INTRODUCTION

The author is National Animal IAS training Consultant based on Personal Service Agreement No. 111/TCP/INS/3203/IV/11 that signed by the FAO representative of Indonesia Dr. James Mc Grane on April 7, 2011. Under the overall supervision and guidance of the FAO Representative in Indonesia, and under the direct technical supervision of the LTU Officer (RAPG) and in close collaboration with the team leader, the author has completed his assignment for 1 month working days within April 2011 up to July 2011 lasted for 30 working days spread over the period of 7 April to 17 June 2011. The implementation improving the design of training course on Invasive Alien Animal and Fish Species for Indonesian Quarantine and Port Border Inspectors and facilitating of the animal and fish IAS data/information preparation and entry in the web-based IAS information management system.

In accordance with the term of reference of the National Consultant, the following activities were carried out accordingly:

1. Prepare curriculum for Training Course on Invasive Alien Animal and Fish Species, e.g. Master Training for Management Information System on IAS and Master Training on Risk Analysis for Invasive Alien Animal and Fish Species
2. Involved as lecture and practice on both of the training course
3. Contact the resource person which will be invite to give classroom lecture and laboratory practice for the training course
4. Review and validate of entry data on Invasive Alien Animal and Fish Species into database and web based IAS Information System by staff of Indonesia Agriculture Quarantine Agency (IAQA) and Center for Indonesian Veterinary Analytical Studies (CIVAS)
5. Prepare brief end-of-consultancy report and submit it to FAO representative

The Master Training for Management Information System on IAS was organized by Application Quarantine Techniques and Standard Institute, Rawa Banteng, Bekasi on April 26-27, 2011, and The Master Training on Risk Analysis for Invasive Aliens Animal and Fish Species was organized by CIVAS on May 9-13, 2011. Both of them were conducted at Application Quarantine Techniques and Standard Institute, Rawa Banteng, Bekasi.

IMPLEMENTATION 1: MASTER TRAINING FOR MANAGEMENT INFORMATION SYSTEM ON IAS

Curriculum Preparation

The objective of this training is to give knowledge and skills on how to best retrieve and use the available data and information on IAS species posted in IAQA Website including plant, animal, and fish species.

To achieve the objective above, the training curriculum prepared for

1. How to use IAS Information Management System
2. How to use PDA to access Information Management System
3. How users can contribute to the improvement and up-date of the IAS data/information

During the developing curriculum, because of the material handling itself is life creatures, we have to give the basic knowledge of coverage and information features of IAS, e.g. one session for animal and fish species, and another one session for plant species.

Syllabus and Schedule

<table>
<thead>
<tr>
<th>Hour</th>
<th>Course</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st day: Tuesday 26-04-2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:00 - 09:15</td>
<td>Opening Speech and introduction of participants</td>
<td></td>
</tr>
<tr>
<td>09:15 - 10:00</td>
<td>Objectives of Training and How To Search Invasive Alien</td>
<td></td>
</tr>
</tbody>
</table>
How To Entry new IAS data
Discussion
Evaluation and Recommendation

Educational background of the participants who came from many district/province offices of IAQA are very broad such as VetMed, Fisheries, Forestry and Information Technology, them as person in charge to manage database and information. It is a good strategy to elevate and acknowledged the coverage and information features of animal and fish species which are have distinct characteristics on the native ecological distribution of each district/province. In this session, we introduced scientific name (biological nomenclature) and vernacular name of widely known animals and fish species. Moreover, for unfamiliar, exotic, rare, and endemic species, we introduced the use of identification keys and how to read a species description that available on scientific journal, circular, textbook, etc.

Based on the
response of participants during lectures and discussions, we recommend some ideas to strengthening the management information system of Quarantine Control Systems For IAS in Indonesia:

1. How to make IAQA officer recognizing Indonesian species diversity on zoogeographic realms of Indonesia divided into 3 realms
2. How to make Indonesian people aware of biodiversity provided on website of IAQA
3. How to make person in charge of information system of IAQA realize that database of animal and fish species, both native and imported, has to be updated continually.

To achieve all three of above ideas, recognizing, providing and updating, the main office of IAQA should make standard operation procedures to accommodate this additional job easily, and provide some infrastructures related with...
job, for example, the species identification guide, Worksheet template with detail information to be collected.

IMPLEMENTATION 2: MASTER TRAINING ON RISK ANALYSIS FOR INVASIVE ALIEN ANIMAL AND FISH SPECIES

Curriculum Preparation

The objective of this training is to give knowledge and skills to participants on identification of native and non-native animal and fish species, conduct a risk analysis on the import and export of potentially invasive animal and fish species, and using the provided information and data on plant, animal and fish invasive alien species as available in the website of IAQA.
The target of this training is gate-keeper of IAQA (Ministry of Agriculture), quarantine officers (Ministry of Marine and Fishery), and officers of the Natural Resources Conservation Agency (Ministry of Forestry). They are the person in charge to decide which animal transportation is permitted across country boundaries (entry and exit points) and district boundaries within Indonesia.

The output of this training is 20 participants with increased knowledge, understanding, and skill in identifying animal and fish species and utilizing the Invasive Alien Species Information Management System.

The curriculum were developed based on the mission curriculum, which contained IAS regulation ideas, the simplest risk analysis of IAS, theoretical concepts, and practical work. Then, the curriculum was delivered using a serial of activities consisting of lectures, laboratory exercise, field trip, and group project discussion.
Beside of me, we contacted and invited other person who has scientific authority to deliver the specific topics as seen in the syllabus, i.e.

1. Dr. Rika Raffiudin, Faculty of Maths and Natural Science, Bogor Agricultural University, lecture and practice on avertebrate classification.

2. Dr. Dyah Perwitasari, Faculty of Maths and Natural Science, Bogor Agricultural University, lecture and practice on mammals and birds classification.

3. Dr. Muhammad Muchlis, Faculty of Fisheries, Bogor Agricultural University, lecture and practice on fishes classification.

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**The syllabus schedule**

<table>
<thead>
<tr>
<th>Time</th>
<th>Material</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, May 9th 2011</td>
<td>DAY 1 -- Introductions</td>
<td>Operating committee (OC)</td>
</tr>
<tr>
<td>08.00 – 09.00</td>
<td>Registration</td>
<td></td>
</tr>
</tbody>
</table>
Risk Analysis
Coffee break
Concept of Vetebaratae (Mammalia and Aves)
Coffee break
Concept of Avertebratae Classification (Crustaceae and Mollusca)
DAY 3 – Practice in IPB Darmaga – Biology Laboratory
Lunch break
Practice of Water Antrophodae (Crustaceae and Mollusca)
Practice of Land Antrophodae (Insecta)
Travel to Ragunan Zoological Park and Indonesia Miniature Park (TMII) (Freshwater Aquarium Park and Insecta)
and Indonesia Miniature Park (TMII) (Freshwater Aquarium Park and Insecta)
Lunch Break and Friday Prayer
Coffee break
Saturday, May 14
2011
DAY 6 – Check out
1. In Indonesia, IAS legislative is emerging. We need more time to introduce the idea how to handle and manage IAS. During the training, we found the participant got confuse in understanding of IAS in related to available regulation.

2. The participant show high degree misconception about animal and fish definition. Actually this concept came from Indonesian law (Undang-Undang). We assume that practical work in the quarantine gate have to be protected by well defined law, then it will be easy for gate keeper to adjust the knowledge and coverage to perform the right action. This evaluation reflected by the increasing the knowledge of participant based on pre-and post test (showed increase capacity for 55% participants).

3. Before the gate keeper can perform classifying the IAS, they have to know the native species in their district authority. It aimed to increased the protection of the specific environment in relation to uniqueness of animal and fish distributed on each district. Regarding to evoutionary history on Indonesian creatures, we can find many endemic species, exotic species and underutilized species for recent human welfare and the futures.

4. IAS suspected mostly are pet animals for hobbies, and minutes of them stoway from pet animal, for...
agriculture, biological control agent, and hitchikers. The pet animals usually have certification of health and reproductive condition for Zoo and restricted community. The final decision of gate keeper always is influenced by this certificate document when the risk analyses management of IAS has not yet established.

5. The time for practical work and field trip were limited during the training. Both of them was needed to increase the knowledge and sense of thinking about IAS

Recommendation
Based on evaluation mentioned above, we make recommendation in relation to Indonesian Goverments, IAQA and gate keeper:

1. IAS regulation
2. IAS legislation
3. Definitive agency to perform the legislation
4. Standard operation procedures

2. Infrastructures for IAS identification
1. List of Indonesian animal and fish species
2. Guideline for rapid species identification
3. Worksheet template with detail information to be collected

3. Information management
4. When all three of the above have not finished or drafted, we suggest the gate
IMPLEMENTATION

3: REVIEW AND VALIATE OF ENTRY DATA ON INVASIVE ALIEN ANIMAL AND FISH SPECIES INTO DATABASE AND WEB BASE IAS INFORMATION SYSTEM

Data Collection and Review

Data collection and entry into database for animal and fish IAS were conducted by CIVAS in cooperation with staff of IAQA and Fish Quarantine office. The main data sources is The Global Invasive Species Database (ISSG). Additional data were collected from various resources. We emphasize the invasiveness of data according to many report from other countries, especially within Asia, and invasive occurrences report within Indonesia. The collected data were selected and compiled using email communication between participants and using online system during website drafted and
developed. Before one animal and fish species in database is announce into public, the data was validated by me. At the middle of June, the total number of species compiled was 342 species, i.e.

1. Mammal 40
2. Bird 31
3. Reptile 30
4. Amphibian 11
5. Fish 58
6. Arthropods 104 (Arachnid 4, insect 80, Crustacean 18 and Centi/millipede 2)

1. Mollusc 32
2. Annelid 11
3. Small invertebrates 6 (Flatworm 1, Nematode 1, Sea star 2, Jellyfish 1, and Comb Jelly 1)
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<td>Objectives of Training and How To Search Invasive Alien Species</td>
<td>Rudyanto</td>
</tr>
<tr>
<td>10:00 - 10:15</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>10:15 - 11:30</td>
<td>How To Entry new IAS data</td>
<td>Rudyanto</td>
</tr>
<tr>
<td>13:30 - 14:15</td>
<td>IAS Plant Knowledge - Features of IAS Data/information</td>
<td>Dr. Sri Sudarmiati</td>
</tr>
<tr>
<td>14:15 - 15:15</td>
<td>IAS Animal &amp; Fish Knowledge: Coverage and information features;</td>
<td>Dr. Farajallah</td>
</tr>
<tr>
<td>15:15 - 15:30</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>15:30 - 16:15</td>
<td>How To Approve/Verify IAS Data</td>
<td>Rudyanto</td>
</tr>
<tr>
<td>16:15 - 17:00</td>
<td>Discussion</td>
<td>Rudyanto</td>
</tr>
<tr>
<td>09:00 - 09:45</td>
<td>PDA/Tablet - Basic Operation</td>
<td>Rudyanto</td>
</tr>
<tr>
<td>09:45 - 10:15</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>10:15 - 11:30</td>
<td>PDA/Tablet - Searching Data using PDA</td>
<td>Rudyanto</td>
</tr>
<tr>
<td>13:30 - 14:15</td>
<td>IAS Home Page &amp; Directory Structure</td>
<td>Rudyanto</td>
</tr>
<tr>
<td>14:15 - 15:15</td>
<td>Discussion: How users can contribute to improve IAS data base?</td>
<td>Rudyanto and Dr. Sri S.</td>
</tr>
<tr>
<td>15:15 - 15:30</td>
<td>Closing: Concluding Remarks by the NPC</td>
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The output of this training is 20 (twenty) participants with increased knowledge, understanding and skill in identifying animal and fish species and utilizing the Invasive Alien Species Information Management System.

The curriculum were developed base on 1st mission curriculum, contained IAS regulation idea, the simplest risk analysis of IAS, theoritical concepts and practical work. Then, the curriculum was delivered using serial of activities consisted of lectures, laboratory exercise, field trip and group project discussion.

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<tr>
<td>Monday, May 9th</td>
<td>DAY 1 -- Introductions</td>
</tr>
<tr>
<td>08.00 – 09.00</td>
<td>Registration</td>
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<td>Operating committee (OC)</td>
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<tr>
<td>09.00 – 09.20</td>
<td>Opening</td>
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<tr>
<td></td>
<td>Director of AQA</td>
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<tr>
<td>09.20 – 10.00</td>
<td>Coffee break and photo session</td>
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<tr>
<td></td>
<td>Operating committee (OC)</td>
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<tr>
<td>10.00 – 10.30</td>
<td>Pre-Test</td>
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<td></td>
<td>Operating committee (OC)</td>
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<tr>
<td>10.30 – 11.15</td>
<td>Animal Quarantine Regulation</td>
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<td></td>
<td>Drh. Bambang Erman</td>
</tr>
<tr>
<td>11.15 – 12.00</td>
<td>Concept of IAS and Impact to The Environment</td>
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<tr>
<td></td>
<td>Dr. Achmad Farajallah</td>
</tr>
<tr>
<td>12.00 – 13.00</td>
<td>Lunch break</td>
</tr>
<tr>
<td>13.00 – 14.00</td>
<td>Biology of IAS</td>
</tr>
<tr>
<td></td>
<td>Dr. Achmad Farajallah</td>
</tr>
<tr>
<td>14.00 – 15.00</td>
<td>Risk Analysis</td>
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<tr>
<td></td>
<td>Dr. Eliot Potter</td>
</tr>
<tr>
<td>15.00 – 15.30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>15.30 – 16.30</td>
<td>Risk Analysis</td>
</tr>
<tr>
<td></td>
<td>Dr. Eliot Potter</td>
</tr>
<tr>
<td>Tuesday, May 10th</td>
<td>DAY 2 -- Risk Analysis</td>
</tr>
<tr>
<td>08.00 – 09.45</td>
<td>Risk Analysis</td>
</tr>
<tr>
<td></td>
<td>Dr. Eliot Potter</td>
</tr>
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</tr>
<tr>
<td>13.00 – 14.00</td>
<td>Concept of Vertebratae (Mammalia and Aves) Classification</td>
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<tr>
<td></td>
<td>Dr. R.R. Dyah Perwitasari</td>
</tr>
<tr>
<td>14.00 – 15.00</td>
<td>Concept of Reptile Classification</td>
</tr>
<tr>
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<td>Dr. Achmad Farajallah</td>
</tr>
</tbody>
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Evaluation

1. In Indonesia, IAS legislative is emerging. We need more time to introduce the idea how to handle and manage IAS. During the training, we found the participant got confuse in understanding of IAS in related to available regulation.

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4. Standard operation procedures

2. Infrastructures for IAS identification

1. List of Indonesian animal and fish species
2. Guideline for rapid species identification
3. Worksheet template with detail information to be collected

3. Information management

4. When all three of the above have not finished or drafted, we suggest the gate keeper can make a note and develop a database whenever animal and fish passed the boundary within their authority district.
IMPLEMENTATION

3: REVIEW AND VALIDATE OF ENTRY DATA ON INVASIVE ALIEN ANIMAL AND FISH SPECIES INTO DATABASE AND WEB BASE IAS INFORMATION SYSTEM

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<tr>
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<td>Fish</td>
<td>58</td>
</tr>
<tr>
<td>Arthropods</td>
<td>104</td>
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<tr>
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<td>32</td>
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<tr>
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</tr>
<tr>
<td>Small invertebrates</td>
<td>6</td>
</tr>
<tr>
<td>Flatworm</td>
<td>1</td>
</tr>
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</tr>
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<td>Sea star</td>
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1. Microorganism
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Discussion: How users can contribute to improve IAS data base?
Evaluation and Recommendation

Educational background of participants who came from many district/province offices of IAQA are very broad such as VetMed, Fisheries, Forestry and Information Technology. All of them as person in charge to manage database and information. It is a good strategy to elevate and acknowledged the coverage and information features of animal and fish species which are have distinct characteristics rely on the native ecological distribution of each district/province. In this session, we introduced scientific name (biological nomenclature) and vernacular name of widely known of animals and fish species. Moreover, for unfamiliar, exotic, rare, and endemic species, we introduced the use of identification keys and how to read a species description that available on scientific journal, circular, textbook, etc.
response of participants during lectures and discussions, we recommend some ideas to strengthening the management information system of Quarantine Control Systems For IAS in Indonesia:

1. How to make IAQA officer on recognizing Indonesian species diversity rely on zoogeographic realm of Indonesia that divided into 3 realms

2. How to make Indonesian people to be awared to our biodiversity provided on website of IAQA

3. How to make person in charge of information system of IAQA reliazed that database of animal and fish species, both native and imported species, has to be updated continually.

To achieve all three of above ideas, recognizing, providing and updating, the main office of IAQA should make standard operation procedures to accommodate this additional job easily, and provide some infrastructures related with this
job, for example, the species identification guide, Worksheet template with detail information to be collected.

IMPLEMENTATION 2: MASTER TRAINING ON RISK ANALYSIS FOR INVASIVE ALIEN ANIMAL AND FISH SPECIES

Curriculum Preparation

The objective of this training is to give knowledge and skills to participants on identification of native and non-native animal and fish species, conduct a risk analysis on the import and export of potentially invasive animal and fish species, and using the provided information and data on plant, animal and fish invasive alien species as available in the website of IAQA.
The target of this training is the gate-keeper of IAQA (Ministry of Agriculture), fish quarantine officers (Ministry of Marine and Fishery), and officers of the Natural Resources Conservation Agency (Ministry of Forestry). They are the persons in charge to decide which animal transportation is permitted across country boundaries (entry and exit points) and district boundaries within Indonesia islands.

The output of this training is 20 (twenty) participants with increased knowledge, understanding and skill in identifying animal and fish species and utilizing the Invasive Alien Species Information Management System.

The curriculum were developed based on the 1st mission curriculum, contained IAS regulation idea, the simplest risk analysis of IAS, theoritical concepts and practical work. Then, the curriculum was delivered using a series of activities consisted of lectures, laboratory exercise, field trip and group project discussion.
Beside of me, we contacted and invited other person who has scientific authority to deliver the specific topics as seen in the syllabus, i.e.

1. Dr. Rika Raffiudin, Faculty of Maths and Natural Sciences, Bogor Agricultural University, lecture and practice on invertebrate classification
2. Dr. Dyah Perwitasari, Faculty of Maths and Natural Sciences, Bogor Agricultural University, lecture and practice on mammals and birds classification
3. Dr. Muhammad Muchlis, Faculty of Fisheries, Bogor Agricultural University, lecture and practice on fishes classification

The syllabus and schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Material</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, May 9th 2011</td>
<td>DAY 1 -- Introductions</td>
<td>Operating committee (OC)</td>
</tr>
</tbody>
</table>
Tuesday, May 10th, 2011

DAY 2 -- Risk Analysis
Coffee break
Lunch break
Concept of Vetebaratae (Mammalia and Aves)
Concept of Reptile Classification
Concept of Avertebratae Classification (Arthropodae)
Concept of Avertebratae Classification (Crustaceae and Mollusca)
Trip to Bogor
Lunch break
Practice of Water Antrophodae (Crustaceae and Mollusca)
Practice of Land Anthropodae (Insecta)
Trip to Rawa Banteng, Jakarta
07.00 – 08.30
Travel to Ragunan Zoological Park and Indonesia Miniature Park (TMII) (Freshwater Aquarium Park and Insecta)
and Indonesia Miniature Park (TMII) (Freshwater Aquarium Park and Insecta)
Check out
Evaluation

1. In Indonesia, IAS legislative is emerging. We need more time to introduce the idea how to handle and manage IAS. During the training, we found the participant got confuse in understanding of IAS in related to available regulation.

2. The participant show high degree misconception about animal and fish definition. Actually this concept came from Indonesian law (Undang-Undang). We assume that practical work in the quarantine gate have to be protected by well defined law, then it will be easy for gate keeper to adjust the knowledge and coverage to perform the right action. This evaluation reflected by the increasing the knowledge of participant based on pre- and post test (showed increase capacity for 55 % participants).

3. Before the gate keeper can perform clasifying the IAS, they have to know the native species in their district authority. It aimed to increased the protection of the specific environment in relation to uniqueness of animal and fish distributed on each district. Regarding to evoutionary history on Indonesian creatures, we can find many endemic species, exotic species and underutilized species for recent human welfare and the futures.

4. IAS suspected mostly are pet animals for hobbies, and minutes of them stoway from pet animal, for
agriculture, biological control agent, and hitchikers. The pet animals usually have certification of health and reproductive condition for Zoo and restricted community. The final decision of gate keeper always is influenced by this certificate document when the risk analyses management of IAS has not yet established.

5. The time for practical work and field trip were limited during the training. Both of them was needed to increase the knowledge and sense of thinking about IAS

Recommendation

Based on evaluation mentioned above, we make recommendation in relation to Indonesian Goverments, IAQA and gate keeper:

1. IAS regulation
   1. IAS legislation
   2. Definitive agency to perform the legislation

2. Infrastructures for IAS identification
   1. List of Indonesian animal and fish species
   2. Guideline for rapid species identification
   3. Worksheet template with detail information

3. Information management

4. When all three of the above have not finished or drafted, we suggest the gate
IMPLEMENTATION

3. REVIEW AND VALIDATE OF ENTRY DATA ON INVASIVE ALIEN ANIMAL AND FISH SPECIES INTO DATABASE AND WEB BASE IAS INFORMATION SYSTEM

Data Collection and Review

Data collection and entry into database for animal and fish IAS were conducted by CIVAS in cooperation with staff of IAQA and Fish Quarantine office. The main data sources is The Global Invasive Species Database (ISSG). Additional data were collected from various resources. We emphasize the invasiveness of data according to many report from other countries, especially within Asia, and invasive occurrences report within Indonesia. The collected data were selected and compiled using email communication between participants and using online system during website drafted.
developed. Before one animal and fish species in database is announce into public, the data was validated by me.

At the middle of June, the total number of Species Compiled was 342 species, i.e.

1. Mammal 40
2. Bird 31
3. Reptile 30
4. Amphibian 11
5. Fish 58
6. Arthropods 104 (Arachnid 4, insect 80, Crustacean 18 and Centi/millipede 2)

1. Mollusc 32
2. Annelid 11
3. Small invertebrates 6 (Flatworm 1, Nematode 1, Sea star 2, Jellyfish 1, and Comb Jelly 1)