

# MAPPING OF AQUATIC INVASIVE ANIMALS IN CA MAU PROVINCE

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## ABSTRACT

This study aims to enhance the discussion about the usefulness of invasive animals for biodiversity assessment in Mekong Delta provinces. Data were used for the area of 5.331 km<sup>2</sup> in Ca Mau Province [1]. The data covered the period 2017 – 2018. To implement this evaluation, the analyses were based on the scientific documents “*Introduction to Invasive Species in Vietnam*” of Vietnam Agency of Biodiversity Conservation and “*The Aquatic Invasive Species Assessment and Management Plan*” Massachusetts Department of Conservation and Recreation, and the working experiences of research group for the invasive species assessment [2, 3]. The results found two invasive animal species such as apple snail – *Pomacea canaliculata* (Lamarck, 1819) and Amazon sailfin catfish – *Pterygoplichthys pardalis* (Castelnau, 1855) [2]. These species mapped in the map of Ca Mau Province. The problem of invasive species has become an important issue of concern for the local government and community. However, if appropriate targets for ecosystem management planning is suggested, these “*invaders*” can be prevented the spread of invasive species.

**Keywords:** aquatic invasive species, biodiversity assessment, Mekong Delta

## 1 INTRODUCTION

The invasive alien species do not only appear in Ca Mau, Vietnam but globally. This is a real problem that the entire community faces today and will continue to face in the future. The explosive reproductive potential of some species, degrading ecosystems and affecting income can become a concern for many communities [4, 5]. For these reasons, the problem of invasive species has become an important issue of concern for the local government and community. However, if appropriate targets for ecosystem management planning is suggested, these “*invaders*” can be prevented the spread of invasive species.

## 2 METHODOLOGY

### 2.1 Identification of invasive species

From the field surveys combined with interviews with officials and local people, three species of invasive alien species have been identified in Ca Mau province: apple snail (*Pomacea canaliculata*), Amazon sailfin catfish (*Pterygoplichthys pardalis*), and black tilapia these were recorded in the “*Introduction invasive alien species in Vietnam*” by the Agency of Biodiversity Conservation in 2012 [1]. During the field survey, the black tilapia (*Oreochromis mossambicus*) has recorded for aquaculture with tiger shrimp and whiteleg shrimp in ditches around rice fields. This breed has created remarkable income for farmers in the districts of Ca Mau such as U Minh, Thoi Binh, Tran Van Thoi, for many years.

Another species is an African sharptooth catfish (*Clarius gariepinus*) imported to Vietnam and hybridized with broadhead catfish (*Clarius macrocephalus*) to produce hybrid catfish. Nowadays, the hybrid catfish also provides a significant source of income for local people. As noted from the survey, the catfish has not been appeared too many in the rivers and canals of Ca Mau province as the black tilapia. We proposed that black tilapia and hybrid catfish are not recorded into the list of invasive species in Ca Mau province.

### 2.2 In the field

In each commune, three sites were surveyed, including canals, ponds and rice fields in belows:

- Snail sampling was carried out in many water bodies such as rivers, canals, ponds and rice fields to increase sampling efficiency. Walk slowly along the waterways and check the woods, stones or aquatic plants. Take pictures of invasive alien species and record GPS coordinates [3, 4, 6, 7];
- Use of gill nets and fish nets to collect samples of invasive species in rivers, canals and ponds. In order to achieve high efficiency, the team interviewed fishermen and local people also [3, 4, 6, 7].

## 2.3 Mapping

Habitats identified within the study area were mapped based on aerial photos (Google Earth) and updated during the field surveys to identify and delineate the distribution of different ecological habitats found within the study area. Color photographs were taken of all habitat types surveyed as well as other features or species of ecological importance or conservation value or conservation value encountered [8].

## 3 RESULTS AND DISCUSSION

The results of the invasive species survey at Ca Mau Province in 2017 – 2018 recorded two species of apple snail – *Pomacea canaliculata* (Lamarck, 1819) and Amazon sailfin catfish – *Pterygoplichthys pardalis* (Castelnau, 1855).

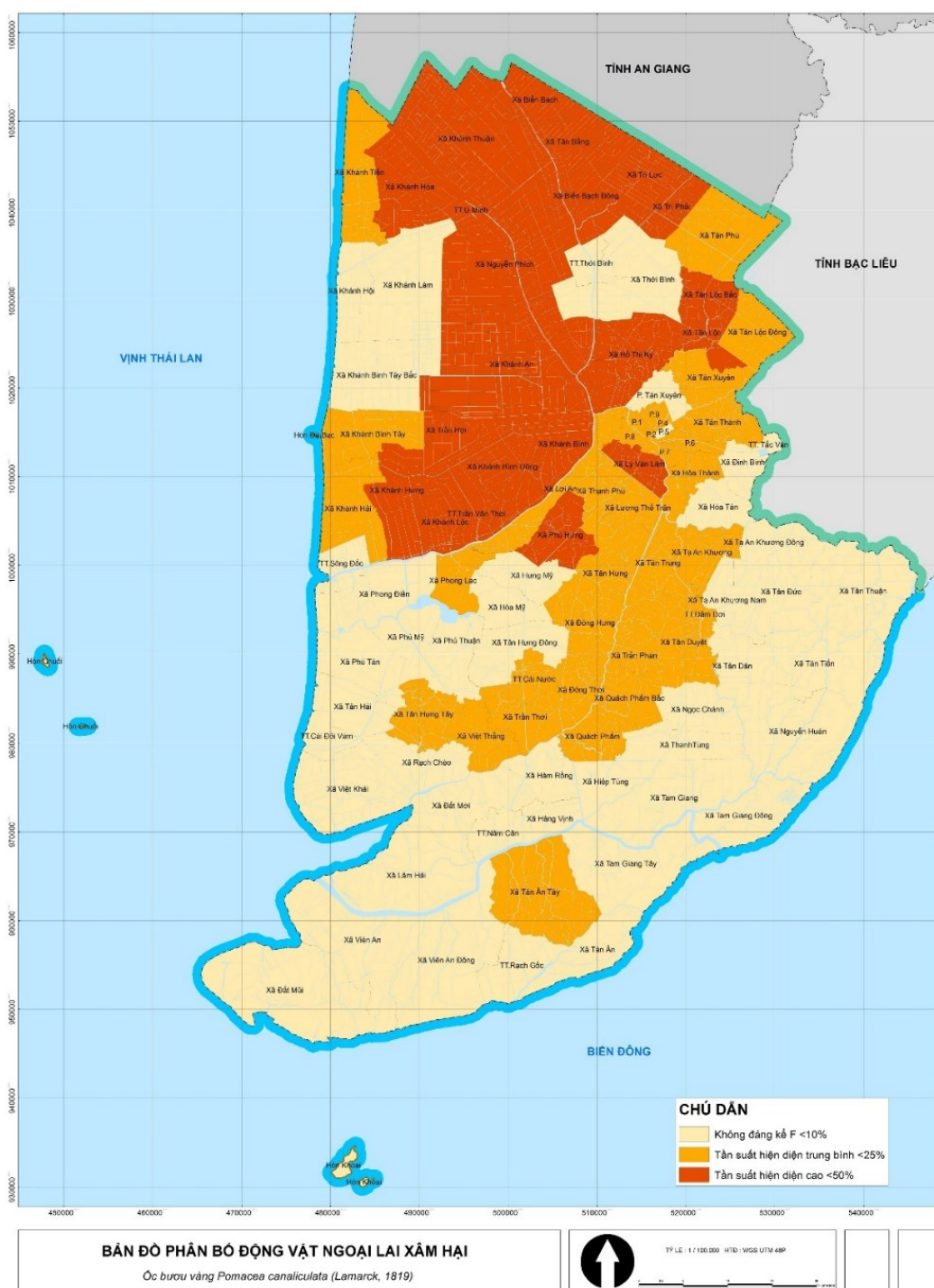


Figure 1. Distribution map of yellow snail species in Ca Mau province

### 3.1 Apple snail

The results of the survey of species of snails in Ca Mau Province in 2017 - 2018 showed that this species is more widely distributed in the North (U Minh, Thoi Binh, Tran Van Thoi, Ca Mau districts). Descending to the South (Dam Doi, Cai Nuoc, Phu Tan, Nam Can) (Figure 1). This species can survive and develop well in freshwater water bodies, but they can survive in low brackish canals (S: 0.5 - 8.0 ‰). Because of this characteristic, snails that grow and develop in Ca Mau are not as strong as other provinces in the Mekong Delta because most of the water bodies are belonged to the brackish waters.

### 3.2 Amazon sailfin catfish

Compared with yellow snail, large herring family imported into Vietnam later, however, this species is also growing in many provinces of Vietnam. The results of the survey of Amazon sailfin catfish in Ca Mau province from 2017 to 2018 indicated that this species appears much less frequently than the apple snail and only occurs in freshwater areas (districts of U Minh, Thoi Binh, and Tran Van Thoi) of the province, not seen in the districts these is affected by brackish and saline waters (Figure 2).



Figure 2. Map of distribution of species of giant spiny catfish in Ca Mau province

#### 4 CONCLUSION

From the research results, there were two invasive animal species such as apple snail – *Pomacea canaliculata* (Lamarck, 1819) and Amazon sailfin catfish – *Pterygoplichthys pardalis* (Castelnau, 1855) these found at the water bodies in Ca Mau Province. These species mapped in the map of Ca Mau Province. Local government and agencies needed be have the appropriate approaches for ecosystem management planning to prevent the invasive animals at water bodies in Ca Mau Province.

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