Native |
| Shabout / Shabot          | Arabibarbus grypus | 30-60 | 2000 | 30-60 | 2000-3000 |            |               |                |
| Yellowfin barbel / Qattan | Luciobarbus xanhopterus | 20-60 | 6500 | 20-60 | 6500-7000 | 20-35 | 8000-10000 | 4, Native |
| Yellow barbel / Himri     | Mesopotamichthys luteus | 5-15 | 1000 | 5-15 | 1500-2000 | 15-25 | 4000 | 6, Native |
| Tigris asp / Shiliq       | Leuciscus vorax | 15-45 | 1500-2000 | 20-50 | 2000-2500 | 15-35 | 2500-3000 | 4, Native |
| Freshwater mullet / Qishni | Planiliza abu | 10-15 | 500 | 10-15 | 500-1000 | 10-20 | 2500 | 8, Native |
| Mesopotamian catfish / Juri | Sillurus triostegus | 20-60 | 500 | 20-60 | 500-1000 | 20-45 | 3000 | 2, Native |
| Red belly tilapia / Zili  | Coptodon zillii | - | - | 10-20 | 1500 | 10-20 | 2000 | 8, Exotic |
| Blue tilapia              | Oreochromis aureus | - | - | - | - | 10-23 | 3000 | 7, Exotic |
| Nile tilapia              | Oreochromis niloticus | - | - | - | - | 10-23 | 3000 | 7, Exotic |
| Common carp/ Samty        | Cyprinus carpio | - | - | 20-40 | 2500 | 20-40 | 4000 | 3, Exotic |
| (Imported from Iran)      |                 |            |               |            |               |            |               |                |
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