



Original research article

A popular and potentially sustainable fishery resource under pressure–extinction risk and conservation of Brazilian Sciaenidae (Teleostei: Perciformes)



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ABSTRACT

Croakers (Sciaenidae) are major fishery resource in Brazil; constituting 22% of marine and 9% of freshwater fishery landings. Croakers are subject to heavy fishing pressure throughout Brazil, but habitat alteration is also an important threat to regional populations. In this regional Sciaenidae assessment, each species was analyzed for relative risk of extinction, including the identification and quantification of the impact of major threats and existing conservation measures, based on application of the Categories and Criteria of the IUCN Red List of Threatened Species. Of the 52 species of Sciaenid fishes (34 marine and 18 freshwater) present in Brazilian waters, the majority are at low risk of extinction, with 10 species classified as Data Deficient (DD) and 36 as Least Concern (LC). However the Southern black drum (*Pogonias cromis*), listed as Endangered (EN) is the most threatened species in the region, while three other species are classified as Near Threatened (NT). A large portion of Brazilian croakers is landed by small-scale artisanal fisheries, which are scattered along coastal and riverine communities. However, our assessments reveal that available fishery landing statistics may have greatly underestimated the artisanal fishery production and by-catch of Sciaenids. We recommend establishing, with adequate enforcement, coastal and riverine protected areas as well as strategic fishing seasons to improve and maintain the conservation status of Sciaenids and sustainable Sciaenid fisheries.

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R É S U M É

Os peixes Cienídeos são os recursos mais importantes da pesca extrativa no Brasil. Constituem 22% dos desembarques marinhos e 9% dos continentais e estão sujeitos a forte pressão de pesca, embora a destruição de habitat seja considerada como uma das maiores ameaças. A avaliação regional dos Cienídeos teve como objetivo analisar o risco de extinção, identificar as principais ameaças e medidas de manejo para esse grupo no Brasil. Nós aplicamos os critérios da lista vermelha da IUCN em 52 espécies, sendo 34 marinhas e 18 de água-doce. Cienídeos estão sob baixo a moderado risco de extinção. Uma espécie marinha, a miragaia *Pogonias cromis*, está regionalmente Em Perigo (EN), enquanto uma espécie marinha e duas de água-doce estão Quase Ameaçadas (NT). Adicionalmente, 10 espécies foram categorizadas como Dados Insuficientes (DD), 36 como Menos Preocupante (LC) e duas espécies marinhas com registros incidentais como Não Aplicável (NA). Uma grande parcela dos Cienídeos no Brasil são capturados pela pesca artesanal, dispersa nas comunidades costeiras e ribeirinhas. As estatísticas de desembarque no Brasil, em geral, subestimam a pesca de pequena escala e a captura incidental dos Cienídeos. Nós recomendamos, com o cumprimento apropriado, o estabelecimento de períodos e áreas protegidas nas zonas costeiras e continentais, definidas estrategicamente de forma a manter a conservação deste grupo e a atividade de pesca em níveis sustentáveis.

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1. Introduction

Sciaenidae, also known as croakers and drums (*corvinas e pescadas*), is a large family of percoid fishes with about 280 species in 90 genera worldwide (Table 1). They are primarily tropical and warm temperate coastal marine fishes; with some confined to freshwater rivers. Globally, the highest abundance of freshwater species are found in Neotropical rivers connected to the Caribbean Sea and Atlantic Ocean. Among 20 species of freshwater Neotropical Sciaenids, 18 are either endemic to Brazil or have the majority of their range of distribution in Brazil (Table 2; Casatti, 2001, 2002, 2005). Croakers range from small to large size fishes (10–200 cm total length), most with a silvery, elongate and compressed body, often with yellowish or reddish color on the lower parts of the body and fins when mature. Most croakers are found near the bottom in near-shore coastal waters, although a few are mid-water column cruisers. Croakers are often randomly scattered in small patches migrating along the shallow coast waters, although a few species can be found to 300 or 600 m depth. Sciaenids often are found at the interface of estuaries and coastal marine areas, and/or locally migrate between floodplains and river channels. Most marine Sciaenids use estuarine environments as nursery grounds, or move along the near shore and river margins seasonally for reproduction. Sciaenids often form large aggregations during spawning migration, which make them extremely vulnerable to overfishing.

Sciaenids are exploited throughout Brazil by artisanal, commercial and recreational fisheries. Brazilian fishery production, however, is comprised predominantly of local artisanal fisheries scattered along the coast and riverbanks (Vasconcellos et al., 2007; Diegues, 2008; Sanders and Hjort, 2011). Sciaenids constitute about 20% of total marine fish landings and 9% of freshwater landings (Table 3) in Brazil. Although the Brazilian Sciaenid fishery production has been relatively stable over the past decade (Fig. 1), the level of production has likely been maintained by increased fishing effort and expansion of fishing grounds. Small sized Sciaenids (<20 cm total length) also constitute a significant portion of by-catch mortality from coastal fish and shrimp trawlers (Haimovici and Mendonça, 1996; Isaac, 1998; Vieira et al., 1996). In Brazil, both freshwater and marine Sciaenid resources are considered vulnerable to over fishing; coastal habitat degradation from urbanization and aquaculture; oil exploration and dam construction.

As part of a national effort to establish baseline population information for all species and to create a national Brazilian Red List of Threatened Species, the objectives are to analyze the relative risk of extinction, to identify and quantify the impact of major threats and document existing conservation measures for Sciaenid species in Brazil, based on IUCN Red List of Threatened Species assessment methodology. Development and design a national red list of threatened species can often serve different purposes, including identification of species with elevated extinction risk, intrinsic or increased rarity, cultural importance, conservation value, or trends of population decline, while also expanding conservation priorities, international responsibility for protection, and taxonomic representation (Miller et al., 2007). Without exception, the national program to evaluate the risk of species extinction of Brazilian fauna is a combination of all of these factors.

2. Methods

The IUCN-SSC (Species Survival Commission) is comprised of 9000 volunteer experts deployed in 130 specialist groups focused on specific taxa (e.g., Shark and Ray Specialist Group) or special topics (e.g., Invasive Species Specialist Group). Each

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