

The status of the endangered freshwater fishes in China and The analysis of the endangered causes

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Abstract

More than 800 species of freshwater fishes are precious biological resources in inland water system of China. Among them, there are a great number of endemic and precious group, and a lot of monotypic genera and species. Recently, owing to the synthetic effects of the natural and human-beings, many of these fishes gradually became endangered. The preliminary statistic result indicates that 92 species are endangered fishes and account for 10% of the total freshwater fishes in China. For the purpose of protection of the biodiversity of fishes, it is necessary to analyse these causes which have led the fishes to become endangered. This report could be used as a scientific reference for researching and saving the endemic precious freshwater fishes in China.

Key words Endangered freshwater fishes, Endangered causes, China

In the process of the evolution of living things, along with the origin of life, the extinction of life also existed. In the long life history, the speciation and the extinction of living things often keep a relative balance. As time goes on, especially after by the impact of human beings activity of production and life, the pattern of the biodiversity were changed or damaged, more or less. At last, in the modern society, human beings activity not only accelerate the progress of society and the development of economy, but also, as a special species, become the source of disturbing to other species. The human beings influence to the nature, happened all around the globe, is the main factor of the extinction of living things (Solbrig, 1992).

The same as other living things, the life of freshwater fishes are influenced by the human beings activity of economy and production and the change of environment, so that some regional economic fishes before several decades become the endangered species now. And most of the structure of fish population become small sized and lower-aged. In present time, not only the total number of resource of freshwater fishes are obviously declined, but the number of species of fish is also decreased.

1. The status of the endangered freshwater fishes in

In China, due to the enormous different geographical environment, there are a great biodiversity, only of the freshwater fishes there are about 300 species. They are precious biological resources in inland water system of China. 10% are cyprinid fishes, and so there is a great

groups, and lot of the monotypic genera and monotypic species. They are special and precious research material for the phylogenetics and biogeography. And they are very important biological resource for human beings. But in recent several decades, many of them became the endangered or extinct. The preliminary statistic result indicates that 92 species of Chinese freshwater fishes are in endangered and account for 10% of the total freshwater fishes in China (Fig. 1). Among them, cyprinid fishes 52 species, catfishes fishes 11, sturgeon 5 species, salmons 6 species and others 18 species (Tab.1 and Fig. 2). The imminent danger are divided into 4 grades: extinct, rare, endangered and gradual endangered. In Chinese freshwater fishes, 4 species are extinct, 23 species are rare, 28 species are endangered and 37 species are gradual endangered (Fig.3).

Tab. 1 The statistics of endangered freshwater fishes in China

Group	Endangered species	Total species
Cyprinid	52	600
Catfish	11	
Sturgeon	5	5 =
Salmons	6	
Others	18	
Total	92	860

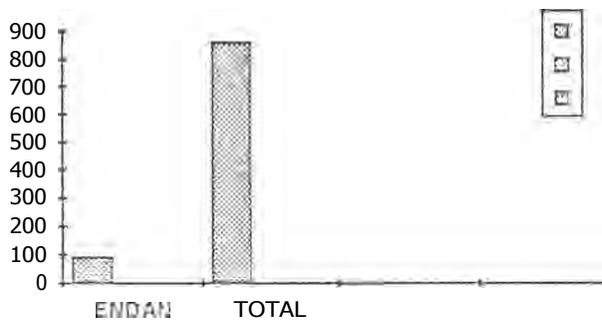


Fig. 1 The percentage of the endangered freshwater fishes in China



Fig. 2 The statistics of the endangered Chinese freshwater fishes

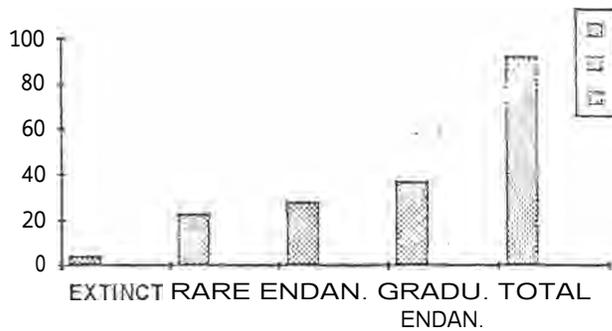


Fig. 3 The statistics of the endangered grade of Chinese freshwater fishes

The list of the endangered freshwater fishes in China

EEL: 1-2

1. *Lampetra reissneri* (Dybowsky)
2. *Lampetra japonica* (Martens)

STURGEON: 3-7

3. *Acipenser schrencki* (Brandt)
4. *Acipenser dabryanus* Dumeril
5. *Acipenser sinensis* Gray
6. *Huso dauricus* (Georgi)
7. *Psephurus gladius* (Martens)
8. *Macrura reevesi* (Richardson)

SALMONS: 9-15

9. *Oncorhynchus masou formosanus* (Jordan et Oshima)
10. *Hucho taimen* (Pallas)
11. *Hucho bleekeri* Kimura
12. *Brachymystax lenok tsinlingensis* Li
13. *Stenodus leucichthys nelma* (Pallas)
14. *Coregonus ussuriensis* Berg
15. *Thymallus arcticus grubei* Dybowsky
16. *Plecoglossus altivelis* Temminck et Schlegel
17. *Anguilla marmorata* Quoy et Gaimard

IS. *Gyrinocheilus aymonieri* (Tirant)

SUCKER: 19

19. *Myxocyprinus asiaticus* (Bleeker)

CYPRINID: 20-71

20. *Candidia barbatus* (Regan)
21. *Parazacco spilurus* (Günther)
22. *Zacco chengdui* Kimura
23. *Tanichthys albonubes* Lin
24. *Aphyogpris pooni* Lin
25. *Gobiocypris rams* Ye et Fu
26. *Luciobrama macrocephalus* (Lacepede)
27. *Leuciscus merzbacheri* (Zugmayer)
23. *Atrilinea roulei* (Wu)
29. *Macropodus chinensis* (Cuvier et Valenciennes)
- Rasbora formosus* Oshima

31. *Pogobrama barbatula* (Luo et Huang)
 32. *Anabarilius alburnops* (Regan)
 33. *Hainania serrata* Koller
 34. *Xenocypris yunnanensis* Nichols
 35. *Xenocyprinoides parvulus* Chen
 36. *Hampala macrolepidota* van Hasselt
 37. *Sinocyclocheilus grahmani* (Regan)
 38. *Sinocyclocheilus anophthahnua* Chen et Chu
 39. *Typhlobarbus nudiventris* Chu et Chen
 40. *Luciocyprinus langsori* Vaillant
 41. *Cosmochilus cardinalis* Chu et Roberts
 42. *Scaphesthes alticorpus* Oshima
 43. *Parator zonatus* (Lin)
 44. *Balantiocheilus hekouensis* Wu
 45. *Epalzeorhynchus bicornis* Wu
 46. *Semilabeo obseurus* Lin
 47. *Ptychidio macrops* Fang
 48. *Sinocrossocheilus guizhouensis* Wu
 49. *Placocheilus cryptonemus* Cui et Li
 50. *Pseudorashora elongata* Wu
 51. *Squalidus minor* (Harada)
 52. *Coreius septentrionalis* (Nichols)
 53. *Platysmacheilus longibarbatu*s Lo, Yao et Chen
 54. *Schizothorax hiddulphi* G *ther
 55. *Schizothorax taliensis* Regan
 56. *Aspiorhynchus laticeps* (Day)
 57. *Diptychus kaznakovi* (Nichosky)
 58. *Oxygymnogpris stewartii* (Lloyd)
 59. *Chuanchia labiosa* Herzenstein
 60. *Platypharodon extremus* Herzenstein
 61. *Puntioplites proctozysron* (Bleeker)
 62. *Procypris merus* Lin
 63. *Progrpris rabaudi* (Tchang)
 64. *Cyprinus micristius* Regan
 65. *Cyprinus yilongensis* Yang et al.
 66. *Cyprinus megalophthalmus* Wu et al.
 67. *Cyprinus longipectoralis* Chen et Hwang
 68. *Cyprinus pellegrini* Tchang
 69. *Cyprinus yunnanensis* Tchang
 70. *Cyprinus ilishaestomus* Chen et Hwang
 71. *Gobiobotia hamulopteroidea* Rendahl
 72. *Psilorhynchus hamuloptera* Hara et Mukerji
- COBITID: 73-76
73. *Oreonectes amphidulmus* Zhen g
 74. *Noemacheilus gejiuensis* (Chu et Chen)
 75. *Triplophysa siluroides* (Herzenstein)
 76. *Leptobotia elongata* (Meeker)
 77. *Physilanthus haotingensis* Zheng et Chen
 78. *Physilanthus pachycheilus* Chen

CATFISHES: 79-89

79. *Silurus soldatovi* Nikolsky et Soin
80. *Silurus mento* Regan
81. *Kryptopterus moorei* Smith
82. *Sinopangasius senzicuitratus* Chang et Wu
83. *Pangasius sanitwangsei* Smith
84. *Cranoglanis boudierius* (Richardson)
85. *Akysis brachybarbatus* Chen
86. *Pseudobagrus madianalis* (Regan)
87. *Liobagrus kingi* Tchang
88. *Bagarius bagarius* (Hamilton)
89. *Gagata cenia* (Hamilton)
90. *Coresiniperca roulei* (Wu)
91. *Trichogaster trichopterus* (Pallas)
92. *Trachidermus fasciatus* Heckel

II. The endangered causes of the freshwater fishes in China:

1. The change of the fish habitat

Even there are different endangered causes, the conspicuous reason is the change and loss of habitat for live things. For the fishes, the main factors of endangered causes are change of environment caused by the construction of the hydroelectric project, excessive exploitation of fishery resource, pollution of water system, unchecked introduction of fish species and uncompleted regulation of fishery (Walter et al, 1993).

1.1 The construction of water conservancy project(the dams of hydroelectric project)

After construction of the dams, the natural environment of rivers changed enormously. The changes caused by the dams form many stress for the fishes so that they can not adapt to new condition. For example, after the construction of dam, environment of the running water changed to the still water, so these running water fishes can not survive. The most serious affect of the dam-building to the fishes is the change of the reproductive environment. Also, the dam can cut off the fishes migratory way, directly affect the growth and reproduction, limit the distribution of the population, all these result must make the genetic resources of species declined..

Recently in China, for the purpose of the hydroelectric and irrational project, many dams are built in stems and branches of river, for example, on the Changjiang River, the Gezhouba dam and the Three-gorges darn in building. These project must change the fish habitat and deeply influence the structure of the fish population and the reproduction. The reproduction and growth of the Chinese sturgeon was deeply influenced by these project.

1.2 The cause of the reclaiming land from lakes and rivers

The reduction of the area of rivers and lakes is the main problem for the fishery recently. The human beings' economic activity greatly increase the requirement of the grains. For this purpose, people build dikes to the rivers and lakes. The dike-building makes the shallow area of rivers and lakes disappeared. This action result in reduction of the living space of fishes and other water life. The fishes population also are reduced

greatly. These kind of projects are often built to the area of lakes so that they are more harmful to the fishes in the lakes.

1.3 The natural catastrophe

The nature catastrophe is one of the reasons for the environment changes. The damage of the forest and vegetation often cause the mountain torrents in the upper reaches of the river, the floods can take great amount of soil and sands into the river and this must directly influence the fish respiration. This condition often cause the death of great number of fishes.

2. The damage of the environment of reproduction and the limited food resource.

The construction of dam often cause damage or disappear of the spawning area of fish in river. Because most of fishes in river have a fixed spawning area, if the dam cut off river current, spawning area must be moved or damaged. Also, construction of industry and different pollution can cause damage of fish spawning area. This condition must enormously limit reproduction and stability of population. The damage of water plants which belong to food environment of fishes often influence habitat and reproduction of fishes. In the same time, the population of plant-eating fishes are decreased or disappeared.

3. Excessive exploitation of the fishes resource

3.1 The Excessive fishery

The increase of human beings population result in need more and more food. So fish's resource were over exploited as food. This is one of very important reason for decline of freshwater fishes resource. And excessive exploitation have greatly reduced fish resource in all Chinese rivers and lakes. Many former economic fishes become rare species or endangered fishes. Such as the *Macrura reevesi* (Richardson) and *Trachidermus fasianis* Heckel. Because of excessive fishery in passed times, now in the Changjiang River, the production of economic fishes were decreased in a very small scale. And the number of professional fishman is decreased greatly because there are not enough commerical worth fishes in the Changjiang River.

3.2 Unchecked elimination of carnivorous fishes from lakes

For the purpose of aqua culture in lakes, people often remove all carnivorous fishes from lakes, this method sometimes can increase fish production, but it damaged the biodiversity and ecosystem of lake, and simplified the fish species, make fish population small-sized and low-aged in lakes. *Elopichthys bambusa* and *Erythriculterid* are often removed from fish-garming field, but in the same time, the other different species also are eliminated.

3.3 The capture of mass fishes

This fishery indicate the capture of mass of parent fish, juvenile, larva and overwintering fishes. Recently, these harmful fishery become more and more wild used. Unchecked capture of all-aged fishes often influence the balance of fish population. And this obstruct the replenishment of the fry. This result in greatly decrease of the fish population.

3.4 The special fishery

Some current fishery used in rivers and lakes often catches all-sized and all-aged fishes, including the larva and juvenile fishes. Most of the traditional wild-used fishery catch fishes no matter how small the fishes are. These fishery seriously limit the development of fish population and fatally damage the fish resource. Some water birds and otter are often used as the tool of fishery, these animal often catch fishes of any small size, especially the juvenile and larva.

4. The pollution of water environment

Along with the development of the industry, agriculture and capital construction, more and more industrial wastes and farm chemical are poured into the rivers and lakes, this directly influence the reproduction of fishes. These waste seriously pollute the water environment for fishes, so that the live space of fishes are smaller and smaller.

5. Unchecked introduction of fishes species

This often caused the damage of the balance among the fishes in the same water system. Some times, different species occupy same niche. This often result in extinction of endemic species. Some introduced fish species have more powerful adaptive capacity. They can occupy all the niche and so that the endemic species have not enough live space and food. The typical example is the introduction of perch (*Perca fluviatilis* Linnaeus) from the Erqisi River into Bosten River. This introduction make the extinction of the schizothoracin (*Aspiorhynchus laticeps* (Day)).

6. The problems of laws

In China, there are many regulation for the protection of fish resource, also there are many limit of fishery. But the execution of these regulation is very difficult in some area. To change this condition, the propaganda and education are necessary.