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Endangered fish species of the world – a review

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Abstract. The present paper summarizes a large part of the endangered and critically endangered fish species of the world. The list was constructed using the comprehensive IUCN Red List of Threatened Species (available in December 2008) and the well elaborated FISHBASE (available on the official website, in 2008) for taxonomy and accepted scientific names of the species. To these two important sources, many scientific papers and communications were added when recent and useful reports were found. However, there is a long way from the fish species list of this review to the world's complete list of endangered and critically endangered fish species. In our list were not included subspecies, populations, varieties, or species having a debatable taxonomic status. The scope of this review was not to inventorize all the fishes included in these two categories, but to make possible drawing some general conclusions regarding most important possible causes of fish species extinction and to make suggestions concerning fish species conservation possibilities through aquaculture.

Key Words: endangered fish species, critically endangered, causes, population trend.

Abstract. Cet article passe en révue une grande partie des espèces de poissons du monde se trouvant en danger et en danger critique d'extinction. La liste a été construite selon l'UICN pour la Liste Rouge des espèces menacées (disponible en Décembre 2008) et la bien organisée base de données FISHBASE (disponible sur le site officiel, en 2008) pour la taxonomie et les noms scientifiques des espèces. A ces deux sources, de nombreux articles scientifiques et de communications ont été ajoutés lorsque des rapports récents et utiles ont été trouvés. Toutefois, il reste un long chemin à parcourir depuis la liste des espèces de poissons de cette révue jusqu'à la liste mondiale complète des espèces de poissons en danger et en danger critique d'extinction. Dans notre liste n'ont pas été inclues de sous-éspèces, de populations, de variétés ou d'espèces ayant un statut taxonomique discutable. La portée de cet examen n'était pas de faire l'inventaire de tous les éspèces des deux catégories, mais de rendre possible l'élaboration des conclusions générales en ce qui concerne les plus importantes causes possibles de l'extinction des espèces de poissons et de faire des suggestions concernant les possibilités de conservation des espèces de poissons par l'aquaculture.

Mots clés: les espèces de poissons menacées, en danger critique d'extinction, les causes, la tendance démographique.

Rezumat. Prezentul articol aruncă o privire de ansamblu asupra speciilor de pești periclitați din întreaga lume. La realizarea listei s-au utilizat date postate online de către cuprinzatoarele baze de date ale IUCN Red List (Lista Roșie a speciilor, disponibilă în decembrie 2008) și FISHBASE (pagina web oficială din 2008) pentru taxonomie și denumirile științifice actual acceptate ale speciilor de pești. La aceste două importante surse au mai fost adăugate date din literatura de specialitate atunci când alte date de actualitate, utile, au fost găsite. Cu toate acestea, lista nu se pretinde una care cuprinde toate speciile periclitate de pești. În cadrul ei nu au fost introduse subspeciile, populațiile, varietățile și nici speciile care au un statut taxonomic controversat. Scopul prezentului articol nu este acela de a inventaria toate speciile periclitate, ci acela de a sublinia în linii mari care sunt cele mai importante posibile cauze ale dispariției speciilor și de a sugera soluții privind conservarea speciilor de pești periclitate, prin acvacultură.

Cuvinte cheie: specii de pești periclitate, critic periclitate, cauze, orientarea populațiilor.

Introduction. The article refers to the fish species known to be endangered from various reasons that include pollution, fishing, collection, competition from non-native fish species and also the drastic environment changes. It is a serious fact that many fish species may go extinct without even being discovered. Much more fresh water fish

species than marine species will appear in this article due to the fact that they are much better known. The present paper summarizes a large part of the endangered and critically endangered fish species of the world. The list was constructed using the comprehensive IUCN Red List (available in 2008) and the well elaborated FISHBASE (available on the official website, in 2008) for taxonomy and accepted scientific names of the species. To these two important sources, many scientific papers and communications were added when recent and useful reports were found. However, there is a long way from the fish list of this review to the world's complete list of endangered and critically endangered fish species. In our list were not included subspecies, populations, varieties, extinct and vulnerable species, or species having a debatable taxonomic status (e.g. *Oncorhynchus masou* (Brevoort)). The scope of this review was not to inventorize all the fishes included in these two categories, but to make possible drawing some general conclusions regarding most important causes of fish species extinction and to make suggestions concerning fish species conservation possibilities through aquaculture and aquarium.

Checklist. The discussion in this paper was based on the following checklist (IUCN 2008; FISHBASE 2008; completed with information from other cited sources and personal data).

1. *Acipenser dabryanus* Duméril (Critically Endangered, A1acd + 2cd, see Annex 2), Dabry`s Sturgeon or Yangtze Sturgeon. The native population has sharply declined in the last two decades due to overfishing, pollution and habit alteration or destruction, especially since the construction of the Gezhouba Dam, which was built in 1981 across the Yangtze River at Yichang, Hubei Province (Zhuang et al 1997).

2. Acipenser gueldenstaedtii Brandt & Ratzeburg (Endangered, A2d, see Annex 2), Russian Sturgeon.

3. Acipenser mikadoi Hilgendorf (Endangered, C1, see Annex 2), Sakhalin Sturgeon.

4. Acipenser nudiventris Lovetsky (Endangered, A1acde+2d, see Annex 2), Fringebarbel Sturgeon.

5. Acipenser persicus Borodin (Endangered, A2d, see Annex 2), Persian Sturgeon.

6. Acipenser schrenckii Brandt (Endangered, A1acd+2d, see Annex 2), Amur Sturgeon.

7. *Acipenser sinensis* Gray (Endangered, A2cd, see Annex 2), Chinese Sturgeon.

8. *Acipenser stellatus* Pallas (Endangered, A2d, see Annex 2), Stellate Sturgeon.

9. *Acipenser sturio* Linnaeus (Critically Endangered, A2d, see Annex 2), European Sturgeon or Common Sturgeon. The population sizes decreased rapidly due to overfishing, pollution and hydroconstruction (Kirschbaum & Gessner 2000).

10. *Adrianichthys kruyti* Weber (Critically Endangered, A1ae, see Annex 2), Duck-billed Buntingi.

11*. Aetobatus flagellum* (Bloch & Schneider) (Endangered, A2d+3d+4d, see Annex 1), Longheaded Eagle Ray. Population trend: decreasing.

12*. Aetomylaeus maculatus* (Gray) (Endangered, A2d+3d+4d, see Annex 1), Mottled Eagle Ray. Population trend: decreasing.

13*. Aetomylaeus vespertilio* (Bleeker) (Endangered, A2bd+3d+4d, see Annex 1), Reticulate Eagle Ray or Ornate Eagle Ray, Population trend: decreasing.

14. *Alcolapia alcalicus* (Hilgendorf) (Endangered, B1ab(i,ii,iii)+2ab(i,ii,iii) see Annex 1), Natron Tilapia. Population trend: unknown.

15. *Anisotremus moricandi* (Ranzani) (Endangered, A2c, see Annex 2), Brownstriped Grunt.

16. *Allotoca maculata* (Critically Endangered, B1+3abc, see Annex 2), Opal Goodeid. In some area extinct, but we know it still survives in the Laguna de Magdalena because Dr. Shane Webb in 2003 and Dr. John Lyons in 2006 collected specimens there (Langhammer 2006). Close to extinction due to collection.

17. *Anabarilius alburnops* (Regan) (Endangered, B1ab(iii,v)+2ab(iii,v), see Annex 1), Silvery White Fish. Population trend: decreasing.

18. *Anabarilius polylepis* (Regan) (Endangered, B1ab(ii,iii,v)+2ab(ii,iii,v), see Annex 1), Big White Fish. Population trend: decreasing.

19. *Anoxypristis cuspidata* (Latham) (Critically Endangered, A2bcd+3cd+4bcd, see Annex 1), Knifetooth Sawfish. Population trend: decreasing.

20. *Argyrosomus hololepidotus* (Lacepéde) (Endangered, B1ab(ii,iii,v)+2ab(ii,iii,v), see Annex 1), Madagascar Meagre. Population trend: unknown.

21. *Astatotilapia desfontainii* (Lacepede) (Endangered, B2ab(i,ii,iii,iv,v), see Annex 1), Blaumaul-Maulbrüter. Population trend: unknown.

22. *Astatotilapia flaviijosephi* (Lortet) (Endangered, B1ab(iii)c(i,ii)+2ab(iii)c(i,ii), see Annex 1), Amnunit Joseph. Population trend: decreasing. Endemic to the central part of Jordan system.

23. *Austroglanis barnardi* (Skelton) (Endangered, B1ab(ii,iii,v)+2ab(ii,iii,v), see Annex 1), Barnard's Rock-Catfish. Population trend: decreasing.

24. *Bahaba taipingensis* (Herre) (Critically Endangered, A2bd, see Annex 1), Chinese Bahaba. Population trend: decreasing.

25. *Barbus acuticeps* Matthes (Endangered, A2bcd, see Annex 1). Population trend: decreasing.

26. *Barbus andrewi* Barnard (Endangered, B2ab(iii,v), see Annex 1), Berg-breede River Whitefish. Population trend: decreasing.

27. *Barbus chantrei* (Sauvage) (Endangered, B1ab(ii,iii), see Annex 1). Population trend: decreasing. Known from Turkey and Syria.

28. *Barbus claudinae* (Endangered, B1ab(ii,iii)+2ab(ii,iii), see Annex 1). Population trend: unknown.

29. *Barbus erubescens* Skelton (Critically Endangered, B2ab(ii,iii,v), see Annex 1), Twee River Redfin). Population trend: decreasing.

30. *Barbus euboicus* Stephanidis (Critically Endangered, B1ab(i,ii)c(ii) + 2ab(i,ii)c(ii), see Annex 1), Petropsaro. Population trend: stable.

31. *Barbus graecus* Steindachner (Endangered, B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv), see Annex 1), Population trend: unknown.

32. *Barbus quadralineatus* De Vos & Thys van den Audenaerde (Endangered, B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v), see Annex 1). Population trend: decreasing.

33. *Barbus ruasae* Pappenheim (Critically Endangered, B1ab(ii,iii)+2ab(ii,iii), see Annex 1). Population trend: decreasing.

33. *Barbus serra* Peters (Endangered, B2ab(iii,v), see Annex 1), Clanwilliam Sawfin. Population trend: decreasing.

34. *Barbus treurensis* Groenewald (Endangered, B1ab(i,ii,iv,v)+2ab(i,ii,iv,v), see Annex 1), Treur River Barb. Population trend: stable.

35. *Bathyraja griseocauda* (Norman) (Endangered, A2bd+4bd, see Annex 1), Graytail Skate. Population trend: decreasing.

36. *Barbus trevelyani* Günter (Endangered, B1ab(ii,iii)+2ab(ii,iii), see Annex 1), Border Barb. Population trend: unknown.

37. *Betta livida* Ng & Kottelat (Endangered, B1+2c, see Annex 2), Betta, Ikan Bettah (Tan & Ng 2005) or Tulitaistelija.

38. *Betta miniopinna* Tan & Tan (Critically Endangered, A2c, see Annex 2), Betta, Ikan Bettah (Tan & Tan 1994; Tan & Ng 2005) or Minitaistelija.

39. *Betta persephone* Schaller (Critically Endangered, B1+2c, see Annex 2), Betta, Ikan Bettah (Tan & Ng 2005), Mustataistelija or Laub-Kampffisch.

40. *Betta spilotogena* Ng & Kottelat (Critically Endangered, A2c, see Annex 2), Betta, Ikan Bettah (Tan & Ng 2005) or Mustahuulitaistelija.

41. *Brachionichthys hirsutus* (Lacepéde) (Critically Endangered, A1cde, see Annex 2), Spotted Handfish. Endemic to Tasmania, Australia. Endangered due to non-native species introductions and interspecific competition.

42. *Callionymus sanctaehelenae* Fricke (Critically Endangered, D, see Annex 2), St. Helena Dragonet. Known only from St. Helena.

43. *Carcharhinus borneensis* (Bleeker) (Endangered, C2b, see Annex 2), Borneo Shark. Population trend: unknown.

44. *Carcharhinus hemiodon* (Müller & Henle) (Critically Endangered, A2acd, C2a(i), see Annex 1), Pondicherry Shark. Population trend: unknown.

45. *Centrophorus harrissoni* McCulloch (Critically Endangered, A2bd+3d+4bd, see Annex 1), Harrison's Deepsea Dogfish or Dumb Gulper Shark. Population trend: decreasing.

46. *Chasmistes brevirostris* Cope (Endangered, B1+2c, see Annex 2), Shortnose Sucker.

47. *Chasmistes cujus* Cope (Critically Endangered, B1+2b, see Annex 2), Cui-ui. Occurs in deep water. Spawns only around margin of Pyramid Lake in Nevada, USA but formerly made spectacular spawning runs up Truckee River in Nevada, USA. Populations were subject to intensive fishing in the 19th and early 20th century; habitats have been greatly altered by water development projects; species is now endangered (Scoppettone & Vinyard 1991).

48. *Cheilinus undulatus* Rüppell (Endangered, A2bd+3bd, see Annex 1), Undulate Wrasse. Population trend: decreasing.

49. *Chela caeruleostigmata* (Smith) (Critically Endangered, A1c, see Annex 2), Leaping Barb.

50. *Chetia brevis* Jubb (Endangered, B1ab(iii,v)+2ab(iii,v), see Annex 1), Orange-Fringed River Bream. Population trend: unknown.

51. *Chilatherina sentaniensis* (Weber) (Critically Endangered, A1ace, see Annex 2), Sentani Rainbowfish. Population trend: unknown. Known only from Lake Sentani in Irian Jaya, Indonesia.

52. *Chiloglanis asymetricaudalis* de Vos (Endangered, B2ab(ii,iii), see Annex 1), Population trend: unknown.

53. *Chiloglanis bifurcus* Jubb & Le Roux (Endangered, B1ab(i,ii,iii,iv,v) + 2ab(i,ii,iii,iv,v), see Annex 1), Incomati Suckermouth. Population trend: unknown. Endemic to the Crocodile-Incomati system.

54. *Chiloglanis lufirae* Poll (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1), Population trend: decreasing.

55. *Chiloglanis ruziziensis* de Vos (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1). Population trend: unknown.

56. *Chlamydogobius micropterus* Larson (Critically Endangered, A1c, B1+2c, see Annex 2), Elisabeth Springs Goby.

57. *Chlamydogobius squamigenus* Larson (Critically Endangered, A1ace, B2abcde + 3d, see Annex 2), Edgbaston Goby. Co-occurs with the Red-finned Blue-eye *Scaturiginichthys vermeilipinnis*, another endangered species (Allen et al 2002).

58. *Cichlasoma labridens* (Pellegrin) (Endangered, A2ce, B2ab+3a, see Annex 2), Mojarra or Curve-bar Cichlid.

59. *Clarias cavernicola* Trewavas (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1), Cave Catfish. Population trend: unknown.

60. *Clarias maclareni* Trewavas (Critically Endangered, B1+2c, see Annex 2). Endemic to Lake Barombi-ma-Mbu, Northwest Cameroon.

61. *Clinus spatulatus* Bennett (Endangered, B1+2c, see Annex 2), Bot River Klipfish.

62. *Coregonus bavaricus* Hofer (Critically Endangered, B1ab(iii,v)+2ab(iii,v), see Annex 1), Ammersee Kilch. Population trend: unknown.

63. *Coregonus hoferi* Berg (Critically Endangered, B1ab(v), see Annex 1), Schwebrenke. Population trend: unknown. Known from Lake Chiemsee, Germany.

64. *Coregonus pennantii* Valenciennes (Critically Endangered, B1ab(iii,v)+2ab(iii,v), see Annex 1), Gwyniad. Population trend: unknown. Endemic to England.

65. *Coregonus pollan* Thompson (Endangered, B1ab(iii)+2ab(iii), see Annex 1), Pollan. Population trend: unknown.

66. *Coregonus reighardi* (Koelz) (Critically Endangered, A1ae, see Annex 2), Shortnose Cisco.

67. *Coregonus vandesius* Richardson (Endangered, B1ab(iii)+2ab(iii), see Annex 1), Vendace. Population trend: unknown.

68. *Cyprinella alvarezdelvillari* Contreras-Balderas & Lozano-Vilano (Critically Endangered, A1ace, B1+2c, C2b, see Annex 2), Tepehuan Shiner.

69. *Cyprinella bocagrande* Chernoff & Miller (Critically Endangered, A2e, C2b, see Annex 2), Sardinita Bocagrande or Largemouth Shiner. Endemic to Guzman basin, Northern Mexico.

70. *Cyprinella panarcys* (Hubbs & Miller) (Endangered, A1ace, E, see Annex 2), Conchos Shiner.

71. *Cyprinella xanthicara* (Minckley & Lytle) (Endangered, A2ce, see Annex 2), Cuatro Cienegas Shiner.

72. *Cyprinodon beltrani* Alvarez (Endangered, A1abc+2bc, B1+2c, C2b, see Annex 2), Cachorrito Lodero.

73. *Cyprinodon bovinus* Baird & Girard (Critically Endangered, A2c, see Annex 2), Leon Springs Pupfish.

74. *Cyprinodon elegans* Baird & Girard (Endangered, A2ce, B1+2ac, see Annex 2), Comanche Springs Pupfish.

75. *Cyprinodon fontinalis* Smith & Miller (Endangered, A1ae+2e, B1+2ab, C2a, see Annex 2), Perrito De Carbonera.

76. *Cyprinodon labiosus* Humphries & Miller (Endangered, A1abc+2bc, B1+2c, C2b, see Annex 2), Cachorrito Cangrejero.

77. *Cyprinodon macrolepis* Miller (Endangered, A1abc+2bce, B1+2c, C2b, see Annex 2), Largescale Pupfish.

78. *Cyprinodon maya* Humphries & Miller (Endangered, A1abc+2bc, B1+2c, C2b, see Annex 2), Cachorrito Gigante.

79. *Cyprinodon meeki* Miller (Critically Endangered, A1ae+2e, see Annex 2), Cachorrito de Mezquital or Mezquital Pupfish.

80. *Cyprinodon pachycephalus* Minckley & Minckley (Critically Endangered, A1abc + 2bc, B1+2c, C2b see Annex 2), Cachorrito Cabezon or Bighead Pupfish.

81. *Cyprinodon pecosensis* Echelle & Echelle (Critically Endangered, A2ce, see Annex 2), Pecos Pupfish. Endemic to Pecos river system in New Mexico and Texas, USA.

82. *Cyprinodon radiosus* Miller (Endangered, A2ce, see Annex 2), Owens Pupfish.

83. *Cyprinodon simus* Humphries & Miller (Endangered, A1abc+2bc, B1+2c, C2b, see Annex 2), Cachorrito Boxeador.

84. *Cyprinodon verecundus* Humphries (Critically Endangered, A1abc+2bc, B1+2c, C2b, see Annex 2), Cachorrito de Dorsal Larga or Largefin Pupfish.

85. *Cyprinodon veronicae* Lozano-Vilano & Contreras-Balderas (Critically Endangered, A1ac, B1+2abce, C1+2b, see Annex 2), Cachorrito De Charco Azul or Charco Palma Pupfish.

86. *Danio pathirana* (Kottelat & Pethiyagoda) (Critically Endangered, B1+2c, see Annex 2), Barred Danio.

87. *Dasyatis laosensis* Roberts & Karnasuta (Endangered, A1cde+2cde, B1+2ce, see Annex 2), Mekong Freshwater Stingray. Population trend: unknown.

88. *Dipturus batis* (Linnaeus) (Critically Endangered, A2bcd+4bcd, see Annex 1), Flapper Skate or Blue Skate. Population trend: decreasing.

89. *Dipturus laevis* (Mitchill) (Endangered, A1bcd, see Annex 1), Barndoor Skate. Population trend: stable.

90. *Economidichthys trichonis* Economidis & Miller (Endangered, B1ab(ii,iii) + 2ab(ii,iii), see Annex 1), Nanogoviós. Population trend: unknown. Endemic to the oligotrophic Lake Trichonis, Western Greece.

91. *Encheloclarias curtisoma* Ng & Lim (Critically Endangered, B1+2bce, see Annex 2), Malaijinkonnamonni.

92. *Encheloclarias kelioides* Ng & Lim (Critically Endangered, B1+2bcde, see Annex 2), Vähäkonnamonni.

93. *Epinephelus akaara* (Temminck & Schlegel) (Endangered, A2d, see Annex 1), Hong Kong Grouper. Population trend: decreasing.

94. *Epinephelus drummondhayi* Goode & Bean (Critically Endangered, A2d+3d, see Annex 1), Strawberry Grouper or Speckled Hind. Population trend: unknown.

95. *Epinephelus itajara* (Lichtenstein) (Critically Endangered, A2d, see Annex 1), Itajara, Jewfish or Goliath Grouper. Population trend: unknown.

96. *Epinephelus marginatus* (Lowe) (Endangered, A2d, see Annex 1), Dusky Grouper. Population trend: decreasing.

97. *Epinephelus nigritus* (Holbrook) (Critically Endangered, A2d+3d, see Annex 1), Warsaw Grouper. Population trend: unknown.

98. *Epinephelus striatus* (Bloch) (Endangered, A2ad, see Annex 1), Nassau Grouper. Population trend: decreasing.

99. *Etheostoma boschungi* Wall & Williams (Endangered, B1+2c, see Annex 2), Slackwater Darter.

100. *Etheostoma nuchale* Howell & Cladwell (Endangered, B1+2ce, see Annex 2), Watercress Darter.

101. *Etheostoma okaloosae* (Fowler) (Endangered, B1+2c, see Annex 2), Okaloosa Darter. Found only in Choctawhatchee Bay drainage in Florida panhandle in the USA.

102. *Galaxias fontanus* Fulton (Critically Endangered, B1+2bc, see Annex 2), Swan Galaxias. Known only from the upper Swan River of eastern Tasmania.

103. *Galaxias fuscus* Mack (Critically Endangered, A1c+2c, B1+2b, see Annex 2), Barred Galaxias or Brown Galaxias.

104. *Galaxias johnstoni* Scott (Critically Endangered, A1c, B1+2a, see Annex 2), Clarence Galaxias. Known only in Clarence Lagoon and tributaries and the upper reaches of the Clarence River.

105. *Galaxias pedderensis* Frankenberg (Critically Endangered, A1ac+2c, B1+2abcde, see Annex 2), Pedder Galaxias. Known only from Lake Pedder and Lake Gordon in Southern Tasmania, Australia.

106. *Gambusia eurystoma* Miller (Critically Endangered, A1ac+2ce, B1+2ac, C2b, see Annex 2), Guayacon Bocon or Widemouth Gambusia.

107. *Gila modesta* (Garman) (Critically Endangered, A1ace+2ce, B1+2ab, see Annex 2), Charalito Saltillo or Salinas chub. Found in one stream of the Salinas River System in Coahuila, Mexico.

108. *Gila nigrescens* (Girard) (Critically Endangered, A1ace+2ce, B1+2abc, see Annex 2), Charalito Chihuahua or Chihuahua Chub.

109. *Glossolepis wanamensis* Allen & Kailola (Critically Endangered, A1ae, see Annex 2), Lake Wanam Rainbowfish. Population trend: unknown. This species is known only from Lake Wanam, a roughly circular lake located on a small plateau 24 km West of Lae, in Papua New Guinea.

110. *Glyphis gangeticus* (Critically Endangered, A2cde, C2b, see Annex 1), Ganges Shark. Population trend: decreasing. Probable threats include overfishing, habitat degradation from pollution, increasing river utilization and management, including construction of dams and barrages. This species is amphidromous: freshwater, brackish, marine. Its distribution is: Hooghly River, Ganges system, West Bengal, India, and likely from the vicinity of Karachi, Pakistan.

111. *Glyphis glyphis* (Müller & Henle) (Endangered, C2a, see Annex 2), Speartooth Shark. Population trend: unknown.

112. *Gobio tauricus* Vasil'eva (Critically Endangered, B1ab(ii,iii)+2ab(ii,iii), see Annex 1), Chornaya Gudgeon or Short-barbeled Crimean Gudgeon. Population trend: unknown. Found in River Chornaya in Ukraine. We use here taxonomy of Nowak et al (2008) and not (FISHBASE 2008). In 2005, Freyhof & Naseka described a new gudgeon species from Crimea, *G. delyamurei*. In the same time, Vasil'eva et al (2005) also described a new gudgeon, *G. tauricus*, from the same Chornaya River. Moreover the dates of publication of both papers were separate by only one day (Kottelat & Bogutskaya 2006), the name *G. delyamurei* seemed to be a senior synonym of *G. tauricus,* and should take precedence. Irrespective, Mendel et al (2008) speculated that designation of Freyhof & Naseka (2005) was based on the specimens of hybrid origin, contrary to the work of Vasil'eva et al (2005), who examined gudgeons of "pure" identity (Nowak et al 2008).

113. *Gobio skadarensis* Karaman (Endangered, B1ab(ii,iii)+2ab(ii,iii), see Annex 1), Skadar Gudgeon. Population trend: unknown.

114. *Hampala lopezi* Herre (Critically Endangered A1a, B1+2a, see Annex 2), Manumbok.

115. *Haplochromis annectidens* Trewavas (Critically Endangered, A1ace, B1+2cde, see Annex 2). Found in Lake Nabugabo, Africa.

116. *Haplochromis argenteus* Regan (Critically Endangered, D, see Annex 1). Population trend: unknown. Found in Lake Victoria.

117. *Haplochromis barbarae* Greenwood (Endangered, A1ace, B1+2bcde, see Annex 2). Found in Lake Victoria.

118. *Haplochromis bayoni* (Boulenger) (Critically Endangered, A2bcde, see Annex 1). Population trend: unknown. Found in Lake Victoria.

119. *Haplochromis beadlei* Trewavas (Critically Endangered, A1ace, B1+2cd, see Annex 2). Found in Lake Nabugabo, Africa.

120. *Haplochromis bicolor* Boulenger (Critically Endangered, A2abcde, see Annex 1). Population trend: unknown. Distribution: Lake Victoria.

121. *Haplochromis brownae* Greenwood (Endangered, A1ace, see Annex 2). Found in Lake Victoria.

122. *Haplochromis cavifrons* (Hilgendorf) (Critically Endangered, B1ab(i,ii,iii) + 2ab(i,ii,iii), see Annex 1). Population trend: decreasing.

123. *Haplochromis chromogynos* Greenwood (Critically Endangered, D, see Annex 1). Population trend: unknown. Found in Lake Victoria.

124. *Haplochromis cryptodon* Greenwood (Endangered, B1ab(i,ii,iii)+2ab(i,ii,iii), see Annex 1). Population trend: decreasing. Found in Lake Victoria.

125. *Haplochromis cyaneus* Seehausen, Bouton & Zwennes (Endangered, B1ab(iii) + 2ab(iii), see Annex 1). Population trend: decreasing. To not be confused with *Copadichromis cyaneus* (Trewavas).

126. *Haplochromis erythromaculatus* De Vos, Snoeks & Thys van den Audenaerde (Endangered, B1ab(iii)+2ab(iii), see Annex 1), Bulera haplo. Population trend: decreasing.

127. *Haplochromis flavus* Seehausen, Zwennes & Lippitsch (Endangered, B1ab(i,ii,iii), see Annex 1). Population trend: decreasing. Distribution: Eastern Lake Victoria, Tanzania.

128. *Haplochromis granti* Boulenger (Endangered, A1ace, B1+2acd, see Annex 2). Found in Lake Victoria.

129. *Haplochromis guiarti* (Pellegrin) (Critically Endangered, B1ab(i,ii,iii) + 2ab(i,ii,iii), see Annex 1). Population trend: decreasing. Found in Lake Victoria.

130. *Haplochromis heusinkveldi* Witte & Witte-Maas (Critically Endangered, D, see Annex 1). Population trend: decreasing. Found in Lake Victoria.

131. *Haplochromis howesi* van Oijen (Critically Endangered, B1ab(i,ii,iii) + 2ab(i,ii,iii), see Annex 1). Population trend: decreasing. Found in Lake Victoria.

132. *Haplochromis latifasciatus* Regan (Critically Endangered, A1acde, B1+2ce, see Annex 2). Found in African Lake Kyoga.

133. *Haplochromis igneopinnis* (Seehausen & Lippitsch) (Endangered, B1ab(iii,iv) + 2ab(iii,iv), see Annex 1). Population trend: decreasing. Reported from Southwestern shores of the Speke Gulf, Lake Victoria, in Tanzania.

134. *Haplochromis luteus* (Seehausen & Bouton) (Endangered, B1ab(i,ii,iii,v), see Annex 1). Population trend: decreasing. Known from Lake Victoria, Tanzania.

135. *Haplochromis macrocephalus* (Seehausen & Bouton) (Endangered, B1ab(iii) + 2ab(iii), see Annex 1). Population trend: decreasing. Found in Lake Victoria, Tanzania.

136. *Haplochromis maculipinna* (Pellegrin) (Critically Endangered, D, see Annex 1). Population trend: decreasing. Lives in Lake Victoria, Africa.

137. *Haplochromis maxillaris* Trewavas (Critically Endangered, A1ace, B1+2abcde, see Annex 2). Found in Lake Victoria.

138. *Haplochromis megalops* Greenwood & Gee (Critically Endangered, A2bcde, see Annex 1). Population trend: unknown. Found in Lake Victoria.

139. *Haplochromis melanopterus* Trewavas (Endangered, B1ab(i,ii,iii)+2ab(i,ii,iii), see Annex 1). Population trend: unknown. Lives in Lake Victoria.

140. *Haplochromis mento* Regan (Critically Endangered, A1ace, B1+2acd, see Annex 2). Known from Lake Victoria.

141. *Haplochromis microdon* (Boulenger) (Critically Endangered, A2bce, see Annex 1). Population trend: unknown. Known from Lake Victoria.

142. *Haplochromis nuchisquamulatus* (Hilgendorf) (Endangered, A1ace, B1+2acd, see Annex 2). Known from Lake Victoria and from Victoria Nile.

143. *Haplochromis paropius* Greenwood & Gee (Critically Endangered, A1ace, B1+2acd, see Annex 2). Found in Lake Victoria.

144. *Haplochromis phytophagus* Greenwood (Critically Endangered, A2bcde, see Annex 1). Population trend: unknown. Known from Lake Victoria.

145. *Haplochromis piceatus* Greenwood & Gee (Critically Endangered, A2bcde, B1ab(i,ii,iii), see Annex 1). Population trend: unknown. Found in Lake Victoria.

146. *Haplochromis plagiodon* Regan & Trewavas (Endangered, B1ab(v), see Annex 1). Population trend: decreasing. Known from Lake Victoria. To not be confused with *Haplochromis plagiostoma* (see below).

147. *Haplochromis plagiostoma* Regan (Critically Endangered, A2bce, see Annex 1). Population trend: unknown. Found in Lake Victoria.

148. *Haplochromis rubripinnis* Seehausen, Lippitsch & Bouton (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1). Population trend: decreasing. Endemic to the Mwanza Gulf in Southern Lake Victoria, Tanzania.

149. *Haplochromis rufus* (Seehausen & Lippitsch) (Critically Endangered, B1ab(iii) + 2ab(iii), see Annex 1). Population trend: decreasing. Endemic to the Mwanza Gulf in southern Lake Victoria, Tanzania.

150. *Haplochromis simpsoni* Greenwood (Endangered, A1ace, B1+2cd, see Annex 2). Known from Lake Nabugabo, Africa.

151. *Haplochromis spekii* (Boulenger) (Critically Endangered, D, see Annex 1). Population trend: unknown. Known from Lake Victoria and Victoria Nile.

152. *Haplochromis venator* Greenwood (Endangered, A1ace, B1+2cd, see Annex 2). Lives in Lake Nabugabo.

153. *Haplochromis victoriae* (Greenwood) (Critically Endangered, A1ace, B1+2abcd, see Annex 2). Known from Lake Victoria. To not be confused with *Haplochromis victorianus* (which is another critically endangered species, see below).

154. *Haplochromis victorianus* (Pellegrin) (Critically Endangered, A2bce, see Annex 1). Population trend: unknown. Distribution: Lake Victoria.

155. *Haplochromis xanthopteryx* (Seehausen & Bouton) (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1). Population trend: decreasing. Endemic to the Mwanza Gulf in Southern Lake Victoria, Tanzania.

156. *Haplochromis welcommei* Greenwood (Critically Endangered, A1acde, B1+2ce, see Annex 2). Known from Lake Victoria.

157. *Haplochromis worthingtoni* Regan (Critically Endangered, A1acde, B1+2ce, see Annex 2). Known from Lake Kyoga, Uganda.

158. *Hemitriakis leucoperiptera* Herre (Endangered, B1+2ce, C2b, see Annex 2), Whitefin Topeshark. Population trend: unknown.

159. *Himantura fluviatilis* (Hamilton) (Endangered, A1cde+2cde, B1+2c, see Annex 2), Ganges Stingray. Population trend: unknown.

160. *Himantura oxyrhyncha* (Sauvage) (Endangered B1+2c, see Annex 2), Marbled Freshwater Stingray. Population trend: unknown

161. *Himantura signifer* Compagno & Roberts (Endangered, B1+2c, see Annex 2), White-edge Freshwater Whipray. Population trend: unknown.

162. *Hubbsina turneri* de Buen (Critically Endangered, A1ac+2c, B1+2e, C2b, see Annex 2), Highland Splitfin or Mexcalpique Michoacano. Endemic to the Lerma River drainage, Mexico.

163. *Hucho hucho* (Linnaeus) (Endangered, B2ab(ii,iii), see Annex 1), Huchen, Huch, Danube Salmon or Lostrița. Population trend: unknown. Originar to the Danube drainage. Introduced also in other rivers in Europe.

164. *Huso dauricus* (Georgi) (Endangered, A1acde+2d, see Annex 2), Kaluga.

165. *Huso huso* (Linnaeus) (Endangered A2d, see Annex 2), European Sturgeon or Beluga.

166. *Isogomphodon oxyrhynchus* (Müller & Henle) (Critically Endangered, A2ad+3d+4ad, see Annex 1). Daggernose Shark, Population trend: decreasing.

167. *Kiunga ballochi* Allen (Critically Endangered, A1ac, B1+2abcde, see Annex 2), Glass Blue-eye. Population trend: unknown.

168. *Knipowitschia cameliae* Nalbant & Oţel (Critically Endangered, A2b, B1ab(v)+2ab(v), see Annex 1), Danube Delta Dwarf Goby. Population trend: unknown. Known from a single small lagoon near Portiţa, South of Danube Delta in the Golovita-Sinoe-Razelm Lake complex (Black Sea, Romania).

169. *Knipowitschia ephesi* Ahnelt (Critically Endangered, B1ab(iii), see Annex 1). Population trend: unknown. Known from Turkish waters.

170. *Knipowitschia mermere* Ahnelt (Critically Endangered, B1ab(iii), see Annex 1). Population trend: decreasing. Found in Turkey.

171. *Knipowitschia milleri* (Ahnelt & Bianco) (Critically Endangered, B1ab(i,ii,iii) + 2ab(i,ii,iii) see Annex 1). Population trend: decreasing. Lives in Greece.

172. *Knipowitschia thessala* (Vinciguerra) (Endangered, B2ab(ii,iii,v), see Annex 1), Thessalogovinós. Population trend: unknown. Endemic to the Pinios river system of Thessaly, Greece.

173. *Konia dikume* Trewavas (Critically Endangered, A1cde, B1+2c, see Annex 2), Dikume. Endemic to Lake Barombi-ma-Mbu, West Cameroon.

174. *Konia eisentrauti* (Trewavas) (Critically Endangered, B1+2c, see Annex 2), Konye. Endemic to Lake Barombi-ma-Mbu, West Cameroon.

175. *Labeo porcellus* (Heckel) (Critically Endangered, A1c+2c, C1, see Annex 2), Orange Fin Labeo.

176. *Labeo seeberi* Gilchrist & Thompson (Endangered, B2ab(iii,v), see Annex 1), Clanwilliam Sandfish. Population trend: decreasing.

177. *Lamprologus kungweensis* Poll (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1), Täpläkotiloahven. Population trend: unknown. Endemic to Northeastern shore of Lake Tanganyika.

178. *Lates angustifrons* Boulenger (Endangered, A2bcd, see Annex 1), Tanganyika Lates. Population trend: decreasing. Found in Lake Tanganyika.

179. *Lates macrophthalmus* Worthington (Endangered, B1ab(iii), see Annex 1), Albert Lates. Population trend: decreasing. Endemic to Lake Albert, Africa.

180. *Lates microlepis* Boulenger (Endangered, A2bcd, see Annex 1), Forktail Lates. Population trend: decreasing. Endemic to Lake Tanganyika.

181. *Latimeria chalumnae* Smith (Critically Endangered, A2cd, C2b, see Annex 2), Coelacanth. Population trend: unknown. Considered a living fossil, highly stenobiont, occurs in oceans. Ovoviviparous - with as much as 5-29 young (Heemstra 1995; Smith et al 1975). Gestation period estimated at 3 years, which would be the longest known in vertebrates (Froese & Palomares 2000).

182. *Lebias transgrediens* (Ermin) (Critically Endangered, B1+2bcd, see Annex 2), pupfish species, Acigöl-Anatolienkärpfling.

183. *Lethrinops macracanthus* Trewavas (Endangered, C2a(i), see Annex 1), Chisawasawa. Population trend: decreasing. Known from Lake Malawi.

184. *Lethrinops micrentodon* (Regan) (Endangered, A2b, see Annex 1). Population trend: unknown. Found in Lake Malawi.

185. *Lethrinops microdon* Eccles & Lewis (Endangered, A2bd, see Annex 1). Population trend: unknown. Endemic to Malawi, Africa.

186. *Lethrinops stridei* Eccles & Lewis (Endangered, A2bd, see Annex 1), Chisawasawa. Population trend: unknown. Endemic to Lake Malawi.

187. *Leucoraja melitensis* (Clark) (Critically Endangered, A2bcd+3bcd+4bcd, see Annex 1), Maltese Skate or Ray. Population trend: decreasing.

188. *Lucania interioris* Hubbs & Miller (Critically Endangered, A1ac+2c, B1+2abc, C2a, see Annex 2), Sardinilla Cuatro Cienegas or Cuatrocienegas Killifish.

189. *Maccullochella ikei* Rowland (Endangered, A1acd, see Annex 2), Eastern Freshwater Cod.

190. *Maccullochella macquariensis* (Cuvier) (Endangered, C2a, see Annex 2), Trout Cod.

191. *Maccullochella peelii* (Mitchell) (Critically Endangered, C2a, see Annex 2), Murray River Cod.

192. *Mandibularca resinus* Herre (Critically Endangered, A1ce, see Annex 2), Bagangan. Known from the outlet of Lake Lanao, Mindanao, in Philippines.

193. *Moapa coriacea* Hubbs & Miller (Critically Endangered, B1+2c, see Annex 2), Moapa Dace. Endemic to headwaters of Moapa River, Southeastern Nevada, USA.

194. *Mobula mobular* (Bonnaterre) (Endangered, A4d, see Annex 1), Giant Devilray or Devilfish. Population trend: decreasing.

195. *Mugilogobius amadi* (Weber) (Critically Endangered, A1ae, see Annex 2), Poso Bungu. Known only from Lake Poso, Sulawesi, Indonesia.

196. *Mustelus fasciatus* (Garman) (Critically Endangered, A2abd+3bd+4abd, see Annex 1), Striped Smooth-hound. Population trend: decreasing.

197. *Mustelus schmitti* Springer (Endangered, A2bd+3bd+4bd, see Annex 1), Narrownose Smoothhound. Population trend: decreasing.

198. *Myaka myaka* Trewavas (Critically Endangered B1+2c, see Annex 2), Myaka. Endemic to Lake Barombi Mbo, West Cameroon, Africa.

199. *Mycteroperca fusca* (Lowe) (Endangered, B1ab(v), see Annex 1), Island Grouper. Population trend: decreasing.

200. *Mycteroperca jordani* (Jenkins & Evermann) (Endangered, A2d+3d, see Annex 1), Gulf Grouper. Population trend: decreasing.

201. *Myliobatis hamlyni* Ogilby (Endangered, B1ab(v), C2a(i), see Annex 1), Purple Eagle Ray. Population trend: decreasing.

202. *Nannoperca oxleyana* Whitley (Endangered, A1ce+2c, see Annex 2), Oxleyan Pygmy Perch. Oceania: endemic in the coastal drainages of Northeast and Southeast Australia, from Noosa River to Richmond River (Allen 1989), also in dune lakes between the Maroochy and Noosa River systems, Queensland to New South Wales, Australia (Merrick & Schmida 1984).

203. *Narcine bancroftii* (Griffith & Smith) (Critically Endangered, A2abd+3bd+4bd, see Annex 1), Caribbean Electric Ray. Population trend: unknown.

204. *Haplochromis simotes* (Boulenger) (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1). Population trend: decreasing. Found in Lake Victoria, Uganda.

205. *Notropis cahabae* Mayden & Kuhajda (Critically Endangered, B1+2cd, see Annex 2), Cahaba Shiner. Found in the main channel of Cahaba River, Shelby and Bibb counties in Alabama, USA.

206. *Notropis mekistocholas* Snelson (Critically Endangered, B1+2cd, see Annex 2), Cape Fear Shiner.

207. *Notropis moralesi* de Buen (Critically Endangered, C2b, see Annex 2), Sardinita De Tepelmene. Found in Mexico.

208. *Noturus baileyi* Taylor (Critically Endangered, B1+2c, see Annex 2), its vernacular name is Smoky Madtom.

209. *Noturus trautmani* Taylor (Critically Endangered, B1+2c, see Annex 2), Scioto Madtom. Known only from Big Darby Creek (Scioto River system), in Southern Ohio, USA.

210. *Oncorhynchus apache* Miller (Critically Endangered, A1cd, see Annex 2), its vernacular name is Apache Trout.

211. *Oncorhynchus gilae* (Miller) (Endangered, B2ad+3c, see Annex 2), Gila Trout.

212. *Oreochromis amphimelas* (Hilgendorf) (Endangered, B1ab(i,iii,v), see Annex 1), Galiläa-Buntbarsch. Population trend: decreasing. Found in Lakes Manyara, Eyasi, Kitangiri and Singida in Tanzania.

213. *Oreochromis chungruruensis* (Ahl) (Critically Endangered, B1ab(i)c(i), see Annex 1). Population trend: decreasing. Found in Lake Chungruru, a crater lake in the Rungwe Mountains, North of Lake Malawi in Tanzania.

214. *Oreochromis esculentus* (Graham) (Critically Endangered, A2bcde, see Annex 1), Singidia Tilapia. Population trend: decreasing.

215. *Oreochromis hunteri* Günter (Critically Endangered, B1ab(i,iii), see Annex 1), Lake Chala Tilapia. Population trend: decreasing. Endemic to Lake Chala, Africa (Seegers et al 2003).

216. *Oreochromis jipe* (Lowe) (Critically Endangered, B1ab(i,iii,v), see Annex 1), Jipe Tilapia). Population trend: decreasing.

217. *Oreochromis karomo* (Poll) (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1), Karomo. Population trend: decreasing. Distribution: Malagarasi River drainage, Tanzania.

218. *Oreochromis karongae* (Trewavas) (Endangered, A2bd, see Annex 1), Chambo. Population trend: decreasing. Only found in lake Malawi.

219. *Oreochromis lidole* (Trewavas) (Endangered, A2bd, see Annex 1), Chambo Cha Blue. Population trend: decreasing. Distribution: Lakes Malawi, Kingiri and Chungruru, Africa.

220. *Oreochromis mortimeri* (Trewavas) (Critically Endangered, A2ae, see Annex 1), Kariba Tilapia. Population trend: decreasing.

221. *Oreochromis pangani* (Lowe) (Critically Endangered, B1ab(i,ii,iii,v), see Annex 1), Panganintilapia. Population trend: decreasing. Known from Pagani River, above the Power Station Falls in Tanzania, Africa.

222. *Oreochromis squamipinnis* Günther (Endangered, A2bd, see Annex 1). Population trend: decreasing. Endemic to Lake Malawi, Africa.

223. *Oreochromis variabilis* (Boulenger) (Critically Endangered, B1ab(i,ii,iii,iv,v), see Annex 1), Victoria Tilapia. Population trend: decreasing.

224. *Orthochromis kasuluensis* de Vos & Seegers (Endangered, B1ab(iii)+2ab(iii), see Annex 1). Population trend: unknown. Found in upper Ruchugi drainage near Kasulu, Malagarasi basin in Western Tanzania.

225. *Orthochromis mazimeroensis* de Vos & Seegers (Endangered, B1ab(iii) + 2ab(iii), see Annex 1). Population trend: unknown. Known only from the Mazimero and Nanganga rivers, Burundi.

226. *Orthochromis mosoensis* de Vos & Seegers (Endangered, B1ab(iii)+2ab(iii), see Annex 1). Population trend: unknown. Only known from the upper Malagarasi drainage, Burundi.

227. *Orthochromis rubrolabialis* de Vos & Seegers (Endangered, B1ab(iii) + 2ab(iii), see Annex 1). Population trend: unknown. Known only from the Majamazi River, Africa.

228. *Orthochromis uvinzae* de Voos & Seegers (Critically Endangered, B1ab(iii) + 2ab(iii), see Annex 1). Population trend: unknown. Known only from the middle Malagarasi drainage at Uvinza, Tanzania, Africa.

229. *Oxylapia polli* Kiener & Maugé (Critically Endangered, B1ab(i,iii), see Annex 1). Population trend: unknown.

230. *Pagrus pagrus* (Linnaeus) (Endangered, A1bd+2d, see Annex 2), Red Porgy or Common Sea Bream.

231. *Pandaka pygmaea* Herre (Critically Endangered, A1ace, see Annex 2), Dwarf Pygmy Goby.

232. *Paretroplus dambabe* Sparks (Endangered, B1ab(i,ii,iii), see Annex 1). Population trend: decreasing. Only found in Madagascar.

233. *Paretroplus maculatus* Kiener & Maugé (Critically Endangered, B1ab(i,iii,v), see Annex 1), Damba Mipentina. Population trend: decreasing. Endemic to Northwest of Madagascar, Kamoro area.

234. *Paretroplus maromandia* Sparks & Reinthal (Endangered, B1ab(i,iii), see Annex 1). Population trend: decreasing. Found in Madagascar.

235. *Paretroplus menarambo* Allgayer (Critically Endangered, B1ab(i,ii,iii,iv,v) + 2ab(i,ii,iii,iv,v), see Annex 1), Pinstripe Damba. Population trend: unknown. Known from Madagascar.

236. *Parosphromenus harveyi* Brown (Endangered, B1+2c, see Annex 2), Turkoosigurami.

237. *Percina cymatotaenia* (Gilbert & Meek) (Endangered, B1+2ac, see Annex 2), Bluestripe Darter. Known only from the Gasconade and Osage River drainages in Southern central Missouri.

238. *Physiculus helenaensis* Paulin (Critically Endangered, D, see Annex 2), Skulpin. Distribution: St. Helena Island, Atlantic Ocean.

239. *Poblana alchichica* de Buen (Critically Endangered, A1ac+2c, B1+2c, C2b, see Annex 2), Charal De Alchichica or Alchichica Silverside.

240. *Poecilia latipunctata* Meek (Critically Endangered, A1ace+2ce, B1+2ab, C1, see Annex 2), Molly Del Tamesi or Broadspotted Molly. Known from Rio Panuco drainage in Tamaulipas, Mexico.

241. *Poecilia sulphuraria* (Alvarez) (Critically Endangered, A1ac+2ce, B1+2ac, C2b, see Annex 2) Molly Del Teapa or Sulphur Molly. Known from Mexico.

242. *Pristis clavata* Garman (Critically Endangered, A2bcd+3cd+4bcd, see Annex 1), Queensland Sawfish or Dwarf Sawfish. Population trend: decreasing.

243. *Pristis microdon* Latham (Critically Endangered, A2abcd+3cd+4bcd, see Annex 1), Leichhardt's Sawfish or Largetooth Sawfish. Population trend: decreasing.

244. *Pristis pectinata* Latham (Critically Endangered, A2bcd+3cd+4bcd, see Annex 1), Wide Sawfish. Population trend: decreasing.

245. *Pristis perotteti* Müller & Henle (Critically Endangered, A2abcd, see Annex 1), Largetooth Sawfish. Population trend: decreasing.

246. *Pristis pristis* (Linnaeus) (Critically Endangered, A1abc+2cd, see Annex 2), Common Sawfish. Population trend: decreasing.

247. *Pristis zijsron* Bleeker (Critically Endangered, A2bcd+3cd+4bcd, see Annex 1), Narrowsnout Sawfish or Longcomb Sawfish. Population trend: decreasing.

248. *Proterorhinus tataricus* Freyhof & Naseka (Critically Endangered, B1ab(ii,iii) + 2ab(ii,iii), see Annex 1). Population trend: unknown. Occur in the river Chornaya, Crimea, Ukraine.

249. *Psephurus gladius* (Martens) (Critically Endangered, A2cd, see Annex 2), Chinese Paddlefish or Chinese Swordfish. China, endemic to the Yangtze River and its tributaries.

250. *Pseudobarbus afer* (Peters) (Endangered, B2ab(ii,iii,v)c(ii,iv), see Annex 1), Eastern Cape Redfin. Population trend: decreasing.

251. *Pseudobarbus asper* (Boulenger) (Endangered, B2ab(ii,iii,v), see Annex 1), Smallscale Redfin. Population trend: decreasing.

252. *Pseudobarbus burgi* (Boulenger) (Endangered, B2ab(iii,v), see Annex 1), Berg River Redfin. Population trend: decreasing. Decline caused by habitat deterioration and impact of introduced predatory species (IUCN 1990).

253. *Pseudobarbus phlegethon* (Barnard) (Endangered, B1ab(ii,iii,v)+2ab(ii,iii,v), see Annex 1), Fiery Redfin. Population trend: decreasing.

254. *Pseudobarbus quathlambae* (Barnard) (Endangered, B2ab(ii,iii,v), see Annex 1), Maloti Redfin or Maluti Minnow. Population trend: decreasing. Headwater streams of the Orange River in Lesotho, Africa. Type locality is the Umkomazana River in Natal, but the species wasn't recorded there since the 1930s. In present, it is protected within the Sehlabathebe National Park.

255. *Pseudophoxinus egridiri* (Karaman) (Critically Endangered, B1ab(i,ii,iv,v) + 2ab(i,ii,iv,v), see Annex 1), Yag Baligi. Population trend: decreasing. Endemic to Turkey.

256. *Pseudophoxinus handlirschi* (Pietschmann) (Critically Endangered, A2ae, see Annex 1), Ciçek or Kavinne. Population trend: unknown. Known from Lake Egridir, Turkey.

257. *Pseudoscaphirhynchus fedtschenkoi* (Kessler) (Critically Endangered, A1ae, D, see Annex 2), Syr-dariya Shovelnose Sturgeon. Endemic to Syr Dariya drainage of the Aral Sea.

258. *Pseudoscaphirhynchus hermanni* (Kessler) (Critically Endangered, A1ae, D, see Annex 2), Small Amu-dar Shovelnose Sturgeon or Dwarf Sturgeon. Endemic to the drainage of Amu Dariya and Syr Dariya rivers (Ministry of Nature Protection of Turkmenistan, 1999).

259. *Pterapogon kauderni* Koumans (Endangered, B2ab(ii,iii,iv,v), see Annex 1), Banggai Cardinalfish. Population trend: decreasing. Known in present only from Banggai Islands, Indonesia. Threatened by extinction due to collection for the aquarium trade (Roberts et al 1988).

260. *Ptychochromis inornatus* Sparks (Endangered, B1ab(i,iii,v)+2ab(i,iii,v), see Annex 1), Juba. Population trend: decreasing. Known from Madagascar.

261. *Ptychochromoides betsileanus* (Boulenger) (Critically Endangered, B2ab(ii), see Annex 1), Trondo Mainty. Population trend: unknown. Endemic to central Madagascar.

262. *Ptychochromoides vondrozo* Sparks & Reinthal (Critically Endangered, B1ab(i,iii), see Annex 1), Friandahy. Population trend: decreasing. Known from Madagascar.

263. *Pungitius hellenicus* Stephanidis (Critically Endangered, B2ab(i,ii,iii,iv,v), see Annex 1), Ellinopygósteos. Population trend: decreasing. Endemic to Greece.

264. *Pungu maclareni* (Trewavas) (Critically Endangered, B1+2c, see Annex 2), Pungu. Endemic to Lake Barombi Mbo, West Cameroon.

265. *Puntius amarus* (Herre) (Critically Endangered, A1ce, see Annex 2), Pait. Endemic to Lake Lanao, Mindanao, Philippines.

266. *Puntius bandula* Kottelat & Pethiyagoda (Critically Endangered, B1+2c, C1, see Annex 2), Bandula Barb. Known only from a small, unnamed stream flowing through Minimaru Coloniya in Pallegama Estate near Galapitamada, Sri Lanka.

267. *Puntius baoulan* (Herre) (Critically Endangered, A1ce, see Annex 2), Baolan. Endemic to Lake Lanao, Mindanao, Philippines.

268. *Puntius clemensi* (Herre) (Critically Endangered, A1ce, see Annex 2), Bagangan. Endemic to Lake Lanao, Mindanao, Philippines.

269. *Puntius disa* (Herre) (Critically Endangered, A1ce, see Annex 2), Disa. Endemic to Lake Lanao, Lanao Province, Mindanao Island, Philippines.

270. *Puntius flavifuscus* (Herre) (Critically Endangered, A1ce, see Annex 2), Katapa-tapa. Endemic to Lake Lanao, Lumbatan, Mindanao, Philippines.

271. *Puntius herrei* (Fowler) (Critically Endangered, A1ce, see Annex 2). Endemic to Lake Lanao, Lanao Province, Mindanao Island, Philippines.

272. *Puntius katalo* (Herre) (Critically Endangered, A1ce, see Annex 2), Katolo. Endemic to Lake Lanao, Mindanao, Philippines.

273. *Puntius lanaoensis* (Herre) (Critically Endangered, A1ce, see Annex 2), Kandar. Endemic to Lake Lanao, Philippines.

274. *Puntius manalak* (Herre) (Critically Endangered, A1ce, see Annex 2), Manalak. Endemic to Lake Lanao, Mindanao, Philippines.

275. *Puntius tras* (Herre) (Critically Endangered, A1ce, see Annex 2), Tras. Endemic to Lake Lanao, Mindanao, Philippines.

276. *Rheocles wrightae* Stiassny (Endangered, B1ab(i,iii), see Annex 1), Zona or Zonobe. Population trend: decreasing. Found in Manambola River, Madagascar.

277. *Rhinobatos cemiculus* Geoffroy Saint-Hilaire (Endangered, A4bd, see Annex 1), Blackchin Guitarfish. Population trend: decreasing.

278. *Rhinobatos horkelii* Müller & Henle (Critically Endangered, A2bd, see Annex 1), Brazilian Guitarfish. Distribution: Western South Atlantic - From Rio de Janeiro to Argentina. Population of Southern Brazil decreased by 96% from 1984–1994 due to overexploitation; the species faces extinction in the near future if fishing continues (WildAid 2007).

279. *Rhinobatos rhinobatos* (Linnaeus) (Endangered, A4cd, see Annex 1), Common Guitarfish. Population trend: decreasing.

280. *Rhynchobatus luebberti* Ehrenbaum (Endangered, A2ad+3d+4ad, see Annex 1), Lubbert's Guitarfish. Population trend: decreasing.

281. *Romanichthys valsanicola* Dumitrescu, Bănărescu & Stoica (Critically Endangered, B1ab(ii,iii)+2ab(ii,iii), see Annex 1), Asprete. Population trend: unknown. Endemic to Vâlsan River, in Romania, Europe.

282. *Romanogobio benacensis* (Pollini) (Endangered, B2ab(i,ii,iii,iv,v), see Annex 1), Italian Gudgeon. Population trend: decreasing. We use here taxonomy of Nowak et al (2008) and not (FISHBASE 2008). Considered previously as subspecies of *G. gobio* (Bănărescu et al 1999 vs. Bianco 1995; Kottelat 1997; Bianco & Ketmaier 2001, 2005; Kottelat & Persat 2005).

283. *Rostroraja alba* (Lacepède) (Endangered, A2cd+4cd, see Annex 1), Bottlenose Skate. Population trend: decreasing.

284. *Salaria economidisi* Kottelat (Critically Endangered, B1ab(i,ii,iii), see Annex 1). Population trend: unknown. Endemic to Lake Trichonis, Greece.

285. Salmo platycephalus Behnke (Critically Endangered, B1ab(v)+2ab(v), see Annex 1), Ala Balik. Population trend: unknown. Found in Turkish freshwaters.

286. *Sandelia bainsii* Castelnau (Endangered, B1b(ii,iii)+2ab(ii,iii), see Annex 1), Eastern Cape Rocky. Population trend: decreasing.

287. *Sarotherodon caroli* (Holly) (Critically Endangered, B1+2c, see Annex 2), Fissi. Endemic to Lake Barombi-Mbo, Cameroon.

288. *Sarotherodon linnellii* (Lönnberg, 1903) (Critically Endangered, B1+2c, see Annex 2), Unga or Blackfin Tilapia. Endemic to Lake Barombi Mbo, West Cameroon.

289. *Sarotherodon lohbergeri* (Holly) (Critically Endangered, B1+2c, see Annex 2), Leka Keppe or Keppi. Endemic to Lake Barombi Mbo and Kumba stream, Cameroon.

290. *Sarotherodon steinbachi* (Trewavas) (Critically Endangered, B1+2c, see Annex 2), Kululu. Endemic to Lake Barombi Mbo, West Cameroon.

291. *Scaphirhynchus albus* (Forbes & Richardson) (Endangered, A4ce, see Annex 1), Pallid Sturgeon. Population trend: decreasing.

292. *Scaphirhynchus suttkusi* Williams & Clemmer (Critically Endangered, A4cde, see Annex 1). Alabama Sturgeon, Population trend: decreasing. Endemic to Alabama, USA.

293. *Scaturiginichthys vermeilipinnis* Ivantsoff, Unmack, Saeed & Crowley (Critically Endangered, A1ce, B2abcde+3d, see Annex 2), Red-finned Blue-eye.

294. *Scleropages formosus* (Müller & Schlegel) (Endangered, A1cd+2cd, see Annex 2), Golden Dragon Fish or Asian Bonytongue.

295. *Scomberomorus concolor* (Lockington) (Endangered, A1c+2d, see Annex 2), Monterrey Spanish Mackerel. Endemic to the Northern Gulf of California.

296. *Sebastes paucispinis* Ayres (Critically Endangered, A1abd+2d, see Annex 2), Bocaccio Rockfish.

297. *Serranochromis meridianus* Jubb (Endangered, B2ab(iii,v), see Annex 1), Lowveld Largemouth. Population trend: unknown.

298. *Silhouettea sibayi* Farquharson (Endangered, B1ab(iii)+2ab(iii), see Annex 1), Sibayi Goby or Barebreast Goby. Population trend: unknown.

299. *Sinocyclocheilus grahami* (Regan) (Critically Endangered, A2ce, see Annex 1), Golden Line Fish. Population trend: decreasing. Known from China.

300. *Speoplatyrhinus poulsoni* Cooper & Kuehne (Critically Endangered, C2b, see Annex 2), Alabama Cavefish. Known only from Key Cave in Alabama, USA.

301. *Sphyrna mokarran* (Rüppell) (Endangered, A2bd+4bd, see Annex 1), Squat-headed Hammerhead Shark. Population trend: decreasing.

302. *Spratellicypris palata* (Herre) (Critically Endangered, A1ce, see Annex 2), Palata. Endemic to Lake Lanao, Dansalan, Mindanao Island, Philippines.

303. *Squatina aculeata* Cuvier (Critically Endangered, A2bcd+3cd+4cd, see Annex 1), Sawback Angelshark. Population trend: decreasing.

304. *Squatina argentina* (Marini) (Endangered, A2b, see Annex 1), Argentine Angel Shark. Population trend: decreasing.

305. *Squatina guggenheim* Marini (Endangered, A2bd, see Annex 1), Spiny Angel Shark. Population trend: decreasing.

306. *Squatina occulta* Vooren & da Silva (Endangered, A2bd, see Annex 1), Smoothback Angel Shark. Population trend: decreasing.

307. *Squatina oculata* Bonaparte (Critically Endangered, A2bcd+3cd+4bcd, see Annex 1), Smoothback Angel Shark. Population trend: decreasing.

308. *Squatina punctata* Marini (Endangered, A2bd, see Annex 1), Angular Angelshark. Population trend: decreasing.

309. *Squatina squatina* (Linnaeus) (Critically Endangered, A2bcd+3d+4bcd, see Annex 1), Angel Shark. Population trend: decreasing.

310. *Stereolepis gigas* Ayres (Critically Endangered, A1bd, see Annex 1), Giant Sea Bass. Population trend: unknown.

311. *Stomatepia mariae* (Holly) (Critically Endangered, B1+2c, see Annex 2), Nsess. Endemic to Lake Barombi-Mbo, Cameroon.

312. *Stomatepia mongo* Trewavas (Critically Endangered, A1cde, B1+2c, see Annex 2), Mongo. Endemic to Lake Barombi-Mbo, Cameroon.

313. *Stomatepia pindu* Trewavas (Critically Endangered, B1+2c, see Annex 2). Pindu. Endemic to Lake Barombi-Mbo, West Cameroon.

314. *Syngnathus watermeyeri* Smith (Critically Endangered, B1+2abd, see Annex 2), River Pipefish. Known only from areas of tidal influence within the Kariega, Kasouga and Bushmans Rivers, South Africa.

315. *Thunnus maccoyii* (Castelnau) (Critically Endangered, A1bd, see Annex 2), Southern Bluefin Tuna.

316. *Tilapia guinasana* Trewavas (Critically Endangered, B1ab(iii)+2ab(iii), see Annex 1), Otjikoto tilapia. Population trend: unknown. Endemic to Lake Guinas, Namibia.

317. *Totoaba macdonaldi* (Gilbert) (Critically Endangered, A1abce+2bce, B1+2ce+3ad, see Annex 2), Totoaba. Distribution: Eastern Central Pacific - Gulf of California. Formerly abundant, now threatened by extinction due to fishing and habitat change (Roberts et al 1998).

318. *Tristramella sacra* (Günther) (Critically Endangered, A2abc, see Annex 1). Population trend: unknown. Endemic to Lake Tiberas, Asia.

319. *Typhleotris madgascariensis* Petit (Endangered, B1ab(i,iii)+2ab(i,iii), see Annex 1). Population trend: unknown. Endemic to South of Onilahy River, Southwestern Madagascar.

320. *Typhleotris pauliani* Arnoult (Endangered, B1ab(i,iii)+2ab(i,iii), see Annex 1). Population trend: unknown. Known only from the type locality, North of Onilahy River, Southwestern Madagascar.

321. *Urogymnus ukpam* (Smith) (Endangered, B1+2abcd, see Annex 2, Pincushion Ray. Population trend: unknown.

322. *Urolophus javanicus* (Martens) (Critically Endangered, B1ab(iii,v), see Annex 1), Java Stingaree. Population trend: decreasing.

323. *Urolophus orarius* Last & Gomon (Endangered, B1ab(v), see Annex 1), Coastal Stingaree. Population trend: unknown.

324. *Xiphophorus couchianus* (Girard) (Critically Endangered, A1ce+2ce, B1+2abc, C2a, see Annex 2), Monterrey Platyfish. Known from Mexico (Lucinda 2003).

325. *Xiphophorus gordoni* Miller & Minckley (Endangered, A1a, B1+2abce, C1, see Annex 2), Platy Cuatro Cienegas or Northern Platyfish. Kown from Cuatrociénegas basin, North Mexico.

326. *Xiphophorus meyeri* Schartl & Schröder (Endangered, A1ace+2ce, B1+2c, C2b, see Annex 2), Platy De Muzquiz or Marbled swordtail. Known from Northern Mexico.

327. *Zearaja maugeana* Last & Gledhill (Endangered, B1+2c, see Annex 2), Maugean Skate. Population trend: unknown. Distribution: Southwest Pacific - Tasmania. Endemic to Bathurst and Macquarie Harbours, in Southwestern Tasmania.

328. *Zingel asper* (Linnaeus) (Critically Endangered, B2ab(iii), see Annex 1), Apron. Population trend: decreasing. Distribution: Rhone River drainage, Europe.

Discussion. About 53.35% from the total number of fish in danger (*sensu lato:* Endangered and Critically Endangered) are facing a very high risk of extinction in the wild in the near future due to population reduction as defined by litter A from IUCN Annex 3.1 or IUCN Annex 2.3.

Around 58.23% from the total number of fish species in danger *sensu lato* are facing a very high risk of extinction in the wild in the near future due to extent of occurrence estimated to be less than 5000 km^2 or area of occupancy estimated to be less than 500 km^2 as defined by litter B from IUCN Annex 3.1 or IUCN Annex 2.3.

Cca 13.11% from the total number of fish species in danger *sensu lato* are facing a very high risk of extinction in the wild in the near future due to population size estimated to number less than 2500 mature individuals (as described in IUCN Annex 3.1 or 2.3, litters C+D).

In only about 0.30% from the cases, quantitative analysis shows the probability of species extinction ≥20% in the wild within less than 20 years (classified by litter E).

However, in more than 33.84% (the real percentage is much higher) from the cases the population trend is decreasing.

This almost continuous decreasing of the species population trend should be stopped, and many good solutions are available.

Solutions. Aquaculture and aquarium bear the blame for most of the non-native fish species introductions, exotic fish releases and also for the excessive fish captures for aquarium trade which, combined, contributed to the natural habitats alteration and, directly on not, to the extinction of many endangered fish species. At the same time, aquaculture and aquarium, together with legislation, were the best solution for many re-establishment programmes for sturgeons, killifishes, salmonids, livebearers and so forth.

On one hand, an intensive aquacultural and aquarium activity leads to decrease of the excessive fishing in the nature, and on the other hand it prevents the complete extinction of the species which are already extinct in the wild (e.g. *Cyprinodon alvarezi* or *C. longidorsalis*; IUCN 2008). Moreover, many vulnerable, endangered or critically endangered fish species should be reproduced in captive (extensive, intensive or superintensive) conditions and stocked into their native range in order to increase the population effective. Stocking is a good solution also for the small number of populations per species or fragmentation of the species occupancy area. Because 58.23% from the total number of fish species in danger are facing a very high risk of extinction in the wild in the near future due to reduced extent of occurrence or area of occupancy, reproduction, rearing and stocking, should be not omitted in order to enlarge the extent of occurrence or area of occupancy.

Stocking or releasing the fish: not anywhere. First of all, ecology and biology of the species should be well understood in order to not stock in waters where the fish has no chance to survive or no opportunity to reproduce. However, in the case of endangered species the fishes have small chance to establish self sustaining populations even stocked into their own native range ("native range" refers here to geographical area in which it occurred before the Neolithic, according to Manchester & Bullock 2000). Nevertheless, stocking fish into their native range in order to enlarge their area of occupancy is mostly accepted among the scientist. Introduction and naturalization of the species (endangered or not) ouside their native range create situations similar to introduction of Asian and European fishes in North America or introduction of North American fishes in Europe: invasion. Intercontinental movements are the worst solution in the terms of conservation (they are often considered benefic from economical point of view). Sometimes, the new introduced species go to extinction in their new waters, but often establish self sustaining populations due to the lack of enemies in their new environment and replace one ore more native species by competition. The history of introductions is plenty of such examples, and many fish species are currently in danger because of foreign feral fish populations.

Good knowledge before the law. Conservation of natural resources, including fish species, is not an easy task. There can not be any successful conservation without thorough knowledge about what is to be conserved (Kottelat 1997; Mace 2004; Hey et al 2003; Nowak et al 2008). A good taxonomic knowledge and also complete information regarding the steady state in that field of research are needed before any law is proposed. The enforcement, dissemination and observation of a law is a matter of education, so that good project proposals in this sense are needed, too.

Further research, complete databases and good publications combining ichthyology, ecology, economy, education and legislation are needed to discuss and clarify the latest issues in the fish conservation field.

Projects. Research or educational projects, development programmes, conservation plans are on one hand financial resources for the applicant institution and on the other hand they are beneficial for biodiversity. The both should convince us to reproduce, rear,

stock and protect the endangered and critically endangered fish species of the world, and all these things just doing our job and duty.

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IUCN Annex 3.1

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:

A. Reduction in Population size based on any of the following:

1. An observed, estimated, inferred or suspected Population size reduction of ≥ 90% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:

(a) direct observation

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected Population size reduction of ≥ 80% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A Population size reduction of ≥ 80%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected Population size reduction of ≥ 80% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 100 km^2, and estimates indicating at least two of a-c:

a. Severely fragmented or known to exist at only a single location.

b. Continuing decline, observed, inferred or projected, in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) area, extent and/or quality of habitat

(iv) number of locations or subPopulation s

(v) number of mature individuals.

c. Extreme fluctuations in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) number of locations or subPopulation s

(iv) number of mature individuals.

2. Area of occupancy estimated to be less than 10 km^2, and estimates indicating at least two of a-c:

a. Severely fragmented or known to exist at only a single location.

b. Continuing decline, observed, inferred or projected, in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) area, extent and/or quality of habitat

(iv) number of locations or subPopulation s

(v) number of mature individuals.

c. Extreme fluctuations in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) number of locations or subPopulation s

(iv) number of mature individuals.

C. Population size estimated to number fewer than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future) OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

(a) Population structure in the form of one of the following:

(i) no subPopulation estimated to contain more than 50 mature individuals, OR

(ii) at least 90% of mature individuals in one subPopulation .

(b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

A. Reduction in Population size based on any of the following:

1. An observed, estimated, inferred or suspected Population size reduction of ≥ 70% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:

(a) direct observation

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected Population size reduction of ≥ 50% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A Population size reduction of ≥nbsp;50%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected Population size reduction of ≥ 50% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 5000 km^2, and estimates indicating at least two of a-c:

a. Severely fragmented or known to exist at no more than five locations.

b. Continuing decline, observed, inferred or projected, in any of the following:

(i) extent of occurrence

(ii) area of occupancy

(iii) area, extent and/or quality of habitat
(iv) number of locations or subPopulation s
(v) number of mature individuals.
c. Extreme fluctuations in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) number of locations or subPopulation s
(iv) number of mature individuals.

2. Area of occupancy estimated to be less than 500 km^2, and estimates indicating at least two of a-c:

a. Severely fragmented or known to exist at no more than five locations.
b. Continuing decline, observed, inferred or projected, in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) area, extent and/or quality of habitat
(iv) number of locations or subPopulation s
(v) number of mature individuals.
c. Extreme fluctuations in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) number of locations or subPopulation s
(iv) number of mature individuals.

C. Population size estimated to number fewer than 2500 mature individuals and either:

1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future) OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

(a) Population structure in the form of one of the following:
(i) no subPopulation estimated to contain more than 250 mature individuals, OR
(ii) at least 95% of mature individuals in one subPopulation .
(b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 250 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

IUCN Annex 2.3

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 80% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

a) direct observation

b) an index of abundance appropriate for the taxon

c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

d) actual or potential levels of exploitation

e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 80%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 100 km^2 or area of occupancy estimated to be less than 10 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at only a single location.

2) Continuing decline, observed, inferred or projected, in any of the following:

a) extent of occurrence

b) area of occupancy

c) area, extent and/or quality of habitat

d) number of locations or subPopulation s

e) number of mature individuals

3) Extreme fluctuations in any of the following:

a) extent of occurrence

b) area of occupancy

c) number of locations or subPopulation s

d) number of mature individuals

C) Population estimated to number less than 250 mature individuals and either:

1) An estimated continuing decline of at least 25% within three years or one generation, whichever is longer or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and Population structure in the form of either:

a) severely fragmented (i.e. no subPopulation estimated to contain more than 50 mature individuals)

b) all individuals are in a single subPopulation

D) Population estimated to number less than 50 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer.

ENDANGERED (EN)

A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 50% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

a) direct observation

b) an index of abundance appropriate for the taxon

c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

d) actual or potential levels of exploitation

e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 50%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d), or (e) above.

B) Extent of occurrence estimated to be less than 5000 km^2 or area of occupancy estimated to be less than 500 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at no more than five locations.

2) Continuing decline, inferred, observed or projected, in any of the following:

a) extent of occurrence

b) area of occupancy

c) area, extent and/or quality of habitat

d) number of locations or subPopulation s

e) number of mature individuals

3) Extreme fluctuations in any of the following:

a) extent of occurrence

b) area of occupancy

c) number of locations or subPopulation s

d) number of mature individuals

C) Population estimated to number less than 2500 mature individuals and either:

1) An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and Population structure in the form of either:

a) severely fragmented (i.e. no subPopulation estimated to contain more than 250 mature individuals)

b) all individuals are in a single subPopulation .

D) Population estimated to number less than 250 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer.

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