

# Policies on Release of Improved Fish Strains in China

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## Abstract

Since 1991, the certification, release and maintenance of new species for aquaculture have become part of the national policy in China. During the past 15 years, this policy has been conducted and improved and has begun to show its significant role in Chinese fisheries. This paper describes the updated system of certification, release and maintenance of new species for aquaculture in China.

## Present certification system

### Challenges of aquaculture in the 21st century

The history of aquaculture in China dates back at least 2500 years; however, it has developed rapidly since the 1950s. The breakthrough of artificial propagation of Chinese carps in 1960s changed the traditional practice of collecting the wild fry from the rivers, and formed a strong seed base that gave an essential support to the rapid development of aquaculture during the 1960s and 1970s. Further, China's aquaculture has entered a new era since 1978, when the open-policy and economic reform was adopted. The total output of aquaculture in 2004 reached 32.08 million tonnes, representing 65.46 per cent of the total aquatic production.

In the freshwater aquaculture section, the most commonly farmed species are the native carps, mandarin fish, and river crab. The exotic species that are cultured broadly are tilapia, rainbow trout, channel catfish, and largemouth bass. In marine aquaculture section, the representative principal species shifted to seaweeds (kelp and porphyra) in the 1960s, to shellfish (mussel and clam) in the 1970s, to scallop in the 1980s, to shrimps in the 1980s and 1990s, and to fish from 1990 onward.

At present, there are about 60 species of fish, over 10 species of crustacean, over 20 species of shellfish, and more than 10 species of seaweeds that are cultured in different farming systems.

The challenge of aquaculture development in the new millennium is high. The Chinese population is predicted to rise from the present 1.2 billion to 1.6 billion by 2026. This situation and the increase in

living standards have presented the Chinese with several challenges as well as opportunities to meet the rising demand for low- and high-quality animal products, in particular the aquatic products. Apart from this, marine fish stocks from the wild are decreasing; hence, the Chinese fishery development policies have focused on expanding aquaculture as a key strategy to meet the changing national demand and consumer patterns. However, to get to this level, there are three key issues that need to be considered properly: (1) environmental carrying capacity, 2) genetic improvement, and 3) disease control. First, it is urgently needed to develop the environmentally sustainable production systems, namely water saving, land saving, feed saving and low waste culture systems, within the carrying capacity. Second, since most of the species cultured are still from wild stock and without genetic improvement, new genetically improved strains or varieties are needed to pour new energy into development of aquaculture. Finally, the outbreak of new disease must be prevented by effective disease control measures to strengthen the industry.

In view of the national strategies for the development of both inland and marine aquaculture, it has been recognized that increasing the input to production alone is not enough. Good quality seed and its diversity are necessary prerequisites.

In 1991, the Government of China approved the establishment of the National Certification Committee of Aquatic Wild and Bred Varieties (NCCA-WBV) under the Ministry of Agriculture (MOA).

After the establishment of the NCCA, the certification system has been extended into provincial level in some major provinces. But only the NCCA has been authorized by the central government to certify the improved fish strain and the Ministry of Agriculture (MOA) has been authorized to release the improved fish strain.

### *Organization of the NCCA*

The NCCA consists of geneticists, aquaculturists, and administrators from research institutes, universities, as well as officials of the Bureau of Fisheries, Ministry of Agriculture. The secretariat of the NCCA is under the umbrella of the National Fisheries Technology Extension Center in Beijing. The Committee holds its meeting annually to discuss (i) the certification of good aquatic species, and (ii) the evaluation of the national aquatic seed farms.

### *Mandate of the NCCA*

*Certification of good species for aquaculture.* In Article 16 of the “Fisheries Law”(2000), it is stated that “any new aquaculture species”, can only be extended after first being certified by the National Certification Committee of Good Aquatic Species, and then approved by the Fisheries Authority of the National Council, Ministry of Agriculture of China.

The term “good aquatic species” includes four groups: economically important wild stocks, genetically improved varieties, good hybrids, and good exotic species.

*Evaluation and examination of the National Aquatic Wild and Bred Seed Farm* This assesses the major institutions that maintain the popular nature of genetically improved varieties, hybrids and exotic species as well as the wild stocks used in aquaculture.

*Establishment of the certification regulations and policies.* The following regulations and policies have been made and released to the public: (i) the National Certification Standard for Good Aquatic Species; (ii) the Management Standard for the Quality Control of Products of Aquatic Seed Farms; (iii) the Approaches to the Evaluation and Certification of the National Aquatic Seed Farm, (iv) the Standard for Production

Management of the Aquatic Seed Farm; (v) the Key Points for Construction of the National Aquatic Seed farm, (vi) the Operative Technology Standard for the Production of Major Cultured Fish, and (vii) the Management of Aquatic Brooders and Fry.

*Certification procedures.* In order to process the certification of good seeds, two types of documents should be submitted: (i) principal document, and (2) attached documents. The principal document is an application report whose major contents include the original sources of seeds, breeding process, major characteristics, extension and evaluation. The attached documents include a research report, a technical report (covering reproduction, seed production, genetic characterization, inspection of genetic characteristics by an authority appointed by the NCCA), an identification report on disease resistance by an authority appointed by the NCCA (if required), and an on-farm testing report made during the last two years.

### **Release**

In Article 16 of the “Fisheries Law” (2000), it is stated that “any new aquaculture species can only be extended after first being certified by the National Certification Committee of Good Aquatic Species and then approved by the Fisheries Authority of the National Council”. The Fisheries Authority of National Council is the Ministry of Agriculture of China.

All certified and released species/strains are listed in Appendix I.

### **Maintenance**

In order to maintain the nature of certified and released species, the Government has established 36 national seed farms (Appendix II)

## List of certified and released species

	Common name	Scientific (Latin) name	Certification number
1	Xingguo red common carp	<i>Cyprinus carpio singuonensis</i>	GS01 □ 001 □ 1996
2	Purse red common carp	<i>Cyprinus carpio wuyuanensis</i>	GS01 □ 001 □ 1996
3	Pengze crucian carp	<i>Carassius auratus var pengzenensis</i>	GS01 □ 001 □ 1996
4	Jin common carp	<i>Cyprinus carpio var. jian</i>	GS01 □ 004 □ 1996
5	Songpu crucian carp	<i>Carassius auratus gibelio var. songpu</i>	GS01 □ 005 □ 1996
6	Cold tolerant strain of purse red common carp	<i>Cyprinus carpio wuyuanensis</i>	GS01 □ 006 □ 1996
7	Selected strain of German mirror common carp	scattered <i>Cyprinus carpio</i> mirror	GS01 □ 007 □ 1996
8	Hybrid of Nile tilapia × blue tilapia		GS02 □ 001 □ 1996
9	Fushou tilapia ( <i>Oreochromis mossambicus</i> × <i>O. niloticus</i> )		GS02 □ 002 □ 1996
10	Yin common carp (scattered mirror common carp × [nucleon-transfer purse red common carp (nuclear donor) × crucian carp])	<i>Cyprinus carpio</i>	GS02 □ 003 □ 1996
11	Fen common carp (Xingguo red common carp × Scattered-scale mirror common carp)	<i>Cyprinus carpio</i>	GS02 □ 004 □ 1996
12	Heyuan common carp (Purse red common carp × Yuangjiang river common carp)	<i>Cyprinus carpio</i>	GS02 □ 005 □ 1996
13	Yue common carp (Purse red common carp × Xiangjiang river common carp)	<i>Cyprinus carpio</i>	GS02 □ 006 □ 1996
14	Trecrossed common carp (Heyuan common carp × scattered scale common carp)	<i>Cyprinus carpio</i>	(GS02 □ 007 □ 1996)
15	Furong common carp (Scattered scale mirror common carp × Xingguo red common carp)	<i>Cyprinus carpio</i>	GS02 □ 008 □ 1996
16	Allogynogenesis crucian carp (Fangzheng silver crucian carp × Xingguo red common carp)	<i>Carassius auratus gibelio</i>	GS02 □ 009 □ 1996
17	Nile tilapia	<i>Oreochromis niloticus</i>	GS03 □ 001 □ 1996
18	Blue tilapia	<i>Oreochromis aureus</i>	GS03 □ 002 □ 1996
19	Large mouth bass	<i>Micropterus salmoides</i>	GS03 □ 003 □ 1996
20	Colossoma	<i>Colossoma brachypomum</i>	GS03 □ 004 □ 1996
21	Channel catfish	<i>Ictalurus punctatus</i>	GS03 □ 005 □ 1996
22	Rainbow trout	<i>Salmo gairdnerii</i>	GS03 □ 006 □ 1996
23	Donalson strain of rainbow trout	<i>Salmo gairdnerii</i>	GS03 □ 007 □ 1996
24	Leather catfish	<i>Clarias lazier</i>	GS03 □ 008 □ 1996
25	German mirror common carp	Scattered <i>Cyprinus carpio</i> mirror	GS03 □ 009 □ 1996
26	German mirror common carp	Scattered <i>Cyprinus carpio</i> mirror	GS03 □ 009 □ 1996
27	Rohu	<i>Labeo rohita</i>	GS03 □ 011 □ 1996
28	Giant prawn	<i>Macrobrachium</i> sp	GS03 □ 012 □ 1996
29	Cuba frog	<i>Rana catesbiana</i>	GS03 □ 013 □ 1996
30	American frog	<i>Rana</i> sp	GS03 □ 014 □ 1996
31	Bay scallop	<i>Argopecten irradians</i>	GS03 □ 015 □ 1996
32	Xiayi scallop	<i>Patinopecten yessoensis</i>	GS03 □ 016 □ 1996
33	Pacific oyster	<i>Crassostrea gigas</i>	GS03 □ 017 □ 1996
34	"901" kelps	Kelp	GS01 □ 001 □ 1997
35	Songpu common carp	<i>Cyprinus carpio</i>	GS01 □ 002 □ 1997
36	GIFT Nile tilapia	<i>Oreochromis niloticus</i>	GS03 □ 001 □ 1007
37	No.1 Pujiang blunt-snout bream	<i>Megalobrama amblycephala</i>	GS01 □ 001 □ 2000
38	Glass red common carp	<i>Cyprinus carpio wanan</i>	GS01 □ 002 □ 2000
39	Turburt	<i>Scophthalmus maximus</i>	GS03 □ 001 □ 2000
40	Buffalo fish	<i>Ictiobus cyprinellus</i>	GS03 □ 002 □ 2000
41	Xiangyun common carp		GS02 □ 001 □ 2001
42	Xiangyun crucian carp		GS02 □ 002 □ 2001
43	Red-white long-tail goldfish	<i>Carassius auratus</i>	GS02 □ 001 □ 2002
44	Blue long-tail goldfish	<i>Carassius auratus</i>	GS02 □ 002 □ 2002
45	SPF white shrimp	<i>Penaeus vannamei</i>	GS03 □ 001 □ 2002
46	No 1 Yellow Sea Chinese shrimp	<i>Penaeus orientalis</i>	GS01 □ 001 □ 2003
47	Songhe common carp	<i>Cyprinus carpio</i>	GS01 □ 002 □ 2003

	Common name	Scientific (Latin) name	Certification number
48	???	<i>Xiphophorus helleri</i>	GS01 □ 003 □ 2003
49	Black dragon common carp	<i>Cyprinus carpio</i>	GS01 □ 004 □ 2003
50	Yuxuan yellow river common carp	<i>Cyprinus carpio</i>	GS01 □ 001 □ 2004
51	Dongfan 2 hybrid kelp	<i>Laminaria japonica</i>	GS02 □ 001 □ 2004
52	Rongfu hybrid kelp	<i>Laminaria japonica</i>	GS02 □ 002 □ 2004
53	Dalian 1 hybrid abalone	<i>Haliotis discus</i>	GS02 □ 003 □ 2004
54	???	<i>Chelydra serpentine</i>	GS03 □ 001 □ 2004
55	???	<i>Pangasius sutchi</i>	GS03 □ 002 □ 2004
56	???	<i>Hyriopsis schlegdi</i>	GS03 □ 003 □ 2004

Notes:

GS□G: National level, S: Certificated; 01□Group of genetic improved variety; 02□ Group of hybrid; 03□ Group of exotic; 04□ Group of wild; 001□ Order of certification, by year and by group; 1996□ Year certified

## Appendix II

### List of certified and national farms for maintenance of the genetic property of improved fish

	Farm name	Target species/strains	Notes
1	Hangjiang Yangtze River "four Chinese carps" wild stock farm, Jiangsu	Four Chinese carps	
2	Ruichang Yangtze River "four Chinese carps" wild stock farm, Jiangxi	Four Chinese carps	
3	Laohe Yangtze River "four Chinese carps" wild stock farm, Hubei	Four Chinese carps	
4	Laohekou "four Chinese carps" ecological store, Hubei	Four Chinese carps	
5	Wild fish farm, Hunan	Four Chinese carps	
6	Jiaxin "four Chinese carps" wild stock farm, Zhejiang	Four Chinese carps	
7	Jiujiang Penzhe crucian carp farm, Jiangxi	Penzhe crucian carp	
8	Fangzhen silver crucian carp farm, Helongjiang	Fangzhen silver crucian carp	
9	Tilapia seed farm, Guangdong	Tilapia	
10	Nanjing tilapia seed farm, Jiangsu	Tilapia	Closed
11	Qingdao tilapia seed farm	Tilapia	
12	Shangdong tilapia seed farm	Tilapia	
13	Xinguo red common carp farm, Jiangxi	Xinguo red common carp	
14	Wuyuan Purse red common carp, Jianmgxi	Purse red common carp	
15	Fanchang mitten crab farm, Anhui	Mitten crab	
16	Changsha soft-shelled turtle farm, Hunan	Soft-shelled turtle	
17	Shaoxin soft-shelled turtle farm, Zhejiang	Soft-shelled turtle	
18	Nanton zhichai farm, Jiangsu	<i>Porphyra</i>	
19	Yantai kelp farm, Shangdong	<i>Laminaria</i>	
20	Qinghai wild fish farm	<i>Gymnocypris przewalskii</i>	
21	Rizhao Chinese shrimp farm, Shandong	<i>Penaeus orientalis</i>	
22	Weihai flatfish farm, Shandong	<i>Paralichthys olivaceus</i>	
23	Penlai turbot farm, Shangdong	Turbot	
24	Hangzhou black bream wild stock farm, Zejiang	<i>Megalobrama terminalis</i>	
25	Dongguan Luca soft-shelled turtle farm, Guangdong	Soft shelled turtle	
26	Songjiang fish farm, Shanghai	Pujiang 1 bream (blunt snout bream)	
27	Geihu bream farm, Jiangsu	Pujiang 1 bream (blunt snout bream)	
28	Rainbow trout farm, Jinling	Rainbow trout	
29	Gaoshun Yangtze reive mitten crab farm, Jiangsu	Mitten crab	
30	Huanxin aquatic farm, Tianjing	Freshwater fish	
31	Duofu turtles farm, Hubei	Turtles	
32	Tropical fish farm, Hainan	Tropical fish	
33	Liangzhihu bream farm, Hubei	Blunt-snout bream	
34	Ninde yellow croakle fish farm, Fijian	<i>Pseudosciaena crocea</i>	
35	Renque "four Chinese fish" farm, Hebei	Four Chinese carps	
36	Zhongjie tilapia farm, Hebei	Tilapia	
37	Luye tilapia farm, Fujian	Tilapia	
38	Catfish farm, Sichuan	<i>Silurods meridionalis</i>	