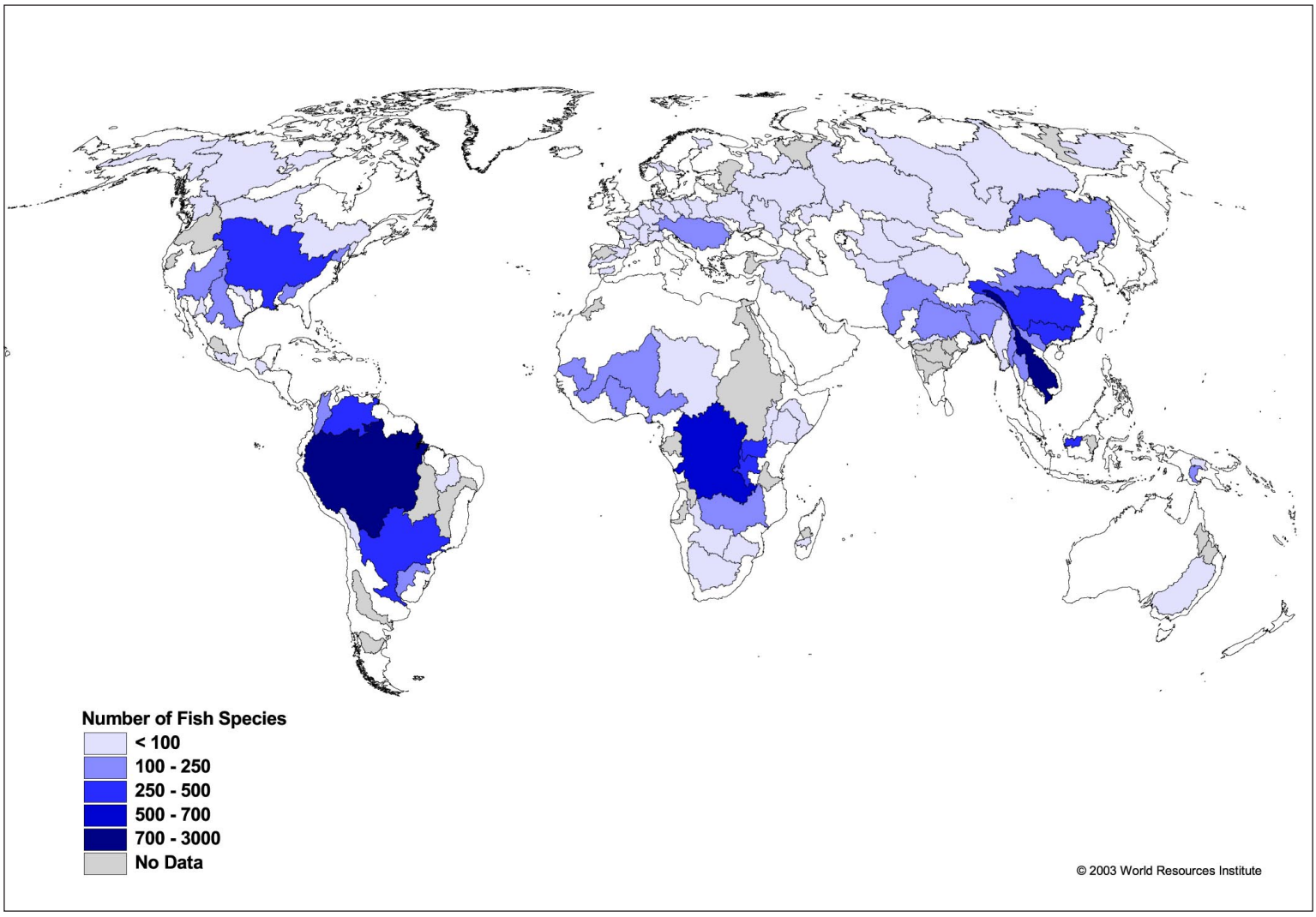
Watersheds of the World : Global Maps

02. Freshwater Fish Species Richness by Basin



Map Description

Despite their value, freshwater ecosystems are being intensely modified and degraded by human activities in many parts of the world. The rapid proliferation of dams and reservoirs, river and stream embankments, and the draining of wetlands for agriculture have caused widespread loss of freshwater habitats. Habitat loss has been accompanied by a decline and loss of freshwater species, to a point where the biodiversity of freshwater ecosystems is currently in far worse condition than that of forest, grassland, or coastal ecosystems (WRI 2000). Habitat degradation, physical alteration, water withdrawals, over-harvesting, pollution, and the introduction of nonnative species all contribute directly or indirectly to declines in freshwater biodiversity. These pressures occur all over the world, although the particular effects of these stresses vary from watershed to watershed. More than 20 percent of the world's 10,000 freshwater fish species have become extinct, endangered, or threatened in recent decades because of the combination of pressures on freshwater systems (Moyle and Leidy 1992:140). This number, however, is considered to be a substantial underestimate.

This map presents fish species richness by basin for selected major watersheds of the world. Of the watersheds with high fish species richness, 56 percent are in the tropics, particularly Central Africa, mainland Southeast Asia, and South America, even though only about a third of all watersheds analyzed are

tropical. High fish diversity is also found in central North America and in several basins in China and India. Because there is a correlation between number of species and basin area, large watersheds tend to have more fish species than smaller ones. To help eliminate this bias and classify the top basins in terms of fish species richness, we grouped basins according to size: large (more than 1,500,000 square kilometers), medium (between 400,000 and 1,499,999 square kilometers) and small (less than 400,000 square kilometers). Following these size categories, the pattern of fish diversity (based on the number of species by river basin) shows that the top three large basins in terms of fish species are the Amazon with more than 3,000 species, the Congo with 700, and the Mississippi with 375. Within the medium-sized basins the top three are the Mekong (>1,200), and two tributaries of the Amazon: the Negro (600), and the Madeira (398). Finally, among the small basins, Lake Victoria (343), Kapuas (320) and Lake Tanganyika (308) are the top three basins in terms of fish species richness (Revenga et al.1998).

Mapping Details

Data on fish species were compiled from multiple sources by the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC). Fish species counts may include diadromous and introduced species. Additional data were added by WRI from technical papers and expert opinion. Data were referenced to major rivers or basins. Because there are several potential sources of error in the species richness values, these numbers should be taken as general indicators of fish diversity and not actual measures. Sources of error include: the amount of research done in a particular basin; species extinctions; and introductions of non-native species. Some rivers, for example, have been highly sampled and most species present identified, while others, particularly in the tropics, have not been thoroughly studied and may contain many not-yet-identified species.

Map Projection

Robinson

Sources

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The case study is available on-line at: http://www.unep.org/bpsp/ Fisheries/Fisheries%20Case%20Studies/COATES.pdf

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