

## **Freshwater fishery regions of the world and their major fish species composition**

Inland fisheries are any activity conducted to extract fish and other aquatic organisms from "inland waters".

The term "inland waters" is used to refer to lakes, rivers, brooks, streams, ponds, inland canals, dams, and other land-locked (usually freshwater) waters (such as the Caspian Sea, Aral Sea, etc.). Whilst most inland waters are freshwater (i.e. zero salinity), there are many areas that are classified nationally as inland waters which have daily or seasonal fluctuations in salinity (e.g. estuaries, deltas, some coastal lagoons). Some areas are permanently brackish-water (coastal lagoons, the Caspian Sea, Lake Van) or even hypersaline (e.g. The Utah Great Salt Lake). For fishery statistical reporting purposes, the FAO Coordinating Working Party on Fishery Statistics (CWP) decided that national authorities should determine the boundaries between marine and inland areas as appropriate to the national context.

Aquatic biodiversity is the variety of life and the ecosystems that make up the freshwater, tidal, and marine regions of the world and their interactions. It encompasses both freshwater and marine ecosystems. Freshwater ecosystems are aquatic systems which contain drinkable water or water of almost no salt content (<.0.5 ppt). They are created by water that enters the terrestrial environment as precipitation, and flows both above and below ground towards the sea. These systems encompass a wide range of habitats, including rivers, lakes, and wetlands, and the riparian zones associated with them. Their boundaries are constantly changing with the seasonality of the hydrological cycle. Their environmental benefits and costs are distributed widely across time and space, through the complex interactions between climate, surface and groundwater, and coastal marine areas.

The earth is estimated to have only 35,029,000 km<sup>3</sup> of freshwater, or only 2.5 % of all water resources, of which only 23.5 % is habitable.

The freshwater ecosystem can be divided into lentic ecosystems (still water) and lotic ecosystems (flowing water). Freshwater resources include lakes and ponds, rivers and streams, reservoirs, wetlands, estuaries and backwaters. They provide the majority of our nation's drinking water resources, water resources for agriculture, industry, sanitation, as well as food including fish and shellfish. They also provide recreational opportunities and a means of transportation. In addition, freshwater ecosystems are home to numerous organisms (e.g., fish, amphibians, aquatic plants, and invertebrates). The multitudes of such forms have created varying ranges of habitats that are the home to the great diversity of freshwater fauna, of which the vertebrate fauna in freshwaters accounts for nearly 25 % of the global vertebrate diversity, but these also happen to be among the world's most threatened ecosystems (Groombridge, 1992). Cohen (1970) professes the percental distribution of living fish in various habitats. Fish do interest people in a number of ways. The world's smallest known vertebrate is a fish, *Pandaka pygmaea* while the largest aquatic a vertebrate too is a whale shark, *Rhincodon typus* which is a giant and the heaviest fish.

Biodiversity in freshwater systems is distributed in a fundamentally different pattern from that in marine systems. Organisms in the sea live in media that is more or less continuous over extensive regions, and species adjust their ranges to some degree as climate or ecological conditions change. But freshwater habitats are relatively discontinuous, and many freshwater species do not disperse easily across the land barriers that separate river drainages into discrete units. This has three important consequences:

1. Freshwater species must survive climatic and ecological changes in place.

2. Freshwater biodiversity is usually highly localized, and even small lake or stream systems often harbour unique, locally evolved forms of life
3. Freshwater species diversity is high even in regions where the number of species at any given site is low, since species differ between one site and the next.

### **Global freshwater fish biodiversity**

Valid scientific descriptions exist for about 27,977 living species of fishes in 515 families and orders (Nelson, 2006). One third of the fish families have, at a minimum, one species with members spending at least part of their life in freshwater. Freshwater fish diversity is therefore large compared to other systems since freshwater lakes and rivers account for only 1% of the earth's surface and < 0.01% of its water. According to Nelson, 2006, 11952 species are exclusively freshwater in origin. The largest number of species occurs in the tropics and the diversity of fishes, in general, increases from the poles to the tropics. For example in many Arctic lakes there is only one species, the Arctic char, *Salvelinus alpinus* (Johnson, 1983) compared to Lake Malawi which has at least 500 species of Cichlidae alone (Craig, 1992). The Palearctic region is species-poor. Southeast Asia, South America and Africa have the most freshwater fishes although many have not been described. For example, the Amazon Basin has about 2,000 species, the Mekong Basin about 1,200 species and the Zaire system about 900 species. However, only about 100 fish species, or species groups, are listed in FAO statistics as making up inland capture. In this regard, the quantification of the importance of individual species and of species groups as inland fishery resources is severely handicapped by the lack of reporting at these levels.

