

DISCLAIMER

The World Organisation for Animal Health (WOAH, founded as OIE), after performing an administrative and technical screening of a self-declaration concerning the disease-free status of a country, a zone or a compartment ("self-declaration"), as described in the standard operating procedures for self-declarations, reserves the right to publish or not the self-declaration on its website. There shall be no right of appeal from this decision nor any recourse of any kind.

The publication by WOA of a self-declaration on its website does not reflect the official opinion of WOA.

Responsibility for the information contained in a self-declaration lies entirely with the WOA Delegate of the Member concerned.

Neither WOA nor any person acting on its behalf may be held responsible for:

- (i) any errors, inaccuracies or omissions in the content of a self-declaration;
- (ii) the use which may be made of the information contained in a self-declaration;
- (iii) any direct or indirect consequences of any nature arising from or relating to the use of the information contained in a self-declaration.

Self-declaration for country freedom from infection with abalone herpesvirus by the Republic of Korea

Declaration sent to the World Organisation for Animal Health (WOAH) on 27 February 2024 by Dr Dongsik Lee, WOA Delegate for the Republic of Korea and Chief Veterinary Officer, Animal Health Policy Bureau, Ministry of Agriculture, Food and Rural Affairs.

1. Introduction

The Republic of Korea's previously self-declared disease freedom from infection with abalone herpesvirus (AbHV) was published by WOA on 09 September 2021¹ and has continued to maintain an active status ever since. The Republic of Korea's self-declaration of disease freedom is hereby resubmitted to reflect adopted amendments to Chapters 1.4. and 11.1. of the *Aquatic Animal Health Code (Aquatic Code)* and evolutions in the standard operating procedure for self-declarations in the intervening period.

The Republic of Korea has implemented targeted surveillance of infection with AbHV for at least the last two years with no detection of the disease, as well as having continuously met the basic biosecurity conditions for at least one year prior to commencement of targeted surveillance, thereby meeting the requirements for self-declaration of freedom from AbHV, provided in Chapters 1.4. and 3.1. and Article 11.1.5. of the *Aquatic Code*. Therefore, the Republic of Korea has the conditions for self-declarations as defined in Article 1.4.3. item 3 of the *Aquatic Code* (pathway 3 - Targeted surveillance).

The country has conducted targeted surveillance of AbHV in susceptible species specified in Article 11.1.2. of the *Aquatic Code* for the last three years since 2021 in accordance with Chapter 1.4. of the *Aquatic Code* and Chapter 2.4.1. of the *Manual of Diagnostic Tests for Aquatic Animals (the Aquatic Manual)*, demonstrating no detection of the disease. Most of the abalone farms in Korea consist of land-based nursery tanks and grow-out sea cages. They are under similar environmental conditions regardless of location and species and are continuously monitored for infection with AbHV under the same surveillance and biosecurity conditions. Abalone aquaculture farms operated in the Republic of Korea neither share nor are bordered by waters of any other country.

¹ [Publication of self-declaration for freedom from infection with abalone herpesvirus by the Republic of Korea \(09 September 2021\)](#)

2. Basic biosecurity conditions in the Republic of Korea

2.1. Aquatic biosecurity system in the Republic of Korea

Under its Aquatic Life Disease Control Act enacted in 2008, the Republic of Korea has established a systematic national disease control and quarantine infrastructure along with financial resources to support the system and implemented the system as follows:

- Under Articles 7 and 9 of the Act, the National Aquatic Life Disease Control System has established an early detection and reporting system for aquatic life diseases.
- The early detection system has been in place since 2008. The occurrence of an infectious aquatic animal disease leads to clinical and technical follow-up measures at the affected farms by trained aquatic animal health professionals or veterinarians.
- Under Article 38 (Education on Disease Control) of the Act, the government provides education on the control of aquatic organism diseases for farmers and aquaculture business entities every two years. Under Article 10 of the Enforcement Rule of the Aquatic Life Disease Control Act, aquatic organism disease control officers who are aquatic organism disease inspectors or veterinarians have received education on the control of aquatic organism diseases.
- Clinically infected animals reported by farms or animals sampled during surveillance activities are sent to disease identification institutions for aquatic organisms or the National Fishery Products Quality Management Service (NFQS) for laboratory diagnosis under Article 10 of the Act.
- If tested positive, the animals are sent for confirmatory diagnosis by the NFQS. With a confirmed case, the Korean government implements a systematic epidemiological investigation to understand the scale of the disease outbreak, trace the source of infection, and identify the transmission mechanism under Article 11 of the Aquatic Life Disease Control Act, as well as develops reasonable control measures to prevent the recurrence of the disease.
- If an occurrence of aquatic infectious disease is confirmed, the equipment, tools, etc., of the affected facility shall be disinfected, incinerated, or buried and affected aquatic organisms shall be subject to measures like stamping out and isolation/movement control, etc. under Articles 13-19 of the Act.

The Republic of Korea quarantines imported aquatic organisms to prevent the introduction of exotic diseases into the country and protect its ecosystem. Aquatic organisms imported for transplant, human consumption, ornament, and research & survey shall undergo quarantine inspections according to Articles 22-32 of the Act. The Republic of Korea improved quarantine efficiency by adopting a standard form of health certificate. The country enhanced import quarantine by mandating a health certificate for all imported fishery products using the standard form, as well as adding emerging overseas diseases of concern, identified through import risk analysis to its list of notifiable diseases subject to quarantine.

2.2. Basic Biosecurity Conditions for AbHV in the Republic of Korea

AbHV is listed as a nationally notifiable disease in the Republic of Korea under Article 2, of the “Enforcement Rule of the Aquatic Life Disease Control Act”. All measures related to surveillance and disease control are implemented as specified in the Aquatic Life Disease Control Act to ensure that basic biosecurity conditions for this disease should be properly achieved.

In terms of surveillance of AbHV, both targeted (twice a year) and general surveillance are carried out, and the surveillance data are all uploaded and maintained in the national integrated network for aquatic life disease control as stipulated in Article 5-2 of the Aquatic Life Disease Control Act. The detection or any suspicious case (e.g. irregular peripheral concave elevation of the foot; minimal movement of the pedal muscle; shrunken and hard foot; reduced pedal adhesion to the substrate) of AbHV must be reported to the competent authority through the early detection system.

- a) In the Republic of Korea, the early detection and reporting system for aquatic life diseases is established under Articles 7 (Aquatic organism disease control officer) and 9 (Reporting on dead or diseased aquatic organisms) of the Aquatic Life Disease Control Act. The measures include:

- The early detection system of the disease has been in place since 2008. In the case of a disease outbreak, a trained aquatic organism disease inspector or a veterinarian conducts clinical testing and performs technical follow-up measures at the affected farms.
- Clinically infected animals reported by farms or apparently healthy animals sampled during surveillance activities are sent to disease identification institutions for aquatic organisms or the National Fishery Products Quality Management Service (NFQS) for a laboratory test under Article 10 of the Act.

b) b. Under Article 10 of the Enforcement Rule of the Aquatic Life Disease Control Act, aquatic organism disease control officers (who are aquatic organism disease inspectors or veterinarians) have received education on the control of aquatic organism diseases.

A laboratory test as well as a confirmatory diagnosis of AbHV is performed following the procedure specified in Article 2.4.1.7. of the *Aquatic Manual*. If an AbHV is finally confirmed by a confirmatory diagnosis, epidemiological investigations and control measures shall be implemented to prevent the transmission and spread of the disease.

3. Control and Management of Infection with AbHV in the Republic of Korea

3.1. Susceptible species to AbHV in the country

Article 11.1.2. of the Aquatic Code refers to blacklip abalone (*Haliotis rubra*), greenlip abalone (*Haliotis laevis*), hybrids of greenlip x blacklip abalone (*Haliotis laevis* x *Haliotis rubra*) and small abalone (*Haliotis diversicolor*) as susceptible to AbHV. And Gu et al. (2019)² reported that abalone herpesvirus was also detected in *Haliotis discus hannai*. The susceptible species in the Republic of Korea are *Haliotis discus* and *Haliotis diversicolor*, and these two species are monitored through surveillance.

The Republic of Korea produces both wild and farmed abalone. There are two cultured abalone species in the country: *H. discus* and *H. diversicolor*. Farms on the southern and western coast of the Republic of Korea mostly use cages to culture *H. discus*, whereas in Jeju, farmers use land-based aquaculture system to culture abalone and small amounts of *H. discus* and *H. diversicolor* (Figure 1). The different culture methods and species are deeply related to water temperatures in the cold season. With water temperatures below 12°C in winter, the southern and western coasts are suitable for cold-water species (*H. discus*). In Jeju, water temperatures are kept above 15°C in winter enabling the culture of warm water species (*H. discus* and *H. diversicolor*).

As of 2023, there are 664 aquaculture farms that culture *H. discus*. Among them, 652 farms culture *H. discus* using sea cages on the southern and western coasts of Korea, mostly being distributed in Jeollanam-do Province (635). The other 12 farms are located on Jeju Island. *H. diversicolor* is only cultured by five farms in Jeju Island (Table 1). As of 2023, the aquaculture production is 24,125 tons for *H. discus* and 2 tons for *H. diversicolor*. Captured species include *H. discus* and *H. diversicolor* and the total capture production is 81 tons representing a negligible share in the total abalone production of the country (Table 2).

Table 1. Number of abalone farms in the Republic of Korea in 2023. (Source: NFQS)

Province	Chungcheongnam-do	Jeollanam-do	Gyeongsangnam-do	Jeju-do	Total
<i>H. discus</i>	5	635	12	12	664
<i>H. diversicolor</i>	–	–	–	5	5

Table 2. Total production of abalone species in the Republic of Korea. Unit: M/T. (Source: Statistics Korea)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Farmed	Abalones	8,977	10,090	12,342	16,027	20,053	18,436	20,059	23,199	22,078	24,125
	<i>H. diversicolor</i>	10	4	5	5	1	4	4	3	3	2
Captured	Abalones	175	145	91	107	112	114	103	99	89	81

² Gu. Lu. et al. The prevalence of Abalone herpesvirus in two *Haliotis* species in South China during 2002-2013. *Aquaculture*. 2019. 505: 18-26.

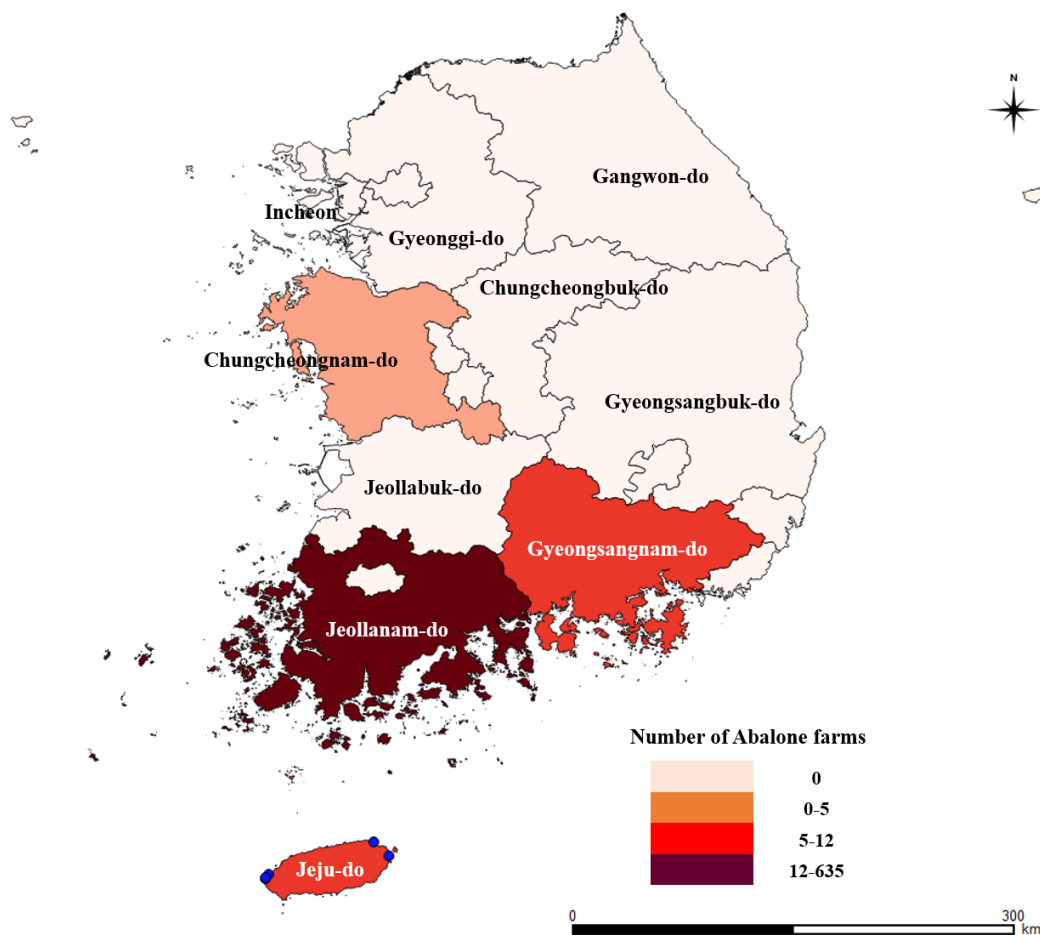


Figure 1. Distribution of abalone (*Haliotis discus* and *H. diversicolor*, ●) farms in Korea in 2023.

3.2. General Surveillance of AbHV

Infection with AbHV has been listed as a notifiable disease since 2008 in the country, and a year-round routine surveillance system has been put in place. General surveillance of AbHV is routinely implemented for persons that own, manage, and operate aquaculture premises subject to surveillance. In general during surveillance activities, inspectors carry out interviews and questionnaire surveys to obtain information on the history and the current status of disease occurrence, mortalities, etc. The information helps operate the early detection system of disease introduction. Since 2014, inspectors have made on average at least two visits per farm every year to perform inspections on AbHV occurrences (Table 3).

Table 3. Number of general surveillance activity for abalones from 2014 to 2023. (Source: NFQS)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
No.	828	720	979	882	616	728	770	720	628	613	8,671

3.3. Targeted Surveillance of AbHV

To demonstrate the country’s freedom from AbHV, the targeted surveillance program, which is carried out over the entire year to capture potential seasonal variations, was designed according to Chapter 1.4. of the WOH *Aquatic Code*. The sample size required to demonstrate the country’s freedom from the disease in each year from 2021 to 2023 was calculated using the FreeCalc two-stage sampling (Table 4 & Figure 2). The number of units to be sampled from the population of 664 *H. discus* farms (sample size) was calculated using the two-stage sampling method. The first sampling stage to select aquaculture establishments (farms) employed parameters of 2% farm-level prevalence,

30% individual-level prevalence, 95% test sensitivity, 95% target cluster sensitivity (SeH), and 95% target system sensitivity (S_{Se}, confidence level). The farm sample size required for targeted surveillance was calculated as 135 farms. The number of sample farms was divided by administrative units (cities and provinces) to plan a targeted surveillance program. In the second stage, the animal sample size per farm was calculated by applying the following parameters: 95% test sensitivity, 95% test specificity, 30% individual-level prevalence, 5% type I error, 5% type II error, and a population of 30,000 animals. From these parameters, the required animal sample size was calculated as 22 per farm.

Thirty animals per farm were sampled from 142~145 abalone farms from 2021 to 2023. A total of 8,520, 8,700 and 8,700 animals were selected in 2021, 2022 and 2023, respectively, to be tested for AbHV (Table 4) and all showed negative results. These results indicate that the country has been free for the last three years from AbHV at a confidence level of 95%. Conventional PCR and viral sequencing are used to diagnose AbHV.

Table 4. Targeted surveillance of abalone species from 2021 to 2022 with two-stage sampling. (Source: NFQS)

Year	Targeted surveillance	Chungcheongnam-do	Jeollanam-do	Gyeongsangnam-do	Jeju-do	Total	
2021	Total No. of farms	5	635	12	12	664	
	Required sample size	No. of farms	1	130	2	2	135
		No. of samples (2 times)	44	5720	88	88	5940
	Tested sample size	No. of farms	1	133	4	4	142
		No. of samples (2 times)	60	7980	240	240	8520
	2022	Total No. of farms	5	635	12	12	664
Required sample size		No. of farms	1	130	2	2	135
		No. of samples (2 times)	44	5720	88	88	5940
Tested sample size		No. of farms	1	138	4	2	145
		No. of samples (2 times)	60	8280	240	120	8700
2023		Total No. of farms	5	635	12	12	664
	Required sample size	No. of farms	1	130	2	2	135
		No. of samples (2 times)	44	5720	88	88	5940
	Tested sample size	No. of farms	1	138	4	2	145
		No. of samples (2 times)	60	8280	240	120	8700

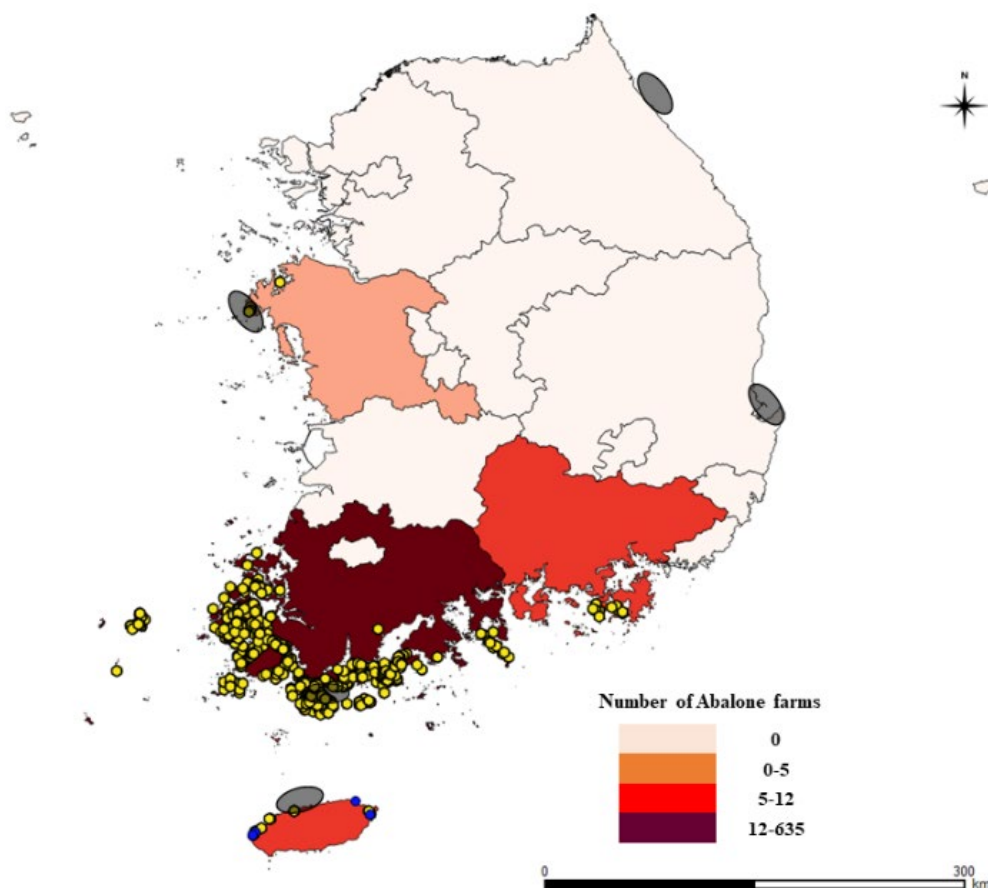


Figure 2. Sampling sites of abalone (*H. discus* (●) and *H. diversicolor* (●) farms and wild abalones (●) for targeted surveillance from 2021 to 2023 with two-stage sampling.

4. Import requirements for species susceptible to AbHV

The Republic of Korea has been carrying out quarantine of imported aquatic organisms since December 2008, under the Aquatic Life Disease Control Act to prevent the introduction of exotic diseases into the country and protect its ecosystem. As specified in Articles 22 (Quarantine of exported and imported organisms), 23 (Things designated for quarantine purpose), 27 (Quarantine inspection on imports), and 31 (Quarantine inspection on exports) of the Act, the government carries out quarantine inspections of 26 kinds of notifiable diseases in live fish, shellfish, crustacean species for transplant, human consumption, ornament, testing, research and survey, frozen and chilled abalone, oysters, and shrimps, and diagnostic reagents including pathogens.

The country formulated a standard form of health certificate, which improved quarantine efficiency by encouraging exporting countries to issue health certificates using the standard form. The Republic of Korea enhances import quarantine by mandating a health certificate for all imported fishery products and adding emerging overseas diseases identified through import risk analysis on its list of notifiable diseases subject to quarantine.

The standard form of health certificate should be included the following requirements:

- Health inspection was conducted in facilities designated by competent authorities in exporting countries.
- Any clinical signs of diseases listed in the Aquatic Life Disease Control Act of the Republic of Korea were not observed.
- Any pathogenic agent of diseases was not detected from laboratory tests based on the *Aquatic Manual of WOA*H or the diagnostic methods approved by the Republic of Korea.

The Republic of Korea had no imports of abalone for transplant.

During the period between 2014 to 2023, the country imports *H. discus*, *H. laevigata*, and *H. rubra* for human consumption (Table 5). To import abalone, the Republic of Korea requests the exporting country to issue the health certificate demonstrating the freedom of infection with abalone herpesvirus in the exporting country.

On arrival in the Republic of Korea, the imported abalone should undergo clinical and laboratory examinations of infection with abalone herpesvirus according to the methods described in the *Aquatic Manual*, and only those that pass the examinations are allowed for domestic entry. When an aquatic organism quarantine officer finds that an imported abalone is confirmed or suspected to be infected or contaminated with abalone herpesvirus, Authorities shall order the consignee to return, incinerate, or bury, etc., it under Article 34 of the Aquatic Life Disease Control Act. The quarantine procedure for importing susceptible species to AbHV will be maintained even if the self-declaration of the country's freedom from the disease is published by the WOA. H.

Table 5. Import quarantine count for human consumption from 2014 to 2023. (Source: NFQS)

Species	2014		2015		2016		2017		2018		2019		2020		2021		2022		2023		
	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	
<i>H. discus</i> (frozen)	-	-	-	-	-	-	1	0.5	1	0.2	-	-	-	-	-	-	-	-	-	-	-
<i>H. discus</i> (live)	-	-	8	1.67	-	-	1	2.0	-	-	3	4.8	2	0.3	2	3.1	2	0.6	-	-	-
<i>H. laevigata</i> (live)	1	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H. rubra</i> (live)	3	0.08	1	0.01	3	0.03	-	-	-	-	-	-	2	0.2	1	0.2	-	-	-	-	-

4.2. Export quarantine

The Republic of Korea exports the single species, *H. discus hannai* (Table 6). For each export consignment, laboratory tests of infection with abalone herpesvirus were carried out from 2016 to 2023 without any detection of the disease.

Table 6. Export quarantine count of abalone from 2016 to 2023. (Source: NFQS)

Species	2016		2017		2018		2019		2020		2021		2022		2023	
	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T	No.	M/T
<i>H. discus</i> (live)	19	17	4	2	82	43	244	195	306	291	217	278	226	442	190	474

5. Measures implemented to maintain freedom

To maintain the country's freedom status from AbHV the Republic of Korea will continue its targeted surveillance activities and basic biosecurity conditions in accordance with the provisions of Article 11.1.8. of the *Aquatic Code* and the quarantine in accordance with the provisions of Articles 11.1.9-14 of the *Aquatic Code*. If infection with AbHV is confirmed, epidemiological investigations and control measures shall be implemented (as described in Section 2.1. Aquatic biosecurity system in the Republic of Korea) to prevent the transmission and spread of the disease under *Aquatic Life Disease Control Act* in the Republic of Korea.

6. Conclusion

The Republic of Korea has continuously met the basic biosecurity conditions for at least one year prior to the commencement of targeted surveillance of AbHV and has implemented targeted surveillance of the disease for the past three years with no detection of AbHV, thereby meeting the requirements for self-declaration of freedom from AbHV provided in Chapters 1.4 and 3.1 and Article 11.1.8. of the *Aquatic Code*.

AbHV is a reportable disease under the Aquatic Life Disease Control Act enacted in 2008, and there are regular ongoing awareness programs in place to encourage prompt reporting of AbHV suspicions.

The Republic of Korea carries out quarantine of imported aquatic organisms to prevent the introduction of exotic diseases and has implemented measures to maintain freedom from AbHV.

Based on the above results, the Delegate of the Republic of Korea declares that the country complies with the requirements as a 'country free from infection with abalone herpesvirus' in accordance with Chapter 1.4. and Article 11.1.5. point 3 of *Aquatic Code* (2023 edition) and Chapter 2.4.1. of the *Aquatic Manual* and is consistent with the information provided in WAHIS.

Statement to be included in the self-declaration document.

I, the undersigned, **Dr. Dongsik Lee**

Delegate of **Republic of KOREA**

to the World Organisation for Animal Health (WOAH, founded as OIE), takes responsibility for the self-declaration of freedom from **Abalone herpesvirus**

DISCLAIMER

WOAH, after performing an administrative and technical screening of a self-declaration concerning the animal health status of a country, a zone or compartment ("self-declaration"), as described in the standard operating procedures for self-declarations, reserves the right to publish or not the self-declaration on its website. There shall be no right of appeal from this decision nor any recourse of any kind.

The publication by the WOAHP of self-declaration on its website does not reflect the official opinion of the WOAHP. Responsibility for the information contained in a self-declaration lies entirely with the WOAHP Delegate of the Member concerned.

Neither the WOAHP nor any person acting on its behalf may be held responsible for:

- (i) any errors, inaccuracies or omissions in the content of a self-declaration;
- (ii) the use which may be made of the information contained in a self-declaration;
- (iii) any direct or indirect consequences of any nature arising from or relating to the use of the information contained in a self-declaration.

Drawn up on 1st March, 2024

Signature of the Delegate: _____

