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COORDINATING WORKING PARTY ON FISHERY STATISTICS

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New 2019 version of proposed revisions for an update of the International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in current use from 2000

Author: CWP Secretariat (Xiaowei Zhou, Aquaculture Officer)

Background

The International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) has been widely used, in combination with the List of Species for Fishery Statistics Purposes (ASFIS), for fisheries and aquaculture statistical data dissemination and analysis. As a living document, the ASFIS list updated annually by FAO as its depository agency. In contrast, the ISSCAAP classification is static and the version in current use was established since 2000. The aquaculture data concerned groups and individuals have expressed their concerns about the current ISSCAAP classification structure being less in favour of aquaculture and potentially misleading or confusing users due to the naming of a number ISSCAAP Groups.

In 2017, FAO conducted a desk study on the ***Need assessment and draft proposal for the update of "the current International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in use from 2000" from the aquaculture statistics perspectives***. The findings of the desk study and a draft proposal for the update of existing ISSCAAP classification was presented as a working document for review and discussion at the Intersessional Aquaculture and Fishery Subject Groups Meetings held in Copenhagen, Denmark 19-22 June 2017. The working document is attached hereafter as Annex-1.

The meeting in Copenhagen appreciated the efforts made by FAO and agreed in general with the analysis of the need assessment and expressed no immediate objections to the preliminarily proposed revisions of the existing ISSCAAP structure. To obtain wider agreement to an updated version of ISSCAAP, the meeting recommended FAO to consult with professionals and experts within and outside of FAO on the proposed draft revision of ISSCAAP classification and collect feedbacks for refining and finalizing the proposed revision for consideration by the 26th Session of CWP in 2019.

Consultations after Copenhagen meeting

Following the recommendation of CWP inter-sessional meeting in Copenhagen in 2017, informal consultations had been carried out by FAO on the draft ISSCAAP revisions with some aquaculture professionals and experts interested in statistics. In December 2018, the draft revision was presented in a more formal way for comments and suggestions by a group of experts participating in a workshop co-organized by FAO and the Network of Aquaculture Centres in Asia-Pacific (NACA) to update knowledge on aquaculture farming systems in relation to statistics. Comments and suggestions from the workshop experts, along with previously collected opinions and suggestion from individuals, were analysed and utilized to refine and improve the ISSCAAP revision based on the 2017 version of proposed revisions.

A 2019 version of proposed update of ISSCAAP classification was prepared as the centre piece of this working document for further comments and suggestions by the 26th Session of CWP. Like the 2017 version of proposed revisions, the 2019 version of proposed revisions continue to be based primarily on the need for farmed species data analysis to suit the greatly diverse aquaculture production situation, without altering the fundamental architectural structure of current ISSCAAP that served the need of data sorting for analytical use for both capture and aquaculture.

Across the ISSCAAP Divisions, the revisions proposed in the 2019 version are more substantive for Division-1 Freshwater fishes, Division-2 Diadromous and euryhaline fishes and Division-9 Aquatic plants.

ISSCAAP revisions proposed in 2019

Using the 2017 version of revision proposal, further changes proposed in 2019 for an updated version of ISSCAAP classification are summarized below, with important points for reasoning.

Division 1

- **Redefine Group-11 Carps, barbels, suckers and other cyprinids**
  - Existing Group-11 includes the species all families under the order ***Cypriniformes***, instead of ***Cyprinidae*** only.
  - Species of the families ***Cobitidae*** (loaches) and family ***Balitoridae*** (hillstream loaches) to be moved out from the existing Group-11.
  - Species of the family ***Catostomidae*** (suckers) to remain in Group-11. And the name of Group-11 to add "suckers" to better reflect the real situation of species composition.

- **Create Group-18 Loaches and hillstream loaches**
  - This new Group-18 is intended to include the species of the families ***Cobitidae*** (loaches) and family ***Balitoridae*** (hillstream loaches).
  - Some species in the two families are commercially are farmed with significant production volume (species of *Misgurnus* and *Paramisgurnus*) in East and Southeast Asian countries and are traded internationally in Northeast Asia. Some species in the family ***Balitoridae*** are farmed in small

quantity and are promoted for indigenous species aquaculture development usually in mountainous regions.
    - Creation of Group-18 will necessitates the change in the composition of existing Group-11 Carps, barbels and other cyprinids. The family ***Cobitidae*** and family ***Balitoridae*** need to be removed from existing Group-11.

- **Create Group-19 Swamp eels and spiny eels**
    - Species of this new Group-19 correspond to all species of three families, namely, ***Synbranchidae***, ***Mastacembelidae*** and ***Chaudhuriidae*** under the order ***Synbranchiformes***.
    - Some species belonging to this new Group-19 are commercially farmed with significant production volume in East, Southeast and South Asian countries, with *Monopterus albus* being traded internationally, too. Several *Mastacembelus* species are farmed commercially as high valued species for niche market with potential for production expansion in the future.
    - Creation of this new Group-19 is potentially helpful for a few producing countries in Southeast Asia to distinguish and separate statistically the production of *Monopterus albus* and *Anguilla* eel species, that are presently confused and mixed up in national statistics systems.

Division 2

- **Rename Group-22 Anguilla eels**
    - Existing Group-22 refers to species of the genus Anguilla only.
    - The common name "river eels" is potentially confusing to data users to mix up true Anguilla eels with other eel-like species.

- **Redefine Group-25 Miscellaneous diadromous and euryhaline fishes**
    - Two important farmed species with significant production volumes, milkfish (*Chanos chanos*) and barramundi (*Lates calcarifer*) are classified as Miscellaneous diadromous fishes by the existing ISSCAAP/ASFIS.
    - Despite that reproduction migration is observed in these two species, there are questions about and disagreement on the way they are classifies currently, because they are not typically diadromous to be able to reproduce.
    - Aquaculture has made full use of species' capability to grow in low salinity brackish water and even in freshwater, in addition to the full-strength sea water.
    - The addition of the word euryhaline would ease questions and disagreement.
    - There is need to assess the classification of mullets (*Mugilidae*) that are currently treated as part of Group-33 Miscellaneous coastal fishes. Mullets, including the flathead grey mullet, are widely farmed around the world. A separate study on the feasibility to move mullets from Group-33 to the newly defined Group-25 appears necessary.

- **Create Group-26 Euryhaline puffer fishes**
  - Almost all the farmed species of puffers, puffer fishes, are in the genus *Takifugu* in the family *Tetraodontidae*. Most farmed species, if not all, migrate between the sea and river to complete their reproductive cycle in natural conditions. Therefore, they are diadromous. Farmed mostly in East Asia, puffer fishes are not big in production volume, but they are not negligible either. Compare with most other farmed fishes, puffer fishes are usually of much higher economic value. They are traded international.
  - All puffer fish species in the family *Tetraodontidae* are currently treated as part of Group-33 Miscellaneous coastal fishes by the existing ISSCAAP/ASFIS.
  - A study needs to be done by experts on the feasibility to move the species of the family *Tetraodontidae* from Group-33 to the new Group-26 to be created. If entire moving is not feasible, partial moving needs to be decided.

- **Delete two Groups proposed in the 2017 proposal**
  - The creation of two more groups in the 2017 proposal (Group-26 Herbivorous & omnivorous euryhaline fishes, and Group-27 Carnivorous euryhaline fishes was primarily aimed to solve the abovesaid classification problem of milkfish and barramundi in question.
  - With Group-25 redefined, the creation of the Group-26 and Group-27, as proposed in 2017, becomes unnecessary.

Division 3

- **Redefine/rename Group-31 Flounders, halibuts, soles and other flat fishes**
  - Apart from flounders, halibuts, soles, there are other common names (brills, turbot, etc.) used for some species in this Group. Adding "and other flat fishes" is appropriate.

Division 4

- **Redefine Group-48 Freshwater crayfishes**
  - Removal of the repeated term crawfishes would not cause confusion

Division 5

- **Redefine Group-52 Abalones, winkles, conchs and other sea snails**
  - Many sea snail species, other than abalones, winkles, conchs, are farmed.
  - The addition of "and other sea snails" could be substituted with "and other marine gastropods".

- **Redefine Group-54 Sea mussels**
  - To avoid possible confusion with some freshwater bivalves that are called freshwater mussels

- **Redefine Group-56 Clams, cockles, arkshells and other bivalves**
  - There are many other farmed bivalve species in the world in addition to various clams, cockles, arkshells.

Division 6

No revision is proposed to Division 6.

Division 7

- **Redefine Group-71 Frogs, salamanders and other amphibians**
  - In addition to frogs, salamanders are artificially propagated and farmed commercially either as food for human consumption, or as aquatic pets.
  - Other amphibians are less relevant, but there is no harm to keep it in the title for this Group.

- **Redefine Group-73 Crocodiles, alligators and caimans**
  - Caimans are farmed in south America for hides and meat are utilized for food.

- **Create Group-79 Polychaeta, Sipuncula and Annelida sea worms**
  - Aquaculture production of marine worms is less known but not rare. It is practiced in many countries. As end products out of aquaculture, marine worms are of multiple uses depending on the farmed species.

Division 8

No revision is proposed to Division 8.

Division 9

- **Redefine Group-93 Marine macro green algae**
  - Composition of this Group need to be redefined to include marine macro (and filamentous) green algae only.
  - Marine micro green algae, freshwater micro green algae and freshwater filamentous green algae need to be moved away from the existing Group-93 to be part of the new Group-95 Miscellaneous aquatic micro-algae described hereafter.

- **Delete currently existing Group-94 Miscellaneous aquatic plants**
  - Deletion of existing Group-94 Miscellaneous aquatic plants is necessary to give way to the creation of Group-94 (new), Group-95 and Group-96, described below.

- **Create new Group-94 Aquatic Cyanobacteria (blue-green algae)**
  - Some species of Cyanobacteria are both collected from the wild and harvested from aquaculture facilities as end products.
  - Need to respect the fact that the old name “blue-green algae” is not totally out of use. Instead, it is still widely and commonly used by related industries, including aquaculture.

- **Create new Group-95 Miscellaneous aquatic micro-algae**

- This new Group include all microalgae. For green algae, freshwater filamentous green algae need to be included.
- Some species of microorganisms, disputed taxonomically but regarded by industry indifferently from microalgae in production and utilization (such as *Schizochytrium* sp, and photosynthetic bacteria, etc.), are to be included in Group-95.
- Cyanobatcteria are excluded (see creation of Group-94).

- **Create new Group-96 Aquatic macrophytes**
  - This new Group-96 is aimed to accommodate seagrasses, freshwater macrophytes bryophytes.

The 2019 version of proposed ISSCAAP revisions is presented in tabular table below, with existing ISSCAAP Divisions and Groups listed for comparison. Grey shaded text indicates the final changes made to the existing ISSCAAP.

ISSCAAP in current use from 2000		**ISSCAAP revisions proposed in 2019**	
1 Freshwater fishes		**1 Freshwater fishes**	
11	Carps, barbels and other cyprinids	11	Carps, barbels, suckers and other cyprinids
12	Tilapias and other cichlids	12	Tilapias and other cichlids
13	Miscellaneous freshwater fishes	13	Miscellaneous freshwater fishes
		14	Freshwater catfishes
		15	Freshwater perches and basses
		16	Snakeheads
		17	Characins
		18	Loaches and hillstream loaches
		19	Swamp eels and spiny eels
2 Diadromous fishes		**2 Diadromous and euryhaline fishes**	
21	Sturgeons, paddlefishes	21	Sturgeons, paddlefishes
22	River eels	22	Anguilla eels
23	Salmons, trouts, smelts	23	Salmons, trouts, smelts
24	Shads	24	Shads
25	Miscellaneous diadromous fishes	25	Miscellaneous diadromous and euryhaline fishes
		26	Euryhaline puffer fishes
3 Marine fishes		**3 Marine fishes**	
31	Flounders, halibuts, soles	31	Flounders, halibuts, soles and other flat fishes
32	Cods, hakes, haddocks	32	Cods, hakes, haddocks

33	Miscellaneous coastal fishes
34	Miscellaneous demersal fishes
35	Herrings, sardines, anchovies
36	Tunas, bonitos, billfishes
37	Miscellaneous pelagic fishes
38	Sharks, rays, chimaeras
39	Marine fishes not identified
4 Crustaceans	
41	Freshwater crustaceans
42	Crabs, sea-spiders
43	Lobsters, spiny-rock lobsters
44	King crabs, squat-lobsters
45	Shrimps, prawns
46	Krill, planktonic crustaceans
47	Miscellaneous marine crustaceans
5 Molluscs	
51	Freshwater molluscs
52	Abalones, winkles, conchs
53	Oysters
54	Mussels
55	Scallops, pectens
56	Clams, cockles, arkshells
57	Squids, cuttlefishes, octopuses
58	Miscellaneous marine molluscs
6 Whales, seals and other aquatic mammals	
61	Blue-whales, fin-whales
62	Sperm-whales, pilot-whales
63	Eared seals, hair seals, walruses
64	Miscellaneous aquatic mammals
7 Miscellaneous aquatic animals	
71	Frogs and other amphibians
72	Turtles

33	Miscellaneous coastal fishes
34	Miscellaneous demersal fishes
35	Herrings, sardines, anchovies
36	Tunas, bonitos, billfishes
37	Miscellaneous pelagic fishes
38	Sharks, rays, chimaeras
39	Marine fishes not identified
4 Crustaceans	
41	Freshwater shrimps and prawns
42	Marine crabs, sea-spiders
43	Lobsters, spiny-rock lobsters
44	King crabs, squat-lobsters
45	Marine shrimps and prawns
46	Krill, marine planktonic crustaceans
47	Miscellaneous marine crustaceans
48	Freshwater crayfishes
49	Miscellaneous freshwater crustaceans
5 Molluscs	
51	Freshwater molluscs
52	Abalones, winkles, conch sand other sea snails
53	Oysters
54	Sea mussels
55	Scallops, pectens
56	Clams, cockles, arkshells and other bivalves
57	Squids, cuttlefishes, octopuses
58	Miscellaneous marine molluscs
6 Whales, seals and other aquatic mammals	
61	Blue-whales, fin-whales
62	Sperm-whales, pilot-whales
63	Eared seals, hair seals, walruses
64	Miscellaneous aquatic mammals
7 Miscellaneous aquatic animals	
71	Frogs, salamanders and other amphibians
72	Turtles

73 Crocodiles and alligators	73 Crocodiles, alligators and caimans
74 Sea-squirts and other tunicates	74 Sea-squirts and other tunicates
75 Horseshoe crabs and other arachnoids	75 Horseshoe crabs and other arachnoids
76 Sea-urchins and other echinoderms	76 Sea-urchins and other echinoderms
77 Miscellaneous aquatic invertebrates	77 Miscellaneous aquatic invertebrates
	78 Sea cucumbers
	79 Polychaeta, Sipuncula and Annelida sea worms
8 Miscellaneous aquatic animal products	**8 Miscellaneous aquatic animal products**
81 Pearls, mother-of-pearl, shells	81 Marine pearls, mother-of-pearl, shells
82 Corals	82 Corals
83 Sponges	83 Sponges
	84 Freshwater pearls and shells
	85 Live rocks
9 Aquatic plants	**9 Aquatic plants**
91 Brown seaweeds	91 Brown algae
92 Red seaweeds	92 Red algae
93 Green seaweeds	93 Marine macro green algae
94 Miscellaneous aquatic plants	94 Aquatic Cyanobacteria (blue-green algae)
	95 Miscellaneous aquatic micro-algae
	96 Miscellaneous aquatic macrophytes

The existing ISSCAAP and the versions proposed in 2017 and 2019, respectively, are attached hereafter in a tabular table as Annex-2 for comparison and for record purpose.

Annex-1:
Need assessment and draft proposal for the update of "the current International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in use from 2000" from the aquaculture statistics perspectives

Annex-2:
Comparison of ISSCAAP classification in current use with the two versions of revisions proposed in 2017 and in 2019

CWP-IS/2019/2 - Annex 1

Need assessment and draft proposal for the update of "the current International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in use from 2000" from the aquaculture statistics perspectives

Note: The content of Annex-1 is that of the Working Document CWP-IS/2017/6, presented at the CWP meeting in Copenhagen, Denmark, 19-22 June 2017

CWP-IS/2017/6 **E**

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COORDINATING WORKING PARTY ON FISHERY STATISTICS

Intersessional Aquaculture and Fishery Subject Groups Meetings

Copenhagen, Denmark 19-22 June 2017

Need assessment and draft proposal for the update of "the current International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in use from 2000" from the aquaculture statistics perspectives

Author: Xiaowei Zhou (FAO)

BACKGROUND

"The current International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in use from 2000"[1] is widely used in grouping aquatic species for analyzing the production statistical data for monitoring, management and planning of capture fishery, aquaculture and the two sectors combined. It is one of the basic statistical classification systems used by concerned organizations in fisheries and aquaculture data dissemination and data analysis. For example, the annually released FAO global statistics datasets of fishery production, aquaculture production and combined production use the ISSCAAP classification for data dissemination through the ***FishStat J*** and ***workspace package***, the ***online query panels*** as well as the ***statistics yearbook***.

All productions from capture and aquaculture are categorized into 9 Divisions by the ISSCAAP in current use, and the number of Groups under each Division varies from 3 to 9. For production data analysis purpose, higher numbers of Groups under a Divisions are generally desirable to illustrate the details better of the species composition of the production.

Finfish, ***crustaceans*** and ***molluscs*** are the most important species for both capture and aquaculture production. However, the number of Groups assigned for freshwater species and marine species under the corresponding Divisions 1 and 3 (excluding Division 2 for diadromous fishes) for these species are greatly imbalanced. As shown in Table 1, there are only 5 Groups assigned for freshwater species under Divisions 1, 3, 4 and 5, collectively, while there are 22 Groups for marine species.

[1] Available at: ftp://ftp.fao.org/FI/DOCUMENT/cwp/handbook/annex/AnnexS2listISSCAAP2000.pdf

Table 1: Number of Groups under current ISSCAAP Divisions for finfish, crustaceans and molluscs*

Selected ISSCAAP Divisions	Freshwater	Marine water
Division 1: Freshwater fishes	3	-
Division 3: Marine fishes	-	9
Division 4: Crustaceans	1	6
Division 5: Molluscs	1	7
Total	**5**	**22**

** Note: Division 2 (Diadromous fishes) excluded for consideration.*

The development status and trend monitoring and reporting on aquaculture sector rely heavily on the analytical use of aquaculture data. The dominance of freshwater species in aquaculture production necessitates the addition of more Groups and the revision of some existing Groups under several Divisions in the current ISSCAAP, which would certainly improve the details and clarity of specific types of farmed species groups for data extraction for analysis.

Points raised in this document are draft in nature and primarily based on aquaculture statistics perspectives.

CONSIDERATIONS

From the year 2000, when the current ISSCAAP came into use, world aquaculture has increased in annual production by 136% in the first fifteen years in the 3rd millennium, while the capture production has stayed relative stable. World total aquaculture production comprises 64% of species farmed in freshwater. Using the existing Groups of ISSCAAP Division 1 (***Group 11 Carps, barbels and other cyprinids***; ***Group 12 Tilapias and other cichlids***, and ***Group 13 Miscellaneous freshwater fishes***), the details of aquaculture production of some important species groups, such as catfishes, perch/bass and Characins, become obscure.

In addition, the Groups under several other current ISSCAAP Divisions could be revised (in terms of species composition, name change or both) to better suit the present aquaculture sectoral situation for improved details for data analysis. For a few existing Groups, there is need to adopt more appropriate names only in order to improved clarity, better understanding by data users and for avoidance of potential confusions.

MAJOR CRITERIA

The criteria used for the current ISSCAAP in use from 2000 appears a mixture of, among others, the taxonomic classification of aquatic species, type of the water as natural habitat of the species according to the salinity (freshwater vs marine water), the behavior of the species and the economic importance of the species.

The same criteria are used in proposing a draft of revised/update version of the ISSCAAP classification, while also taking into consideration of the feeding habit of the aquatic animal species, which is of vital importance in aquaculture.

REVISION NEED ASSESSMENT AND DRAFT PROPOSALS

A first round assessment and draft proposals pertaining to the composition of Groups of the current ISSCAAP Divisions 1,2, 3,4 7,8 and 9 were conducted by FAO, primarily from the aquaculture statistics perspectives, for the preliminary findings to be tabled at this intersessional work meeting for review and discussion. The main points of need assessment for revision and draft proposals for envisaged potentially possible addition and revision to be made under the aforesaid Divisions are summarized thereafter with changes and additions heighted in grey colour.

The numbering of the existing Groups (with or without revision) and additional Groups is not taken into consideration at this stage. No revision is proposed for Divisions 5 and 6.

Division 1

Assessment: Need for the addition of four more Groups. Species under these additional groups are important worldwide or regionally.

1 Freshwater fishes	**1 Freshwater fishes**
11 Carps, barbels and other cyprinids	11 Carps, barbels and other cyprinids
12 Tilapias and other cichlids	12 Tilapias and other cichlids
13 Miscellaneous freshwater fishes	13 Miscellaneous freshwater fishes
	14 Freshwater catfishes
	15 Freshwater perches and basses
	16 Snakeheads
	17 Characins

Division 2

Assessment: (1) Milkfish and several species of mullets are important aquaculture species. They are farmed in freshwater, brackishwater and marine water. They are similar in terms of their relatively low position in the food chain, requiring less animal protein if and when artificial feeds are used for cultivation. Additional species of similar characteristics need to be reviewed for inclusion.

(2) While barramundi is farmed in large volume in SE Asia and Australia, Japanese seabass, a species that also migrates naturally between habitats in inland water and the sea, is an important species farmed East Asia. Both are carnivorous, requiring high dietary animal protein level for feeding in aquaculture. Along with other similar species (to be assessed further), Japanese seabass could be grouped together with barramundi.

2 Diadromous fishes	**2 Diadromous and euryhaline fishes**
21 Sturgeons, paddlefishes	21 Sturgeons, paddlefishes
22 River eels	22 River eels
23 Salmons, trouts, smelts	23 Salmons, trouts, smelts
24 Shads	24 Shads
25 Miscellaneous diadromous fishes	25 Miscellaneous diadromous and euryhaline fishes
	26 Herbivorous & omnivorous euryhaline fishes
	27 Carnivorous euryhaline fishes

Note:

(1) For re-assigning the species to proposed Group 26, species like Milkfish need to be moved out from "Group 25 Miscellaneous diadromous fishes" and mullets from "Miscellaneous coastal fishes".

(2) For re-assigning the species to proposed Group 27, species like Barramundi need to be moved out from "Group 25 Miscellaneous diadromous fishes" and Japanese seabass from "Miscellaneous coastal fishes".

(3) A number of euryhaline fin fish species, including milkfish, mullets, barramundi and Japanese seabass, are globally important species for aquaculture in volume terms. Separating them into different ISSCAAP Groups is based on their feeding habits

Division 3

Assessment: The collective name "flat fish" or "flatfish" is commonly used for most of the species under the Group "Flounders, halibuts, soles". A number of flat fish species, such as turbot, are farmed commercially.

3 Marine fishes	**3 Marine fishes**
31 Flounders, halibuts, soles	31 Flat fishes
32 Cods, hakes, haddocks	32 Cods, hakes, haddocks
33 Miscellaneous coastal fishes	33 Miscellaneous coastal fishes
34 Miscellaneous demersal fishes	34 Miscellaneous demersal fishes
35 Herrings, sardines, anchovies	35 Herrings, sardines, anchovies
36 Tunas, bonitos, billfishes	36 Tunas, bonitos, billfishes
37 Miscellaneous pelagic fishes	37 Miscellaneous pelagic fishes
38 Sharks, rays, chimaeras	38 Sharks, rays, chimaeras
39 Marine fishes not identified	39 Marine fishes not identified

Division 4

Assessment: (1) Existing Group 45 "Shrimps, prawns" refer to only marine shrimps and prawns, causing potential confusion or misleading result to data users.

(2) Similarly, existing Group 42 "Crabs, sea-spiders" posed potential confusion or misleading result to data users. Considering that freshwater crabs are also farmed, a word "marine" could be added to define the "crabs". In the existing Group 46 "Krill, planktonic crustaceans", the word "marine" could be added to further define the planktonic crustacean, in which freshwater planktonic crustaceans (such as Moina spp and Daphnia spp that are cultivated as fish feed) are certainly not included.

(3) A new Group for "Freshwater shrimps and pawns" need to be created, because freshwater shrimps and pawns are farmed in significant quantity today. Currentlythey are aggregated under the current Group 41 "Freshwater crustaceans".

(4) A new Group for crayfish/crawfish species need to be created. They are farmed in significant quantity in North America and East Asia, plus Europe and other regions in small quantity. The proposed name "Freshwater crayfishes (crawfishes)" is tentative. Use of the work "frseshwater" need to be further discussed, because crayfish/crawfish are generally regarded as freshwater aquatics.

4 Crustaceans	**4 Crustaceans**
41 Freshwater crustaceans	41 Freshwater shrimps and prawns
42 Crabs, sea-spiders	42 Marine crabs, sea-spiders
43 Lobsters, spiny-rock lobsters	43 Lobsters, spiny-rock lobsters
44 King crabs, squat-lobsters	44 King crabs, squat-lobsters
45 Shrimps, prawns	45 Marine shrimps and prawns
46 Krill, planktonic crustaceans	46 Krill, marine planktonic crustaceans
47 Miscellaneous marine crustaceans	47 Miscellaneous marine crustaceans
	48 Freshwater crayfishes (crawfishes)
	49 Miscellaneous freshwater crustaceans

Division 7

Assessment: Sea cucumbers are farmed in significant volume, particularly the cold water species in East Asia. Farming several tropical sea cucumber species is spreading in other regions. Creation of a Group for sea cucumber species is desirable.

7 Miscellaneous aquatic animals	**7 Miscellaneous aquatic animals**
71 Frogs and other amphibians	71 Frogs and other amphibians
72 Turtles	72 Turtles
73 Crocodiles and alligators	73 Crocodiles and alligators
74 Sea-squirts and other tunicates	74 Sea-squirts and other tunicates
75 Horseshoe crabs and other arachnoids	75 Horseshoe crabs and other arachnoids
76 Sea-urchins and other echinoderms	76 Sea-urchins and other echinoderms
77 Miscellaneous aquatic invertebrates	77 Miscellaneous aquatic invertebrates
	78 Sea cucumbers

Division 8

Assessment: (1) Existing Group 81 "Pearls, mother-of-pearl, shells" include both marine and freshwater species. In value term, marine pearls are significantly higher than freshwater ones. Marine molluscs are farmed for shells, while freshwater species is rarely farmed for their shells only. Separation of the them by creating a Group for "Freshwater pearls and shells" is desirable.

(2) Live rock is farmed in many tropical countries primarily for aquarium / ornamental use. Defining "live rock" for aquaculture production statistics classification need to be further reviewed due to the multi-species nature

of the so-called live rock purpose live rock, causing difficulties in classifying them taxonomically.

8 Miscellaneous aquatic animal products	**8 Miscellaneous aquatic animal products**
81 Pearls, mother-of-pearl, shells	81 Marine pearls, mother-of-pearl, shells
82 Corals	82 Corals
83 Sponges	83 Sponges
	84 Freshwater pearls and shells
	85 Live rocks (ornamental)

Division 9

Assessment: (1) The existing Group 93 "Green seaweeds" also include micro green algae species. Firstly, the term "seaweeds" (usually refers to marine macro algae) is not adequate for the micro species of green algae. Secondly, many of the micro green algae species are freshwater species (including *Haematococcus pluvialis* farmed commercially in an increasing number of countries.

(2) Micro algae aquaculture is booming for various uses. It is desirable to create a new Group "Aquatic microalgae" to include micro algae species, including the micro green algae species *Haematococcus pluvialis*, Cyanobacteria *Spirulina spp*, and others (to be reviewed further).

(3) For existing Groups "Brown seaweeds" and "Red seaweeds", it is tentatively proposed to change the word "seaweeds" to "algae". Further review by concerned parties in needed.

9 Aquatic plants	**9 Aquatic plants**
91 Brown seaweeds	91 Brown algae
92 Red seaweeds	92 Red algae
93 Green seaweeds	93 Marine macro green algae
94 Miscellaneous aquatic plants	94 Miscellaneous aquatic plants
	95 Aquatic microalgae
	96 Aquatic macrophytes (ornamental)

For comparison of the ISSCAAP classification in current use from 2000 and the propose draft update version are annexed in tabular form to this document.

ANNEX:

Comparison of "the current International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in use from 2000" with the proposed draft update version of ISSCAAP classification

The current International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP) in use from 2000		**Proposed update version**	
Code	**ISSCAAP Groups**	**Code**	**ISSCAAP Groups**
1 Freshwater fishes		**1 Freshwater fishes**	
11	Carps, barbels and other cyprinids	11	Carps, barbels and other cyprinids
12	Tilapias and other cichlids	12	Tilapias and other cichlids
13	Miscellaneous freshwater fishes	13	Miscellaneous freshwater fishes
		14	Freshwater catfishes
		15	Freshwater perches and basses
		16	Snakeheads
		17	Characins
2 Diadromous fishes		**2 Diadromous and euryhaline fishes**	
21	Sturgeons, paddlefishes	21	Sturgeons, paddlefishes
22	River eels	22	River eels
23	Salmons, trouts, smelts	23	Salmons, trouts, smelts
24	Shads	24	Shads
25	Miscellaneous diadromous fishes	25	Miscellaneous diadromous fishes
		26	Herbivorous & omnivorous euryhaline fishes
		27	Carnivorous euryhaline fishes
3 Marine fishes		**3 Marine fishes**	
31	Flounders, halibuts, soles	31	Flat fishes
32	Cods, hakes, haddocks	32	Cods, hakes, haddocks
33	Miscellaneous coastal fishes	33	Miscellaneous coastal fishes
34	Miscellaneous demersal fishes	34	Miscellaneous demersal fishes
35	Herrings, sardines, anchovies	35	Herrings, sardines, anchovies
36	Tunas, bonitos, billfishes	36	Tunas, bonitos, billfishes
37	Miscellaneous pelagic fishes	37	Miscellaneous pelagic fishes
38	Sharks, rays, chimaeras	38	Sharks, rays, chimaeras
39	Marine fishes not identified	39	Marine fishes not identified
4 Crustaceans		**4 Crustaceans**	
41	Freshwater crustaceans	41	Freshwater shrimps and prawns
42	Crabs, sea-spiders	42	Marine crabs, sea-spiders
43	Lobsters, spiny-rock lobsters	43	Lobsters, spiny-rock lobsters
44	King crabs, squat-lobsters	44	King crabs, squat-lobsters
45	Shrimps, prawns	45	Marine shrimps and prawns
46	Krill, planktonic crustaceans	46	Krill, marine planktonic crustaceans
47	Miscellaneous marine crustaceans	47	Miscellaneous marine crustaceans
		48	Freshwater crayfishes (crawfishes)
		49	Miscellaneous freshwater crustaceans
5 Molluscs		**5 Molluscs**	
51	Freshwater molluscs	51	Freshwater molluscs

52	Abalones, winkles, conchs
53	Oysters
54	Mussels
55	Scallops, pectens
56	Clams, cockles, arkshells
57	Squids, cuttlefishes, octopuses
58	Miscellaneous marine molluscs
6 Whales, seals and other aquatic mammals	
61	Blue-whales, fin-whales
62	Sperm-whales, pilot-whales
63	Eared seals, hair seals, walruses
64	Miscellaneous aquatic mammals
7 Miscellaneous aquatic animals	
71	Frogs and other amphibians
72	Turtles
73	Crocodiles and alligators
74	Sea-squirts and other tunicates
75	Horseshoe crabs and other arachnoids
76	Sea-urchins and other echinoderms
77	Miscellaneous aquatic invertebrates
8 Miscellaneous aquatic animal products	
81	Pearls, mother-of-pearl, shells
82	Corals
83	Sponges
9 Aquatic plants	
91	Brown seaweeds
92	Red seaweeds
93	Green seaweeds
94	Miscellaneous aquatic plants

52	Abalones, winkles, conchs
53	Oysters
54	Mussels
55	Scallops, pectens
56	Clams, cockles, arkshells
57	Squids, cuttlefishes, octopuses
58	Miscellaneous marine molluscs
6 Whales, seals and other aquatic mammals	
61	Blue-whales, fin-whales
62	Sperm-whales, pilot-whales
63	Eared seals, hair seals, walruses
64	Miscellaneous aquatic mammals
7 Miscellaneous aquatic animals	
71	Frogs and other amphibians
72	Turtles
73	Crocodiles and alligators
74	Sea-squirts and other tunicates
75	Horseshoe crabs and other arachnoids
76	Sea-urchins and other echinoderms
77	Miscellaneous aquatic invertebrates
78	Sea cucumbers
8 Miscellaneous aquatic animal products	
81	Marine pearls, mother-of-pearl, shells
82	Corals
83	Sponges
84	Freshwater pearls and shells
85	Live rocks (ornamental)
9 Aquatic plants	
91	Brown algae
92	Red algae
93	Marine macro green algae
94	Miscellaneous aquatic plants
95	Aquatic microalgae
96	Aquatic macrophytes (ornamental)

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Comparison of ISSCAAP classification in current use with the two versions of revisions proposed in 2017 and in 2019

ISSCAAP classification in current use	ISSCAAP update proposed in 2017	ISSCAAP update proposed in 2019
1 Freshwater fishes	**1 Freshwater fishes**	**1 Freshwater fishes**
11 Carps, barbels and other cyprinids	11 Carps, barbels and other cyprinids	11 Carps, barbels, suckers and other cyprinids
12 Tilapias and other cichlids	12 Tilapias and other cichlids	12 Tilapias and other cichlids
13 Miscellaneous freshwater fishes	13 Miscellaneous freshwater fishes	13 Miscellaneous freshwater fishes
	14 Freshwater catfishes	14 Freshwater catfishes
	15 Freshwater perches and basses	15 Freshwater perches and basses
	16 Snakeheads	16 Snakeheads
	17 Characins	17 Characins
		18 Loaches and hillstream loaches
		19 Swamp eels and spiny eels
2 Diadromous fishes	**2 Diadromous and euryhaline fishes**	**2 Diadromous and euryhaline fishes**
21 Sturgeons, paddlefishes	21 Sturgeons, paddlefishes	21 Sturgeons, paddlefishes
22 River eels	22 River eels	22 River eels
23 Salmons, trouts, smelts	23 Salmons, trouts, smelts	23 Salmons, trouts, smelts
24 Shads	24 Shads	24 Shads
25 Miscellaneous diadromous fishes	25 Miscellaneous diadromous fishes	25 Miscellaneous diadromous and euryhaline fishes
	26 Herbivorous & omnivorous euryhaline fishes	26 Euryhaline puffer fishes
	27 Carnivorous euryhaline fishes	
3 Marine fishes	**3 Marine fishes**	**3 Marine fishes**
31 Flounders, halibuts, soles	31 Flat fishes	31 Flounders, halibuts, soles and other flat fishes
32 Cods, hakes, haddocks	32 Cods, hakes, haddocks	32 Cods, hakes, haddocks
33 Miscellaneous coastal fishes	33 Miscellaneous coastal fishes	33 Miscellaneous coastal fishes
34 Miscellaneous demersal fishes	34 Miscellaneous demersal fishes	34 Miscellaneous demersal fishes
35 Herrings, sardines, anchovies	35 Herrings, sardines, anchovies	35 Herrings, sardines, anchovies
36 Tunas, bonitos, billfishes	36 Tunas, bonitos, billfishes	36 Tunas, bonitos, billfishes
37 Miscellaneous pelagic fishes	37 Miscellaneous pelagic fishes	37 Miscellaneous pelagic fishes
38 Sharks, rays, chimaeras	38 Sharks, rays, chimaeras	38 Sharks, rays, chimaeras
39 Marine fishes not identified	39 Marine fishes not identified	39 Marine fishes not identified
4 Crustaceans	**4 Crustaceans**	**4 Crustaceans**
41 Freshwater crustaceans	41 Freshwater shrimps and prawns	41 Freshwater shrimps and prawns
42 Crabs, sea-spiders	42 Marine crabs, sea-spiders	42 Marine crabs, sea-spiders
43 Lobsters, spiny-rock lobsters	43 Lobsters, spiny-rock lobsters	43 Lobsters, spiny-rock lobsters
44 King crabs, squat-lobsters	44 King crabs, squat-lobsters	44 King crabs, squat-lobsters
45 Shrimps, prawns	45 Marine shrimps and prawns	45 Marine shrimps and prawns
46 Krill, planktonic crustaceans	46 Krill, marine planktonic crustaceans	46 Krill, marine planktonic crustaceans
47 Miscellaneous marine crustaceans	47 Miscellaneous marine crustaceans	47 Miscellaneous marine crustaceans
	48 Freshwater crayfishes (crawfishes)	48 Freshwater crayfishes
	49 Miscellaneous freshwater crustaceans	49 Miscellaneous freshwater crustaceans
5 Molluscs	**5 Molluscs**	**5 Molluscs**
51 Freshwater molluscs	51 Freshwater molluscs	51 Freshwater molluscs
52 Abalones, winkles, conchs	52 Abalones, winkles, conchs	52 Abalones, winkles, conch sand other sea snails
53 Oysters	53 Oysters	53 Oysters
54 Mussels	54 Mussels	54 Sea mussels
55 Scallops, pectens	55 Scallops, pectens	55 Scallops, pectens
56 Clams, cockles, arkshells	56 Clams, cockles, arkshells	56 Clams, cockles, arkshells and other bivalves
57 Squids, cuttlefishes, octopuses	57 Squids, cuttlefishes, octopuses	57 Squids, cuttlefishes, octopuses
58 Miscellaneous marine molluscs	58 Miscellaneous marine molluscs	58 Miscellaneous marine molluscs
6 Whales, seals and other aquatic mammals	**6 Whales, seals and other aquatic mammals**	**6 Whales, seals and other aquatic mammals**
61 Blue-whales, fin-whales	61 Blue-whales, fin-whales	61 Blue-whales, fin-whales
62 Sperm-whales, pilot-whales	62 Sperm-whales, pilot-whales	62 Sperm-whales, pilot-whales
63 Eared seals, hair seals, walruses	63 Eared seals, hair seals, walruses	63 Eared seals, hair seals, walruses
64 Miscellaneous aquatic mammals	64 Miscellaneous aquatic mammals	64 Miscellaneous aquatic mammals
7 Miscellaneous aquatic animals	**7 Miscellaneous aquatic animals**	**7 Miscellaneous aquatic animals**
71 Frogs and other amphibians	71 Frogs and other amphibians	71 Frogs, salamanders and other amphibians
72 Turtles	72 Turtles	72 Turtles
73 Crocodiles and alligators	73 Crocodiles and alligators	73 Crocodiles, alligators and caimans
74 Sea-squirts and other tunicates	74 Sea-squirts and other tunicates	74 Sea-squirts and other tunicates
75 Horseshoe crabs and other arachnoids	75 Horseshoe crabs and other arachnoids	75 Horseshoe crabs and other arachnoids
76 Sea-urchins and other echinoderms	76 Sea-urchins and other echinoderms	76 Sea-urchins and other echinoderms
77 Miscellaneous aquatic invertebrates	77 Miscellaneous aquatic invertebrates	77 Miscellaneous aquatic invertebrates
	78 Sea cucumbers	78 Sea cucumbers
		79 Polychaeta, Sipuncula and Annelida sea worms
8 Miscellaneous aquatic animal products	**8 Miscellaneous aquatic animal products**	**8 Miscellaneous aquatic animal products**
81 Pearls, mother-of-pearl, shells	81 Marine pearls, mother-of-pearl, shells	81 Marine pearls, mother-of-pearl, shells
82 Corals	82 Corals	82 Corals
83 Sponges	83 Sponges	83 Sponges
	84 Freshwater pearls and shells	84 Freshwater pearls and shells
	85 Live rocks	85 Live rocks
9 Aquatic plants	**9 Aquatic plants**	**9 Aquatic plants**
91 Brown seaweeds	91 Brown algae	91 Brown algae
92 Red seaweeds	92 Red algae	92 Red algae
93 Green seaweeds	93 Marine macro green algae	93 Marine macro green algae
94 Miscellaneous aquatic plants	94 Miscellaneous aquatic plants	94 Cyanobacteria (blue-green algae)
	95 Microalgae	95 Miscellaneous aquatic micro-algae
	96 Aquatic macrophytes (ornamental)	96 Miscellaneous aquatic macrophytes