

# Maintenance Management of Prospective Duck Grouper Parent Fish (*Cromileptes altivelis*) at BPBAP Situbondo

Reni, Abdus Salam Junaedi\*

Trunojoyo Madura University, Faculty of Agriculture, Aquatic Resources Management Study Program, Madura Indonesia

\*Corresponding author: [abdus.salamj@trunojoyo.ac.id](mailto:abdus.salamj@trunojoyo.ac.id)

## Article history

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**Abstract:** Maintenance management of prospective duck grouper broodstock is one of the efforts in cultivation to obtain superior broodstock quality. This research aims to determine aspects of good and correct maintenance management. This research was carried out at the Situbondo Brackish Water Aquaculture Fisheries Center (BPBAP). This maintenance uses pond media with a total of 224 prospective brood fish stocked in a pond measuring 5x2x1.25 meters. Management of rearing prospective broodstock of duck grouper (*Cromileptes altivelis*) includes preparing the pond, filling the pond with water, immersing the potential parent grouper fish in fresh water, stocking the potential parent grouper fish in the cultivation pond, providing food, cleaning the pond, and changing the water circulation. Water quality measurements are carried out three times every week. The FCR results during the activity with a total of 224 fish were 8.46. This research was carried out in a pool using sea water according to its natural habitat with a temperature of 27° C, pH ranges from 8.19-8.22, salinity 34 ppt, nitrite levels range from 0.009-0.02 ppm, and ammonia levels range from 0.005-0.022 mg/L.

**Keywords:** *cromileptes altivelis*, food conversion ratio, parasites, acriflavine

## 1. Introduction

Indonesia is known as a maritime country because most of Indonesia's territory consists of sea areas. Indonesia's potential marine products are diverse, including fish, squid, crab, lobster, seaweed, and others. The large potential of marine products is a strategy to move towards a more advanced Indonesia, especially in the Indonesian fisheries sector [1]. Duck grouper or also known as mouse grouper is a type of seawater fish. Duck grouper is a type of commercial fish that is much liked by consumers and is popular both domestically and abroad. Duck grouper is a type of marine aquaculture fishery that has a fairly high selling price [2].

The fairly high nutritional content of duck grouper meat has caused quite an increase in market demand [3]. Duck grouper is one of the profitable export fishery products because its nutritional content is quite high and the market price is quite expensive compared to other marine fish commodities. Market demand is increasing and the number of markets demands for consumption scale has not yet been met. This is because the type of duck grouper fish has only just been developed and its utilization is still quite low. Efforts or ways that can be done to improve. The results of fish resources, especially duck grouper, can be cultivated using maintenance management for potential broodstock of duck grouper in aquaculture using pond media [4].

One of the factors that supports or hinders the

success and failure of duck grouper cultivation activities is feed and water quality [5]. Providing optimal feed that suits the duck grouper's diet will support its growth and survival. Poor water quality will have an impact on the growth and development of duck grouper, one of which can cause a decrease in the amount of feed consumed by these fish [6]. Good water conditions determine the success of aquaculture. Water quality that needs to be considered in cultivation activities includes three parameters, namely biological, physical and chemical parameters [7].

Fish deaths are often found in fish farming activities. Death of fish in the hatchery, nursery and broodstock phases is often found in rearing ponds. Fish health is very important to pay attention to, this is a factor to support success in cultivation. One of the causes of death in fish is the presence of parasites in the bodies of duck groupers [8].

## 2. Materials and Methods

### 2.1 Material

This research was conducted at the Situbondo Brackish Water Aquaculture Fisheries Center (BPBAP), in December 2023. The rearing of prospective broodstock grouper fish was carried out in concrete ponds with the fish aged 1 to 2 years. The average weight of prospective broodstock grouper fish that are kept is 240 grams, 260 grams, 280 grams, 320 grams and 260 grams. The materials used in this research were water, rearing ponds, fish food,

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laboratory equipment, scissors, buckets and brushes.

## 2.2 Method

Research on the management of rearing potential broodstock for duck grouper fish uses experimental methods, by conducting experiments and observing each stage of rearing potential broodstock for duck grouper fish. Water quality sampling was carried out 3 times during the research activities, in addition, fish weight sampling was carried out 3 times during the research to determine the weight of the fish.

## 2.3 Data Analysis

Data analysis from this research includes 2 calculations, namely, *Feeding Rate* (FR) then *Food Conversion Ratio* (FCR) using a certain calculation formula [9]. FR calculation results using feed data provided during the study with a feed dose of 5% and FCR calculations using data on the weight of the amount of feed consumed during the study and fish deaths at the beginning and end of the study.

### 2.3.1 Calculation of Feeding Rate (FR)

Calculation *Feeding Rate* by using as follows:

FR= Number of fish x weight of fish per fish x 5%

### 2.3.2 Perhitungan Food Conversion Ratio (FCR)

$$FCR = \frac{F}{(Wt + d) - W0}$$

Information:

FCR = feed conversion ratio

F = amount of feed during the study (grams)

Wt = total weight of fish at the end of the study (grams)

W0 = total weight of fish at the start of the study (grams)

d = weight of dead fish during the study (grams)

## 3. Results and Discussion

### 3.1 Maintenance Management

Maintenance of prospective broodstock of duck grouper (*Chromileptes altivelis*) at BPBAP Situbondo All of them follow Standard Operating Procedures (SOP), so that all technical aspects of cultivation follow established cultivation management standards. Management stages for Rearing prospective broodstock for duck grouper are preparation of rearing ponds, filling the pond with water, immersing prospective broodstock in fresh water, stocking prospective broodstock in rearing ponds, feeding, cleaning the pond, and changing water circulation.

The water source used in maintenance comes from the sea because the maintenance pond is close to the sea. Sea water is taken using paralon pipes which flow into each pool. The pools used for maintenance are square with dimensions of 5 m x 2 m x 1.25 m each. The pond used in rearing potential broodstock for duck grouper is a concrete pond. The capacity of this pond can be stocked with 250 fish in each pond. Prospective broodstock for duck grouper fish that are kept are 1 to 2 years old. Prospective broodstock are selected to obtain high quality broodstock. The number of fish stocked in the rearing pond was 224. Before being stocked in the pond, potential broodstock grouper fish have been selected and soaked in fresh water for 5 minutes. This aims to release parasites that stick to the fish's body. Fish that have been selected and soaked in fresh water are then placed in the pond. The distribution of potential broodstock of duck grouper serves to reduce high stocking. The average weight of prospective broodstock of duck grouper that has been selected has an average weight of 260 grams, 280 grams, 320 grams, 360 grams and 380 grams.

The feed used in the management of rearing potential broodstock for duck grouper uses natural food in the form of runcah fish. Feeding is done once a day in the morning. The types of fish used for food are lemuru and kuniran fish. The use of these two types of fish can increase the weight gain of duck grouper. The fish used as food must be cut into small pieces according to the mouth size of the prospective duck grouper parent. Feeding is done in stages, apart from food, water quality must also be considered, this aims to ensure that the water condition in the pond is maintained well. This can be done by cleaning the bottom of the pond to remove residual food that has settled on the bottom of the pond and changing the water circulation. Figure 1.

Control and prevention of diseases that attack the bodies of prospective duck grouper broodstock at BPBAP Situbondo is carried out in two ways, namely naturally and using chemicals. Prospective brood grouper fish that are infected with disease can be seen visually by looking at the behavior of the fish every day. The results of the research carried out found that several potential duck grouper broodstock were attacked by parasites of the same species *Zeylanicobdella arugamensis*. This type of parasite usually attaches to the mouth, eyes, skin surface of the body, gill covers and fins. The impact of parasites that attack the body of prospective duck grouper parents can cause red sores on their body parts and on the eyes, which can cause blindness in prospective duck grouper parents, which affects the fish's appetite.

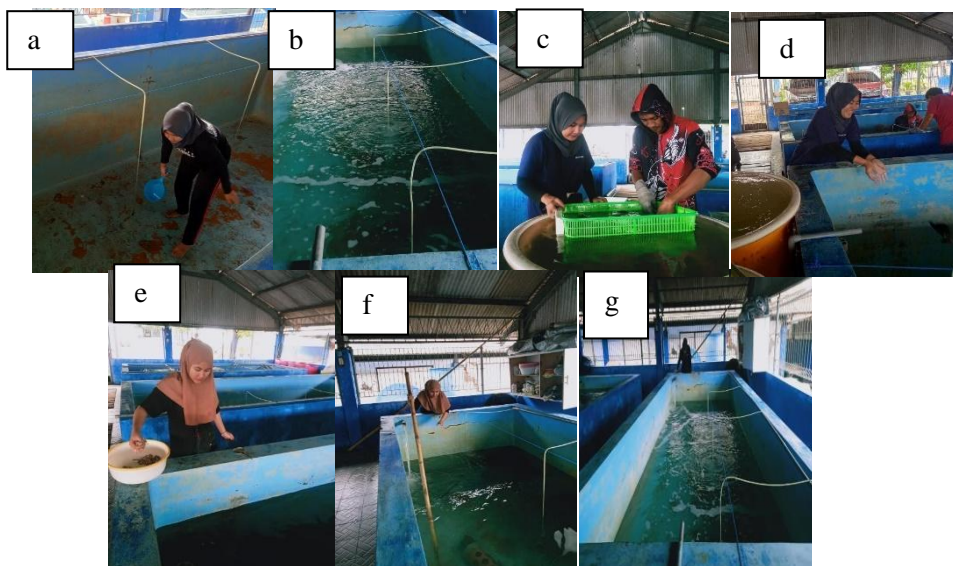


Figure 1. Preparing the pool (a), filling the pool with water (b), soaking using fresh water (c), distributing candidates broodstock in the pond (d), Feeding (e), Cleaning the fish pond (f), Changing the pond water circulation (g)

Prospective brood grouper fish that are infected with this disease have physical symptoms, namely they tend to be alone, swim at the edge of the pond, move slowly. Prevention is carried out by soaking prospective broodstock grouper fish in fresh water for 5 minutes twice a month and using a chemical in the form of 10 mg/L of acriflavine which is then

dissolved in 10 liters of water, stirred until smooth and poured on pool evenly and left for 30 minutes so that acriflavine can be effective in killing parasites that stick to the body of prospective duck grouper broodstock. Figure 2. Types of parasites that attack potential broodstock of duck grouper and how to prevent disease



Figure 2. Types of parasites that attack potential duck grouper fish (*Zeylanicobdella arugamensis*) (1), Prevention disease by immersion in fresh water (2), Chemicals (acriflavine) ((3)

Table 1. Results of Feeding Rate (FR) of prospective duck grouper broodstock

Sampling Week to	Average weight of fish	Feed dosage	Hasil Feeding Rate (FR)
Week 1	314 gram	5%	3,51 kg
Week 2	320 gram	5%	3,58 kg
Week 3	344 gram	5%	3,85 kg

*Feeding Rate* (FR) is the total amount of daily feed given to prospective duck grouper broodstock to meet daily feed requirements which are determined based on the percentage of fish weight. The amount of feeding is determined by the average weight which is calculated based on the biomass or total weight of the fish. Calculation *Feeding Rate* This (FR) was carried out by sampling 10 fish brats which were carried out 3 times in the first, second and third weeks by looking for the average weight of 10 potential broodstock of duck grouper. The calculation results *Feeding Rate* (FR) for 1 week in the first sampling with feeding once a day in the morning with a total sampling of 10 animals, namely 3.51 kg. The second sampling yielded a result of 3.58 kg with feeding once in the morning with a total of 10 fish and the third sampling yielded a yield of 3.85 kg with feeding once in the morning with a total sampling of 10 fish.

### 3.2 Food Conversion Ratio (FCR)

$$FCR = \frac{F}{(Wt+d)-W0}$$

$$= \frac{56.000 \text{ gr}}{(77.056 \text{ gr} + 0) - 70.336 \text{ gr}}$$

$$= 8,46$$

*Food Conversion Ratio* (FCR) is a measure of the amount of feed needed to produce 1 kg of fish weight. Factors that influence the FCR value are the type of fish cultivated, environmental factors, and the amount of feed consumed by the fish. The greater the weight of the duck grouper, the greater the resulting FCR value. The FCR value is influenced by the good quality of the feed provided to support cultivation activities. Factors that influence the FCR value are the level of fish consumption and the type of feed used. The FCR results during the research were 8.46. The results obtained show that the feed provided is of good quality to obtain 1 kg weight of duck grouper.

### 3.3 Water quality

Temperature is the most important factor in water quality which has an impact on fish farming activities. The results of measuring the water temperature in the pool of potential broodstock for duck grouper were 27°C measured in the morning. The water temperature that supports fish cultivation activities, especially marine fish cultivation, is around 27°C-30°C [10]. Temperature measurement results with result 27°C indicates that the temperature is still normal for the cultivation and rearing process of prospective duck grouper broodstock. According to KEPMEN-LH No. 51 of 2004, the water temperature for marine biota is around 28°C-30°C [11].

pH is one of the most important factors in

aquaculture activities because it greatly influences the survival of fish. The average results from measuring the pH of prospective duck grouper broodstock were, in the first repetition the result was 8.19, in the second repetition the result was 8.22 and in the third repetition the result was 8.22. The results of repeating pH measurements in the first sampling showed differences, while the results of the second and third repeats obtained the same results.

The results of measuring the pH of the water show that the pH value in the pool of prospective duck grouper broodstock is above 8, which has alkaline properties. According to SNI 8036.1:2014 concerning "cantang grouper fish," the pH value suitable for grouper cultivation is in the range of 7.5-8.5. Tiger grouper can adapt to a pH of 6.0-8.2. These measurements show that the pH value in the pond is good for the survival of prospective duck grouper broodstock because it does not exceed the quality standard for seawater fish, which is around 6-9 according to PP No. 82 of 2001 [12].

The salinity level in a body of water can be influenced by the presence of weather and wind. The results of salinity measurements from all repetitions found a result of 34 ppt. According to SNI 8036.1:2014 concerning "cantang grouper fish", the salinity that is good for the survival and rearing of potential brood grouper fish is around 28-33 ppt. This type of grouper really likes rocky water habitats with a salinity of 30 ppt-35 ppt [13]. The results of salinity measurements with a result of 34 ppt indicate that the duck grouper tolerates this level of salinity and is able to survive at a certain salinity even though according to SNI it exceeds the quality standard threshold. This type of grouper can tolerate water salinity between 31-34 ppt.

The nitrite content in a body of water can be influenced by the remaining food that settles at the bottom of the pond. Nitrite levels exceeding 0.5 ppm can trigger death in fish [14]. The results of measuring nitrite in the pool of potential broodstock for duck grouper with 3 consecutive measurements found results of 0.009 ppm, 0.020 ppm, and <0.001 ppm. Based on SNI 8036.1:2014 concerning "cantang grouper fish", the appropriate nitrite level for grouper cultivation is not more than 1 ppm. The results of measuring nitrite levels are in accordance with the quality standards, namely <1 ppm, thus supporting sustainability live duck grouper fish.

Ammonia levels in ponds can be affected by excessive amounts of feeding [15]. This affects the fish's appetite level which decreases. High ammonia levels can cause death of fish. Efforts that can be made are by changing the water in the pool so that it is maintained. The results of three repetitions of ammonia levels were measured at 0.005 mg/L, 0.022 mg/L and 0.015 mg/L. Based on SNI 8036.1:2014 concerning "cantang grouper", the appropriate ammonia level for grouper rearing is <0.01 mg/L. The results of

measuring ammonia levels show that the ammonia levels in the pool of potential broodstock for duck

grouper are below the quality standard threshold which is still suitable for the survival of duck grouper.

Table 2. Water quality measurement

Parameter	Week 1 Sampling		
	1	2	3
Temperature (°C)	27	27	27
pH	8,19	8,22	8,22
Salinity (ppt)	34	34	34
Nitrit (ppm)	0,009	0,02	-
Ammonia (mg/L)	0,005	0,022	0,015

#### 4. Conclusion

Maintenance management of prospective grouper broodstock is one of the efforts in developing cultivation. The most important factors in cultivation activities are feed and water quality. Good feed is food that can increase the weight of the fish. The FCR result with a value of 8.46 has good feed quality. It is important to pay attention to the condition of the pond water in order to maintain the survival of the duck grouper. The stages of rearing for prospective duck grouper broodstock must be considered properly and correctly in order to achieve success in cultivation. Prevention and treatment of diseases such as parasites must be carefully considered so that they do not die so that they can minimize losses in fish farming.

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