RESOLUTION VI.2: ADOPTION OF SPECIFIC CRITERIA BASED ON FISH FOR IDENTIFYING WETLANDS OF INTERNATIONAL IMPORTANCE

1.   RECALLING that Recommendation 5.9 instructed the Convention Bureau, in cooperation with experts from Contracting Parties, partner organizations, and the Scientific and Technical Review Panel (STRP), to formulate proposals on criteria to be used when identifying wetlands of international importance as fish habitat or as a nursery for fisheries, and to develop guidelines for application of such criteria;

2.   NOTING WITH GRATITUDE the extensive work on this issue carried out by the STRP and other experts, which has led to the formulation of criteria and guidelines on wetlands of international importance as fish habitats;

3.   EMPHASIZING the importance for the scope of the Convention of the increased recognition of the importance of wetlands as fish habitats; and

4.   RECOGNIZING that in many instances commercial fisheries are regulated by statutes whose objectives are compatible with the sustainable exploitation of fishing resources with due regard for the aquatic environment;

THE CONFERENCE OF THE CONTRACTING PARTIES

5.   ADOPTS the specific criteria based on fish, and guidelines for their application, appended as an Annex to the present resolution, and includes them as an integral part of the criteria for identifying wetlands of international importance adopted by Recommendation 4.2;

6.   EMPHASIZES the need for STRP to continue its work on refining these guidelines on the application of these new criteria in the context of Resolution VI.3; and

7.   CALLS ON the Contracting Parties to use these criteria and guidelines to identify sites for inclusion in the Ramsar List of Wetlands of International Importance, and to designate sites so identified.

Annex to Resolution VI.2

SPECIFIC CRITERIA BASED ON FISH FOR IDENTIFICATION OF WETLANDS OF INTERNATIONAL IMPORTANCE, AND GUIDELINES FOR THEIR APPLICATION

Specific Criteria 4 Based on Fish

"A wetland should be considered internationally important if:

(a)   it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity;

or   (b)   it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend."

Guidelines for the application of the Criterion 4(a)[1]

1.1   Fishes are the most abundant vertebrates associated with wetlands. Worldwide, over 18,000 species of fishes are resident for all or part of their life cycles in wetlands as defined by the Ramsar Convention.

1.2   The importance of Criterion 4(a) is that a wetland can be designated as internationally important if it has a high diversity of fishes and shellfishes even if it does not fulfil the requirements of the other criteria. Furthermore, this criterion emphasizes the different forms that diversity might take, including the number of subspecies, species and families, different life-history stages, species interactions, and the complexity of interactions between the above taxa and the external environment. Fish diversity therefore includes diversity within species, between species and between ecosystems. It also includes the diversity of genetically similiar intraspecific ecological units, for instance, salmon runs or the different geographical races of marine fishes that have been identified in many regional seas around the world. Species counts alone are not sufficient to assess the importance of a particular wetland.

1.3   In addition, the concept of the "niche" needs to be considered, i.e. the different ecological roles that species may play at different stages in their life cycles. This point is especially relevant to animals that have a marked metamorphosis in their life cycle, such as corals, barnacles, many aquatic insects, amphibians, fishes with larvae or leptocephali and birds with naked young, e.g. passerines, some birds of prey, and egrets.

1.4   Implicit in this understanding of diversity is the importance of high levels of endemism and of biodisparity. "Endemic species" are species that are unique to one region, often within one country or continent, and are found nowhere else. Many wetlands are characterized by the highly endemic nature of their fish fauna.

1.5   Some measure of the level of endemism should be used to distinguish sites of international importance. If at least 10% of the ichthyofauna is endemic to a wetland, or to wetlands in a natural grouping, that site should be recognized as internationally important, but the absence of endemic fishes from a site should not disqualify it if it has other qualifying characteristics. In some wetlands, such as the African Great Lakes, Lake Baikal in Russia, Lake Titicaca, sinkholes and cave lakes in arid regions, and lakes on islands, endemism levels as high as 90-100% may be reached, but 10% is a practical figure for worldwide application. In areas with no endemic fish species, the endemism of genetically-distinct infraspecific categories, such as geographical races, should be used.

1.6   Over 977 species of fishes are threatened with extinction worldwide and at least 28 fish species have recently become extinct (Groombridge 1993). The occurrence of rare or

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[1] Please refer to the "Definitions" section of this document for explanation of technical terms.

threatened fish species in a wetland is an important attribute but is catered for in Criterion 2 of the Ramsar Convention.

1.7   The concepts of indicator, flagship and keystone species are also important. The presence of "indicator" species is a useful measure of good wetland quality. "Flagship" species have high symbolic value in the conservation movement (e.g. Siberian crane, flamingo, desert pupfish, sturgeon) whereas "keystone" species play vital ecological roles. The recognition of the important ecological role of keystone species, which are often abundant and widespread, and the need for their conservation, is perhaps foreign to the traditional conservation ethic, but deserve serious consideration. Wetlands with significant populations of indicator, flagship and/or keystone species would merit consideration as sites of international importance.

1.8   An important component of biodiversity is biodisparity, i.e. the range of morphologies and reproductive styles in a community. The biodisparity of a wetland community will be determined by the diversity and predictability of its habitats in time and space, i.e. the more heterogeneous and unpredictable the habitats, the greater the biodisparity of the fish fauna.

1.9   For example, Lake Malawi, a stable, ancient lake, has over 600 fish species of which 92% are maternal mouthbrooding cichlids, but only a few fish families. In contrast, the Okavango Swamps, a palustrine floodplain that fluctuates between wet and dry phases, has only 60 fish species but a wider variety of morphologies and reproductive styles, and many fish families, and therefore has a greater biodisparity (Bruton & Merron, 1990).

1.10   Measures of both biodiversity and biodisparity should be used to assess the international importance of a wetland.

1.11   The problem of invasive aquatic animals also needs to be considered. Fishes (finfishes and shellfishes) have been widely distributed, accidentally or purposely, by humankind from one catchment, ocean or continent to another, with sometimes disastrous consequences for the local fauna and ecology. In some cases, as in the Laurentian Great Lakes in North America, the indigenous fauna of the lakes has been dramatically altered even though the total species count has not declined significantly. In Suisun Marsh in the Sacramento-San Joaquin estuary in the USA, the introduction of alien species has doubled the species count in the wetland. In other cases, as in Lake Victoria in Africa, alien species, combined with overfishing and pollution, have caused a major decline in the diversity of indigenous species. Measures of biodiversity and biodisparity should only take into account representative assemblages of indigenous species, if the true intrinsic worth of the system is to be measured.

1.12   The situation is not simple, however, as many high altitude lakes that formed since the last glaciation contain only introduced fish species. Throughout the world important commercial, recreational and subsistence fisheries are based on introduced species, especially trout, carp, salmon, bass and tilapia. Furthermore, some alien species, for instance those used for biological control, have had beneficial effects on wetlands. In general, the introduction of alien species of fishes and shellfishes which may have adverse impacts on the diversity of indigenous species or for which there are insufficient data available to make a reliable judgement should be discouraged.

Guidelines for the application of the Criterion 4(b)

2.1   Many fishes (including shellfishes) have complex life histories, with spawning, nursery and feeding grounds widely separated and long migrations necessary between them. It is important to conserve all those areas that are essential for the completion of a fish's life cycle if the fish species or stock is to be maintained. The productive, shallow habitats offered by coastal wetlands (including coastal lagoons, estuaries, salt marshes, inshore rocky reefs and sandy slopes) are extensively used as feeding and spawning grounds and nurseries by fishes with openwater adult stages. These wetlands therefore support essential ecological processes for fish stocks, even if they do not necessarily harbour large adult fish populations themselves.

2.2   Furthermore, many fishes in rivers, swamps or lakes spawn in one part of the ecosystem but spend their adult lives in another inland water or in the sea. It is common for fishes in lakes to migrate up rivers to spawn, or fishes in rivers to migrate downstream to a lake or estuary, or beyond the estuary to the sea, to spawn. Many swamp fishes migrate from deeper, more permanent waters to shallow, temporarily inundated areas for spawning. Wetlands, even apparently insignificant ones in one part of a river system, may therefore be vital for the proper functioning of extensive river reaches up- or downstream of the wetland.

2.3   The adoption of this criterion for the identification of wetlands of international importance is for guidance only and does not interfere with the rights of Contracting Parties to regulate fisheries within specific wetlands and/or elsewhere.

Definitions

Catchment: The area drained by a river and all its tributaries; a drainage basin or watershed.

Endemic species: A species that is unique to one region, i.e. it is found nowhere else in the world. A group of fishes may be indigenous to a subcontinent with some species endemic to a part of that subcontinent.

Family: An assemblage of genera and species that have a common phylogenetic origin, e.g. pilchards, sardines and herrings in the family Clupeidae.

Fish: Any finfish, including jawless fishes (hagfishes and lampreys), cartilaginous fishes (sharks, rays, skates and their allies, Chondrichthyes) and bony fishes (Osteichthyes) as well as certain shellfish or other aquatic invertebrates, as listed below.

Fish orders that typically inhabit wetlands (as defined by the Ramsar Convention) and which are indicative of wetland benefits, values, productivity or diversity, include:

Jawless fishes - Agnatha
   -      hagfishes (Myxiniformes)
   -      lampreys (Petromyzontiformes)

Cartilaginous fishes - Chondrichthyes
   -      dogfishes, sharks and allies (Squaliformes)
   -      skates (Rajiformes)
   -      stingrays and allies (Myliobatiformes)

Bony fishes - Osteichthyes
- Australian lungfish (Ceratodontiformes)
- South American and African lungfishes (Lepidosireniformes)
- bichirs (Polypteriformes)
- sturgeons and allies (Acipenseriformes)
- gars (Lepisosteiformes)
- bowfins (Amiiformes)
- bonytongues, elephant fishes and allies (Osteoglossiformes)
- tarpons, bonefishes and allies (Elopiformes)
- eels (Anguilliformes)
- pilchards, sardines and herrings (Clupeiformes)
- milkfishes (Gonorhynchiformes)
- carps, minnows and allies (Cypriniformes)
- characins and allies (Characiformes)
- catfishes and knifefishes (Siluriformes)
- pikes, smelts, salmons and allies (Salmoniformes)
- mullets (Mugiliformes)
- silversides (Atheriniformes)
- halfbeaks (Beloniformes)
- killifishes and allies (Cyprinodontiformes)
- sticklebacks and allies (Gasterosteiformes)
- pipefishes and allies (Syngnathiformes)
- cichlids, perches and allies (Perciformes)
- flatfishes (Pleuronectiformes)

Several groups of shellfishes:

- shrimps, lobsters, freshwater crayfishes, prawns and crabs (Crustacea)
- mussels, oysters, pencil baits, razor shells, limpets, winkles, whelks, scallops, cockles, clams, abalone, octopus, squid and cuttlefish (Mollusca)

Certain other aquatic invertebrates:

- sponges (Porifera)
- hard corals (Cnidaria)
- lugworms and ragworms (Annelida)
- sea urchins and sea cucumbers (Echinodermata)
- sea squirts (Ascidiacea)

Fish stock: The potentially exploitable component of a fish population.

Fishes: "Fishes" is used as the plural of "fish" when more than one species is involved.

Indigenous species: A species that originates and occurs naturally in a particular place.

Life-history stage: A stage in the development of a finfish or shellfish, e.g. egg, embryo, larva, leptocephalus, zoea, zooplankton stage, juvenile, adult, post-adult.

Migration path: The route along which fishes, such as salmon and eels, swim when moving to or from a spawning or feeding ground or nursery. Migration paths often cross international boundaries or boundaries between intranational management zones.

Nursery: That part of a wetland used by fishes for providing shelter, oxygen and food for the early developmental stages of their young. In some fishes, e.g. nest-guarding tilapias, the parent/s remain at the nursery to protect the young whereas in others the young are not protected by the parent/s except by virtue of the shelter provided by the habitat in which they are deposited, e.g. non-guarding catfishes.

The ability of wetlands to act as nurseries depends on the extent to which their natural cycles of inundation, tidal exchange, water temperature fluctuation and/or nutrient pulses are retained; Welcomme (1979) showed that 92% of the variation in catch from a wetland-recruited fishery could be explained by the recent flood history of the wetland.

Population: A group of fishes comprising members of the same species. A wetland community would comprise all the species of plants and animals that live in that wetland.

Significant proportion: In polar biogeographical regions a "significant proportion" may be 3-8 subspecies, species, families, life-history stages or species interactions; in temperate zones 15-20 subspecies, species, families, etc.; and in tropical areas 40 or more subspecies, species, families, etc, but these figures will vary between regions. A "significant proportion" of species includes all species and is not limited to those of economic interest. Some wetlands with a "significant proportion" of species may be marginal habitats for fish and may only contain a few fish species, even in tropical areas, e.g. the backwaters of mangrove swamps, cave lakes, the highly saline marginal pools of the Dead Sea. The potential of a degraded wetland to support a "significant proportion" of species if it were to be restored also needs to be taken into account. In areas where fish diversity is naturally low, e.g. at high latitudes, in recently glaciated areas or in marginal fish habitats, genetically-distinct infraspecific groups of fishes could also be counted.

Spawning ground: That part of a wetland used by fishes for courting, mating, gamete release, gamete fertilization and/or the release of the fertilized eggs, e.g. herring, shad, flounder, cockles, and many fishes in freshwater wetlands. The spawning ground may be part of a river course, a stream bed, inshore or deep water zone of a lake, floodplain, mangrove, saltmarsh, reed bed, estuary or the shallow edge of the sea. The freshwater outflow from a river may provide suitable spawning conditions on the adjacent marine coast.

Species: Naturally occurring populations of fishes that interbreed, or are capable of interbreeding, in the wild.

Species interaction: Exchanges of information or energy between species that are of particular interest or significance, e.g. symbiosis, commensalism, mutual resource defence, communal brooding, cuckoo behaviour, advanced parental care, social hunting, unusual predator-prey relationships, parasitism and hyperparasitism. Species interactions occur in all ecosystems but are particularly developed in species-rich climax communities, such as coral reefs and ancient lakes, where they are an important component of biodiversity.

Wetland benefits: The services that wetlands provide to people, e.g. water purification, supplies of potable water, fishes, plants, building materials and water for livestock, outdoor recreation and education.

Wetland values: The roles that wetlands play in natural ecosystem functioning, e.g. flood attenuation and control, maintenance of underground and surface water supplies, sediment trapping, erosion control, pollution abatement and provision of habitat.

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