CHAPTER I. INTRODUCTION

1.1 Background

The population of Asian land tortoises and freshwater turtles has experienced a significant decline over the past two decades. Approximately 75% of the total 89 species currently fall into the categories of *Critically Endangered*, *Endangered,* or *Vulnerable* (IUCN, 2019). One species that has experienced a significant decline to the point of being classified as *Critically Endangered* is *Manouria emys* (Schlegel and Müller, 1844). This species is known by various common names such as the Asian forest tortoise, Asian giant tortoise, Brown giant tortoise, Brown tortoise, or Mountain tortoise (Iskandar, 2000; Beolens *et al*., 2011). *M. emys* comprises two subspecies *M. emys phayrei* is found across regions ranging from Assam, India, to Myanmar, Bangladesh, and central Thailand, while *M. e. emys* inhabits the Malay Peninsula, Sumatra, and Borneo. (Ernst *et al*., 2001; Iverson, 1992).

Manouria emys emys is a subspecies, also known as the Baniang coklat or Kura-kura kaki gajah, found on the islands of Sumatra and Kalimantan. The conservation of *Manouria emys emys* is threatened by various factors, with the primary threats being habitat degradation, utilization by local communities as a food source, and trade for collection purposes. Other threats include illegal hunting for commercial purposes, such as traditional medicine, and the pet trade. The act of hunting has resulted in a considerable reduction in the population of this species. (Liat & Das, 1999).

According to Moll (2000) and van Dijk (2011), research on the ecology of Asian herpetofauna is still limited. In this context, Asian turtles are often regarded as

an undervalued and overlooked species. *Manouria emys* has been categorized Recognized as critically endangered by the International Union for Conservation of Nature (IUCN) and listed in Appendix II of CITES, this species is acknowledged as being at a severe risk of extinction. Presently, there is insufficient information available regarding the ecology and habitat of this species in Indonesia. This necessitates research efforts to gather detailed data to support conservation initiatives aimed at preventing its extinction.

The term home range refers to the total area utilized by an animal for its activities during a specific period. It is demarcated by tracking the path chosen by the animal during its movements. The home range refers to the geographic area where an individual animal or a group of animals carries out their daily activities, such as searching for food, resting, and moving between locations. This home range encompasses the area occupied by the animals during a specific period and reflects their movement patterns and interactions with the surrounding environment (Kappeler, 1981). Previous research from Høybye-Mortensen (2004) has documented that the largest recorded home range for *M. e. emys* in Danum Valley, Malaysia was 0.51 km2 observed over of 37 days using radio telemetry.

A preliminary study using GPS technology to understand the home range of *M. e. emys* has provided an initial depiction of areas where tortoises spend more time, as well as crucial locations where they engage in activities such as feeding, sunbathing, and resting. These findings indicate that tortoises have specific preferences and needs regarding their surrounding environment.

The habitat of an animal refers to the specific environment where it naturally lives and thrives, encompassing all the biotic and abiotic factors essential for its survival and reproduction. Habitat selection studies involve examining how individuals choose their habitat based on the availability of resources. This process of habitat selection operates at various spatial scales, ranging from an individual's immediate home range to the broader geographical range of the species. The utilization of resources and the selection of habitat are closely intertwined with the movement patterns of individual organisms (Manly, 2002).

Habitat preferences is manifested through the selective utilization of specific habitats, resulting in a disproportionate allocation of resources. This phenomenon becomes pronounced when organisms exhibit a notable preference for habitats that are comparatively scarce within the landscape, a phenomenon of considerable importance for understanding ecological dynamics and species distribution patterns (Krausman, 1997). A comprehensive understanding of the habitat preferences of endangered species is crucial for devising suitable strategies for their conservation efforts (Wiktander *et al*., 2001).

Three major challenges faced by herpetologists in understanding habitats include characterizing habitat in specific environments, determining the extent of the area used as a home range, and identifying relevant habitats for the species under study (Del Vecchio *et al*., 2011). Characterizing habitat involves examining environmental factors that influence the presence and activities of a species, encompassing both biotic and abiotic factors within the environment. Habitat are also linked to the duration that a species spends in a particular habitat and to essential activities in their life cycle,

such as feeding, resting, sunbathing, and reproduction. This study involved monitoring the home range of four individual tortoises released into the Biological Education and Research Forest using GPS for several days. Biological Education and Research Forest, which is a secondary forest with abundant vegetation, provides a suitable habitat for *Manouria emys*.

1.2. Research Question

Based on the description above, the research questions are as follows:

1. What is the size of the home range of the Asian Giant Tortoise in the Biological Education and Research Forest at Universitas Andalas?
2. What are the characteristics of the Asian Giant Tortoise habitat in the Biological Education and Research Forest at Universitas Andalas?

1.3. Research Objectives

1. Determining the size of the home range of the Asian Giant Tortoise in the Biological Education and Research Forest at Universitas Andalas.
2. Understanding the characteristics Asian Giant Tortoise habitat in the Biological Education and Research Forest at Universitas Andalas

1.4 Research Benefit

The results of this study are expected to serve as reference data regarding suitable habitats for *Manouria emys*. This information will be used to assist in the conservation planning of this species, as it is already classified as critically endangered. The data from this research also serves as a reference for conservation efforts when infrastructure development encroaches upon tortoise habitats. Information on home range can be used as a guide for designing tortoise corridors.