

OCCASIONAL PAPER NO. 263

**Records of the
Zoological Survey of India**

**A review of the freshwater fish fauna of
West Bengal, India with suggestions for
conservation of the threatened
and endemic species**

R. P. BARMAN

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Edited by the Director, Zoological Survey of India, Kolkata



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Pages 1–48

CONTENTS

	<i>Page</i>
INTRODUCTION	1
SYSTEMATIC LIST OF THE FRESHWATER FISHES OF WEST BENGAL	2
THREATS AND STRATEGIES FOR CONSERVATION	12
FACTORS RESPONSIBLE FOR THREATENING THE FISH RESOURCES	13
HABITAT LOSS AND DEGRADATION	13
OVER-EXPLOITATION	14
COMPETITION FROM EXOTIC SPECIES	14
SUGGESTIONS TO SAFE GUARD THE THREATENED, NEAR THREATENED AND ENDEMIC FISH SPECIES OF WEST BENGAL	15
HABITAT CHANGE SHOULD BE CAREFULLY CONSIDERED	15
ENVIRONMENT IMPACT ASSESSMENT OF THE EXOTIC FISH SPECIES	15
USE OF ENDEMIC AND NATIVE FISH SPECIES FOR AQUACULTURE	16
MONITORING ON POLLUTION OF THE NATURAL WATER BODIES	16
STRICT IMPLEMENTATION OF THE LAWS GOVERNING THE FISHING ACTIVITIES	16
FISH SANCTUARY	16
PROTECTION AND CONSERVATION OF THE ENDEMIC SPECIES	17
PUBLIC AWARENESS PROGRAMMES	17
SUMMARY AND THE CONCLUDING REMARKS	17
ACKNOWLEDGEMENTS	18
REFERENCES	18
PLATES	19–48

INTRODUCTION

The present paper is primarily aimed to up date the list of the Freshwater Fishes of West Bengal in view of the changes in the nomenclature of the fishes after the publication of the fishes from this state (Sen, 1992). Sen (*op. cit.*) recorded 171 species (he had listed 172 species, one species was recorded twice in the list) from West Bengal. Some of the fishes, which were omitted in the list of the fishes, have been incorporated in this communication. This shows that West Bengal contains 239 species belonging to 147 genera, 49 families and 15 orders of freshwater fishes. Since West Bengal is one of the eight maritime states of our country lying on the northeastern coast of our country, some marine or estuarine fishes are regularly found along with the freshwater fishes of this state. The marine or estuarine fishes have been described as “freshwater visiting species” of this state. These marine and estuarine species have been marked in this list with an asterisk (*) before the name of the species. Twelve (12) exotic fishes, which have been recorded here as “introduced species” (marked in bold letters) have incorporated in this list since they have been acclimatized to the waters of this state and are regularly found along with the catches of the freshwater fishes of this state. The distributional pattern of the Fish species of this state indicates that a great number of the species of this state including several threatened, endemic and unique species are found in the North Bengal. Considering the presence of majority of the species having a number of the threatened, endemic and interesting species in North Bengal, this region may be described as the ‘Hot Spot’ of the Fish resource of West Bengal. The ‘Hot Spot’ may be defined as a geographical area or spot rich in faunal diversity having threatened, endemic and unique species. The freshwater fish fauna of this state has also been reviewed in respect of the threatened and endemic freshwater fishes of our country. This shows that West Bengal possesses 59 threatened freshwater fish species of India as per Molur & Walker (1998) and Menon (1999 and 2004). In addition to the threatened species, this state also shows the occurrence of 42 near threatened species. Moreover, it has been found that this state also contains 7 freshwater fish species endemic to India of which three species are threatened. Considering all the threatened and endemic freshwater fishes of this state, some conservation measures have been suggested for their protection and conservation in this paper. The fact is that the conservative measures suggested are not unique to this state; on the contrary these are almost similar to the conservative measures needed for protection of the fish fauna of other states also. The systematic list of the Fishes of West Bengal has been followed as per that of Jayaram (1999). The factors responsible for the present threats to the freshwater fishes have already been identified and described in Molur and Walker (*op. cit.*) and Menon (2004)

and are not repeated here for the sake of brevity. During this study the fishes of the River Ganga and its branches (Hamilton, 1822) and the fishes of North Bengal (Shaw and Shebbeare, 1937) were consulted. Since the name of the species in Bengali is not uniform everywhere and confusing also, the name of the species in English have also been provided after the name of each species wherever known. The outlined drawings/photographs of the threatened, near threatened, endemic and exotic species have been provided for the easy identification of these fishes in this paper.

SYSTEMATIC LIST OF THE FRESHWATER FISHES OF WEST BENGAL

Order I. CARCHARHINIFORMES

Family 1. CARCHARHINIDAE (Requiem sharks)

- *1. *Glyphis gangeticus* (Muller and Henle) Ganges shark (**Critically endangered**) (**Fig. 1**)

Order II. OSTEOGLOSSIFORMES

Family 2. NOTOPTERIDAE (Feather backs)

2. *Chitala chitala* (Hamilton) Humped feather-back, Chital (**Endangered**) (**Fig. 2**)
3. *Notopterus notopterus* (Pallas) Feather back, Phalui

Order III. ANGUILLIFORMES

Family 3. ANGUILLIDAE (Freshwater Eels)

4. *Anguilla bengalensis bengalensis* (Gray) Indian mottled eel, Eel (**Endangered**) (**Fig. 3**)

Family 4. MORINGUIDAE (Worm eels)

- *5. *Moringua arundinacea* (McClelland) Bengal spaghetti-eel
*6. *Moringua raitaborua* (Hamilton) Purple spaghetti-eel

Family 5. MURAENIDAE (Moray Eels)

- *7. *Gymnothorax tile* (Hamilton) Freshwater moray
*8. *Strophiodon sathete* (Hamilton) Slender giant moray

Family 6. OPICHTHIDAE (Snake Eels)

- *9. *Pisodonophis boro* (Hamilton) Bengal's snake eel/Low finned eel

Order IV. CLUPEIFORMES

Family 7. CLUPEIDAE (Herrings, Sardines, Shads)

10. *Corica soborna* Ganges river sprat
11. *Goniolosa manmina* (Hamilton) Ganges river gizzard shad, Khoira (**Vulnerable**) (**Fig. 4**)

12. *Gudusia chapra* (Hamilton) Indian River/Ganges shad, Chapila
 *13. *Tenualosa ilisha* (Hamilton) Hilsa shad/Ililisa, Ilish (**Vulnerable Nationally**) (Fig. 5)

Family 8. ENGRAULIDAE (Anchovies)

- *14. *Coilia ramcarati* (Hamilton) Tapetail anchovy
 *15. *Coilia reynaldi* Valenciennes Korua grenadier anchovy, Amadi
 *16. *Setipinna brevifilis* (Valenciennes) Short-hairfin anchovy (**Endemic**) (Fig. 6)
 *17. *Setipinna phasa* (Hamilton) Gangetic hairfin anchovy, Phasa

Order V. CYPRINIFORMES

Family 9. CYPRINIDAE (Minnows. Carps)

18. *Amblypharyngodon microlepis* (Bleeker) Indian carplet, Mourala/Mowka
 19. *Amblypharyngodon mola* (Hamilton) Mola carplet, Mourala/Mowka
 20. *Aristichthys nobilis* (Richardson) Bighead carp (**Introduced**) (Fig. 7)
 21. *Aspidoparia jaya* (Hamilton) Jaya, Aspidoparia (**Vulnerable**) (Fig. 8)
 22. *Aspidoparia morar* (Hamilton) Morari/Morar, Aspidoparia (**Near threatened**) (Fig. 9)
 23. *Barilius barila* (Hamilton) Gilland/Caedra (**Vulnerable**) (Fig. 10)
 24. *Barilius barna* (Hamilton) Joia, Bhola/Ghal (**Near threatened**) (Fig. 11)
 25. *Barilius bendelisis* (Hamilton) Khoksa/Joia (**Near threatened**) (Fig. 12)
 26. *Barilius shacra* (Hamilton) Koksha (**Near threatened**) (Fig. 13)
 27. *Barilius tileo* (Hamilton) Boola (**Near threatened**) (Fig. 14)
 28. *Barilius vagra* (Hamilton) Koksa (**Vulnerable**) (Fig. 15)
 29. *Bengala elanga* (Hamilton) (= *Rasbora elanga*) Rasbora (**Endangered**) (Fig. 16)
 30. *Carasius auratus auratus* (Linnaeus) Gold fish (**Introduced**) (Fig. 17)
 31. *Carassius carassius* (Linnaeus) Crucian carp (**Introduced**) (Fig. 18)
 32. *Catla catla* (Hamilton) Catla, Catla (**Vulnerable**) (Fig. 19)
 33. *Chagunius chagunio* (Hamilton) Chaguni, Jerrwah (**Vulnerable**) (Fig. 20)
 34. *Chela cachius* (Hamilton) Chela, Kachi
 35. *Chela laubuca* (Hamilton) Winged rasbora, Chapkhowari/Layubuka
 36. *Cirrhinus mrigala* (Hamilton) Mrigal (**Near threatened**) (Fig. 21)
 37. *Cirrhinus reba* (Hamilton) Reba, Batta/Kharke-bata (**Vulnerable**) (Fig. 22)
 38. *Crossocheilus latius* (Hamilton) Latia, Kala batta
 39. *Ctenopharyngodon idella* (Valenciennes) Grass carp (**Introduced**) (Fig. 23)
 40. *Cyprinion semiplotum* (McClelland) Assamese King Fish, Badangi (**Vulnerable Nationally**) (Fig. 24)

41. *Cyprinus carpio carpio* Linnaeus Common carp (**Introduced**) (**Fig. 25**)
42. *Danio dangila* (Hamilton) Nipati
43. *Danio rerio* (Hamilton) Zebra Danio, Anju
44. *Devario aequipinnatus* (McClelland) Giant Danio, Chebli (**Near threatened**) (**Fig. 26**)
45. *Devario devario* (Hamilton) Sind danio, Bashpata/Anju (**Near threatened**) (**Fig. 27**)
46. *Esomus danricus* (Hamilton) Flying barb, Danrika/Dadhikha/Jongia
47. *Garra annandalei* Hora (= *Garra satyendranathi* Ganguli and Dutta)
48. *Garra gotyla gotyla* (Gray) Stone sucker, Ghor poia (**Vulnerable**) (**Fig. 28**)
49. *Garra lamta* (Hamilton) Stone sucker, Ghor pola/Choalsi
50. *Garra mullya* (Sykes) Stone sucker
51. *Hypophthalmichthys molitrix* (Valenciennes) Silver carp (**Introduced**) (**Fig. 29**)
52. *Labeo angra* (Hamilton) (**Near threatened**) (**Fig. 30**)
53. *Labeo bata* (Hamilton) Bata (**Near threatened**) (**Fig. 31**)
54. *Labeo boga* (Hamilton) Boga labeo/Burmese fish/Jamuna fish (**Near threatened**) (**Fig. 32**)
55. *Labeo calbasu* (Hamilton) Orangefin labeo, Calbasu (**Near threatened**) (**Fig. 33**)
56. *Labeo dyocheilus* (McClelland) (Nil)
57. *Labeo fimbriatus* (Bloch) Fringed-lipped peninsula carp
58. *Labeo gonius* (Hamilton) Kuria labeo, Kurchi/Goni (**Near threatened**) (**Fig. 34**)
59. *Labeo nandina* (Hamilton) Nandin
60. *Labeo pangusia* (Hamilton) Loannee/Utti (**Near threatened**) (**Fig. 35**)
61. *Labeo rohita* (Hamilton) Rohu, Rui (**Near threatened**) (**Fig. 36**)
62. *Neolissocheilus hexagonolepis* (McClelland) Copper mahaseer (= *Barbus dukai* Day) (**Endangered**) (**Fig. 37**)
63. *Oreochthys kosuatis* (Hamilton) Koswati
64. *Osteobrama cotio cotio* (Hamilton) Cotio; Goonta, Koti, Chanda/Maurva (**Near Threatened**) (**Fig. 38**)
65. *Poropuntius clavatus* (McClelland) Stedman barb (**Endangered**) (**Fig. 39**)
66. *Puntius chola* (Hamilton) Swamp barb, Kerrundi (**Vulnerable**) (**Fig. 40**)
67. *Puntius conchonius* (Hamilton) Rosy barb, Kanchan puti (**Vulnerable**) (**Fig. 41**)
68. *Puntius gelius* (Hamilton) Golden barb, Gilli puti
69. *Puntius guganio* (Hamilton) Glass barb, Gugani (**Near threatened**)
70. *Puntius phutunio* (Hamilton) Spottedsail barb
71. *Puntius puntio* (Hamilton) Puntio barb
72. *Puntius sarana* (Hamilton) Olive barb, Swarna puti (**Vulnerable**) (**Fig. 42**)

73. *Puntius sophore* (Hamilton) Pool barb, Puti (**Near threatened**) (Fig. 43)
74. *Puntius terio* (Hamilton) Onespots barb (**Near threatened**) (Fig. 44)
75. *Puntius ticto* (Hamilton) Ticto barb, Tit puti (**Near threatened**) (Fig. 45)
76. *Raiamas bola* (Hamilton) (= *Barilius bola*) Indian trout/Trout barb (**Vulnerable Nationally**) (Fig. 46)
77. *Rasbora daniconius* (Hamilton) Slender rasbora, Darkina/Dankina (**Near threatened**) (Fig. 47)
78. *Rasbora rasbora* (Hamilton) Gangetic Scissortail rasbora
79. *Salmostoma bacaila* (Hamilton) Chela
80. *Salmostoma phulo* (Hamilton) Chela
81. *Salmostoma sardinella* (Valenciennes) Chela
82. *Schizothoracichthys progastus* (McClelland) Dinnawah snowtrout
83. *Schizothorax molesworthi* (Chaudhuri) (Nil)
84. *Schizothorax richardsonii* (Gray) (= *Oreinus richardsonii*) Snow trout (**Vulnerable**) (Fig. 48)
85. *Securicula gora* (Hamilton) Ghora chela
86. *Sinilabeo dero* (Hamilton) Kalabans (**Vulnerable Nationally**) (Fig. 49)
87. *Tor putitora* (Hamilton) Putitor mahaseer, Mahasol/Tor (**Endangered Nationally**) (Fig. 50)
88. *Tor tor* (Hamilton) Mahaseer, Tor (**Endangered Nationally**) (Fig. 51)

Family 10. PSILORHYNCHIDAE (Nil)

89. *Psilorhynchus balitora* (Hamilton) Balitora monnow
90. *Psilorhynchus sucatio* (Hamilton) River stone carp

Family 11. BALITORIDAE (River loaches)

91. *Aborichthys elongatus* (Hora) (**Endemic**) (**Endangered**) (Fig. 52)
92. *Acanthocobitis botia* (Hamilton) Mottled/Striped loach (**Near threatened**) (Fig. 53)
93. *Nemacheilus devdevi* (Hora) (**Endangered**) and (**Endemic**) (Fig. 54)
94. *Nemacheilus multifasciatus* Day (= *Noemacheilus repecula inglisi* (Hora) (**Endangered Nationally**) (Fig. 55)
95. *Schistura beavani* Gunther Creek loach
96. *Schistura corica* (Hamilton) Khorika
97. *Schistura savona* (Hamilton) Savon khorka
98. *Schistura repecula* McClelland (Nil)
99. *Schistura scaturigina* (McClelland) (= *Noemacheilus zonatus* (McClelland and *Noemacheilus shebbearei* Hora) (**Vulnerable**)

Family 12. COBITIDAE (Loaches)

100. *Botia almorae* Gray (= *Botia rostrata* Gunther) Almorah loach (**Endangered**) (Fig. 56)
101. *Botia dario* (Hamilton) Bengal loach
102. *Botia dayi* Hora Hora loach
103. *Lepidocephalus annanalei* Chaudhuri) (**Near threatened**) (Fig. 57)
104. *Lepidocephalus guntea* (Hamilton) Loach, Poia
105. *Pangio pangio* (Hamilton) (= *Acanthopthalmus pangio*) Pangya (**Vulnerable Nationally**) (Fig. 58)
106. *Somileptis gongota* (Hamilton) Ghor poia (**Near threatened**) (Fig. 59)

Order VI. SILURIFORMES

Family 13. BAGRIDAE (Bagrid catfishes)

107. *Batasio batasio* (Hamilton) (**Endemic**) (Fig. 60)
108. *Batasio tengana* (Hamilton) Assamese batasio
109. *Mystus bleekeri* (Day) (**Vulnerable**) (Fig. 61)
110. *Mystus cavasius* (Hamilton) Dwarf catfish, Tengra (**Near threatened**) (Fig. 62)
- *111. *Mystus gulio* (Hamilton) Long whiskered catfish, Nuna Tengra
112. *Mystus menoda* (Hamilton) Tengra
113. *Mystus tengara* (Hamilton) Tengra
114. *Mystus vittatus* (Bloch) Striped dwarf catfish, Tengra (**Vulnerable**) (Fig. 63)
115. *Rama chandrarama*. (Hamilton)
116. *Rita rita* (Hamilton) Rita, Rita (**Vulnerable**) (Fig. 64)
117. *Sperata aor* (Hamilton) (= *Aorichthys aor* (Hamilton)) Long whiskered catfish, Arr (**Vulnerable**) (Fig. 65)
118. *Sperata seenghala* (Sykes) (= *Aorichthys seenghala* (Sykes)) Giant river catfish, Arr (**Vulnerable**) (Fig. 66)

Family 14. SILURIDAE (Sheat fishes)

119. *Ompok bimaculatus* (Bloch) Butter catfish, Pabda (**Endangered Nationally**) (Fig. 67)
120. *Ompok pabda* (Hamilton) Butter catfish, Pabda (**Endangered**) (Fig. 68)
121. *Ompok pabo* (Hamilton) Butter catfish, Pabda
122. *Pterocryptis cochinchinensis* (Valenciennes)
123. *Wallago attu* (Schenider) Freshwater shark, Boal (**Near threatened**) (Fig. 69)

Family 15. SCHILBEIDAE (Schilbid catfishes)

124. *Ailia coila* (Hamilton) Gangetic Ailia, Kajuli (**Vulnerable**) (Fig. 70)
125. *Clupisoma garua* (Hamilton) Garua Bachcha, Gaura (**Vulnerable**) (Fig. 71)

126. *Clupisoma montana* Hora Kocha Garua, Goura
 127. *Eutropiichthys murius* (Hamilton) Murius Vacha, Muribacha (**Near threatened**) (Fig. 72)
 128. *Eutropiichthys vacha* (Hamilton) Vacha, Bacha (**Endangered**) (Fig. 73)
 129. *Pseudeutropius atherinoides* (Bloch) (**Endangered**) (Fig. 74)
 130. *Silonia silondia* (Hamilton) Silond catfish, Shilong mach (**Near threatened**) (Fig. 75)

Family 16. PANGASIIDAE (Shark catfish. Pungas)

131. *Pagasius pangasius* (Hamilton) Pangash, Pangash (**Critically endangered**) (Fig. 76)

Family 17. AMBLYCIPITIDAE (Torrent catfishes)

132. *Amblyceps mangois* (Hamilton) Indian torrent catfish) (**Near threatened**) (Fig. 77)

Family 18. SISORIDAE (Sucker catfishes)

133. *Bagarius bagarius* (Hamilton) Dwarf Goonch/Bagarius, Baghmach (**Vulnerable**) (Fig. 78)
 134. *Gagata cenia* (Hamilton) Indian Gagata Dwarf bloched catfish. Keya katta
 135. *Gagata gagata* (Hamilton) Dwarf bloched catfish/Gagata, Jungla
 136. *Gangra viridescens* (Hamilton) (**Near threatened**) (Fig. 79)
 137. *Glyptothorax cavia* (Hamilton) (**Endangered**) (Fig. 80)
 138. *Glyptothorax conirostre* (Steindachner)
 139. *Glyptothorax indicus* Talwar (= *Glyptothorax horai* Shaw & Shebbeare) (**Vulnerable**) (Fig. 81)
 140. *Glyptothorax telchitta* (Hamilton) (**Near threatened**) (Fig. 82)
 141. *Hara hara* (Hamilton) Kosi hara, Gagot
 142. *Hara horai* Misra Terai hara, Gagot (**Endemic**) (**Endangered**) (Fig. 83)
 143. *Hara jerdoni* Day Sylet hara
 144. *Nangra nangra* (Hamilton) Kosi nangra (**Vulnerable**) (Fig. 84)
 145. *Parachiloganis hodgarti* (Hora) Torrent catfish (**Vulnerable**) (Fig. 85)
 146. *Pseudecheneis sulcata* (McClelland) Sucker throat catfish (**Vulnerable**) (Fig. 86)
 147. *Sisor rhabdophorus* Hamilton Sisor catfish (**Endangered Nationally**) (Fig. 87)

Family 19. ERETHISTIDAE (Nil)

148. *Conta conta* (Hamilton) (= *Erethistes elongata* Day) Conta catfish (**Endemic**) (Fig. 88)
 149. *Erethistes pussilus* Muller and Troschel
 150. *Erethistoides montana* Hora (**Endemic**) (Fig. 89)
 151. *Pseudolaguvia ribeiroi* (Hora) Painted catfish (**Near threatened**) (Fig. 90)
 152. *Pseudolaguvia shawi* (Hora) (**Endangered**) (Fig. 91)

Family 20. CLARIIDAE (Air breathing catfishes)

153. *Clarias batrachus* (Linnaeus) Walking catfish, Magur (**Vulnerable**) (**Fig. 92**)
 154. *Clarias gariepinus* (Burchill) North African catfish (**Introduced**) (**Fig. 93**)

Family 21. HETEROPNEUSTIDAE (Stinging catfishes)

155. *Heteropneustes fossilis* (Bloch) Stinging catfish, Singee (**Vulnerable**) (**Fig. 94**)

Family 22. CHACIDAE (Squarehead catfishes, Angler catfishes)

156. *Chaca chaca* (Hamilton) Squarehead catfish, Kutkutya

Family 23. OLYRIDAE (Longtail catfishes)

157. *Olyra longicaudata* McClelland (= *Olyra kempi* chaudhuri) Himalayan olyra, Bot singhi

Family 24. ARIIDAE (Sea catfishes)

- *158. *Arius arius* (Hamilton) Threadfin sea catfish/Hamilton's catfish
 *159. *Arius caelatus* Valenciennes Engraved catfish
 *160. *Arius gagora* (Hamilton) Gagora catfish
 *161. *Arius nenga* (Hamilton) Nil
 *162. *Arius sagor* (Hamilton) Sagor catfish
 *163. *Arius sona* (Hamilton) Sona seacatfish
 *164. *Batrachocephalus mino* (Hamilton) Frog-headed catfish

Family 25. PLOTOSIDAE (Eel catfishes)

- *165. *Plotosus canius* Hamilton Gray eel-catfish, Canine catfish-eel/Kan magur
 *166. *Plotosus lineatus* (Thunberg) Striped catfish-eel/Kandhia

Order VII. AULOPIFORMES

Family 26. SYNODONTIDIDAE (Lizard fishes)

- *167. *Harpadon nehereus* (Hamilton) Bombay duck, Late mach

Order VIII. MUGILIFORMES

Family 27. MUGILIDAE (Mulletts)

- *168. *Liza parsia* (Hamilton) Gold spot mullet, Parse
 *169. *Liza tade* (Forsskal) (Tade grey mullet, Bhagaon
 170. *Rhinomugil corsula* (Hamilton) Corsula mullet, Corsula/Kanua (**Vulnerable**) (**Fig. 95**)
 171. *Sicamugil cascasia* (Hamilton) Yellow tail mullet, Parshay (**Vulnerable Nationally**) (**Fig. 96**)

Order IX. BELONIFORMES

Family 28. ADRIANICHTHYIDAE (Rice fishes)

172. *Oryzias dancena* (Hamilton) Estuarine top minnow

Family 29. BELONIDAE (Needle fishes, Freshwater Gars)

173. *Xenentodon cancila* (Hamilton) Freshwater garfish, Kakhya/Kankle (**Near threatened**) (Fig. 97)

Order X. CYPRINODONTIFORMES

Family 30. APLOCHEILIDAE (Killifishes, Rivulines)

174. *Aplocheilus panchax panchax* (Hamilton) Blue Panchax/Lesser top minnow, Techokko

Family 31. POECILIDAE (Top minnows)

175. *Gambusia affinis* (Baird and Gimard) Mosquitofish (**Introduced**) (Fig. 98)

176. *Poecilia reticulata* (Peters) Guppy (**Introduced**) (Fig. 99)

Order XI. SYNGNATHIFORMES

Family 32. SYNGNATHIDAE (Pipe fishes)

177. *Ichthyocampus carce* (Hamilton) Freshwater pipefish

178. *Microphis cuncalus* (Hamilton) Crocodile-tooth pipefish

179. *Microphis deocata* (Hamilton) Deocata pipe fish

Order XII. SYNBRANCHIFORMES

Family 33. SYNBRANCHIDAE (Swamp Eels)

180. *Monopterus cuchia* (Hamilton) Freshwater eel/Cuchia, Kuchia (**Near threatened**) (Fig. 100)

181. *Ophisternon bengalense* McClelland Pygmy eel, Kunche

Family 34. MASTACEMBELIDAE (Spiny eels)

182. *Macrogathus aculeatus* (Bloch) Lesser spiny eel, Baim

183. *Macrogathus aral* (Bloch and Schneider) One stripe spiny eel, Baim (**Near Threatened**) (Fig. 101)

184. *Macrogathus pancalus* (Hamilton) Barred spiny eel, Pakal/Baim mach (**Near threatened**) (Fig. 102)

185. *Mastacembelus armatus* (Lacepede) Spiny/Zig-zag eel, Pakal/Baim mach

Order XIII. PERCIFORMES

Family 35. CENTROPOMIDAE (Giant/Glass perches)

*186. *Lates calcarifer* (Bloch) Giant Sea perch, Bhetki

Family 36. AMBASSIDAE (= CHANDIDAE) (Glass fishes)

187. *Chanda nama* Hamilton Elongate Glassy perchlet, Chanda
 188. *Pseudambassis baculis* (Hamilton) Himalayan glassey perchlet, Chanda
 189. *Pseudambassis ranga* (Hamilton) Indian glassfish, Chanda

Family 37. SCIAENIDAE (Jew fishes, Croakers)

- *190. *Bahaba chaptis* (Hamilton) Chaptis bahaba
 *191. *Johnius coitor* (Hamilton) Coitor croaker
 192. *Johnius gangeticus* Talwar Gangetic bola
 193. *Macrospinosa cuja* (Hamilton) Cuja bola
 *194. *Otolithoides pama* (Hamilton) Pama croaker
 **195. *Panna heterolepis* Trewavas Hooghly croaker

Family 38. POLYNEMIDAE (Threadfins, Indian salmon)

- *196. *Eleutheronema tetradactylam* (Shaw) (Fourfinger-threadfin, Guchhia/Sahal
 *197. *Polynemus paradiseus* Linnaeus Paradise threadfin, Tapsee-machh

Family 39. NANDIDAE (Asian leaf fishes, Mud perches)

198. *Nandus nandus* (Hamilton) Gangetic leaffish, Nadus/Nadosh (**Near threatened**)
(Fig. 103)

Family 40. BADIDAE (Nil)

199. *Badis badis* (Hamilton) Badis, Bot-koi

Family 41. CICHLIDAE (Cichlids)

200. *Oreochromis mossambica* (Peter) Mozambique tilapia, Tilapia (**Introduced**) (**Fig. 104**)
 201. *Oreochromis niloticus* (Linnaeus) Nile tilapia, Nilotica (**Introduced**) (**Fig. 105**)

Family 42. GOBIIDAE (Gobies)

- *202. *Apocryptes bato* (Hamilton) (Nil)
 *203. *Awaous gutum* (Hamilton) Scribbled goby
 *204. *Bathygobius fuscus* (Ruppell) Dusky frillgoby
 *205. *Boleophthalmus boddarti* (Pallas) Boddart's goggle-eye goby/Mud skipper
 *206. *Brachygobius nunus* (Hamilton)
 *207. *Glossogobius giuris* (Hamilton) Bar-eyed goby, Beley (**Near threatened**) (**Fig. 106**)
 *208. *Gobiopterus chuno* (Hamilton) Galss goby
 *209. *Odontamblyopus rubicundus* (Hamilton) (Nil)

- *210. *Periophthalmus novemradiatus* (Hamilton) Pearse's mudskipper
- *211. *Periophthalmodon septemradiatus* (Hamilton)
- *212. *Periophthalmus weberi* Eggert Weber's mudskipper (**Critically endangered**)
- *213. *Pseudogobius poecilosomus* (Bleeker) (= *Stigmatogobius poecilosoma*)
- *214. *Stigmatogobius sadanundio* (Bloch) (Nil)
- *215. *Taenioides angullaris* (Linnaeus) Eel goby
- *216. *Taenioides cirratus* (Bloch) Bearded worm goby
- *217. *Trypauchen vagina* (Bloch & Schneider) Burrowing goby

Family 43. ANABANTIDAE (Climbing perch)

- 218. *Anabas cobojus* (Hamilton) Gangetic koi, Koi (**Vulnerable**) (Fig. 107)
- 219. *Anabas testudineus* (Bloch) Climbing perch, Koi (**Vulnerable**) (Fig. 108)

Family 44. OSPHRONEMIDAE (Gouramies)

- 220. *Colisa lalia* (Hamilton) Khalisha
- 221. *Ctenops nobilis* McClelland Indian Paradisefish/Frail gourami
- 222. *Osphronemus goramy* Lacepede Gouramy (**Introduced**) (Fig. 109)
- 223. *Polycanthus fasciatus* (Bloch and Schneider) Banded gouramy. Khalisha) (**Near Threatened**) (Fig. 110)
- 224. *Trichogaster chuna* (= *Polycanthus sota*) (Hamilton) Chuna Khalisha

Family 45. CHANNIDAE (Murrels)

- 225. *Channa amphibiis* (McClelland) Borna snakehead
- 226. *Channa barca* (Hamilton) Barca snakehead, Chenga/Bora cheng
- 227. *Channa gachua* (Hamilton) Gachua snakehead, Gachua
- 228. *Channa marulius* (Hamilton) Giant snake head murrel, Gajal/Sal (**Near Threatened**) (Fig. 111)
- 229. *Channa orientalis* Bloch & Schneider Brown snake head, Cheng (**Vulnerable**) (Fig. 112)
- 230. *Channa punctata* (Bloch) Green snake head, Lata/Taki (**Near threatened**) (Fig. 113)
- 231. *Channa stewarti* (Playfair) Dudu cheng
- 232. *Channa striatus* (Bloch) Striped snake head, Shol/Cheng

Order XIV. PLEURONECTIFORMES

Family 46. PARALICHTHYIDAE (Large-tooth flounders)

- *233. *Pseudorhombus arsius* (Hamilton) Large-tooth flounder

Family 47. CYNOGLOSSIDAE (Tongue soles)

- *234. *Cynoglossus cynoglossus* (Hamilton) Gangetic tonguesole
 *235. *Cynoglossus lingua* Hamilton Long tonguesole

Family 48. SOLEIDAE (Soles)

236. *Brachirus pan* (Hamilton) Pan sole

Order XV. TETRAODONTIFORMES

Family 49. TETRAODONTIDAE (Puffers)

- *237. *Chelonodon patoca* (Hamilton) Gangetic pufferfish
 238. *Tetraodon cutcutia* Hamilton Ocellated bow fish, Tapa (**Near threatened**) (**Fig. 114**)
 239. *Tetraodon fluviatilis* Hamilton green pufferfish

**This species is known only by its type species

THREATS AND STRATEGIES FOR CONSERVATION

The list of Freshwater fishes of this state shows that out of the 239 species, 59 species are threatened freshwater fishes of India found in this state. Among these 59 threatened species, 22 species have been designated as endangered species and 37 species have been designated as vulnerable species of India. Out of these 22 endangered species, three species *Glyphis gangeticus* (Muller and Henle), *Pangasius pangasius* (Hamilton) and *Periopthalmus weberi* Eggert have been designated as critically endangered. This list also includes 7 Indian endemic freshwater fish species. Among these 7 endemic species 3 are also under endangered category. The distributional list of the seven Indian endemic species found in this state reveals that six species have been recorded from North Bengal along with other states including two species, *Batasio batasio* (Hamilton) and *Hara horai* Misra which are exclusively found in North Bengal only in our country. An analysis of the freshwater fish species shows that 25.58% of the freshwater fish species represent threatened species in this state. Besides this, this state also reveals that its 17.5% species are near threatened species. When threatened and near threatened species of this state are considered, this state possesses 42% of its species which are at risk. Careful evaluation for the effective conservation of the 59 threatened, 42 near threatened and 7 endemic species of freshwater of fishes of this state is the need of the hour. In this respect the more the delay in adopting the protection and conservation measures, the lesser will be the options left to us to protect and conserve them. This is due to the fact that most of the listed threatened, near threatened and endemic freshwater fish species are already in grave danger. It may be mentioned in this context that human activities are responsible in case 99% of the threatened species. Humans are the major cause of extinction and the chief threat to different species at risk of their extinction.

FACTORS RESPONSIBLE FOR THREATENING THE FISH RESOURCES

I. *Habitat loss and degradation* :

(i) **Deforestation** : Depletion of forest is caused by both natural causes and human activities. But it is to be kept in mind that it is one of the chief threats contributing to many species for becoming threatened. The destruction of the riparian forests along the course of the rivers and river mouths in the estuarine region should be avoided as deforestation increases the turbidity and temperature of the water bodies which ultimately affects the existence and spawning of the fishes. It has been found that in several locations the original vegetation on either side of the Rivers Hooghly and Damodar have either been lost or replaced by exotics and cultivates due to human agencies. The estuarine regions of the Hooghly–Matla River are very good nursery ground for numerous marine and estuarine fishes near mangroves of Sunderaban in North 24 Parganas district. The mangrove trees are being cut for fuel, thereby resulting in the degradation of mangrove forest.

(ii) **Damming the river systems** : Water diversion due to construction of dams across the rivers has been observed to affect the normal migration of the fishes. Where construction of dams is very much needed for irrigation and hydroelectric purposes, the impact on the aquatic fauna should be assessed properly. It is to be mentioned here that practically all the riverine fishes are migratory in nature moving up and down the river. Dams affect their normal behaviour and movement isolating the feeding and spawning habitats of the fishes. Besides this, construction of dams across the rivers entirely changes the ecosystem of the river and causes irreversible damage to its aquatic organisms, particularly the fishes. In addition to this, dams themselves create serious consequences leading to siltation on one side and the growth of aquatic weed on the other side. It is, therefore imperative that long-term problems should not be ignored for short-term benefits. It may be referred that where dams are to be constructed their consequential effects are to be considered before construction of the dams. Farakka Barrage in the river Ganga in the Farraka district and Damodar Dam in Durgapur district on the River Damodar are two examples where the riverine fishes are obstructed in their normal migratory habit.

(iii) **Shrinkage of Wetlands** : Since several commercial fishes use the wetlands for breeding purposes, these water bodies should be properly protected and conserved. Therefore, shrinkage of the different wetlands scattered throughout the state should be controlled. This will ultimately protect the fishes and other aquatic animals of the wetland. Besides this, the connections, between the rivers and the wetlands wherever they exist are to be maintained properly otherwise riverine fishes will not migrate to the wetland for their spawning.

(iv) **Urbanisation** : It is one of the major threats to the existence of the fish fauna all over our country. Increasing urbanization and industrialization has created pollution both by the

activities of the human and discharge of the industrial waste materials in the different river systems or the water bodies in this state. Several industries, like Jute, Engineering, Cotton textile, Paper, Chemical and leather industries etc. located on both the sides of the River Hoogly in Kolkata are polluting its water. This has caused an unfavourable condition to many riverine fishes, consequently making their life threatened. The same situation is also there along the course of many other rivers in this state. Haldia Industrial Region on the river Haldi, Asansol-Ranigang Industrial Region on the northern side and Durgapur Industrial Region on the western side of Damodar river are also facing the same threat due to community water supply, irrigation, industrial water supply etc. as well as it receives industrial effluents and town and city sewage.

II. *Over-exploitation* :

Over harvesting or over-exploitation of fishing for food is a major factor for threatening the fish communities in general. It is posing a threat to the fish fauna of different natural aquatic bodies due to indiscriminate exploitation of the juvenile as well as the brooders almost throughout the year.

III. *Competition from Exotic species* :

Wherever aquaculture is practiced, escapes of undesirable species are likely to occur. Further, introduction of exotic species in our Indian waters has been proved to be detrimental to the indigenous fishes of our country in some cases primarily due to the competition with native species. Therefore, proper assessment should be made before introducing any alien species in this state.

The introduction or the escape of a North African catfish (*Clarias gariepinus*) has caused considerable damage to the indigenous fishes of in this state as well as rest of our country. It is a carnivorous fish and is known for faster growth rate. It can attain a weight of 60 kg in eight years and can thrive in extreme environmental condition. Wherever this species has been introduced it has caused serious damage to the native species. It may be mentioned here that this species is an example of escapes while importing the exotic species to our state. It is a bottom feeder which sometimes feeds at the surface. It feeds on insects, planktons, invertebrates and other fishes. It is also known to consume young birds, rotting flesh and plants. This species is also noted during intra specific aggressive interactions for generating electric organ discharges. The alarming scenario is that in some of the states of our country it has entered into natural water bodies. Recently another exotic species, *Liposarcus multiradiatus* (Hancock) (Sailfin catfish) has been observed breeding and growing in to an established population along with the native species in an aquaculture pond at the Salt Lake City in Kolkata. It is an aquarium catfish and native of South America and it is of no fisheries

value. It is a demersal species feeding on algae but also feed on worms, insect larvae and other bottom dwelling aquatic animals. Since its body is strongly built with bony outgrowth, it is likely to be a threat to our native species particularly those residing at the bottom layer. It appear that this species is also a case of escape.

Silver carp (*Hypophthalmichthys molitrix*) was introduced in our country in 1959. The impact of the introduction of the Silver carp in different water bodies and reservoirs of this state has been found to reduce the production of Catla (*Catla catla*) (one of our very important commercial fishes) due to competition for common surface feeding habitats.

The introduction of the Common carp (*Cyprinus carpio carpio*) has been observed threatening the existence of some indigenous carp such as *Cirrhinus mrigala* and *Cirrhinus reba* with which Common carp shares its food niche at the bottom.

Tilapia (*Oreochromis mossambicus*) was introduced first into the pond ecosystem of the country in 1952 and was shortly thereafter stocked in reservoirs of South India. Where Tilapia has been introduced it has been found that this fish feeds on the eggs of Rohu (*Labeo rohita* which is one of the very important commercial Indian major carps). The growth rate of Catla, Mrigal (*Cirrhinus mrigala*) and Fringed-lipped peninsula carp (*Labeo fimbriatus*) have been adversely affected due to coexistence of this species.

SUGGESTIONS TO SAFE GUARD THE THREATENED, NEAR THREATENED AND ENDEMIC FISH SPECIES OF WEST BENGAL

I. Habitat change should be carefully considered :

Since habitat destruction or change for industrial development and urbanization, agricultural development or for damming on the course of the river systems alter the growth and production of the fish particularly freshwater fishes, therefore, due consideration should be given to protect and conserve our resident fish populations. Where deforestation is required for the developmental purposes, replantation should be done to maintain the stability of the soil, clear water and optimum temperature for survival and breeding of the fishes.

II. Environment Impact assessment of the exotic fish species :

Since the impact of the introduction of the alien species are uncertain due to their ecological interactions in new environments, careful environment impact assessment prior to introduction is essential to conserve the biodiversity of the fishes of this state. In this respect it is a good principle to try to use endemic species for aquaculture to protect and conserve the endemic species of our country instead of importing exotic species, which sometimes creates very harmful effect to our native species. National policies are to be formed considering the diversity of our native fish fauna. Appropriate laws for checking deliberate or accidental

introduction of exotic fishes are to be formed. Since introduction of the exotic fish species is a significant threat affecting 30% of all threatened fish species, import of alien species should be very carefully assessed.

III. *Use of endemic and native fish species for aquaculture :*

Our country is now one of the leading fish producing countries having 225 endemic fish species. We have almost one hundred potential fish species for aquaculture. Out of them 40 species only are being cultured. It is suggested for use of endemic and native species for aquaculture to protect and conserve our own fish resources.

IV. *Monitoring on pollution of the natural water bodies :*

The industrial waste materials should be treated to remove their toxic effects before discharging their materials in the drainage systems. Pollution due to pesticides and fertilizers in and around the water courses also affect the fish population in general, therefore, the fishermen and the local people should be aware of the detrimental effect of these materials on the fishes and they should be also instructed to use the biodegradable pesticides only. Some are of the opinion that pollution of the River Hooghly has to some extent prevented the migration of the Hilsa fishes in West Bengal. Appropriate steps are to be taken to reduce the pollution of the water bodies where fishes naturally occur or are cultured.

V. *Strict implementation of the laws governing the fishing activities :*

The existing laws for controlling the fishing operations are to be implemented properly. Monitoring of the water bodies should be done periodically to protect and conserve the fish resources and other aquatic animals. Contradictory laws and policies of the Government and in effective implementation of laws have also affected our resident fish species.

VI. *Fish sanctuary :*

The River Hooghly and its tributaries, which pass through this state contains most of the freshwater fishes of West Bengal. Certain portions of their courses may be declared as freshwater fish sanctuaries like that of the Wildlife Sanctuaries of our country. It has been found that several scattered isolated pools are formed during the summer months along the courses of its different tributaries. Many important commercial fishes take shelter in these pools until the next onset of the monsoon. During this period fishermen catch these fishes indiscriminately including the brooders, which ultimately destroy the growth and multiplication of the fish population. In view of this fact these pools may also be declared as fish sanctuaries. Fish sanctuaries may also be set up in different isolated perennial ponds and lakes throughout this state.

VII. Protection and conservation of the endemic species :

Seven endemic species of India are found in this state. These endemic species are considered as our National wealth. Their protection and conservation measures should be like that of the threatened species since out of the 7 endemic species, 3 species are also endangered species of our country.

VIII. Public awareness programmes :

Since the fishermen particularly those living near the different river systems or water bodies are the real custodians of the fish community, they should be informed the followings facts to protect the fishes through different mass awareness programmes.

(i) The traditional fishermen should be aware of the utility and use of proper mesh size of the nets and the effect of indiscriminate fishing since their livelihood is almost completely dependent on the fish catch. During fishing the fishermen should be instructed not to use very small mesh sized net to avoid capturing juveniles or immature fishes.

(ii) The traditional fishermen should be taught the easy identification of the threatened and endemic species of our country occurring in this state to protect them from extinction.

(iii) The impact of over harvesting of fishes in a particular zone should also be intimated to the local fishermen. They should be instructed not to capture matured fishes particularly during the breeding seasons. During breeding seasons netting should be very restricted if not totally stopped. Fishermen may be opted for alternative means of livelihood especially during the breeding season to protect the brooders.

SUMMARY AND THE CONCLUDING REMARKS

The work has recorded 239 freshwater fish species from West Bengal. Out of the 239 species, 59 are listed in the threatened freshwater fishes of India. Among these 59 threatened species, 22 species have been designated as endangered species and 37 species have been identified as vulnerable species of India. Out of these 22 endangered species, three species *Glyphis gangeticus* (Muller and Henle), *Pangasius pangasius* (Hamilton) and *Periopthalmus weberi* Eggert have been identified as critically endangered. This list also includes 7 Indian endemic freshwater fish species. Among these 7 endemic species 3 are already included in to endangered species list. The distributional list of the seven Indian endemic species found in this state reveals that 6 species have been recorded from North Bengal along with other states including 2 species, *Batasio batasio* (Hamilton) and *Hara horai* Misra which are exclusively restricted in North Bengal only throughout India. Since North Bengal contains several endemic, threatened and some unique species, this region may be considered as the

'Hot spot' of West Bengal. This distributional list reveals that 25.58% of the freshwater fish species represent threatened species in this state. Besides this, this state also shows that its 17.5% species are near threatened species. The list of fishes of this state also shows that 42% of its species are at risk taking threatened and near threatened species of this state in consideration. Humans have been identified as the major cause of extinction and the chief threat to different species at risk of their extinction.

Finally it may be stated that fish feeds on another fish when it is hungry. But we, the mankind depend on fish for our food, medicine, mental development, longevity and for aphrodisiac. We keep them as pets and we thrive by selling them. In a nut shell we are the benefactors, so let them survive for our survival.

ACKNOWLEDGEMENTS

I am thankful to Dr. J.R.B. Alfred, ex-Director and to Mr. A.K. Singh, Joint Director Zoological Survey of India, Kolkata for necessary facilities and encouragement for this work. I am also thankful to my colleague Mr. S.S. Mishra, Assistant Zoologist for his cooperation during this study.

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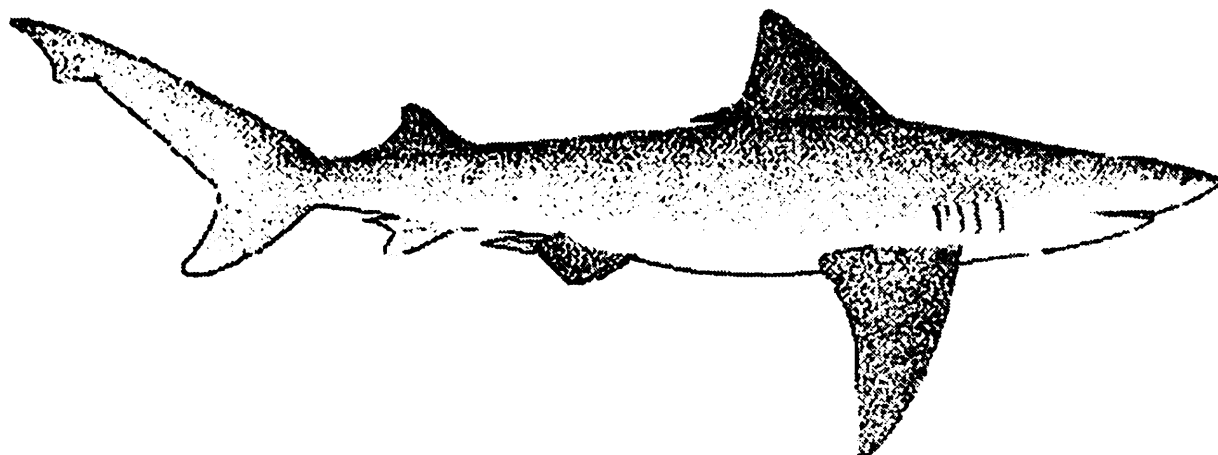


Fig. 1 : *Glyphis gangeticus* (Muller and Henle) (Critically endangered)

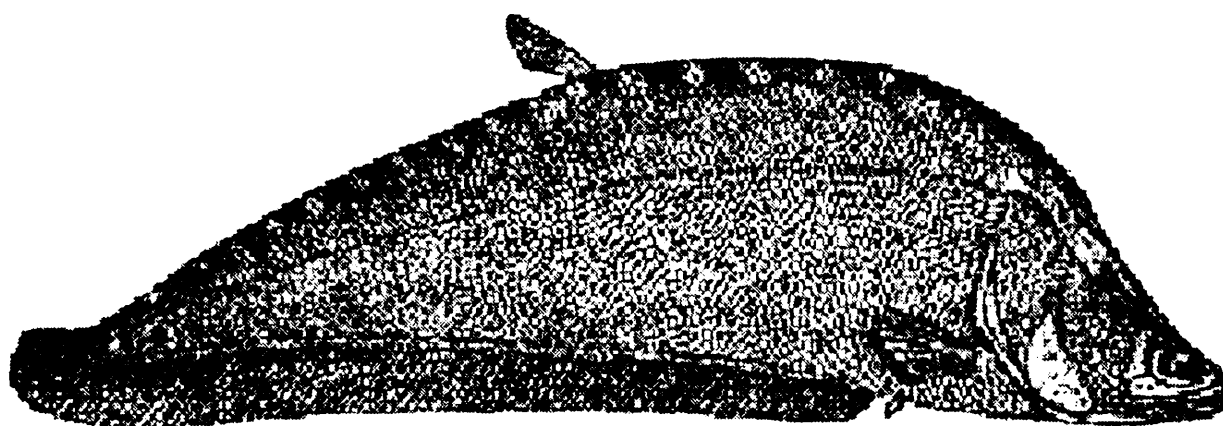


Fig. 2 : *Chitala chitala* (Hamilton) (Endangered)



Fig. 3 : *Anguilla bengalensis bengalensis* (Gray) (Endangered)

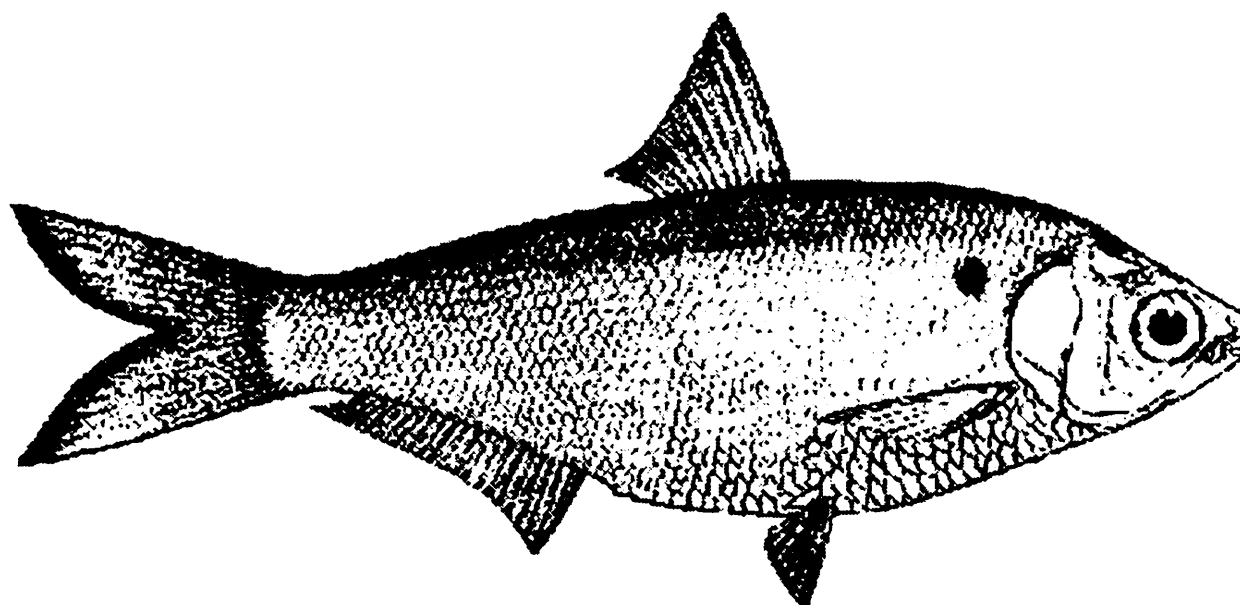


Fig. 4 : *Gonialosa manmina* (Hamilton) (Vulnerable)

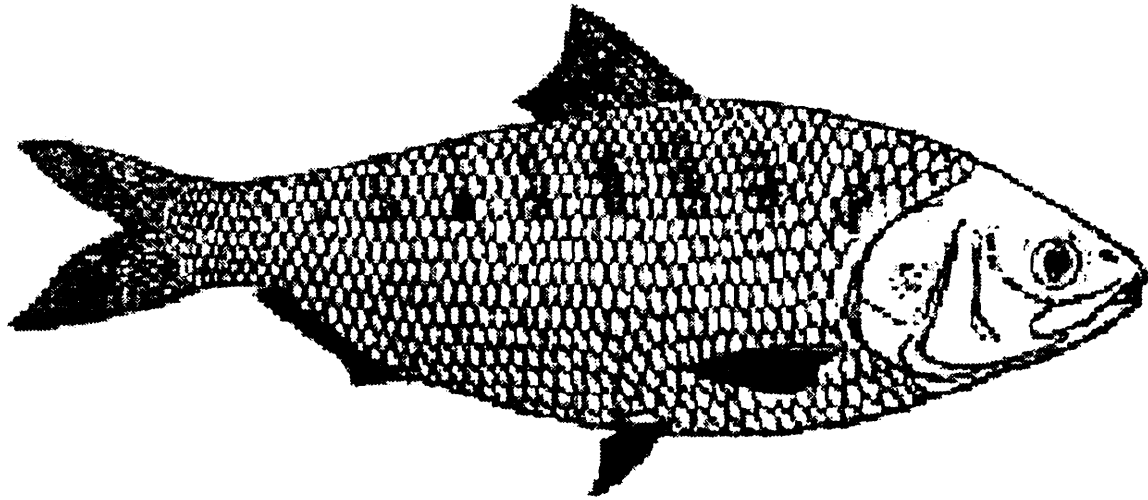


Fig. 5 : *Tenualosa ilisha* (Hamilton) (Vulnerable : Nationally)

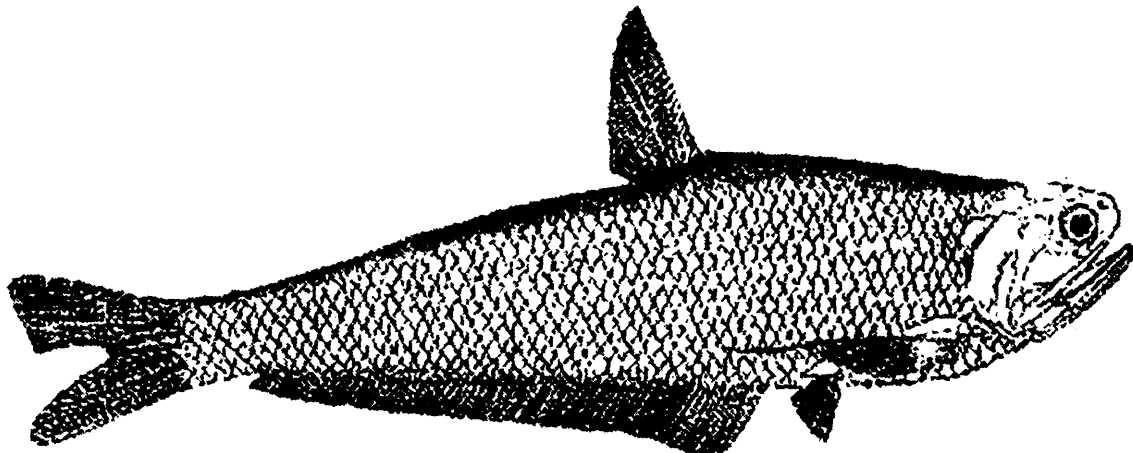


Fig. 6 : *Setipinna brevifilis* (Valenciennes) (Endemic)



Fig. 7 : *Aristichthys nobilis* (Richardson) (Exotic)

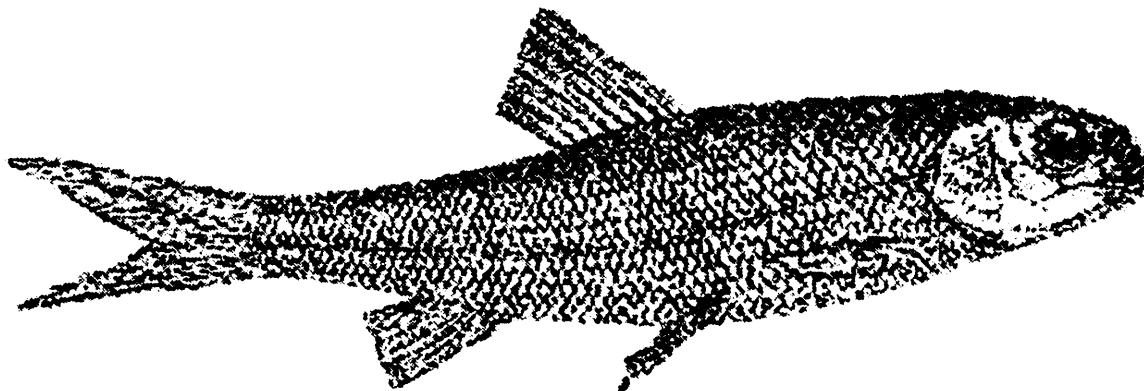


Fig. 8 : *Aspidoparia jaya* (Hamilton) (Vulnerable)

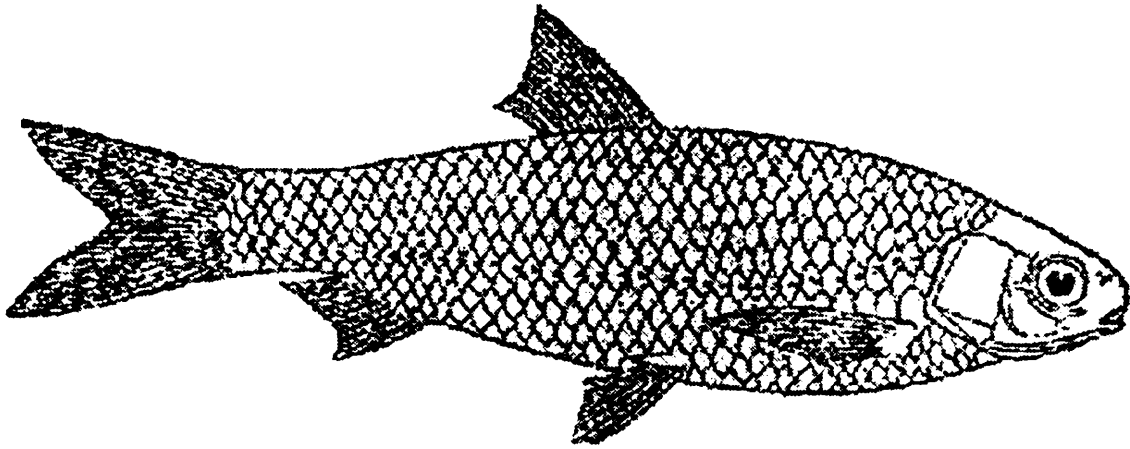


Fig. 9 : *Aspidoparia morar* (Hamilton) (Near threatened)

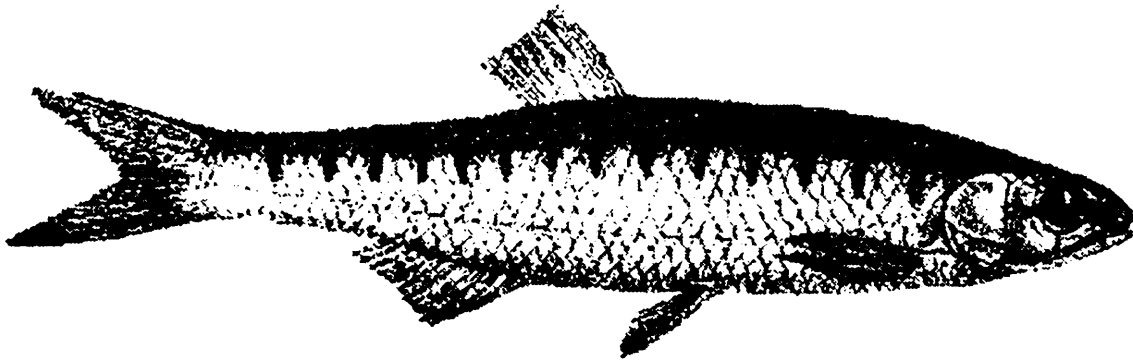


Fig. 10 : *Barilius barila* (Hamilton) (Vulnerable)

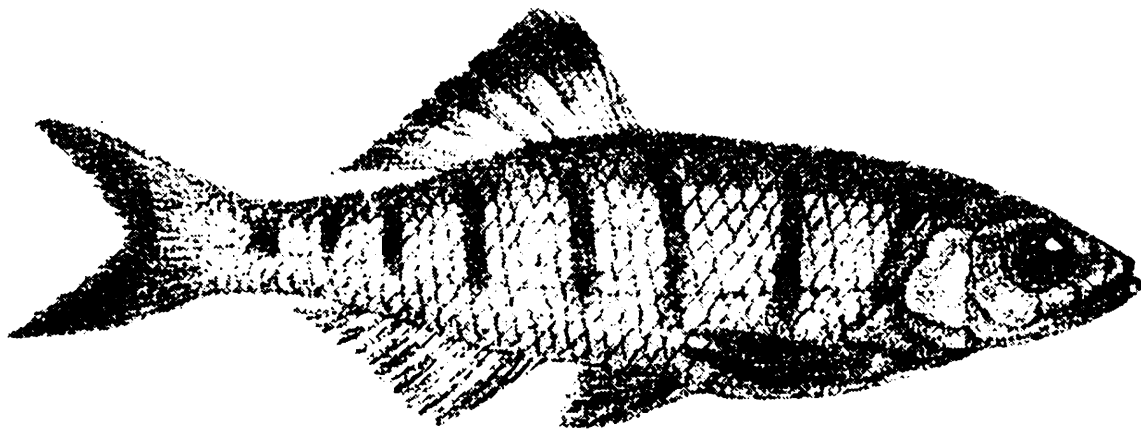


Fig. 11 : *Barilius barna* (Hamilton) (Near threatened)

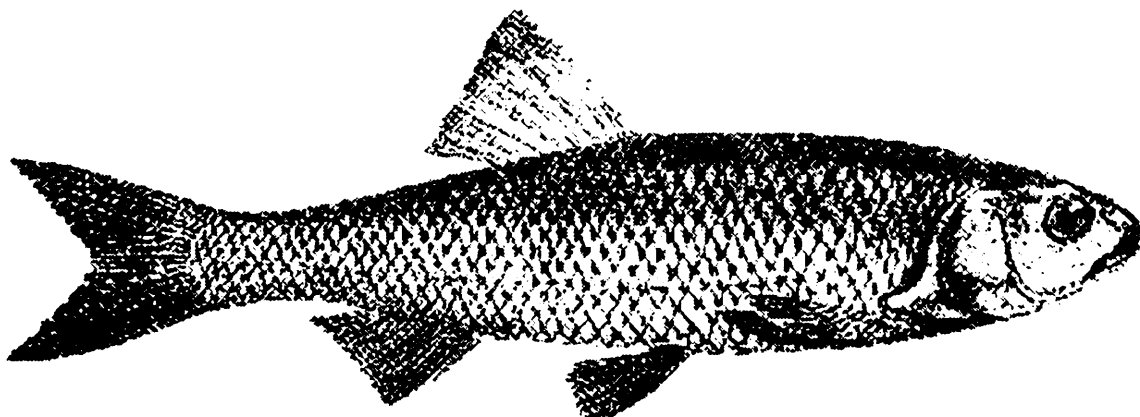


Fig. 12 : *Barilius bendelisis* (Hamilton) (Near threatened)

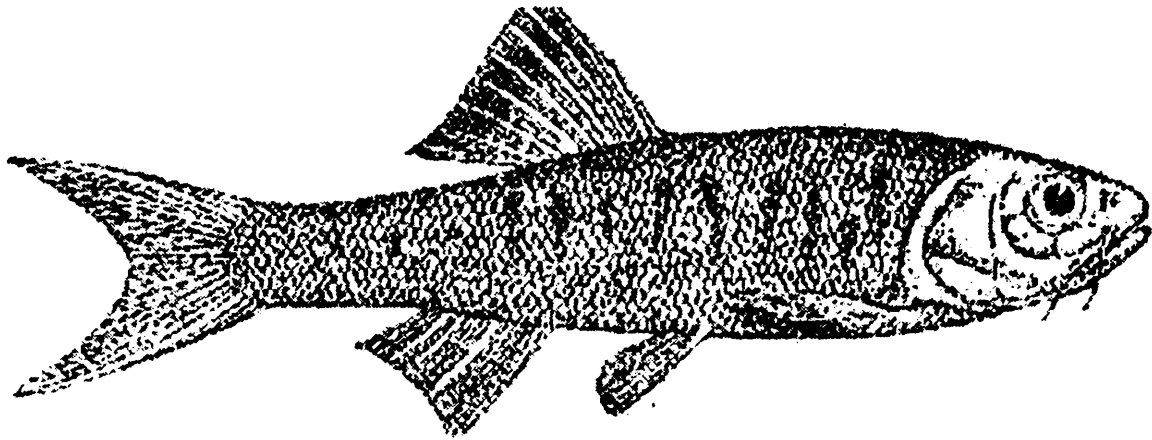


Fig. 13 : *Barilius shacra* (Hamilton) (Near threatened)

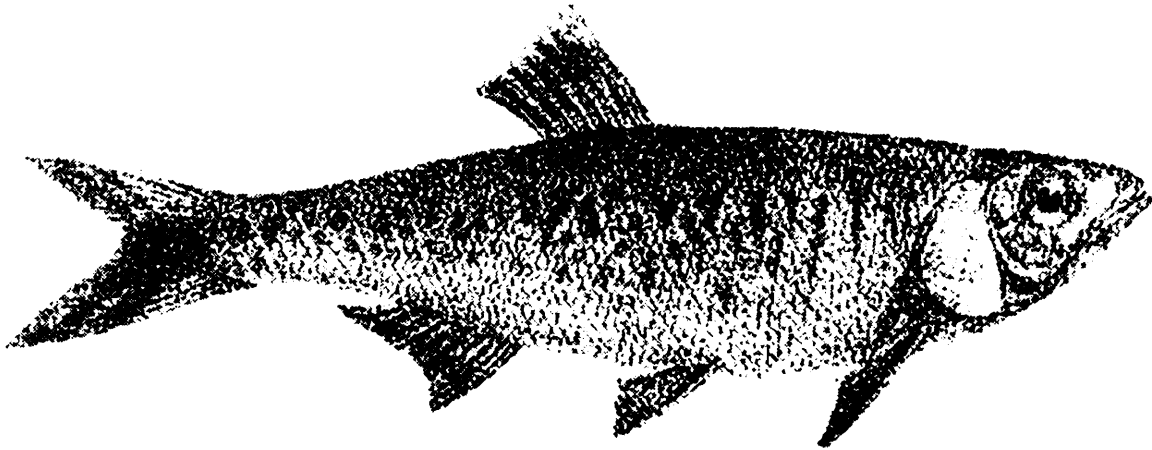


Fig. 14 : *Barilius tileo* (Hamilton) (Near threatened)

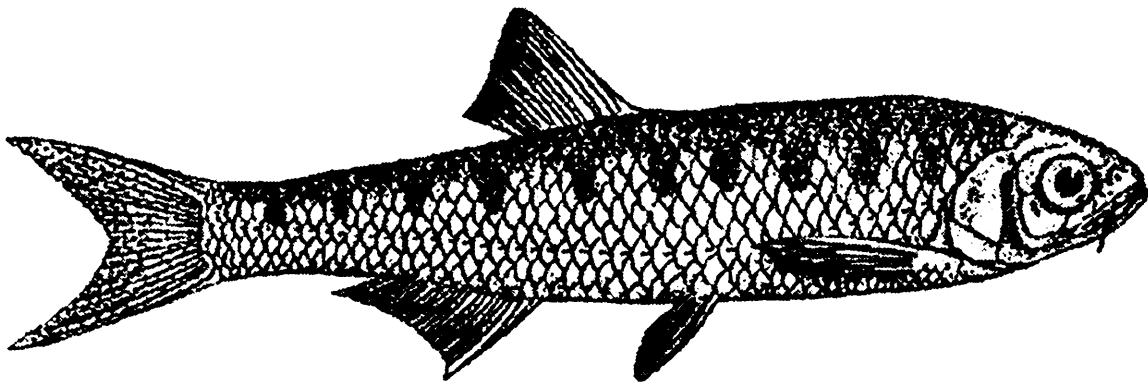


Fig. 15 : *Barilius vagra* (Hamilton) (Vulnerable)

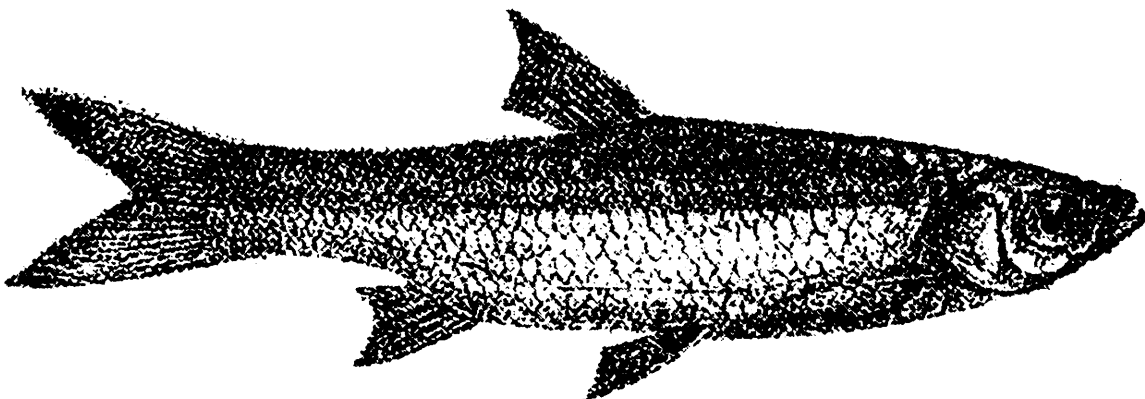


Fig. 16 : *Bengala elanga* (Hamilton) (Endangered)

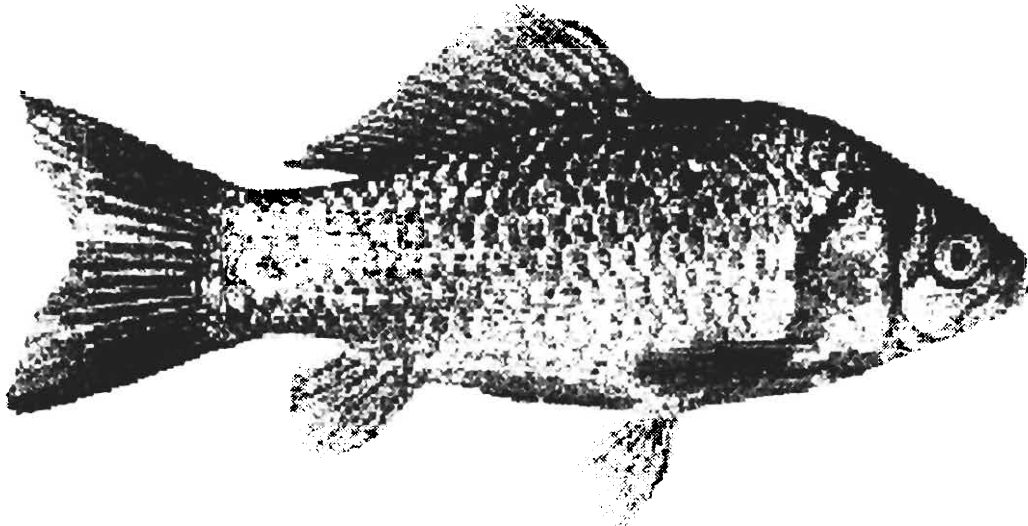


Fig. 17 : *Carassius auratus auratus* (Linnaeus) (Exotic)

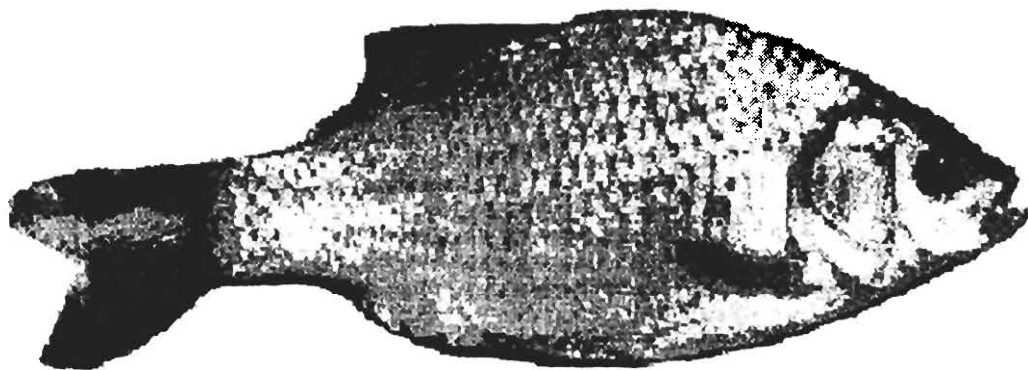


Fig. 18 : *Carassius carassius* (Linnaeus) (Exotic)



Fig. 19 : *Catla catla* (Hamilton) (Vulnerable)

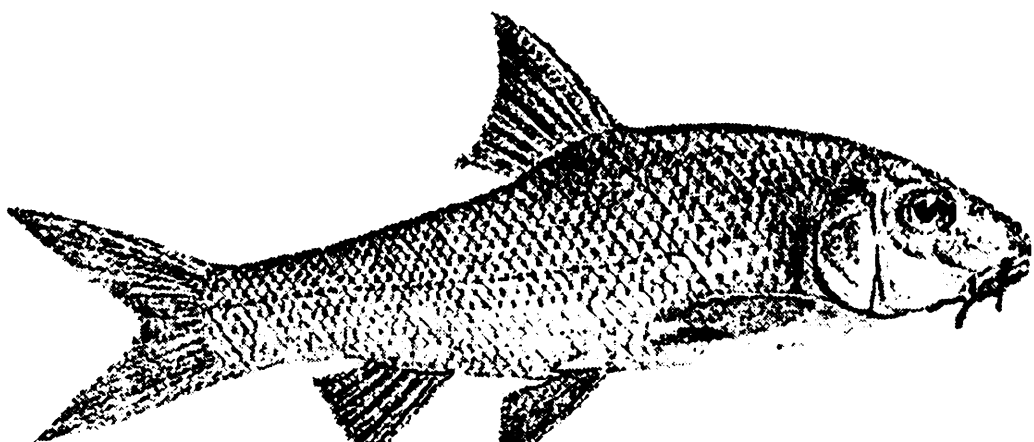


Fig. 20 : *Chagunius chagunio* (Hamilton) (Vulnerable)

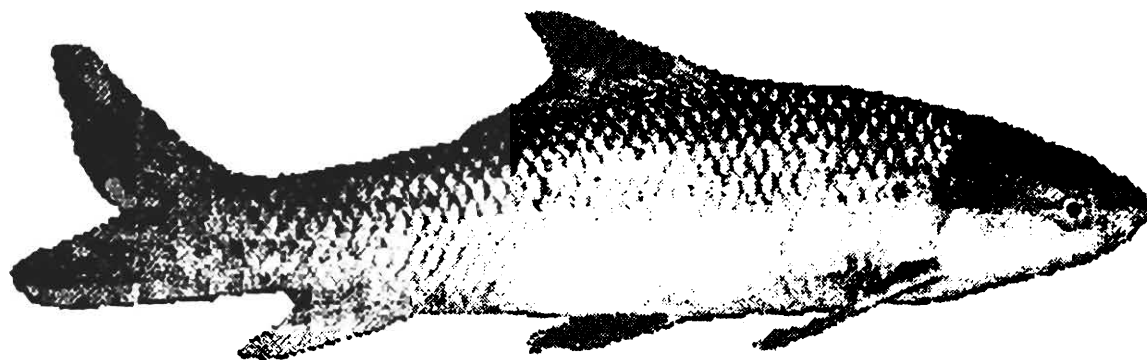


Fig. 21 : *Cirrhinus mrigala* (Hamilton) (Near threatened)

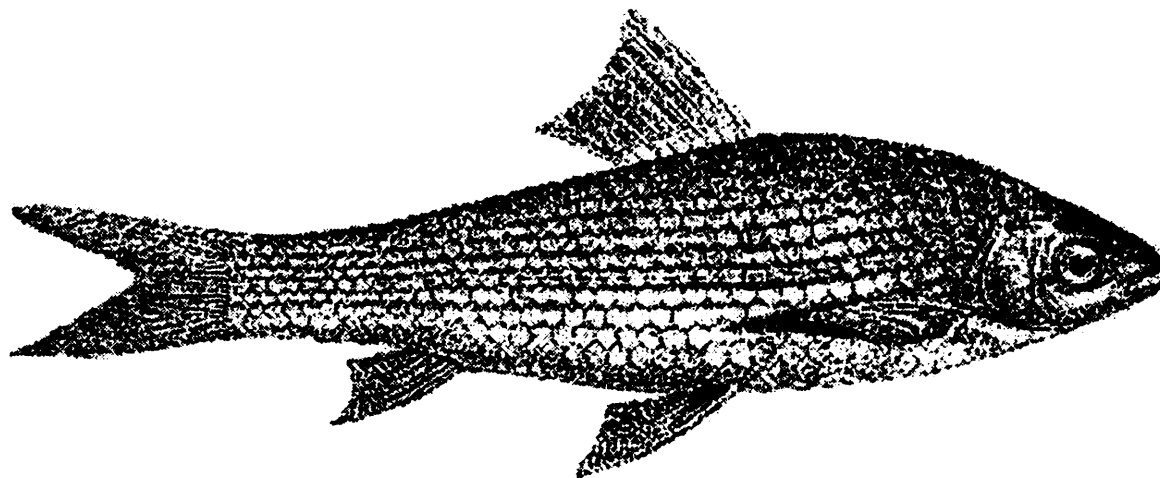


Fig. 22 : *Cirrhinus reba* (Hamilton) (Vulnerable)

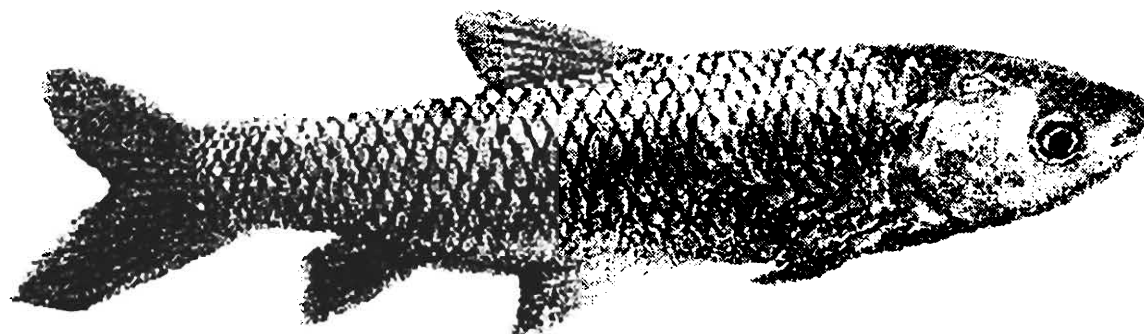


Fig. 23 : *Ctenopharyngodon idella* (Valenciennes) (Exotic)

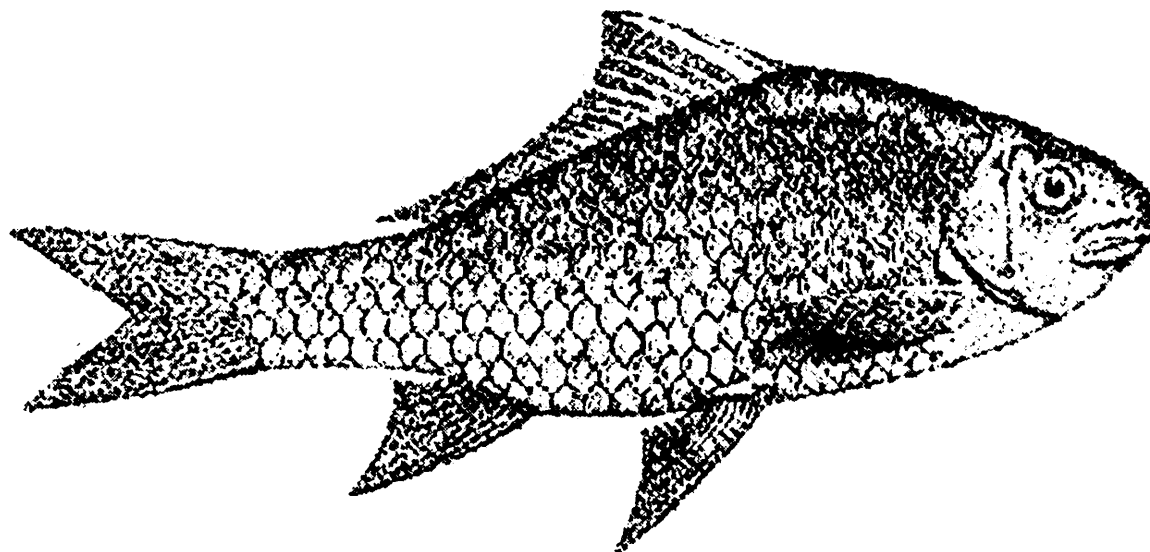


Fig. 24 : *Cyprinion semplotum* (McClelland) (Vulnerable)

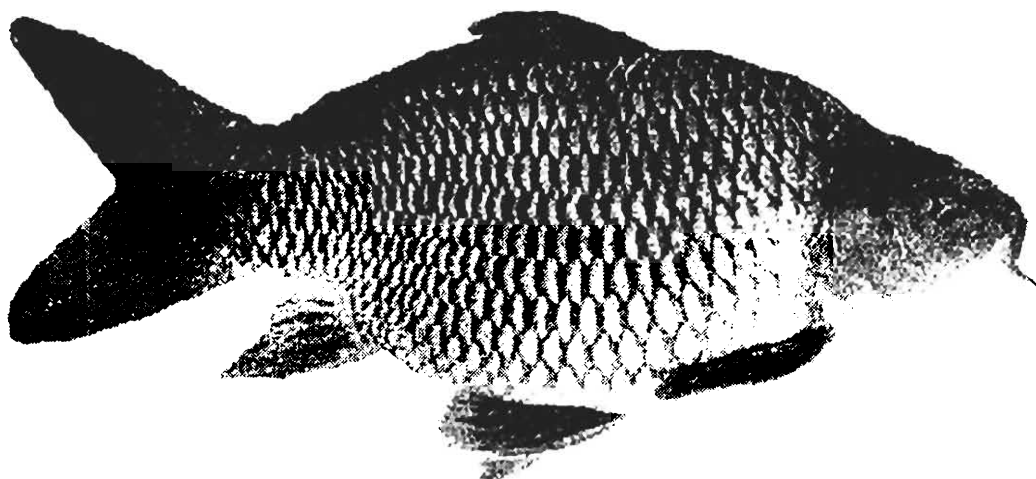


Fig. 25 : *Cyprinus carpio carpio* Linnaeus (Exotic)

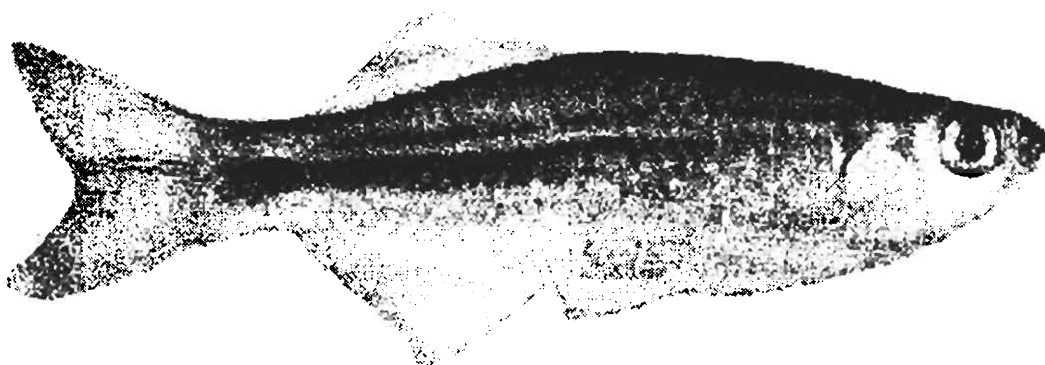


Fig. 26 : *Devario aequipinnatus* (McClelland) (Near threatened)

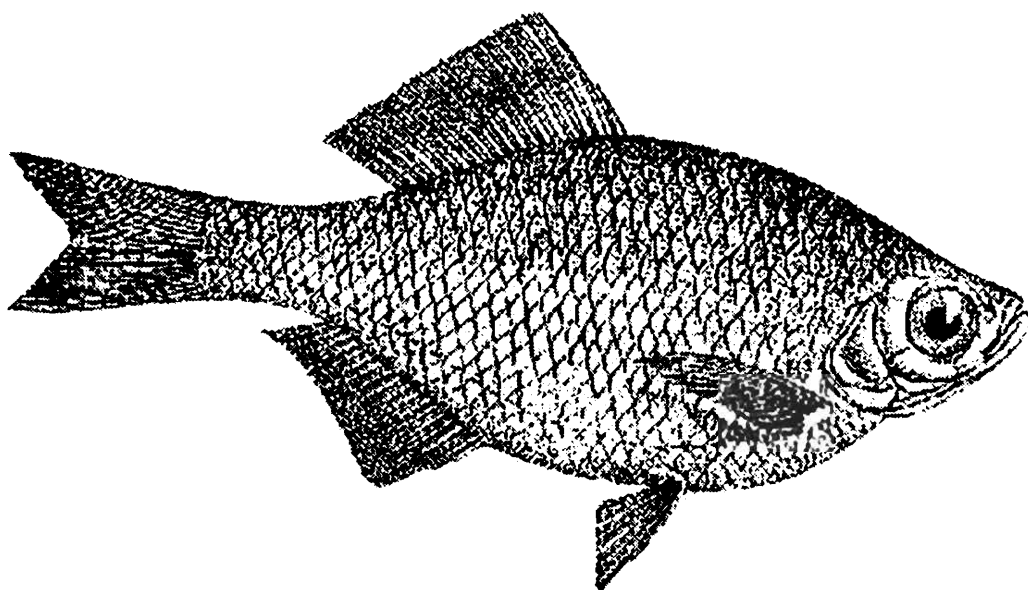


Fig. 27 : *Devario devario* (Hamilton) (Near threatened)



Fig. 28 : *Garra gotyla gotyla* (Gray) (Vulnerable)



Fig. 29 : *Hypophthalmichthys molitrix* (Valenciennes) (Exotic)



Fig. 30 : *Labeo angra* (Hamilton) (Near threatened)

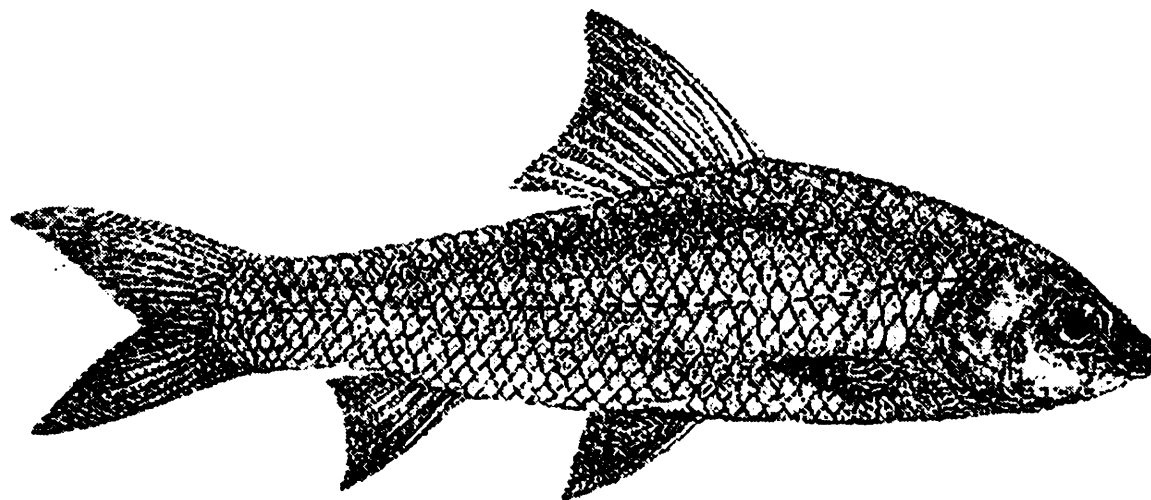


Fig. 31 : *Labeo bata* (Hamilton) (Near threatened)

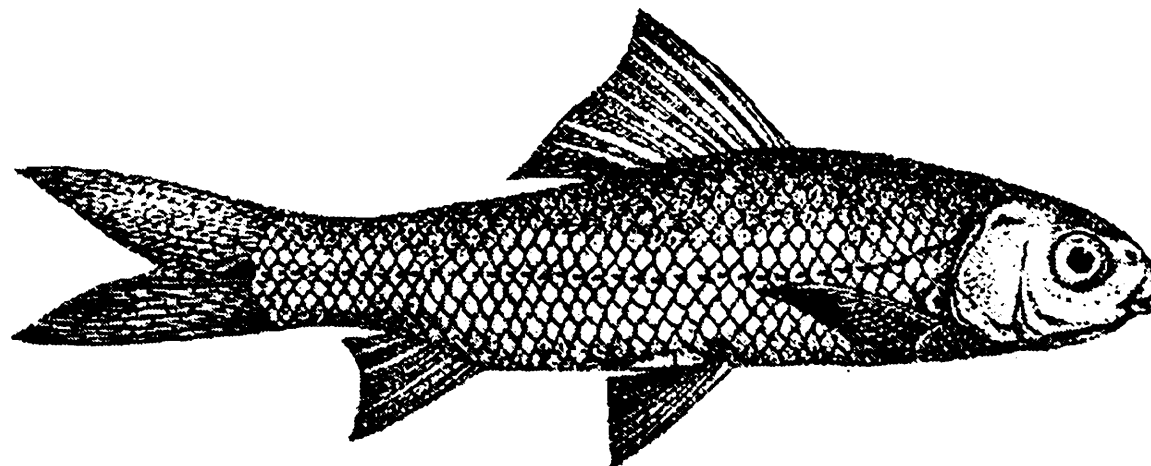


Fig. 32 : *Labeo boga* (Hamilton) (Near threatened)



Fig. 33 : *Labeo calbasu* (Hamilton) (Near threatened)

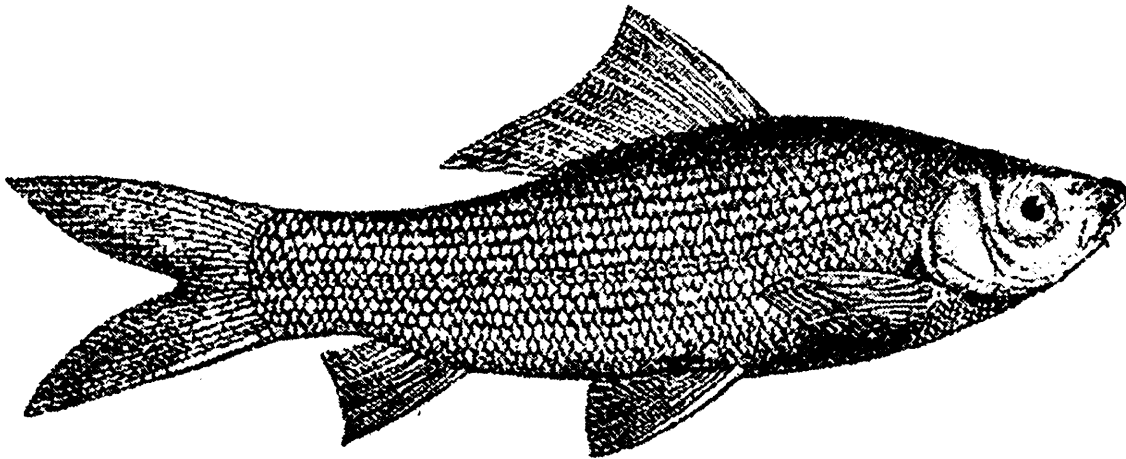


Fig. 34 : *Labeo gonius* (Hamilton) (Near threatened)

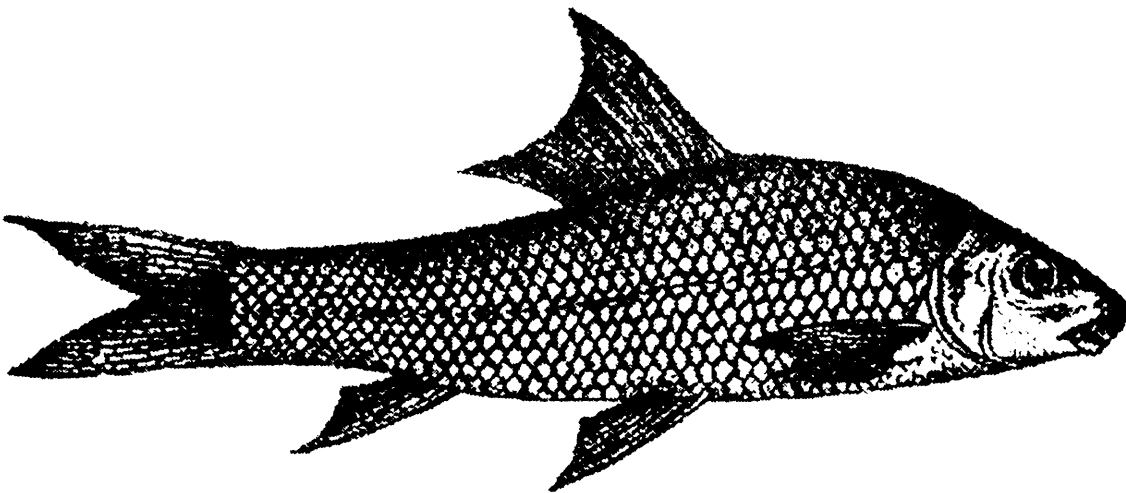


Fig. 35 : *Labeo pangusia* (Hamilton) (Near threatened)



Fig. 36 : *Labeo rohita* (Hamilton) (Near threatened)

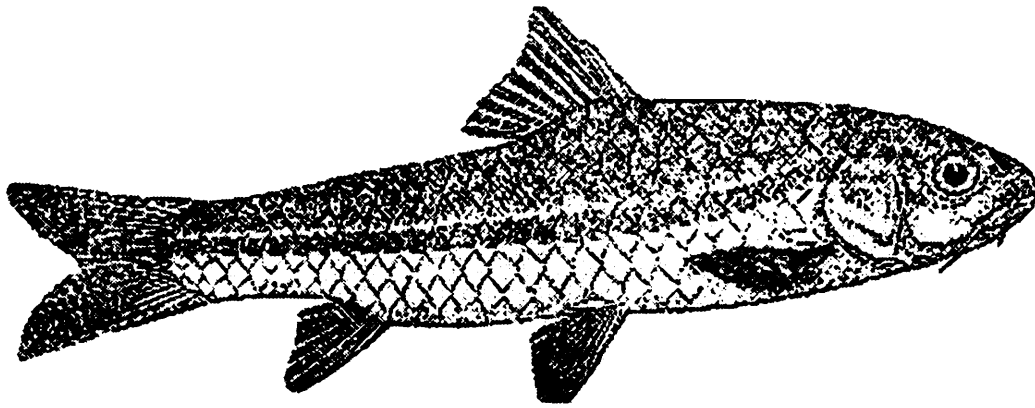


Fig. 37 : *Neolissocheilus hexagonolepis* (McClelland) (**Endangered**)

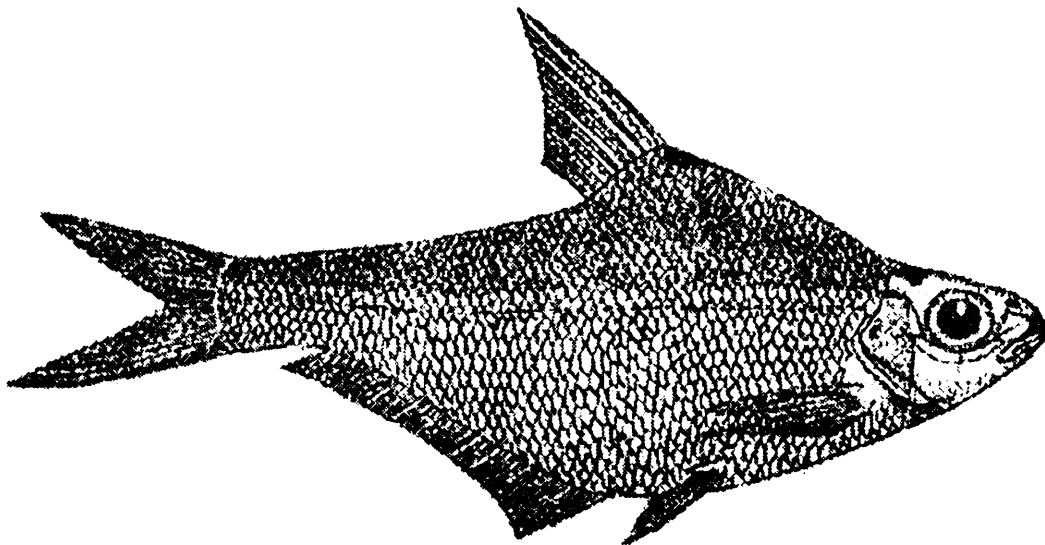


Fig. 38 : *Osteobrama cotio cotio* (Hamilton) (**Near threatened**)

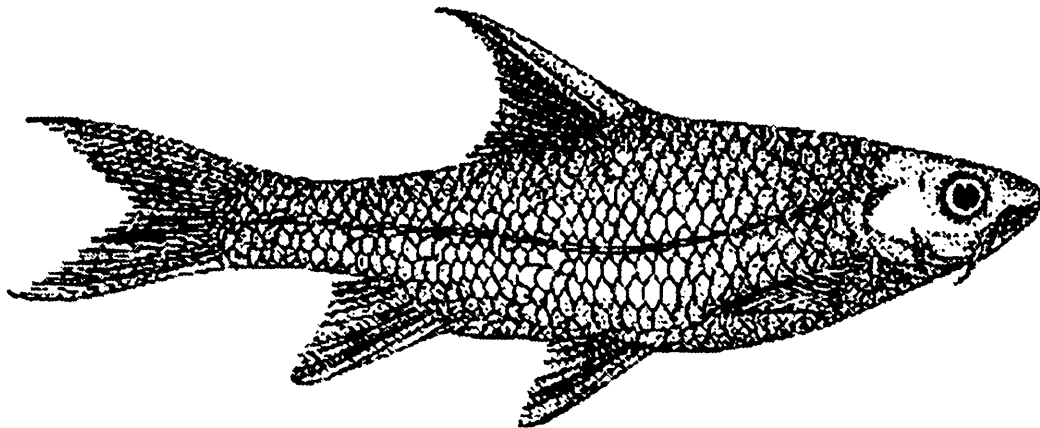


Fig. 39 : *Poropuntius clavatus* (McClelland) (**Endangered**)

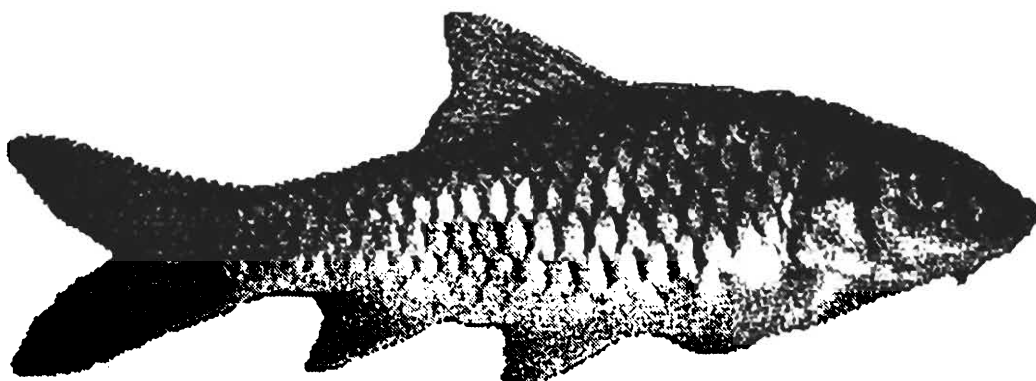


Fig. 40 : *Puntius chola* (Hamilton) (**Vulnerable**)

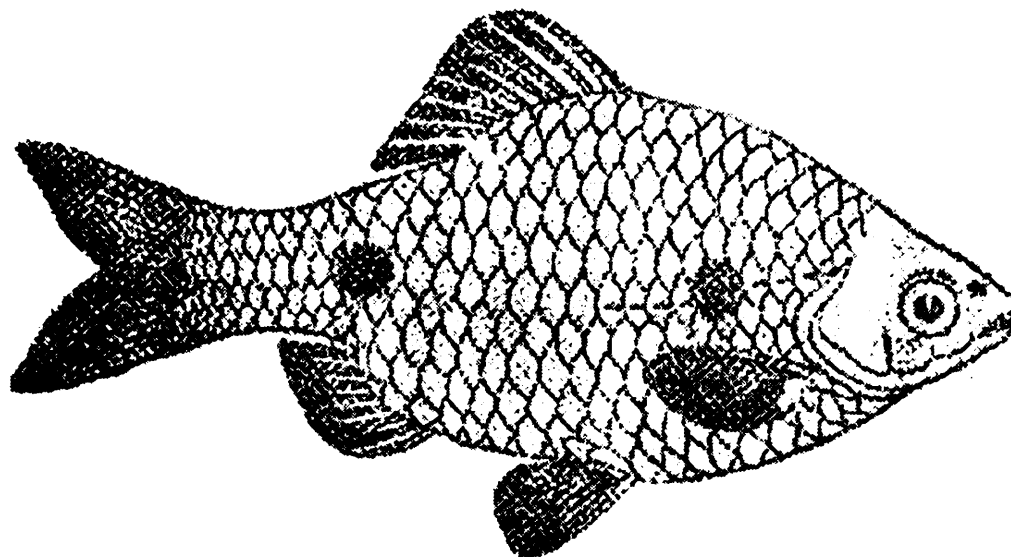


Fig. 41 : *Puntius conchoni* (Hamilton) (Vulnerable)

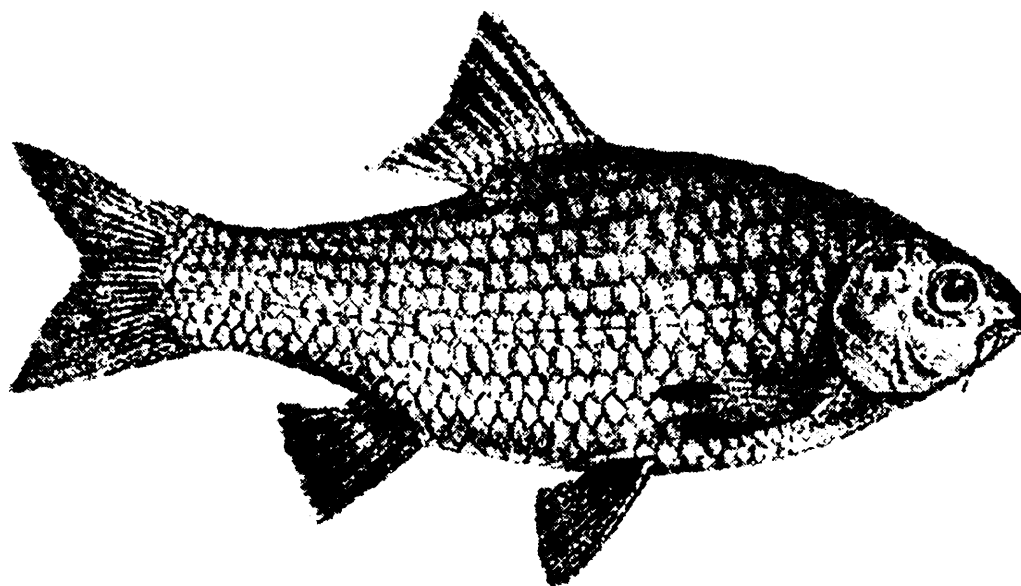


Fig. 42 : *Puntius sarana* (Hamilton) (Vulnerable)

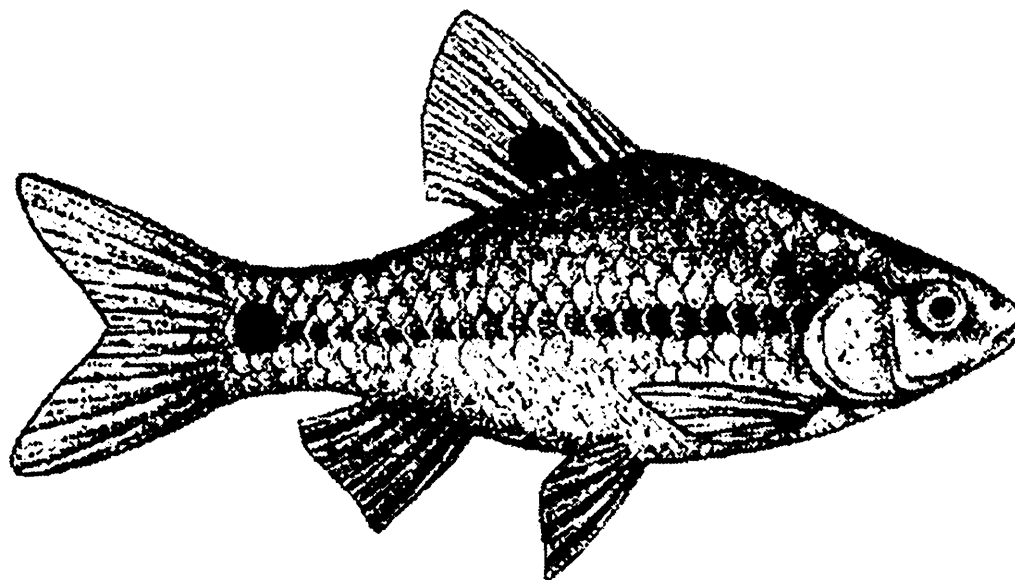


Fig. 43 : *Puntius sophore* (Hamilton) (Near threatened)

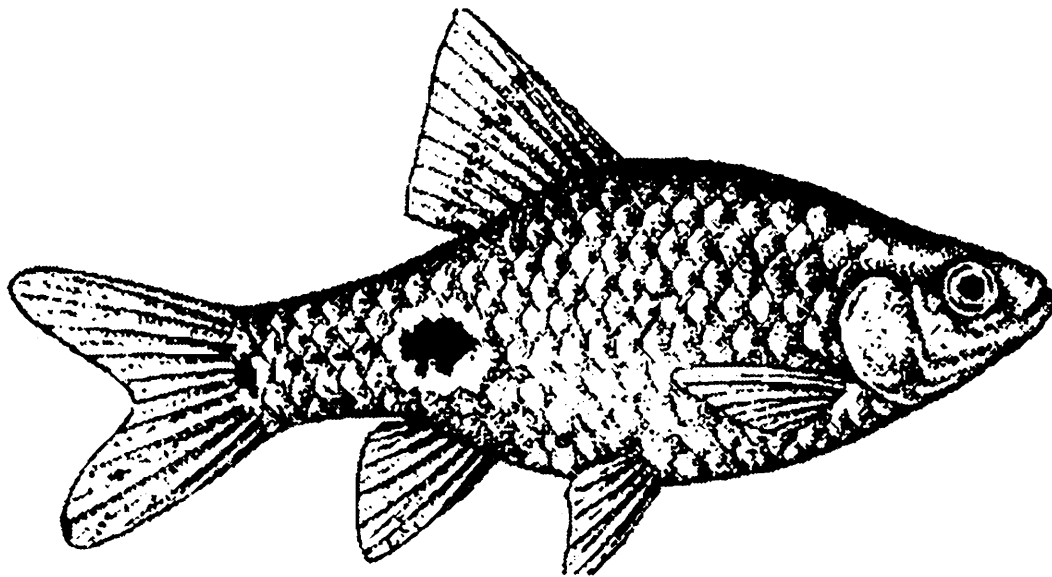


Fig. 44 : *Puntius terio* (Hamilton) (Near threatened)

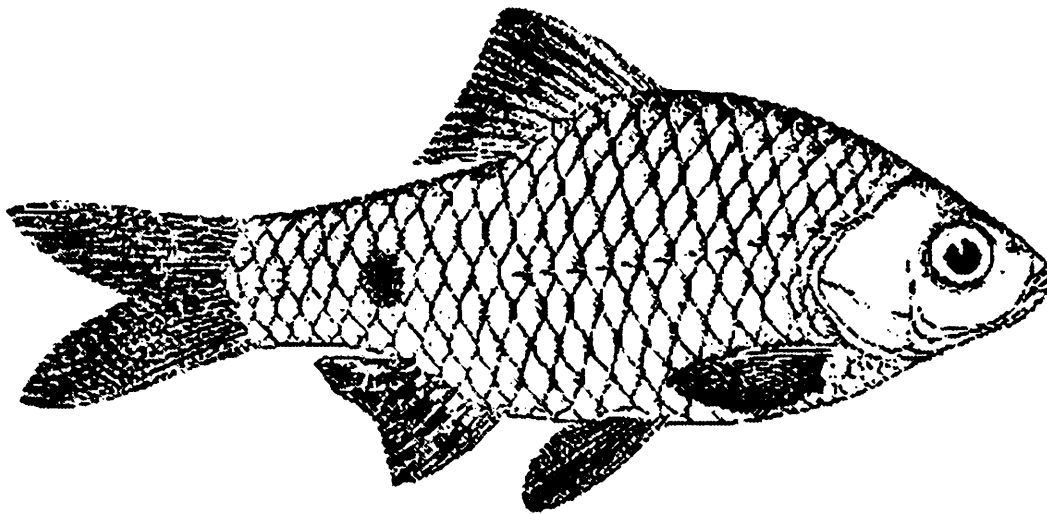


Fig. 45 : *Puntius ticto* (Hamilton) (Near threatened)

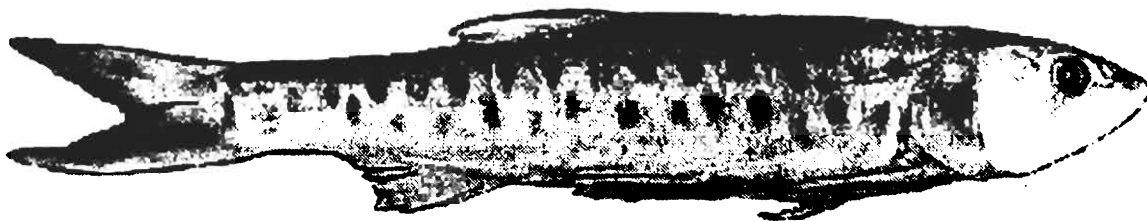


Fig. 46 : *Raiamas bola* (Hamilton) (Vulnerable)

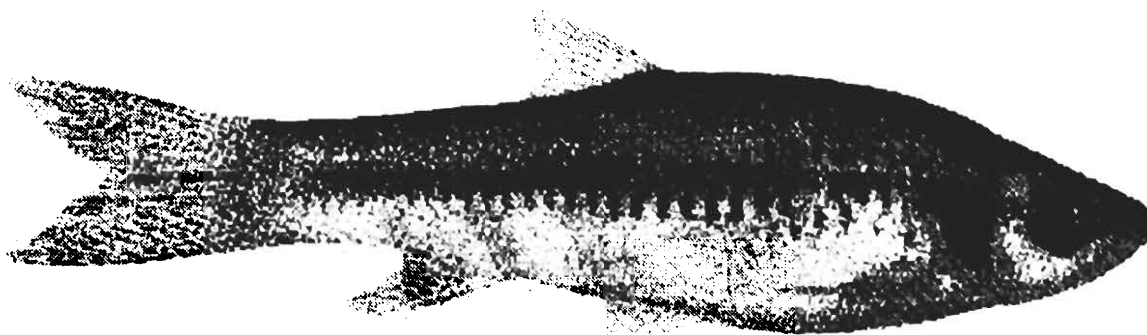


Fig. 47 : *Rasbora daniconius* (Hamilton) (Near threatened)

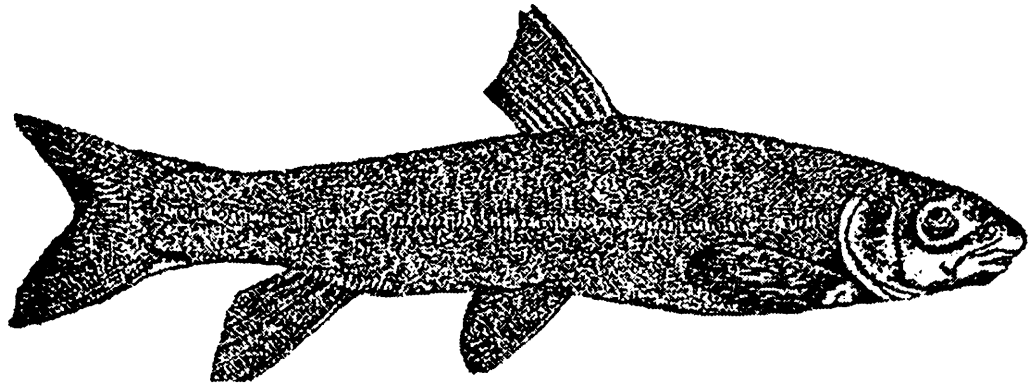


Fig. 48 : *Schizothorax richardsonii* (Gray) (Vulnerable)

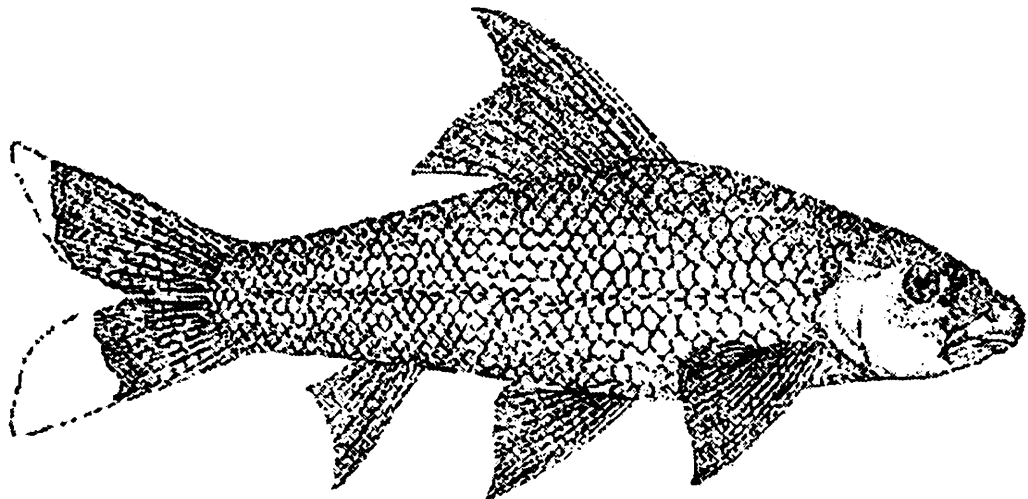


Fig. 49 : *Sinlabeo dero* (Hamilton) (Vulnerable)

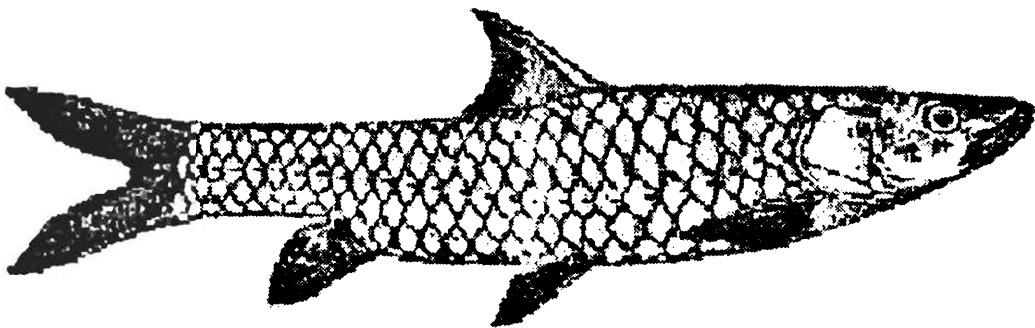


Fig. 50 : *Tor putitora* (Hamilton) (Endangered)

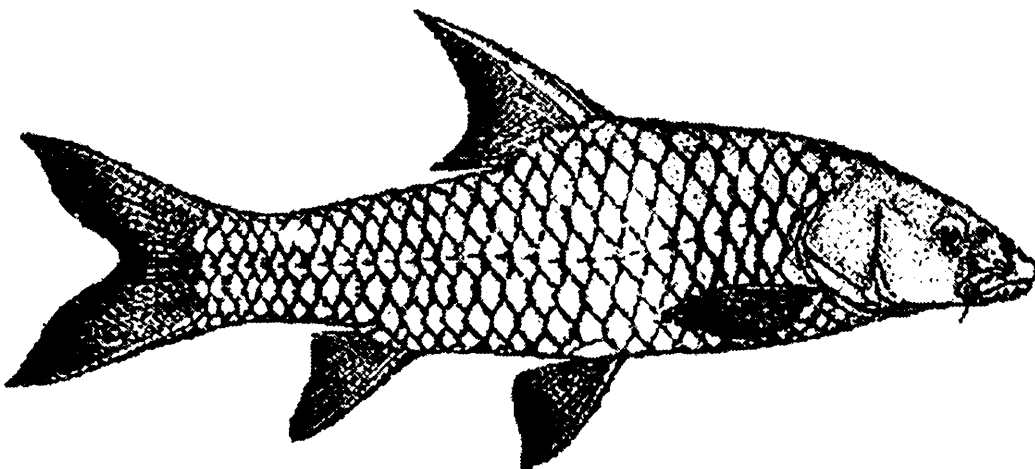


Fig. 51 : *Tor tor* (Hamilton) (Endangered)

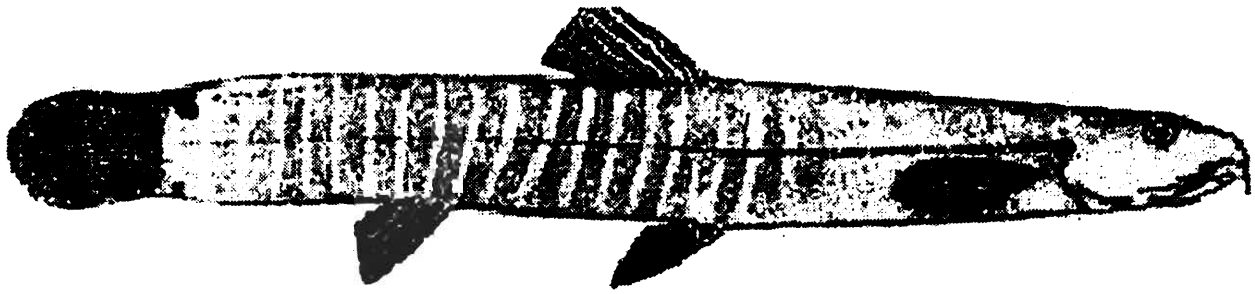


Fig. 52 : *Aborichthys elongatus* (Hora) (Endemic & Endangered)

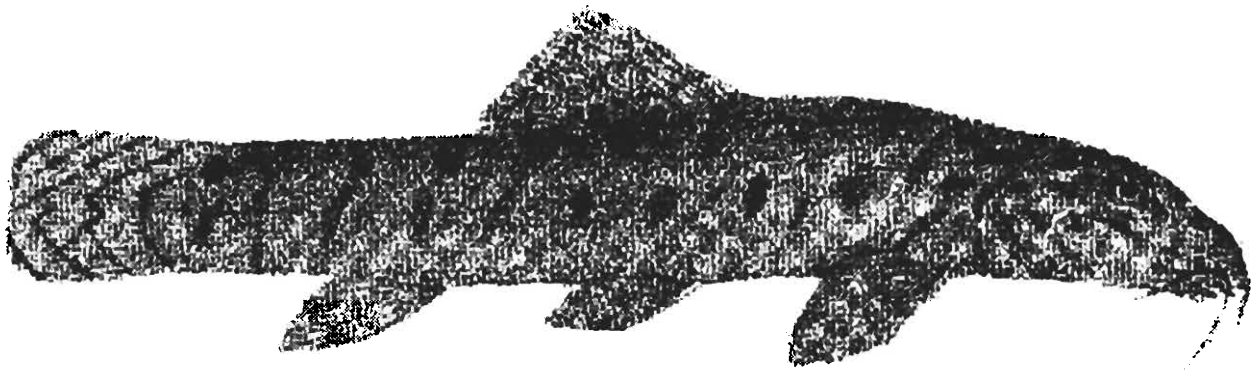


Fig. 53 : *Acanthocobitis botia* (Hamilton) (Near threatened)



Fig. 54 : *Nemacheilus devdevi* (Hora) (Endemic & Endangered)



Fig. 55 : *Nemacheilus multifasciatus* (Hora) (Endangered)

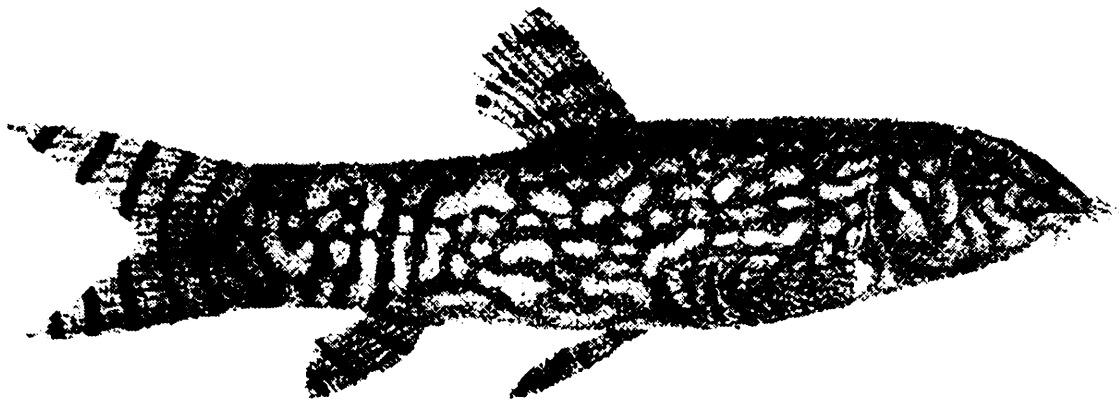


Fig. 56 : *Botia almorae* Gray (Endangered)

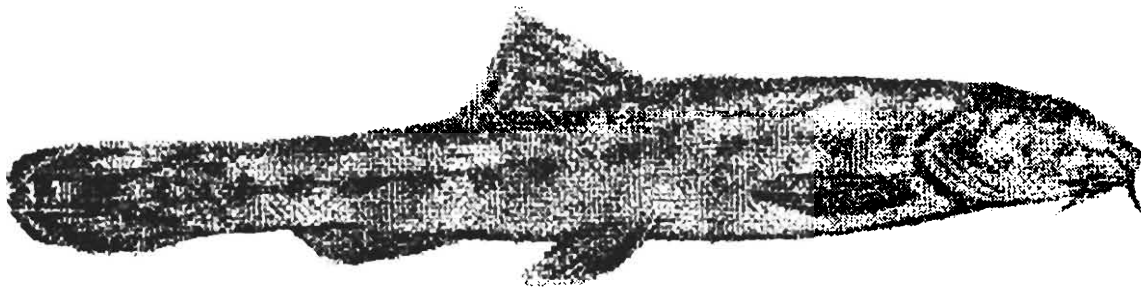


Fig. 57 : *Lepidocephalus annandalei* Chaudhuri (Near threatened)



Fig. 58 : *Pangio pangio* (Hamilton) (Vulnerable)



Fig. 59 : *Somileptis gongota* (Hamilton) (Near threatened)

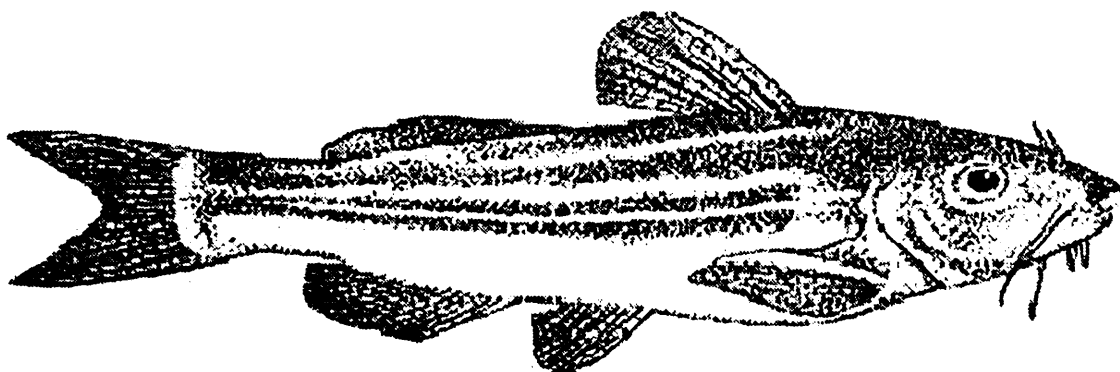


Fig. 60 : *Bataxi batasio* (Hamilton) (Endemic)

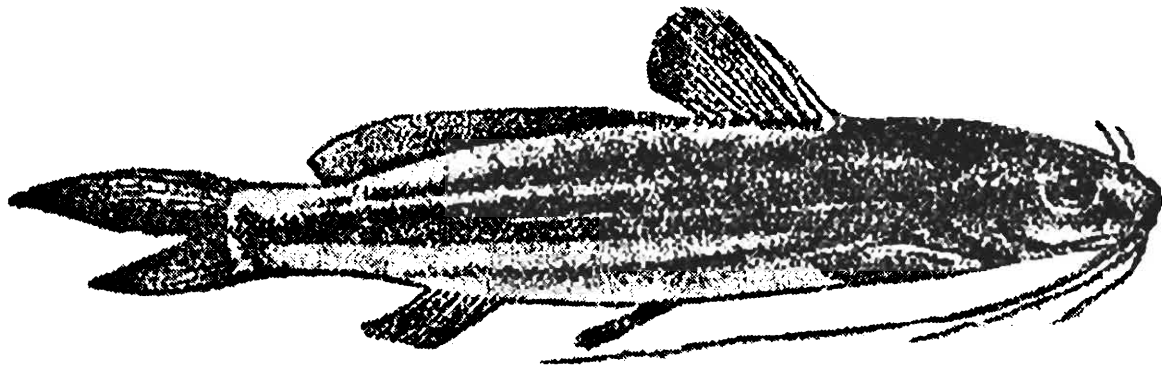


Fig. 61 : *Mystus bleekeri* Day (Vulnerable)

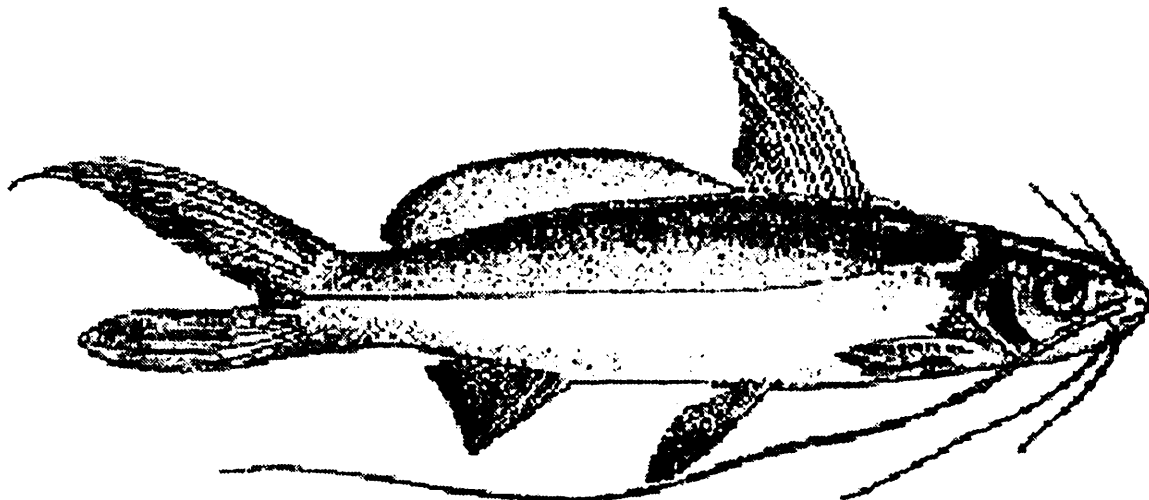


Fig. 62 : *Mystus cavasius* (Hamilton) (Near threatened)

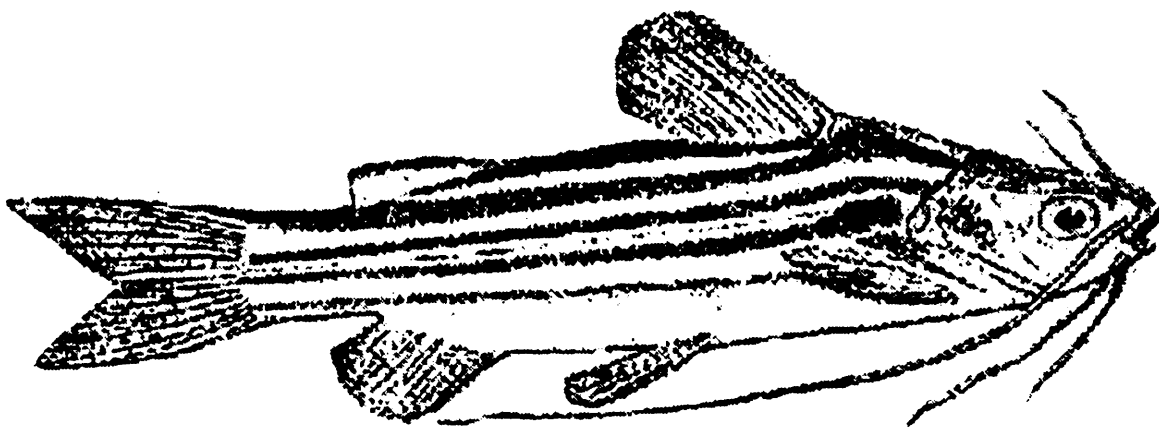


Fig. 63 : *Mystus vittatus* (Bloch) (Vulnerable)

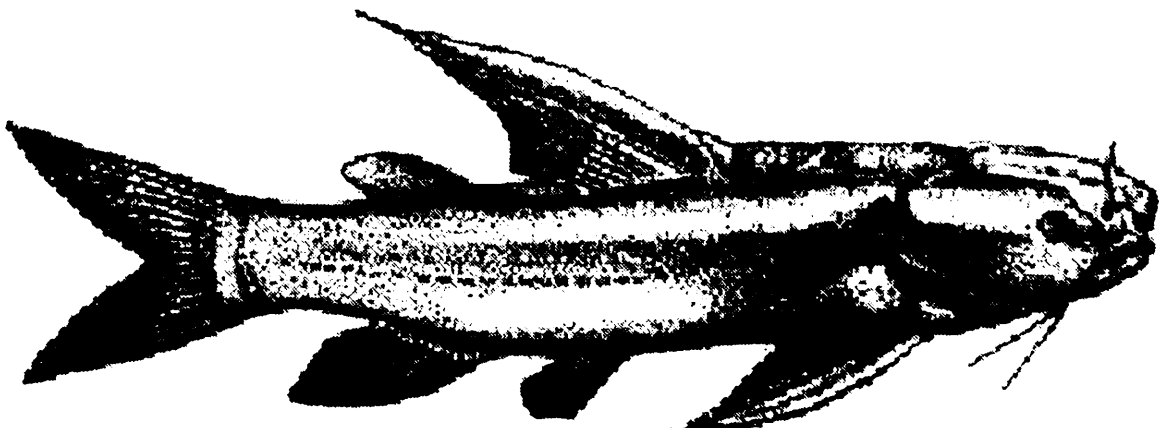


Fig. 64 : *Rita rita* (Hamilton) (Vulnerable)

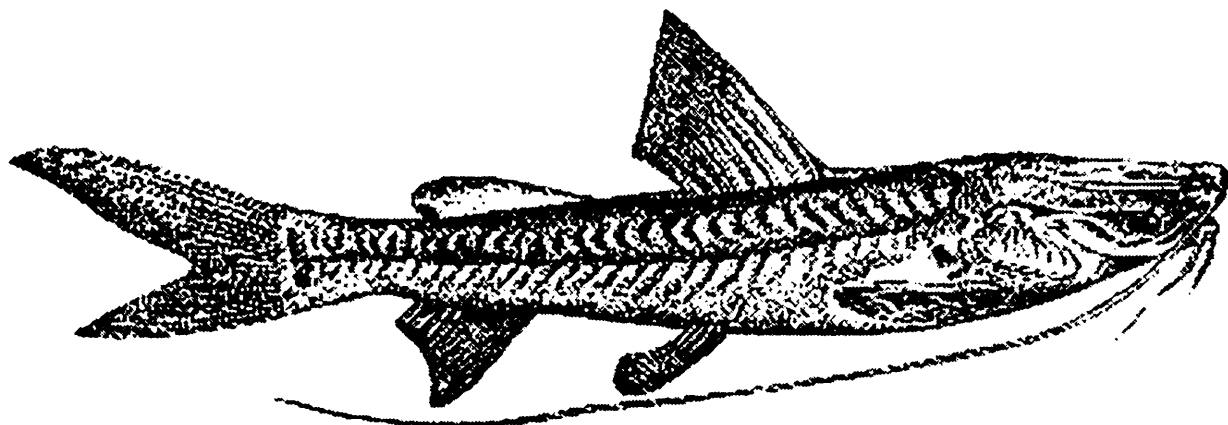


Fig. 65 : *Sperator aor* (Hamilton) (Vulnerable)

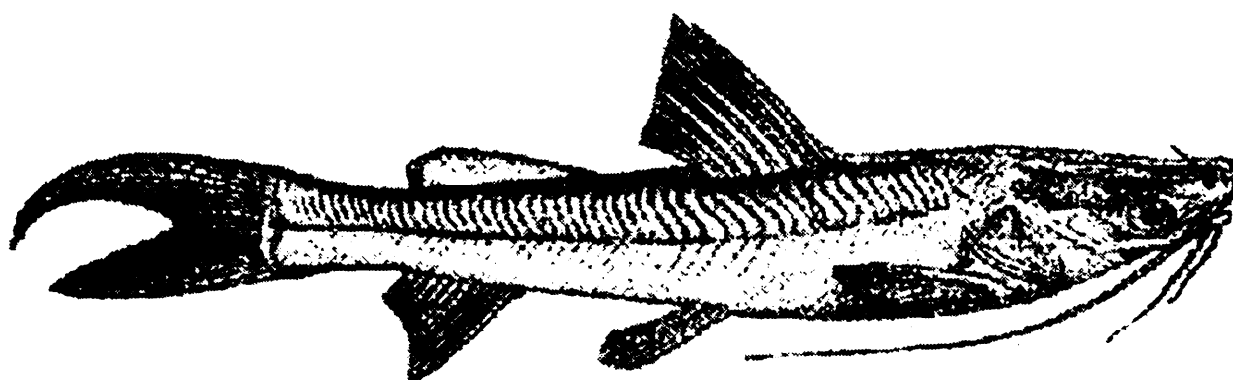


Fig. 66 : *Sperator seenghala* (Sykes) (Vulnerable)

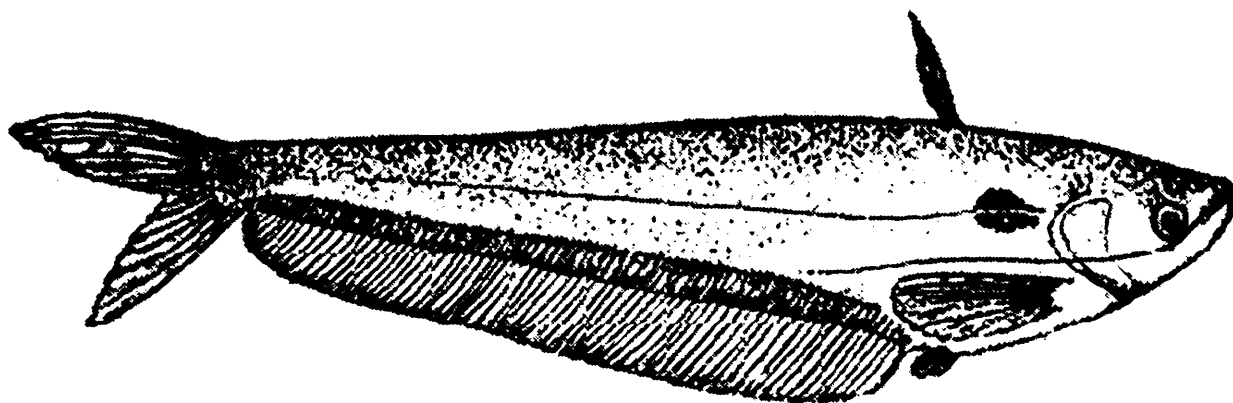


Fig. 67 : *Ompok bimaculatus* (Bloch) (Endangered)

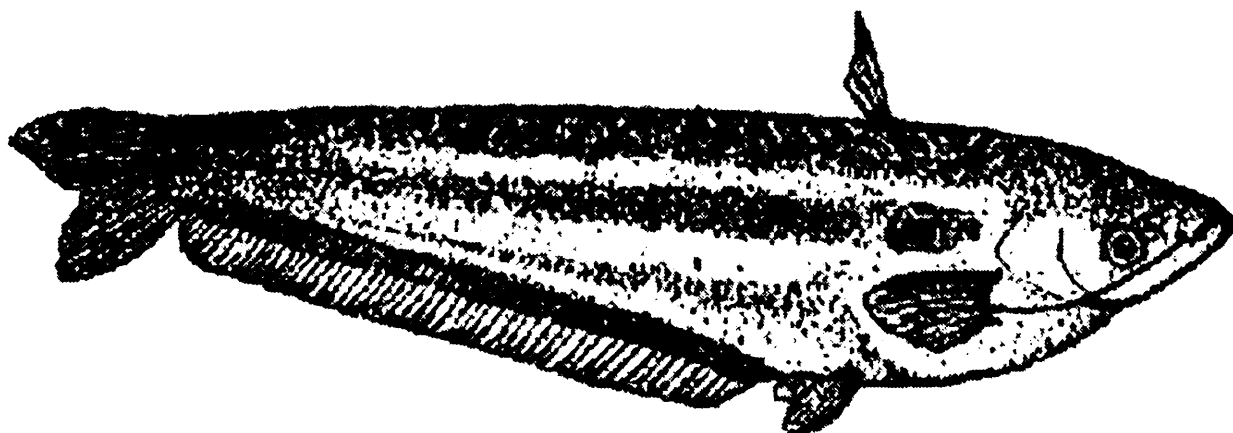


Fig. 68 : *Ompok pabda* (Hamilton) (Endangered)

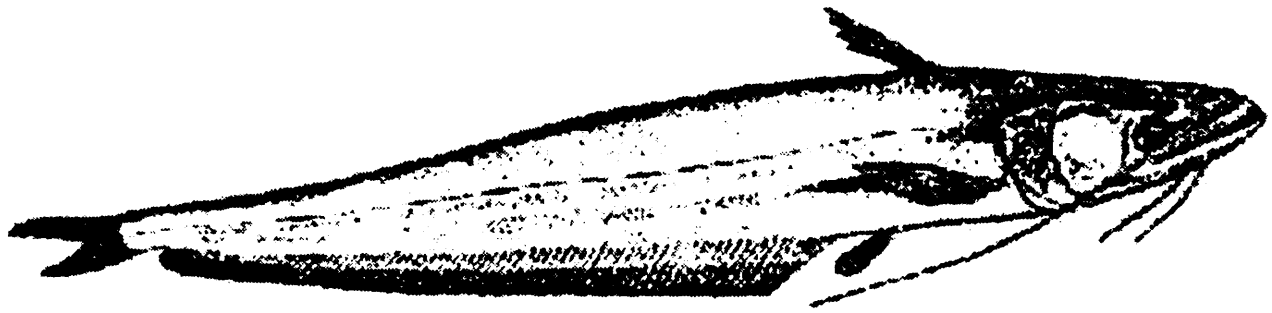


Fig. 69 : *Wallago attu* (Schneider) (Near threatened)

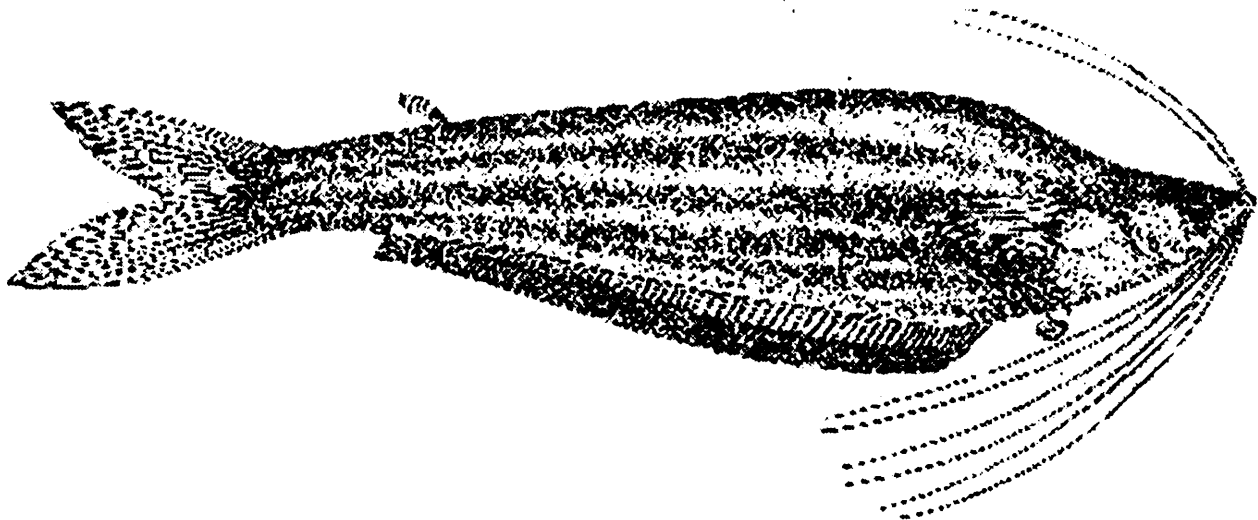


Fig. 70 : *Ailia coila* (Hamilton) (Vulnerable)

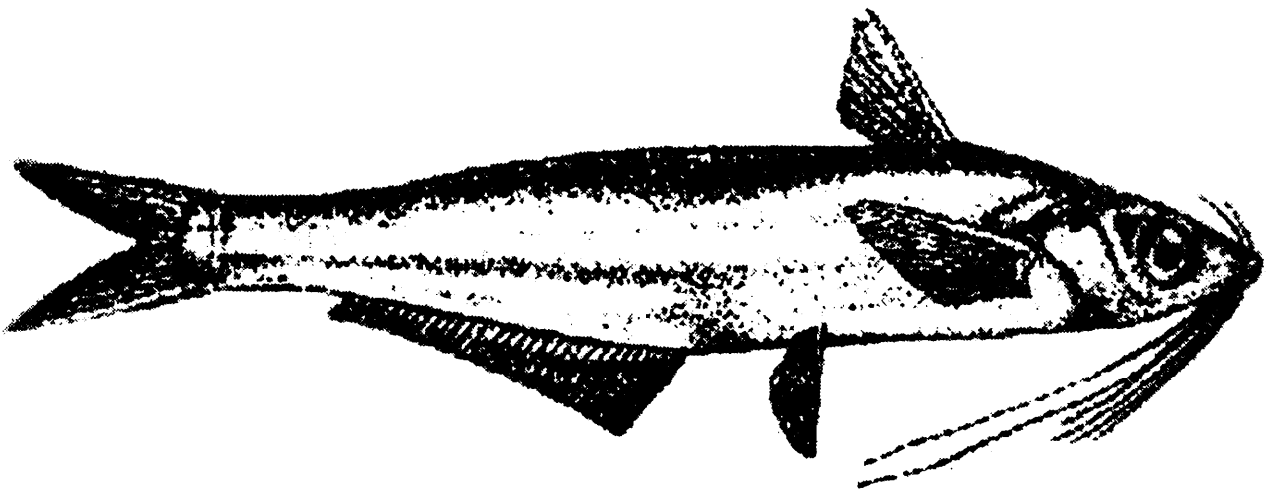


Fig. 71 : *Clupisoma garua* (Hamilton) (Vulnerable)



Fig. 72 : *Eutropiichthys murius* (Hamilton) (Near threatened)

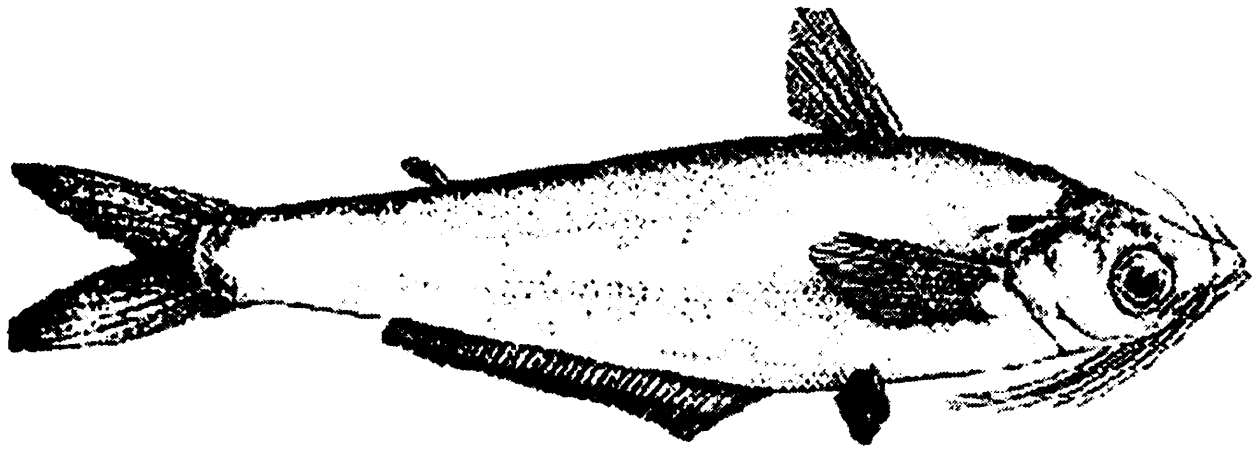


Fig. 73 : *Eutropiichthys vacha* (Hamilton) (Endangered)

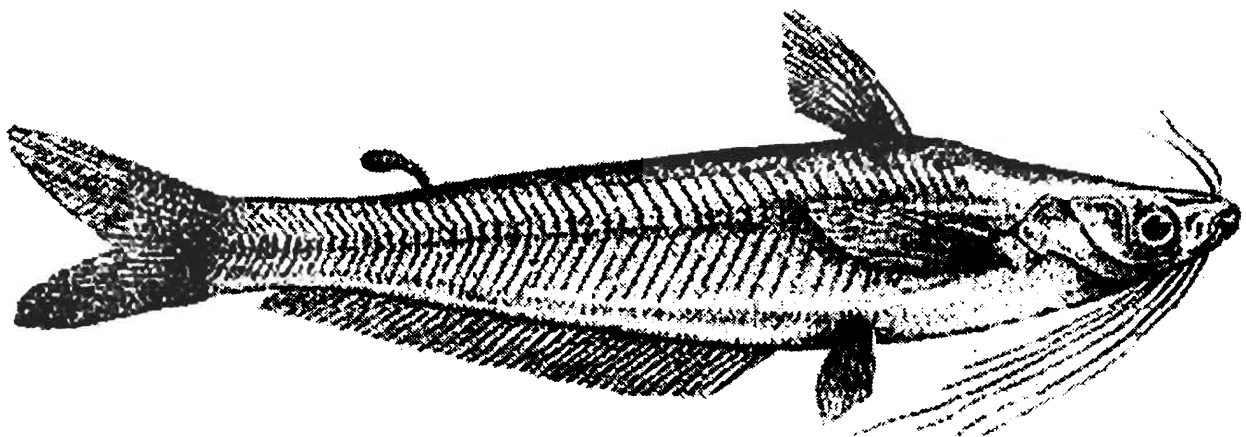


Fig. 74 : *Pseudeutropius atherinoides* (Bloch) (Endangered)

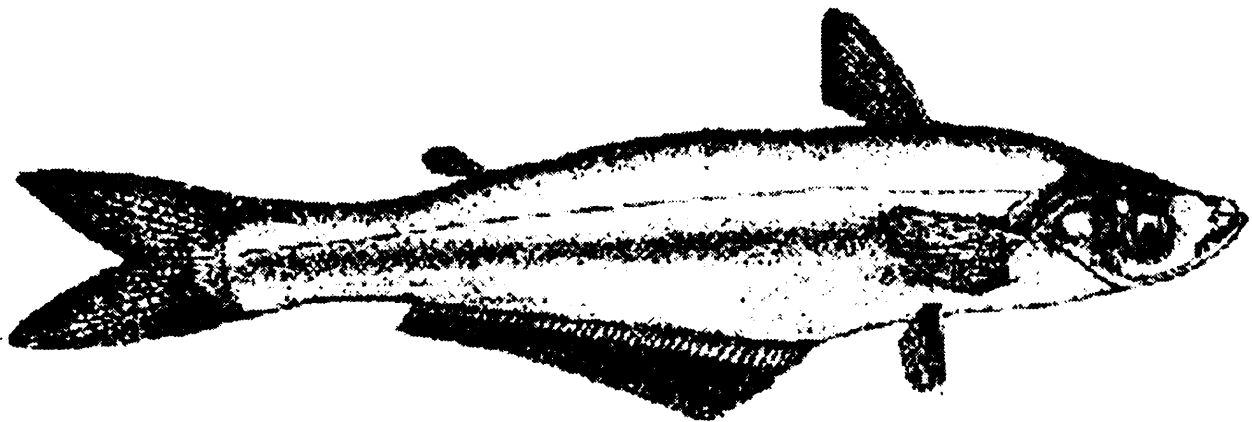


Fig. 75 : *Silonia silondia* (Hamilton) (Near threatened)

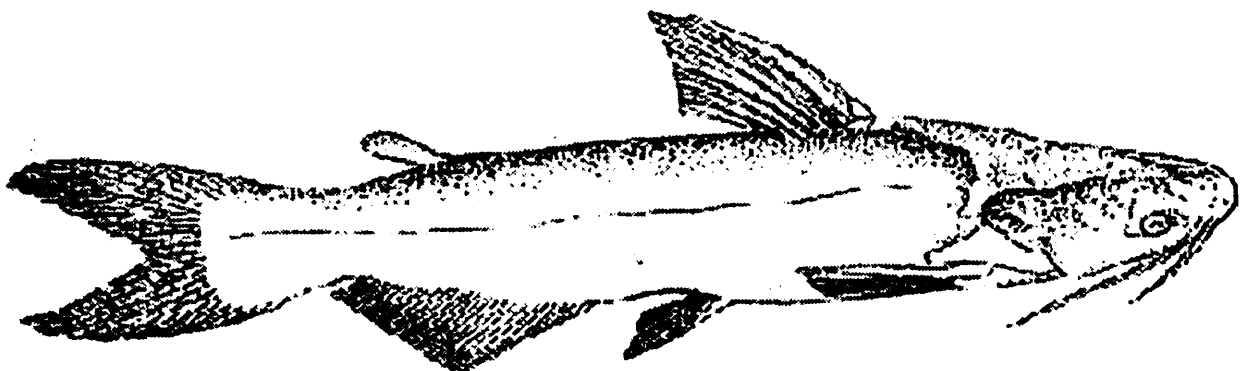


Fig. 76 : *Pangasius pangasius* (Hamilton) (Critically Endangered)

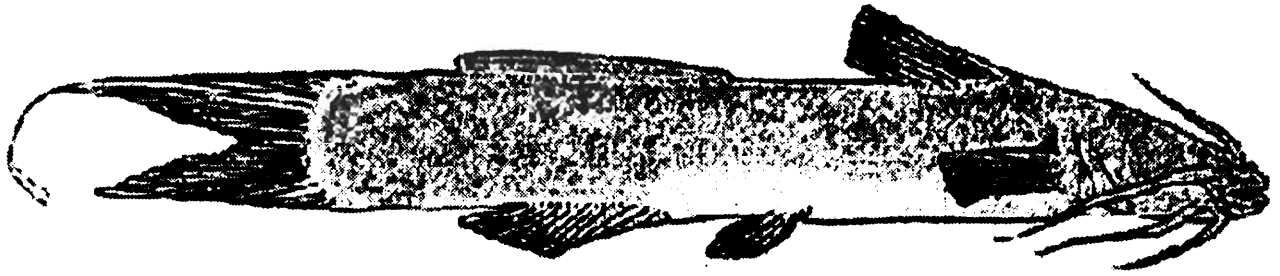


Fig. 77 : *Amblyceps mangois* (Hamilton) (Near threatened)

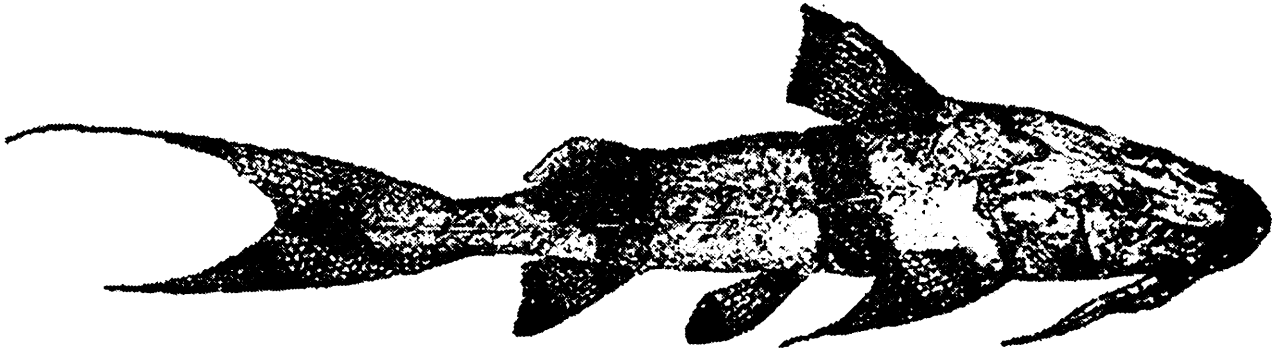


Fig. 78 : *Bagarius bagarius* (Hamilton) (Vulnerable)

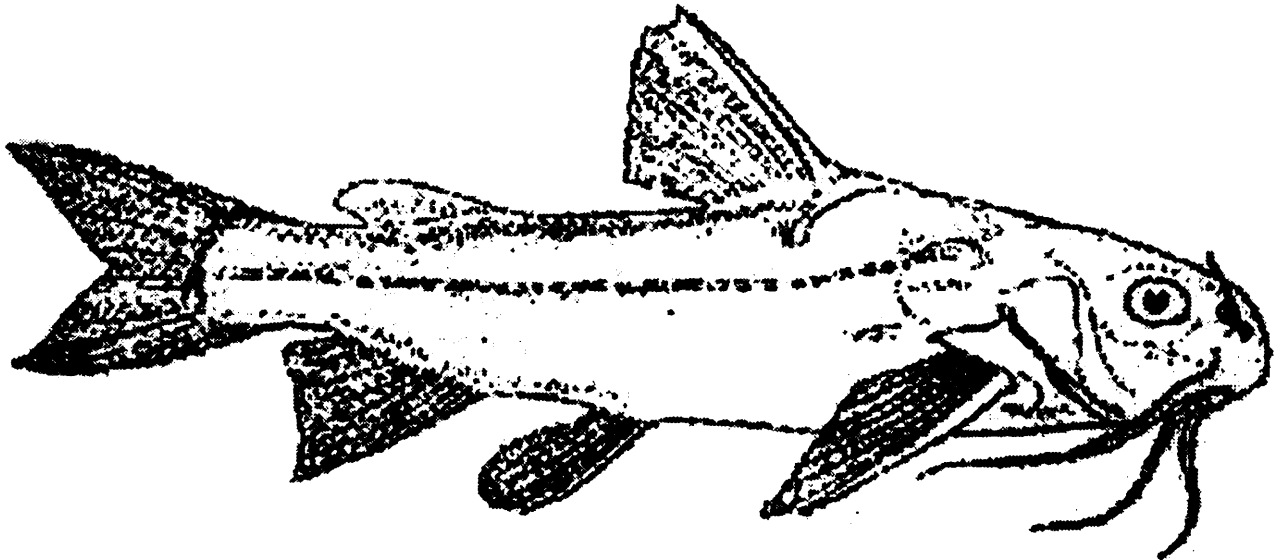


Fig. 79 : *Gangra viridescens* (Hamilton) (Near threatened)

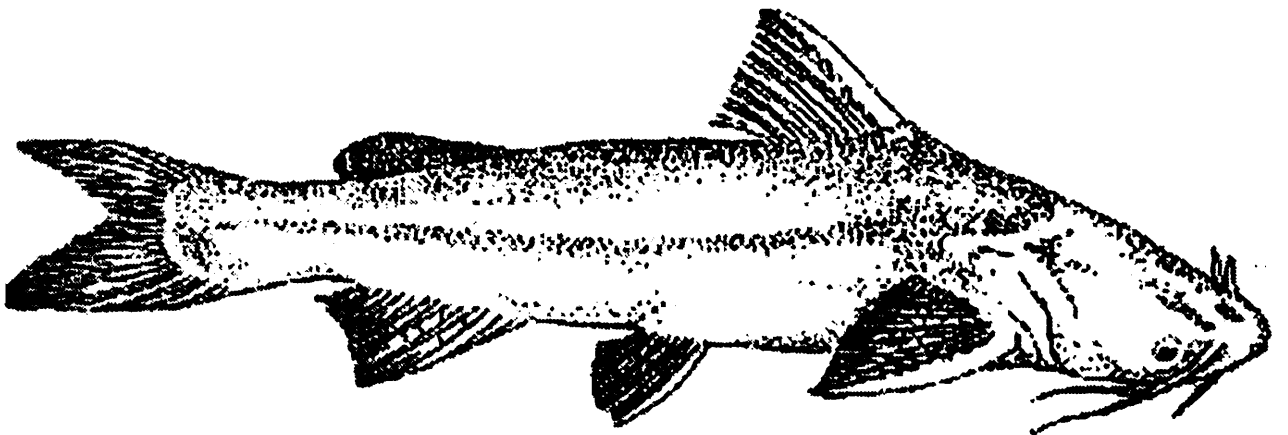


Fig. 80 : *Glyptothorax cavia* (Hamilton) (Endangered)

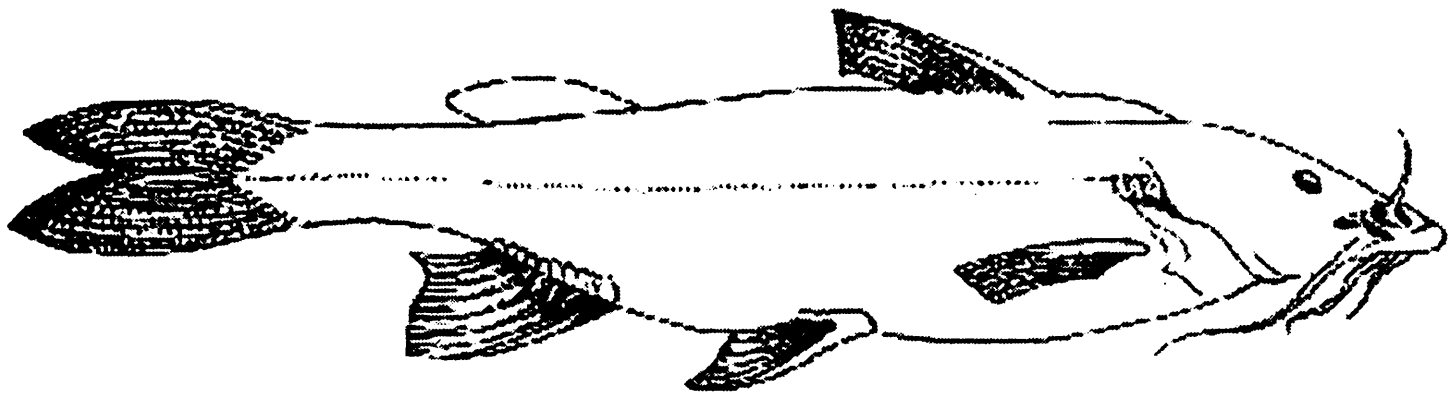


Fig. 81 : *Glyptothorax indicus* Talwar (Vulnerable)

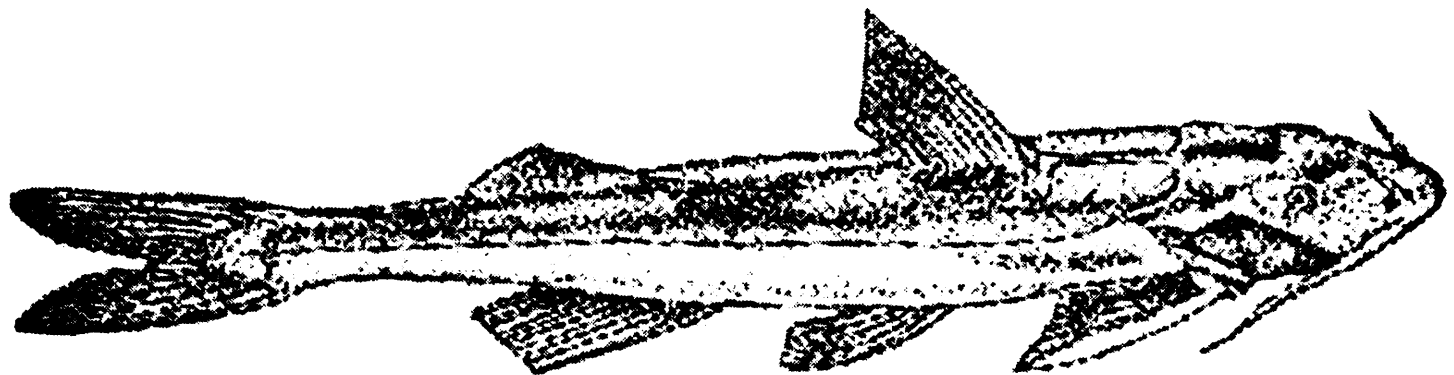


Fig. 82 : *Glyptothorax telchitta* (Hamilton) (Near threatened)

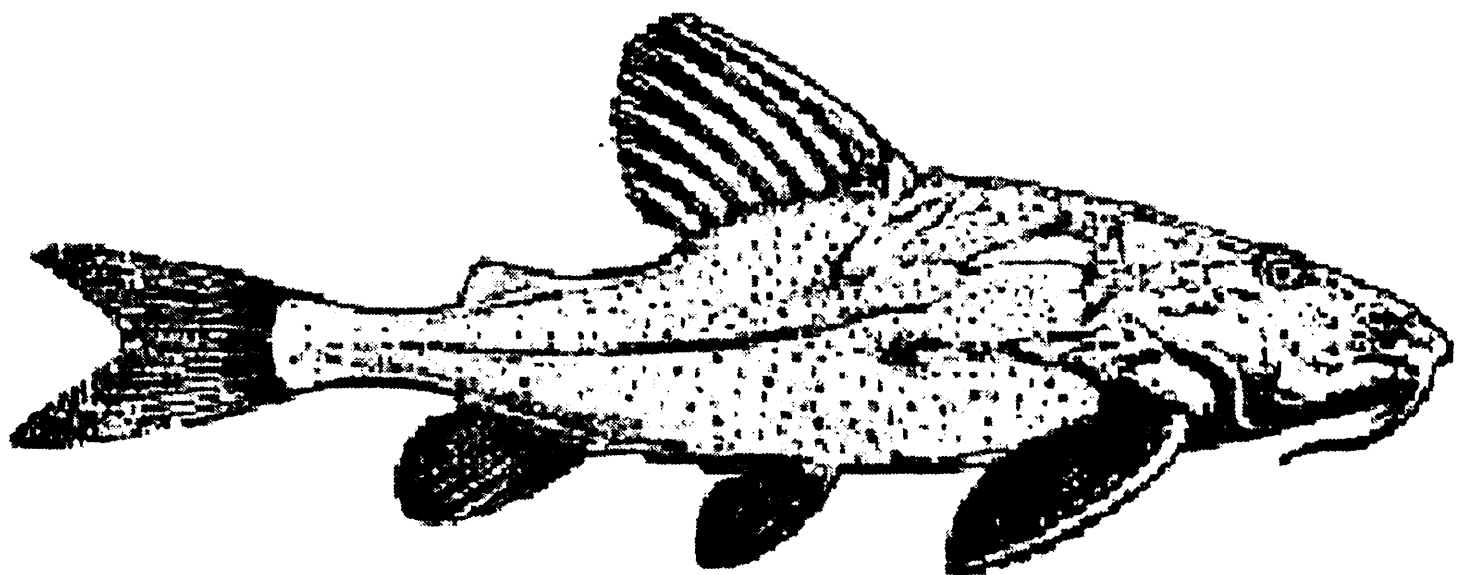


Fig. 83 : *Hara horai* Misra (Endemic & Endangered)

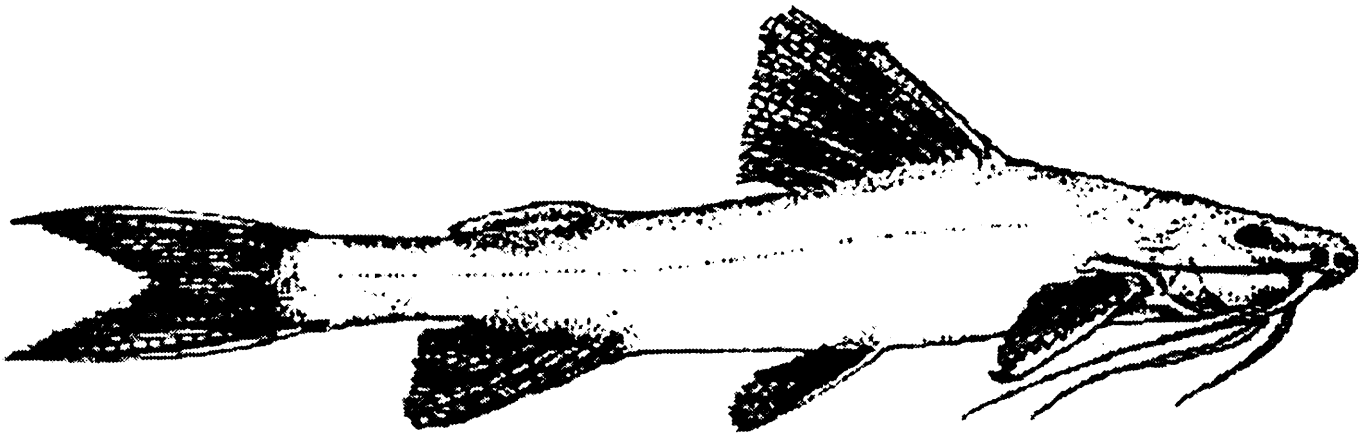


Fig. 84 : *Nangra nangra* (Hamilton) (Vulnerable)

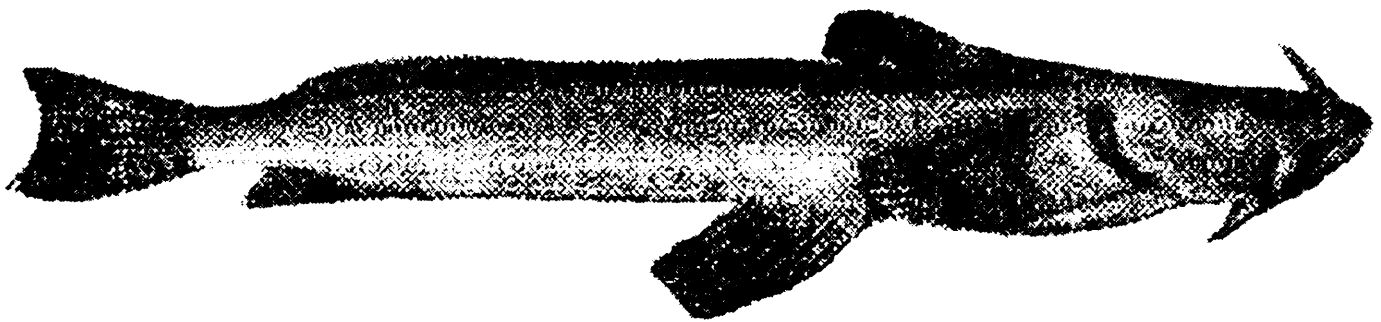


Fig. 85 : *Parachiloganis hodgarti* (Hora) (Vulnerable)

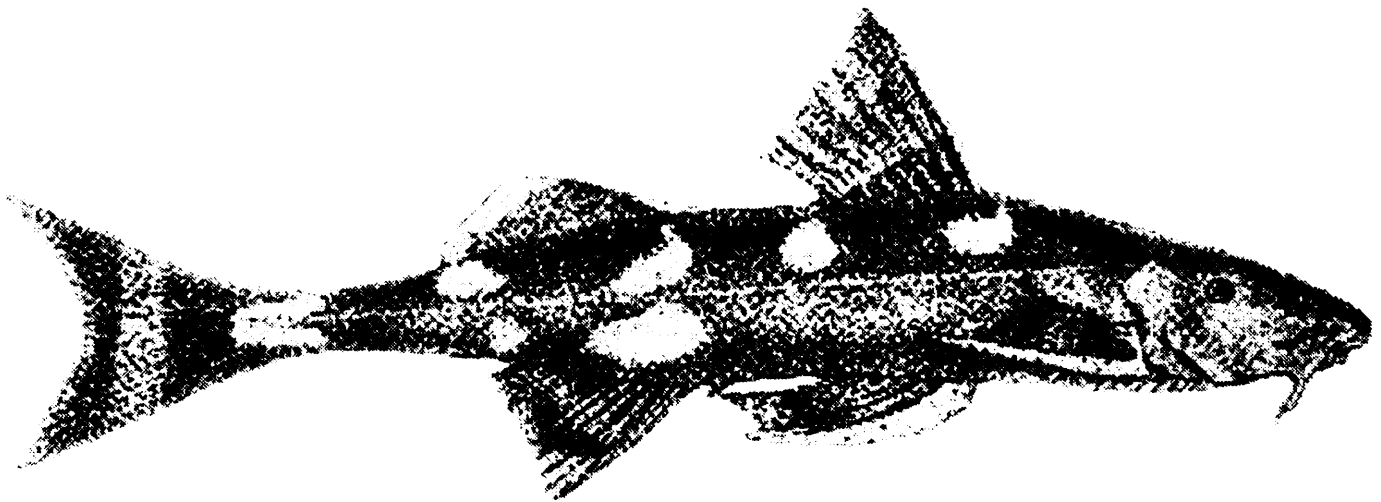


Fig. 86 : *Pseudecheneis sulcata* (McClelland) (Vulnerable)



Fig. 87 : *Sisor rhabdophorus* (Hamilton) (Endangered)

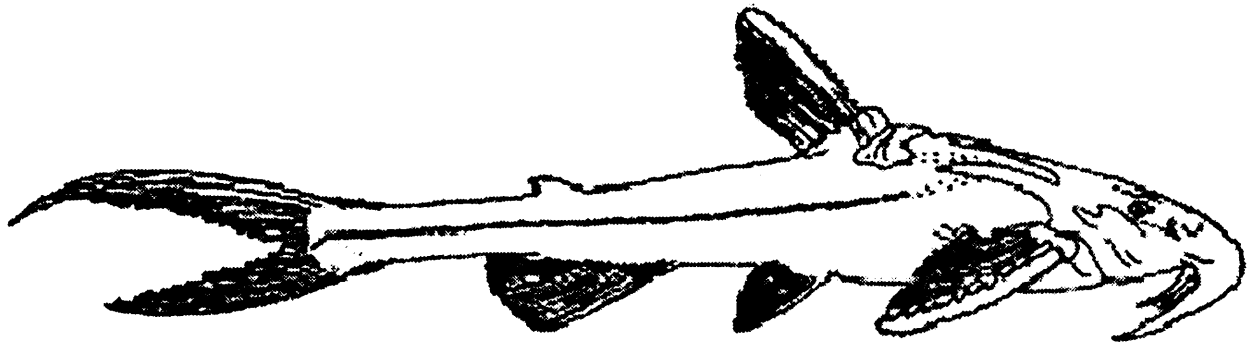


Fig. 88 : *Conta conta* (Hamilton) (Endemic)

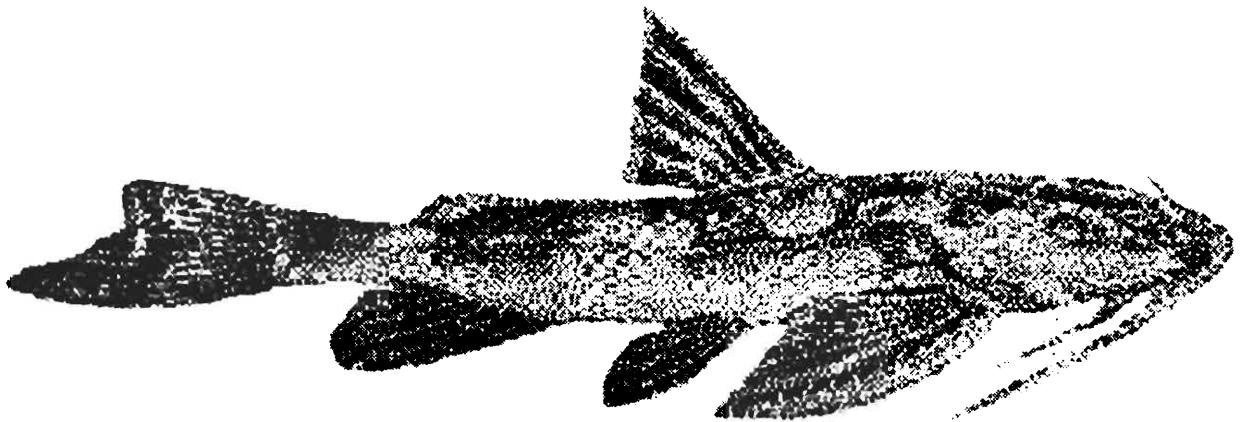


Fig. 89 : *Erethistoides montana* Hora (Endemic)

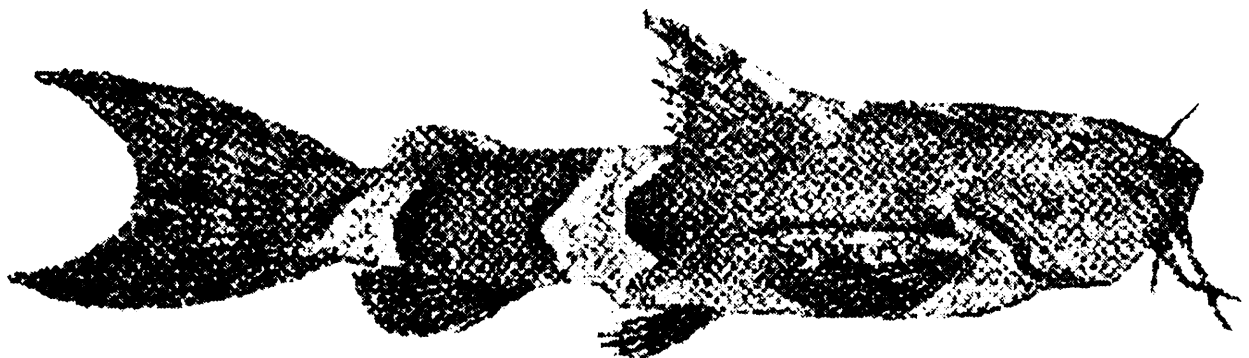


Fig. 90 : *Pseudolaguvia ribeiroi* (Hora) (Near threatened)

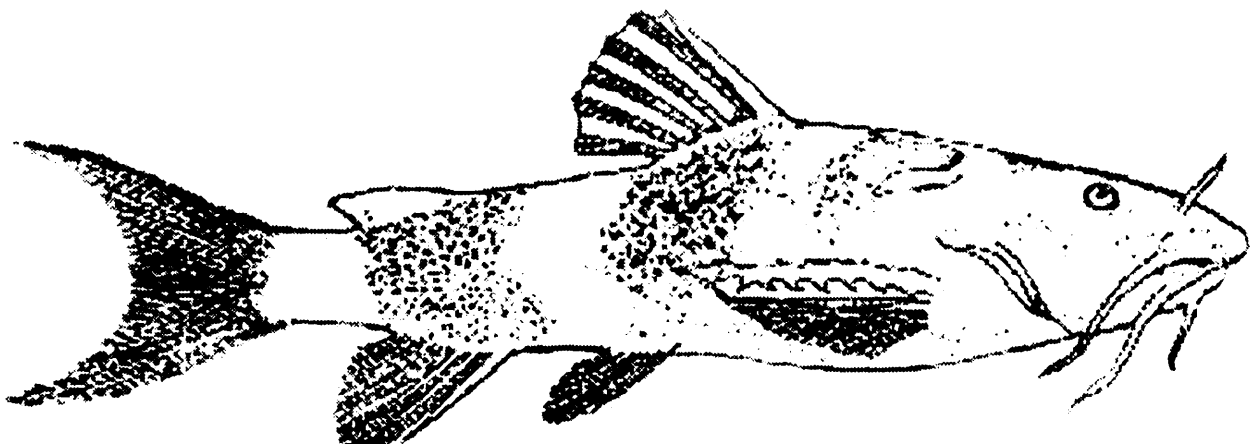


Fig. 91 : *Pseudolaguvia shawi* (Hora) (Endangered)

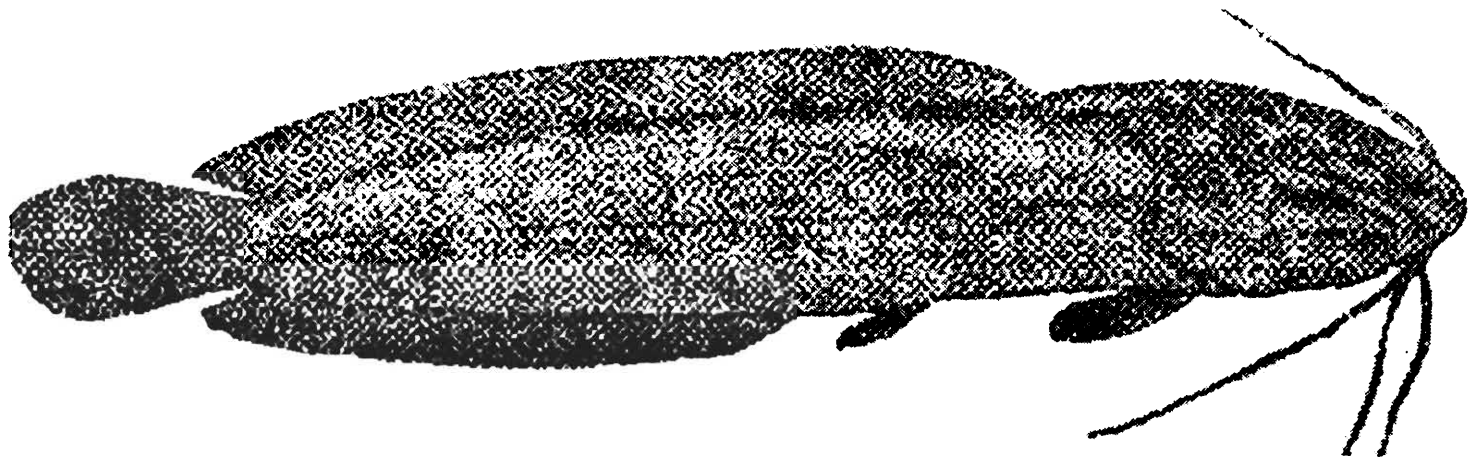


Fig. 92 : *Clarias batrachus* (Linnaeus) (Vulnerable)



Fig. 93 : *Clarias gariepinus* (Burchill) (Exotic)



Fig. 94 : *Heteropneustes fossilis* (Bloch) (Vulnerable)

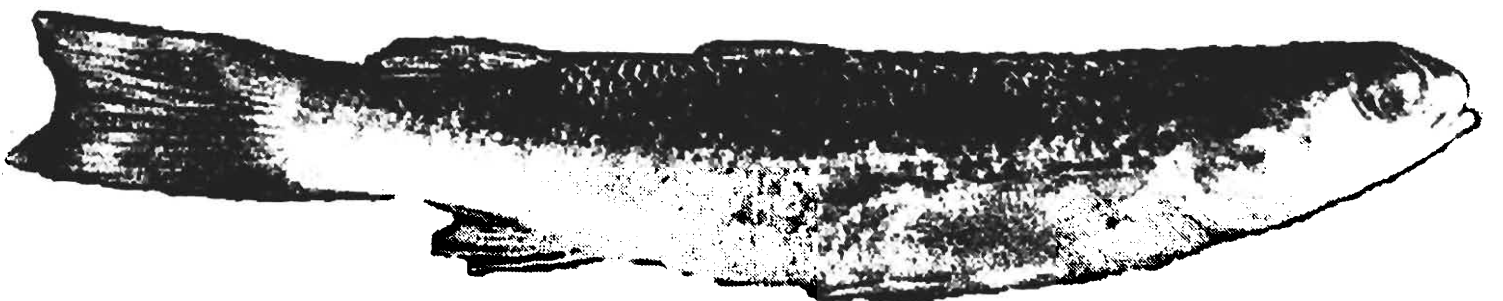


Fig. 95 : *Rhinomugil corsula* (Hamilton) (Vulnerable)

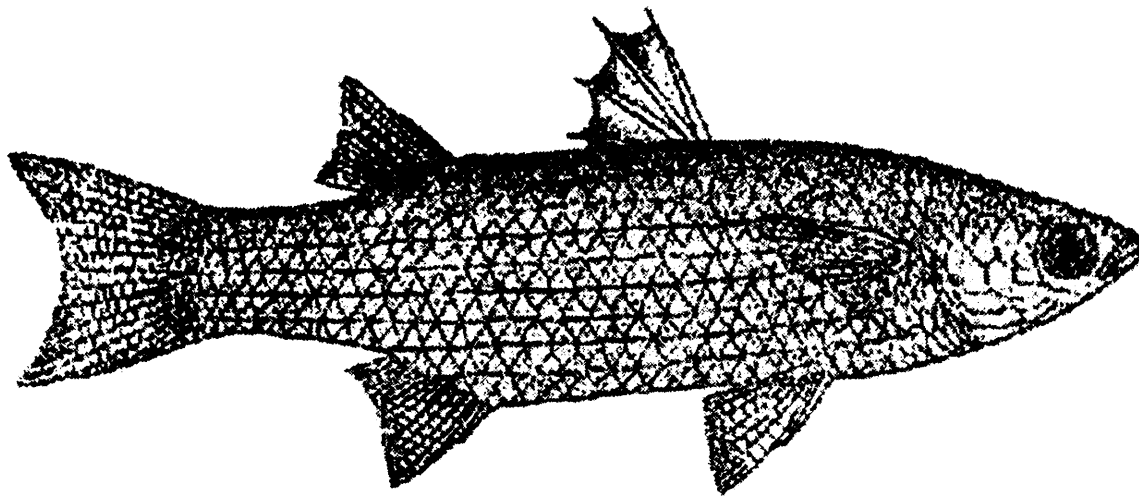


Fig. 96 : *Sicamugil cascasia* (Hamilton) (Vulnerable)

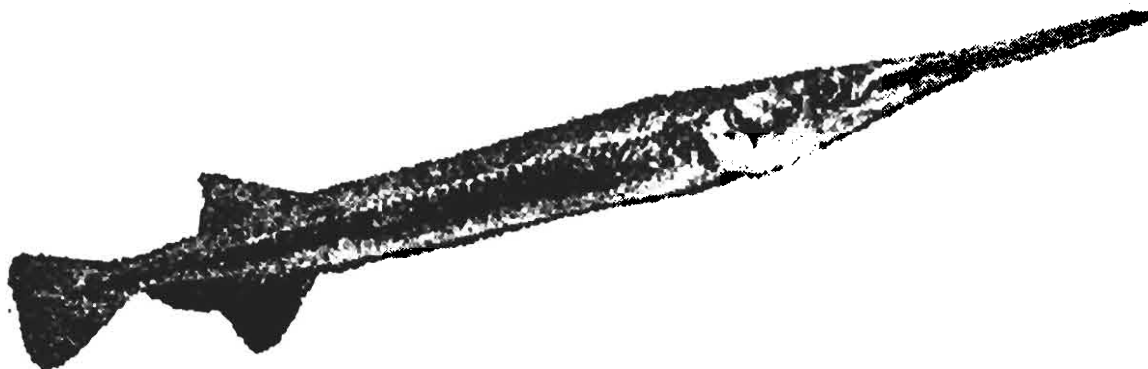


Fig. 97 : *Xenentodon cancila* (Hamilton) (Near threatened)

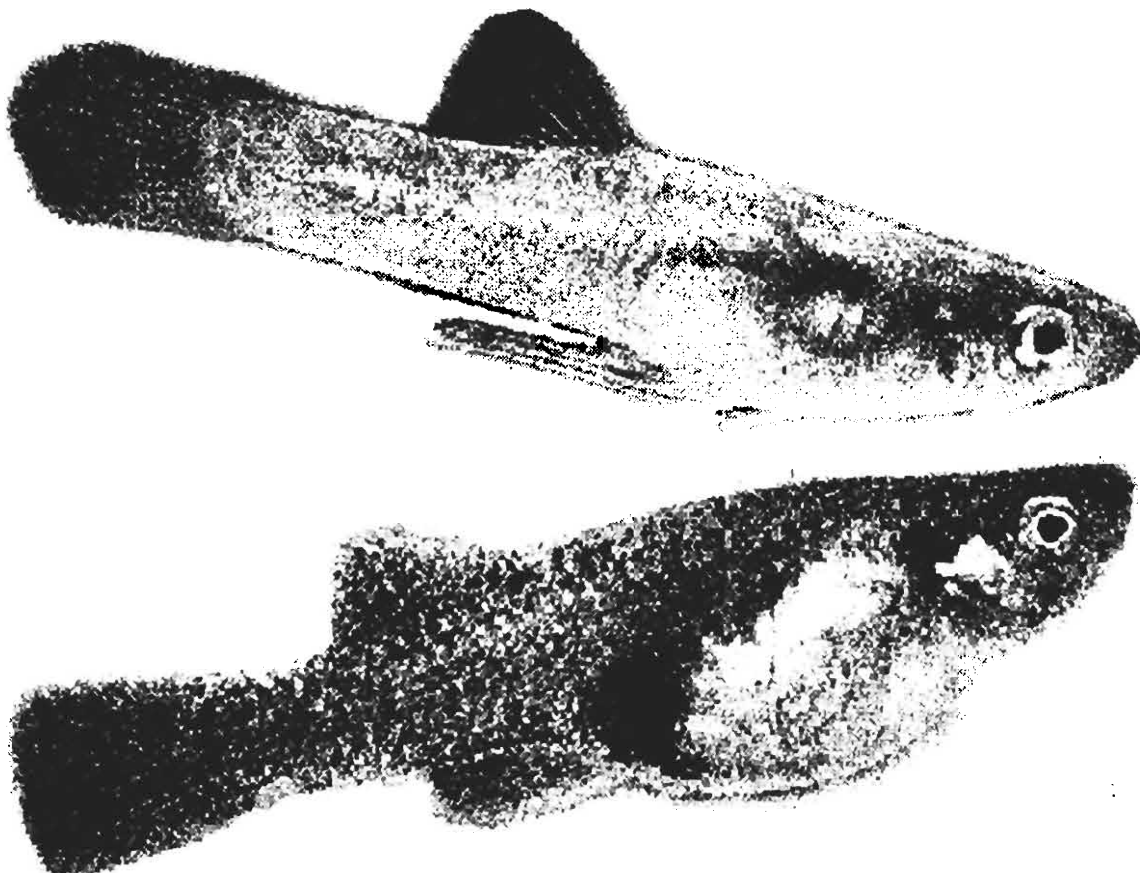


Fig. 98 : *Gambusia affinis* (Baird & Gimard) (Exotic)
Top : Male specimen and Bottom : Female specimen

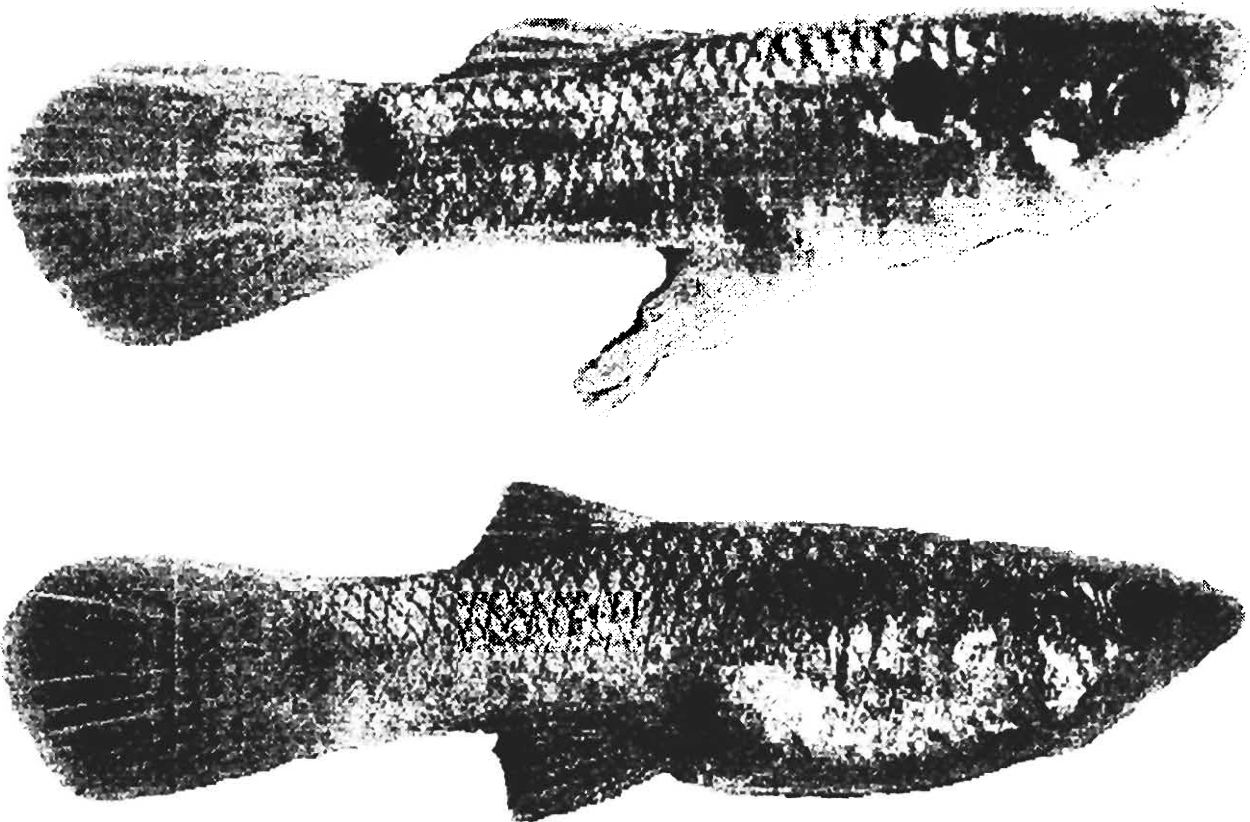


Fig. 99 : *Poecilia reticulata* (Peters) (Exotic)
 Top : Male specimen and Bottom : Female specimen

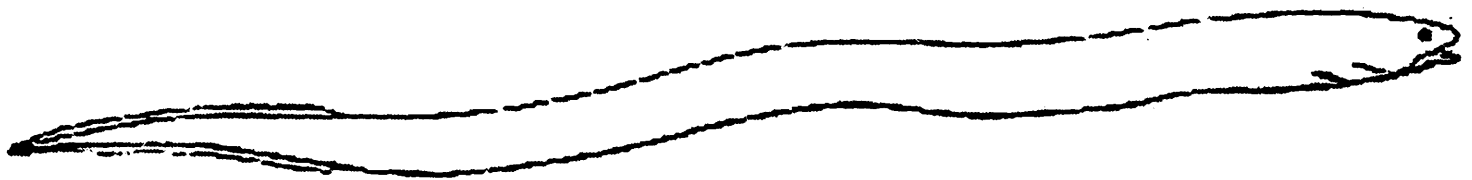


Fig. 100 : *Monopterus albus* (Hamilton) (Near threatened)

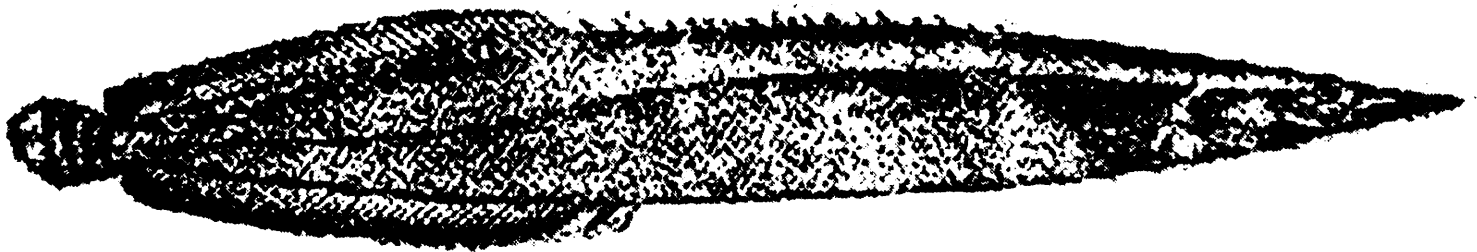


Fig. 101 : *Macrogathus aral* (Bloch & Schneider) (Near threatened)

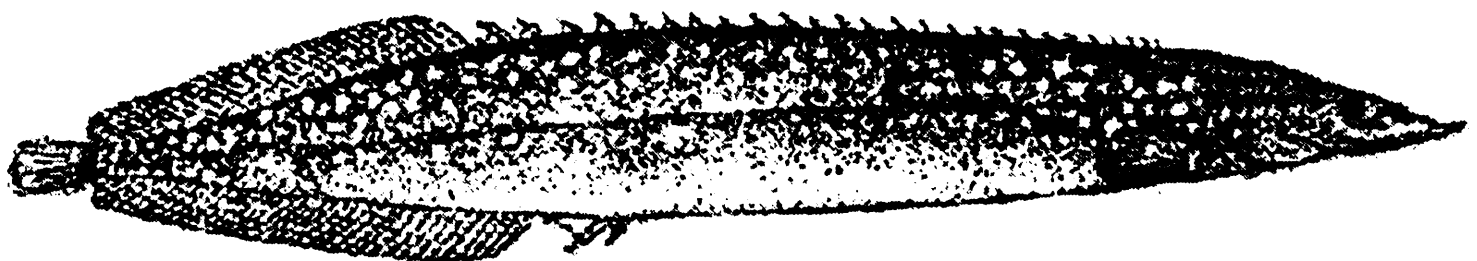


Fig. 102 : *Macrogathus pancalus* (Hamilton) (Near threatened)

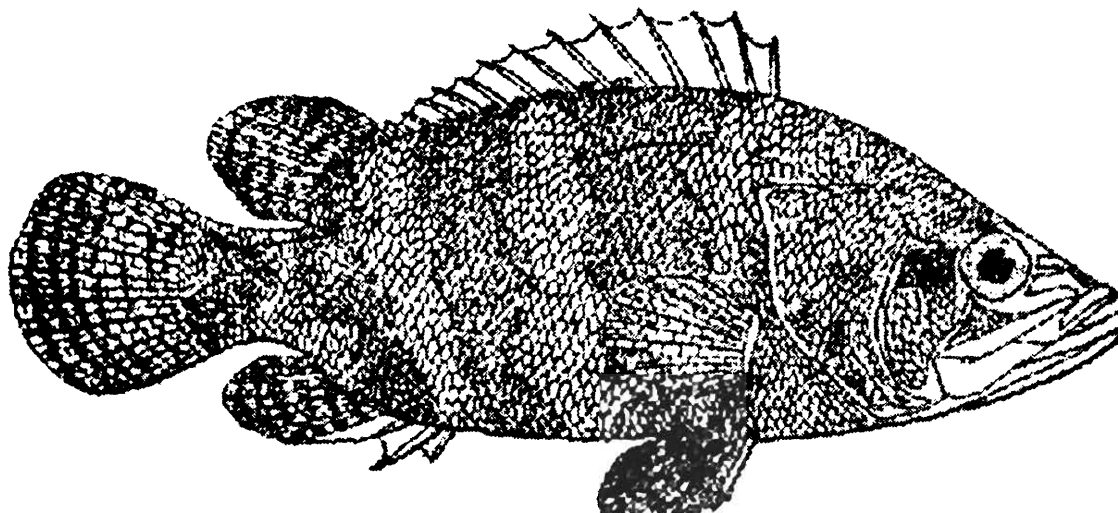


Fig. 103 : *Nandus nandus* (Hamilton) (Near threatened)

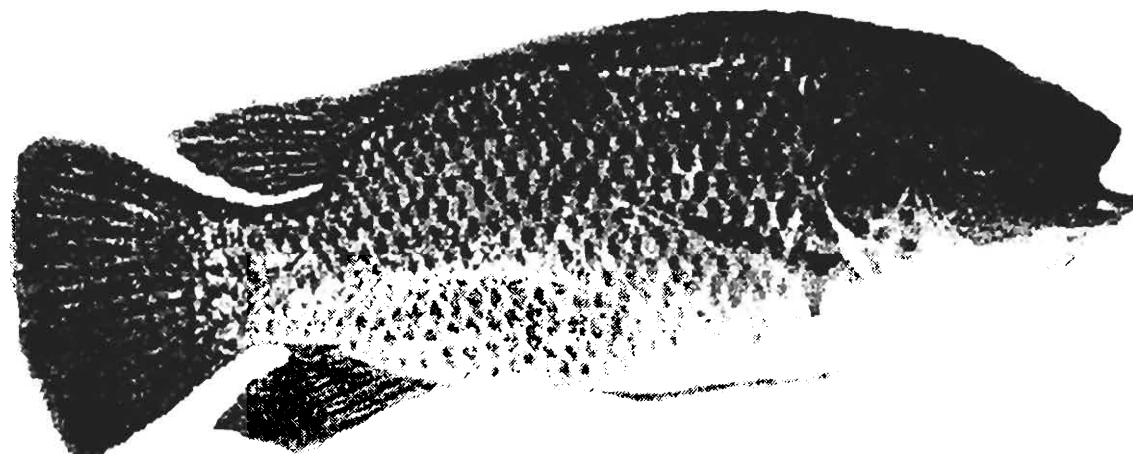


Fig. 104 : *Oreochromis mossambica* (Peter) (Exotic)



Fig. 105 : *Oreochromis niloticus* (Linnaeus) (Exotic)



Fig. 106 : *Glossogobius giuris* (Hamilton) (Near threatened)

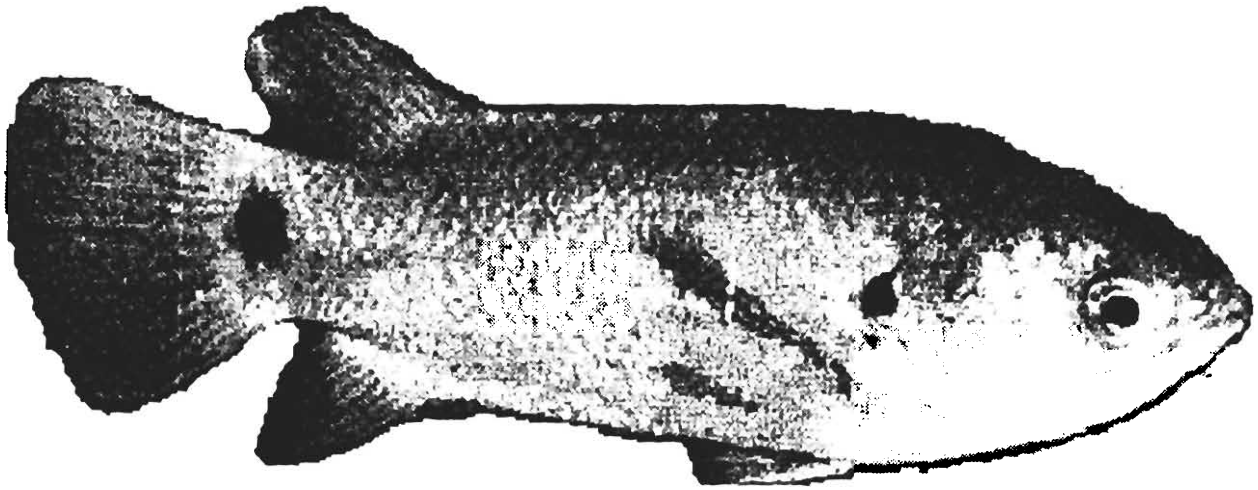


Fig. 107 : *Anabas cobojius* (Hamilton) (Vulnerable)

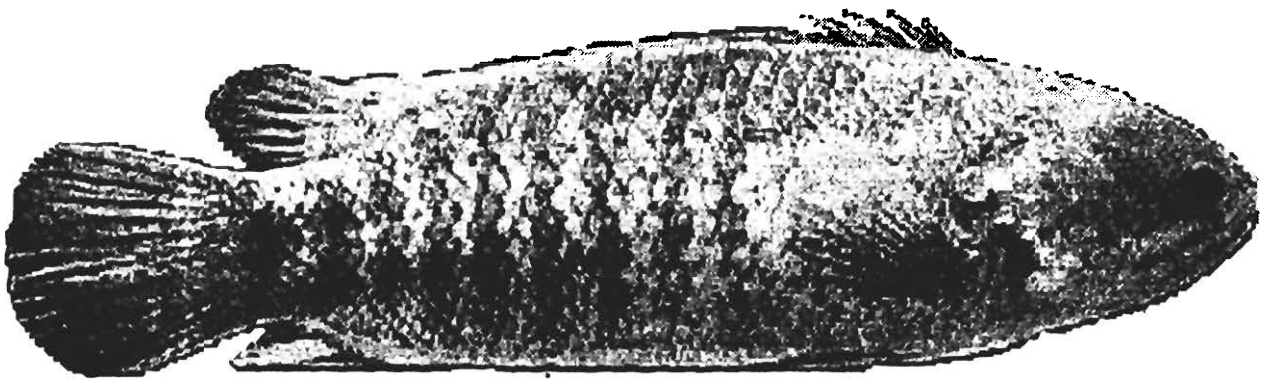


Fig. 108 : *Anabas testudineus* (Bloch) (Vulnerable)

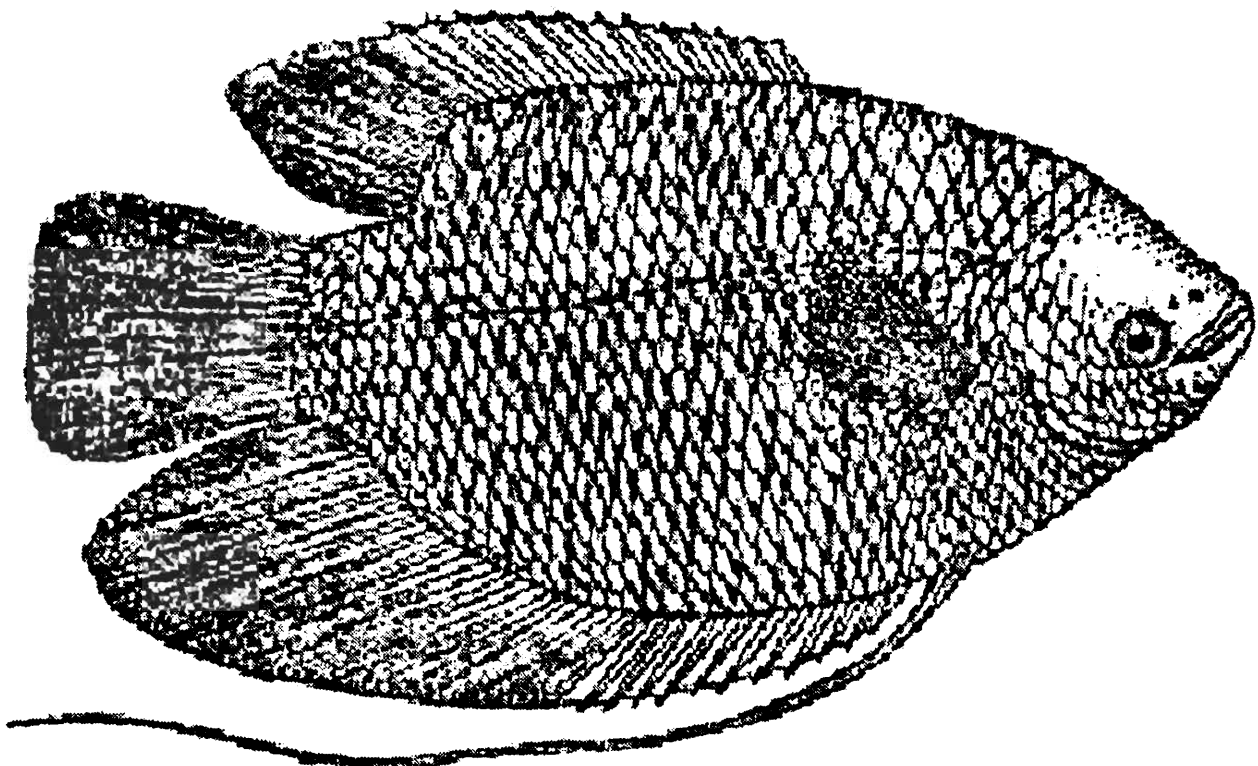


Fig. 109 : *Osphronemus goramy* Lacepede (Exotic)

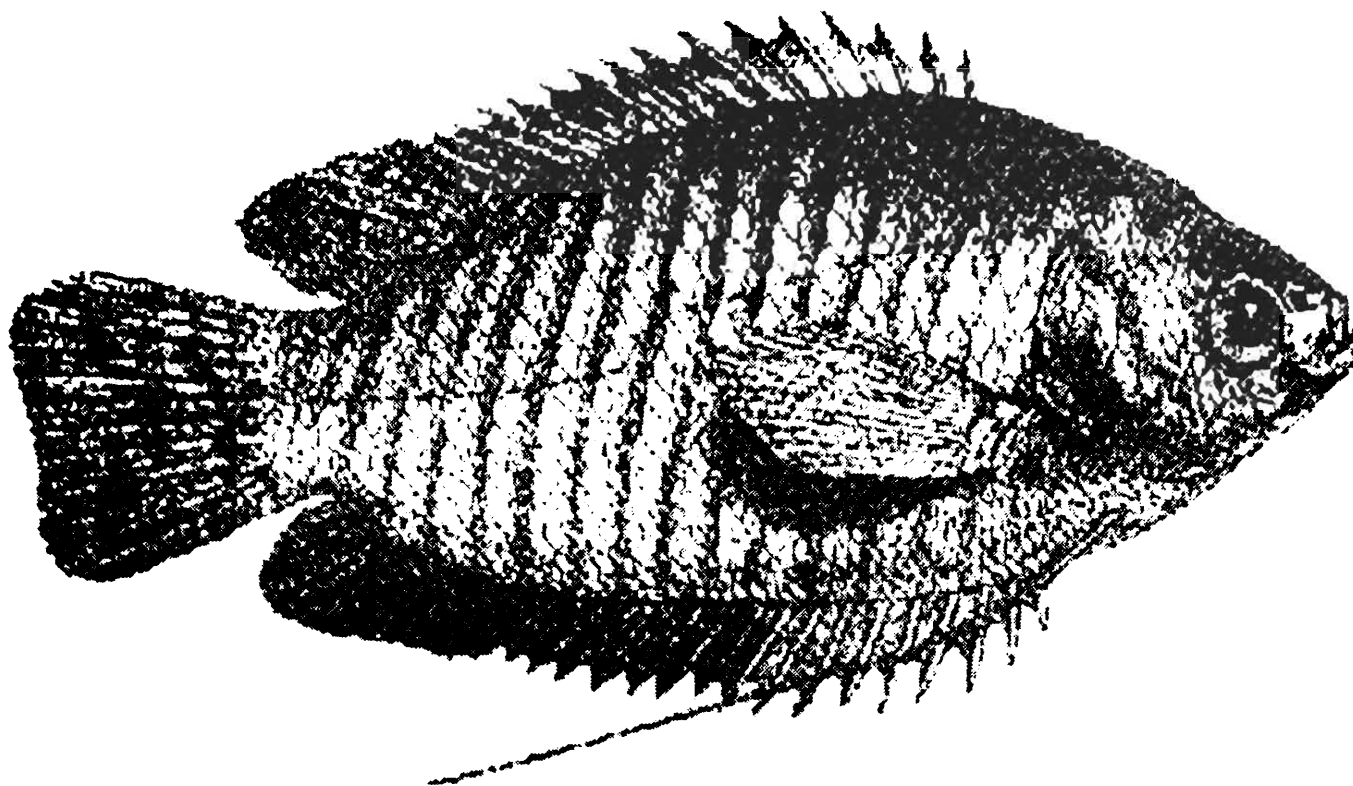


Fig. 110 : *Polycanthus fasciatus* (Bloch & Schneider) (Near threatened)

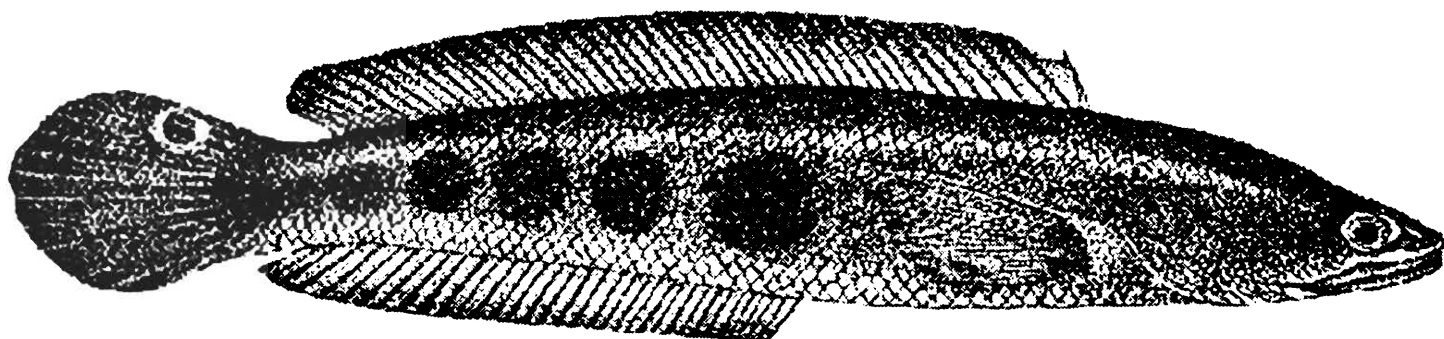


Fig. 111 : *Channa marulius* (Hamilton) (Near threatened)

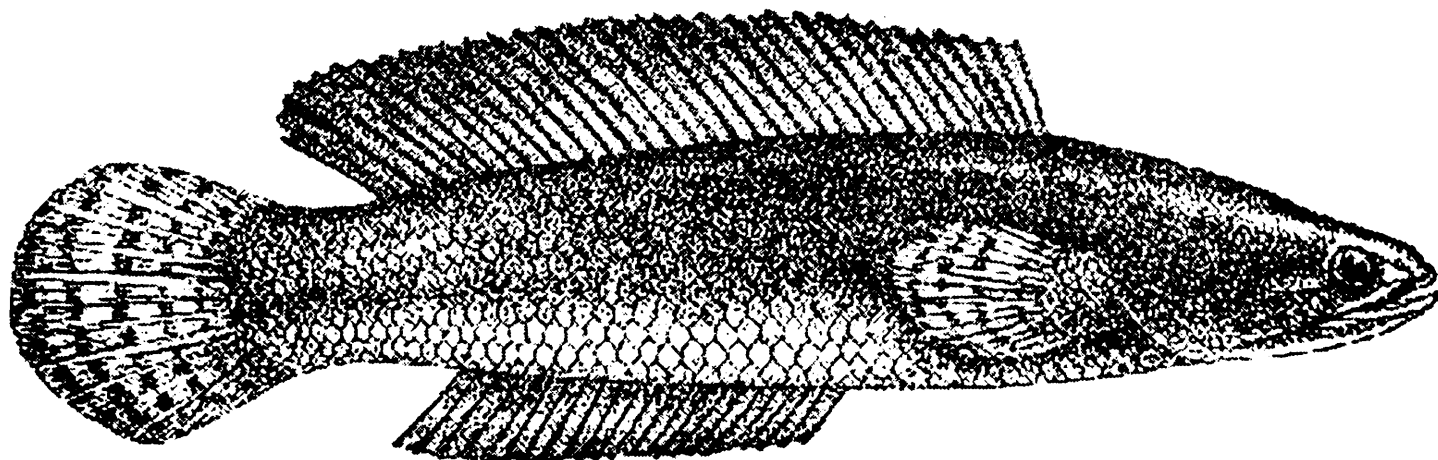


Fig. 112 : *Channa orientalis* Bloch & Schneider (Vulnerable)



Fig. 113 : *Channa punctata* (Bloch) (Near threatened)

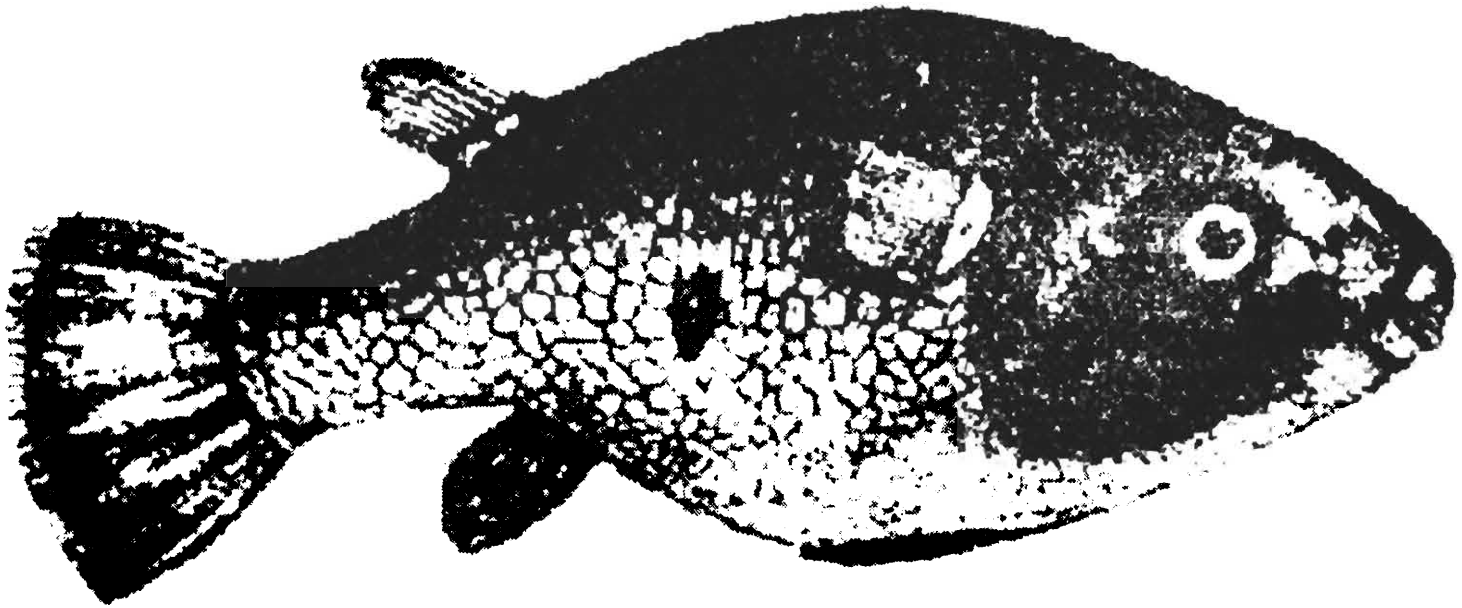


Fig. 114 : *Tetraodon cutcutia* Hamilton (Near threatened)