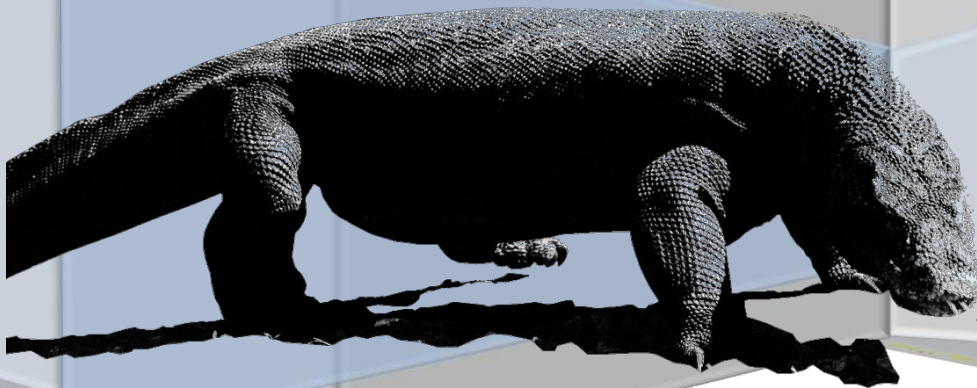


# ACTIVITY IMPLEMENTATION REPORT

Prey Animal Inventory and Habitat Assessment of Komodo monitor lizards (*Varanus komodoensis*) in Golo Lijun, East Manggarai Regency, East Nusa Tenggara Province.

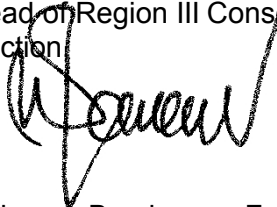


## RATIFICATION SHEET

On behalf of the Head of the East Nusa Tenggara Natural Resources Conservation Center, hereby endorses the document of the Report on the Results of Prey Animal Inventory and Habitat Study of Komodo Lizards (*Varanus komodoensis*) in Golo Lijun, East Manggarai Regency, East Nusa Tenggara Province Year 2024.

Checked by:

Head of Region III Conservation  
Section



Yohanes Berchmans Fua, S.Hut.  
NIP. 19720201 200003 1 006

Ruteng, December 2024

Prepared by:

PEH Beginner,  
Wahid Fortuna Anwar  
NIP. 19991019 202203 1 002



Endorsed by :

Head of the NTT KSDA Center  
Head of the KSDA Region II

Dan Wari Widiyanto, S.Hut., M.Si.  
NIP. 19810119 200501 1 006

## FOREWORD

The Komodo monitor lizard (*Varanus komodoensis*) is an endemic Indonesian reptile species found only on several islands in East Nusa Tenggara. As an apex predator in its ecosystem, the existence and sustainability of the Komodo monitor lizard population is highly dependent on the availability of prey animals and the quality of its habitat.

Effective conservation of Komodo monitor lizards requires an in-depth understanding of prey animal population dynamics and habitat characteristics that support the survival of this species. Therefore, it is very important to conduct prey animal inventories and habitat assessments of Komodo monitor lizards.

This activity report is prepared to provide accurate data and information to support conservation and habitat management efforts for Komodo monitor lizards in the future.

Author,

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## I. INTRODUCTION

### A. Background.

Komodo monitor lizards are the largest lizards in the world, with adult males reaching 3 m in length and weighing 87 kg (Jessop *et al.*, 2006). Although it is unusual for terrestrial reptiles to be apex predators, the absence of carnivorous mammals and their large size make adult Komodo monitor lizards apex predators in their ecosystem (Auffenberg, 1981; Ciofi, 2002; Jessop *et al.*, 2006).

; 2007). Currently, the Komodo monitor lizard's distribution is restricted to five small islands in Eastern Indonesia, with four island populations located within Komodo National Park (TNK) and another fragmented population on the island of Flores (Ciofi & De Boer, 2004). The distribution of Komodo dragons outside of conservation areas on Flores Island is estimated to have declined significantly over the last 40 years (Ciofi, 2002). Anthropogenic threats, including poaching of Timor deer (*Rusa timorensis*) and habitat loss are thought to be the main causes of the various disruptions to the Komodo monitor lizard's distribution (Ciofi *et al.*, 2007; Jessop *et al.*, 2007). As a result, long-term monitoring is recommended to understand the status of Komodo monitor lizard populations so that management authorities can identify threatened populations and take action to save them (Jessop *et al.*, 2007).

According to Auffenberg (1981), the distribution of Komodo dragons includes western Flores Island, Komodo Island, Rinca Island, Padar Island, Gilimotang and Nusa Kode Island. The distribution on Flores Island can be grouped into two main parts, namely in the western part of Flores Island from Labuan Bajo to Nangalili and on the North Coast from Dampek to the west of Riung (BBKSDA NTT-KSP, 2019, Ciofi, 2002). In the NTT KSDA Center area, several conservation areas are the habitat of these animals, namely: Wae Wuul CA and TWA Tujuh Belas Pulau, including the Essential Ecosystem Area of HL Pota and Longos Island.

Golo Lijun Village and Nanga Buntal Village are located in the northern part of Elar Sub-district and are crossed on the stretch of the north Manggari Timur - Elar road. Golo Lijun Village is geographically located at an altitude of 50 meters above sea level, with a temperate climate characterized by annual rainfall ranging from 4-5 wet months and 6-7 dry months. This area does not have a conservation area status, but instead has the status of Other Use Area (APL). The population in this area is estimated at 1,904 people who generally have professions as farmers and fishermen.

Based on the Minister of Environment and Forestry Regulation Number: P.106/MENLHK/SETJEN/KUM.1/2018, Komodo dragons are included in the list of protected animals. Internationally, Komodo dragons are categorized as Vulnerable by IUCN and included in Appendix I of CITES. The existence of this animal is generally

Komodo dragons are only known to be in the Komodo National Park area, but the actual condition is that these rare animals can also be found in the Flores Island area and its surroundings. Komodo dragons are one of the animals included in the list of 25 priority endangered species, determined by the Decree of the Director General of KSDAE Number: SK.180/IV-KKH/2015 dated June 30, 2015 so that their population must be increased. Collecting data and information on Komodo dragons is important to determine the next steps and conservation strategies.

The Golo Lijun Village and Nanga Buntal Village areas are outside the conservation area (ex situ), monitoring the Komodo monitor lizard population is very necessary to determine its existence and estimate the current Komodo monitor lizard population in nature, especially in the Golo Lijun Village and Nanga Buntal Village areas. Data and information obtained through this activity will be used in management as a consideration in making policies related to Komodo monitor lizards.

## **B. Purpose and Objectives**

This activity is intended to collect the latest data and information on prey animal populations and habitat conditions of Komodo monitor lizards in their distribution areas. This information will form the basis for decision-making and planning of more effective conservation strategies to protect this species and its ecosystem.

The objectives of this activity include:

1. Inventory the species and abundance of prey animals of Komodo monitor lizards in the study area.
2. Assess the characteristics and quality of Komodo monitor lizard habitat, including vegetation, water sources and other environmental factors.
3. Identify factors affecting prey availability and habitat quality of Komodo monitor lizards.
4. Analyze potential threats to prey animals and Komodo monitor lizard habitat.
5. Provide baseline data for long-term monitoring of Komodo monitor lizard prey populations and habitat conditions.

## **C. Legal Basis**

1. Presidential Decree No.4 of 1993, concerning National Animals and Flowers;
2. Law No. 5 of 1990 on Conservation of Biological Resources and Ecosystems;
3. Law No. 41 of 1999 on Forestry;
4. Decree of the Director General of KSDAE No. 180/IV/KKH/2015, priority endangered animals that are monitored for population of 25 species;

5. Minister of Environment and Forestry Regulation No. 15 of 2021 on the Organization and Work Procedures of the Ministry of Environment and Forestry;
6. Minister of Environment and Forestry Regulation No. 17 of 2022 on the Organization and Work Procedure of the Technical Implementation Unit of the Directorate General of Natural Resources and Ecosystem Conservation;
7. Budget Implementation List (DIPA) of Direct Foreign Grants Project In- Flores Year 2024
8. Task Letter of the Head of the East Nusa Tenggara KSDA Center Number: ST.888/K.5/BKWII/PEG.3/12/2024 concerning carrying out Komodo monitor lizard (*Varanus komodoensis*) population monitoring activities outside the conservation area in Golo Lijun in 2024.

## II. METHODOLOGY

### A. Prey animal population monitoring method

#### 1. *Population assessment of large mammals*

In wild mammal management, information on both numbers and other factors affecting species numbers over time is needed. Various methods have been used to conduct direct surveys of animals (Buckland *et al.* 2001). However, for some species there are problems with capture techniques, so indirect surveys by finding signs of their presence (pellets, droppings, nests, tracks, etc.) can provide more accurate data. Furthermore, direct measurements are often very complex and tend to be costly, making them less applicable in developing countries. Particularly, where activities are conducted to monitor multiple species.

Dung counts using line transect, quadrat sampling, or line transect-based sampling methods have been used extensively to estimate the numbers, often to provide population density indices, of a wide variety of vertebrate species including deer, kangaroos, elephants, possums, pigs and goats (Forsyth *et al.* 2003; Marques *et al.* 2001). The advantage of using this method, compared to conventional techniques for estimating population density based on encounter and capture of target animals, is that it is not affected by avoidance behavior or the presence of dense vegetation that reduces the probability of encounter.

This method can be applied especially to monitor the population condition of Timor deer (*Cervus timorensis*), water buffalo (*Bubalus bubalis*), wild boar (*Sus scrofa*) which are the major prey of Komodo monitor lizards.

#### 2. *How it works*

- a) At the location to be surveyed, random points are first determined to determine the location of the transect, the number of points is adjusted to the area to be surveyed, and the number of points is expected to be sufficient to represent all habitat types at the location. Then the points are recorded coordinates using GPS. These points will then become the starting point as a reference for laying transect lines.
- b) After obtaining the reference point, then determine the direction of the transect (compass direction in the range of 0-360°) randomly.

- c) From the transect reference point, lay a transect that is 150 meters long and has been marked every 5 meters as the center point of the plot in the predetermined direction.
- d) Along the transect line, 30 plots were placed every 5 meters in the form of a circle with a radius of 1m. To facilitate the creation of circular plots, plastic/wooden pegs with 1 meter long ropes can be used, which are stuck at the center point of the plot to create the circumference of the circle.
- e) An observer then records all dung groups (for deer, pigs and buffalo) within the plot area. Leaf and grass debris were removed or set aside to clarify the area so that counting could be done properly.
- f) Dung was counted as a group unit if more than 50% of the dung was within the plot. Dung was called a group if it: 1) in the form of whole clumps; 2) in the form of clustered granules; 3) in the form of scattered granules but still in one group. Identification of dung groups can be based on similarities in color, shape and size.
- g) If there are scattered dung (especially deer) in a plot then they are counted individually (one by one, each grain). To determine how many scattered dung groups are in a plot, the number of individual dung is then divided by the average value of the number of individual dung from 10 intact dung groups, thus obtaining the number of groups in a plot.
- h) All litter groups are counted, unless they are in a completely damaged or destroyed state (due to decomposition or trampling, or other reasons) are excluded from the count.
- i) Environmental variables, especially rainfall and temperature, affect breakage. It is recommended that dung counts are conducted in the summer, when there is no significant rain (around late August - September). In addition, to maintain consistent counts, the survey should be conducted at the same time for each site.

## **B. Prey Animal Population Data Analysis**

The prey density index value obtained using this method is not an absolute prey density value. The prey density index is calculated by dividing the number of dung groups in all transects by the number of transects to obtain an average value of dung per transect for each area surveyed.

$$IP = \frac{n_{1-30}}{nt}$$

- Where *IP* : Population index  
*n*<sub>1-30</sub> : Total number of dung groups in the plot for all transects in the study site  
*nt* : Number of transects

This index value can be used to compare the density of large prey of Komodo monitor lizards between locations as well as to compare large prey of Komodo monitor lizards at the same location each year.

### C. Methods to detect the presence of Komodo monitor lizards Camera traps.

*Camera trap* device (Blaze Video model A-252). *The camera trap* was attached to a tree trunk at a height of 40 cm from the ground and placed at a distance of 3-4 meters from the bait box (Figure 2). *The camera trap* was programmed to take 3 pictures every time an animal was detected and the video was 15 seconds long. A time interval of 15 minutes was set to avoid shooting the same animal continuously. The results of the data collection were written in the form of a *tally sheet* (attached) for analysis in data processing.

### D. Analysis to determine the probability of detection and site occupancy values.

Analysis of the value of the proportion of area *occupied* by Komodo monitor lizards used the *site occupancy* model approach, with the help of the PRESENCE 2.4 program (Hines, 2006; <http://www.mbr-pwrc.usgs.gov/software/presence.html>). The analysis model used was the Royle/Nichols Heterogeneity model (Royle and Nichols, 2003), based on a modification of the closed population *Mark-Recapture* method by MacKenzie *et al.* (2002; 2006). The model estimates population size based on temporally replicated presence/absence data at several study sites. The model assumes heterogeneity in detection probabilities between each study site due to heterogeneity in abundance, meaning that higher detection probability values indicate a tendency for higher abundance values as well (Royle and Nichols, 2003).

The *single season* model was chosen because the data collection was carried out in a short period of time on a regular basis without any long breaks that could disrupt the data collection effort, so the weather conditions were relatively good.

data collection efforts, so weather conditions are relatively the same (MacKenzie *et al.*, 2002). The basic assumptions that must be met in the *single season* model include:

(1) The study site is free from change during the sampling duration, (2) the probability of occupancy is the same for all areas, (3) the species can be well identified, (4) the probability of detection of a species in one area is independent of other areas (MacKenzie *et al.*, 2002; MacKenzie & Kendall, 2002).

## E. Vegetation Data Collection

The sampling method used is the plot line method. The sampling method of this plant vegetation analysis is guided by Sundra (2018), namely the transect path is drawn perpendicularly from the base line and also uses a non-destructive method, which is a method carried out without destroying the object being measured. Transect is a narrow path across the land to be studied. The aim is to determine the relationship between vegetation changes and environmental changes.

The process of collecting vegetation analysis data begins with determining the location assisted by GPS to determine the geoposition, then a transect line is made with a length of 60 meters. In the transect, it is divided into 3 quadrants with an area of 20x20 meters. In the 20x20 meter quadrant, tree stands, poles, saplings, and shrubs were measured using a sewing meter for the calculation of Diameter at breast height (DBH). Furthermore, within the quadrant, a plot of 10x10 meters was determined to determine pole stands, 5x5 meters for saplings and shrubs, and 2x2 meters for seedlings and understory plants. Analysis plots for each stand were taken in a representative manner. All data were recorded on observation sheets and plants found were documented to facilitate identification. The following is an example of a picture of the use of transects, quadrants and plots that have been done:

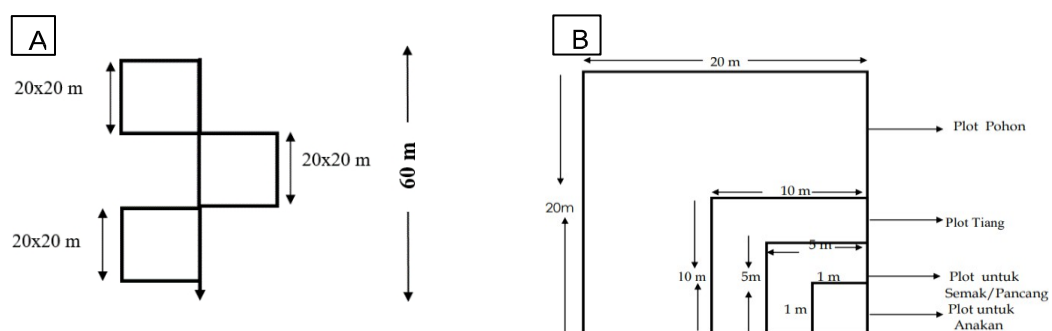


Figure 2. 1 Schematic of the Combination Method of Paths and Plotted Lines. A. Transect; B. Plot and Sub-Plot The measurement of Diameter at Breast Height (DBH) refers to Manuri (2011). The following is a scheme of DBH measurements that have been carried out:

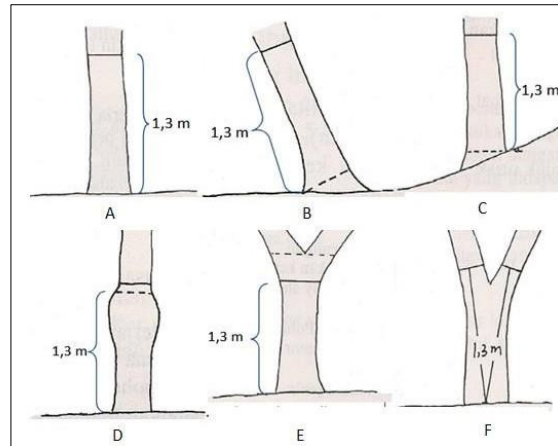


Figure 2. 2 Measurement of the circumference of the tree at breast height. A. Normal tree, B. Tilted tree, C. Normal tree on sloping ground, D. Deformed tree, E. Branch tree, F. Low branch tree (Manuri, 2011).

## F. Vegetation Data Analysis

### 1. Species Diversity Index (H')

The species diversity index is an index that expresses the interaction between diversity and evenness (Nurhidayah, 2017). The diversity index expresses community structure and ecosystem stability. Where if the better the species diversity index, the more stable an ecosystem (Diana, 2020). The diversity index can also serve as an indicator of the complexity of an ecosystem if the important components in its calculation are met, namely abundance and evenness (Sundra, 2016).

In monitoring the biodiversity of the Golo Lijun location, East Manggarai Regency, NTT Province to calculate and interpret the data obtained, the Shannon-Winner diversity index is used. The Shannon-Winner equation (Ludwig, 1988) used in the analysis is as follows:

$$H' = -\sum P_i \times \ln P_i$$

Description:

H' : Shannon-Winner diversity index

P<sub>i</sub> : The ratio of the number of *i*-th species to the total number of species

(n<sub>i</sub>/N) n<sub>i</sub> : Number of *i*-th species

N : Total number of individuals of all species

In the calculation results, 5 categories are determined based on Fernando in Baliton (2020), namely:

Table 2. 1 Shannon-Winner Diversity Index Criteria

H' value	Description
$H' \geq 3.50$	Very high
$3.00 \leq H' < 3.49$	High
$2.50 \leq H' < 2.99$	Medium
$2.00 \leq H' < 2.49$	Low
$H' < 1.99$	Very Low

## 2. Dominance Index (D)

The dominance index shows the level of influence of a species in a community. Determination of the dominance value serves to know or determine the types of flora that are dominant or not. The dominance index is calculated using the equation (Palaghianu, 2014), which is as follows:

$$D = \frac{\sum ni^2}{N}$$

Description:

D : Species dominance index/relative abundance  
 $n_i$  : Number of *i*-th species  
 N : Total number of individuals of all species

Table 2. 2 Criteria for Species Dominance Index (Palaghianu, 2014)

D value	Description
$D < 0.5$	Low dominance
$D > 0.5$	High dominance

## 3. Evenness Index (E)

The Index of Evenness serves to determine the evenness of each species in each community encountered (Wahyuningsih, 2019). The calculation of the evenness index uses the following formula (Palaghianu, 2014):

$$E = \frac{H'}{\ln(S)}$$

E : Evenness Index  
 $H'$  : Species Diversity Index  
 Ln: Natural Logarithm  
 S : Total number of species

Table 2. 3 Criteria for Evenness Index

E value	Description
0,96 - 1	Evenly distributed
0,76 - 0,95	Almost evenly distributed
0,51 - 0,75	Fairly Even
0,26 - 0,50	Less evenly distributed
0,00 - 0,25	Uneven

#### 4. Important Value Index (INP)

The important value index describes the role of a vegetation type in the ecosystem it lives in (Rakhmawati, 2018). Then each plant species found is calculated absolute density (Ka), relative density (Kr), absolute frequency (Fa) and relative frequency (FR) and at the tree level vegetation, the INP value is obtained from the results of absolute dominance (Da) and the sum of relative dominance (Dr), the analysis of the Important Value Index (INP) is calculated using the following mathematical equation (English in Permadi, et al., 2016):

##### a) Density

Density is the number of individuals of a plant species in a certain area. Density in observations is determined based on the discovery of plant species from a number of plots made (Febriandito, 2019). Density calculation is done by dividing the number of one tree per total plot area. Density calculation can be determined using the following formula:

$$Ka = \frac{ni}{L}$$

Description:

Ka : Absolute density (ind./ha)  
 This : Total number of stands of the i-th species  
 L : Total area of the plot

##### b) Relative Density

Relative density is the density of a plot expressed as a percentage.

$$Kr = \frac{Ka}{K_{total}} \times 100\%$$

Description:

Kr : Relative density  
 Ki : Density of the i-th species  
 Ktotal : Density of all species

**c) Absolute frequency**

Frequency is a description of population distribution in an area. Frequency can be measured by recording the presence or absence of a plant species in a sample area (area) which is ideally randomly distributed throughout the area studied (Febriandito, 2019; Nabila, 2021).

$$Fa = \frac{qi}{Q}$$

Description:

Fa : Frequency of Species i

qi : Number of points/plots where the *i*-th species was found

Q : Total number of monitoring points/plots

**d) Relative frequency**

The frequency of a species divided by the frequency of all species expressed as a percentage (Febriandito, 2019):

$$Fr = \frac{Fa}{F_{total}} \times 100 \%$$

Description:

Fr : Relative frequency

Fa : Frequency of the *i*-th species

F<sub>total</sub> = Frequency of all species

**e) Dominance**

Cover (Dominance) is described as the proportion of land cover by species that inhabit the area viewed from above. Dominance can indicate the success of a species in occupying a certain area and can be used as a reference for the suitability of the environment for a particular species. Dominance is calculated by dividing the weight, canopy area, or basal area of a tree species by the area of all observation stations (m<sup>2</sup>/ha). Basal area values were obtained by calculating the cross-sectional area of tree trunks that had been measured in diameter. Relative dominance was obtained by dividing the dominance of the species with the dominance of all species found and then multiplied by 100%.

$$Da = BA_i / A$$

Description:

Da : Dominance of the *i*-th species

BA<sub>*i*</sub> : Total basal area of species *i*

:  $\pi d^2 / 4$

A : Total area of observation

$$Dr. = \frac{Da}{D_{total}} \times 1100\%$$

Description:

Da : Relative dominance

D<sub>*i*</sub> : Frequency of the *i*-th species

D<sub>total</sub>: Dominance of all species

#### f) Important Value Index (INP)

The important value index is an index of importance that describes the importance of the role of a vegetation type in its ecosystem. If the INP of a species is high, then the species greatly affects the stability of the ecosystem (Rakhmawati, 2018). INP for tree, pole, and sapling stand types is (Febriandito, 2019):

$$INP = Kr + Fr + Dr$$

Description:

INP = important value index

Kr = relative density

Fr = relative frequency

Dr = relative dominance

Meanwhile, the INP of seedling, herbaceous and shrub stand types is :

$$INP = Kr + Fr$$

Description:

INP = index of importance

Kr = relative density

Fr = relative frequency

The greater the INP value, the higher the tolerance to environmental conditions. The magnitude of the INP value is defined in the table as follows (Hidayat, 2017):

Table 2. 4 Important Value Index Criteria and Indicators

No	Criteria	Indicator
1.	$INP > 42.66$	High importance
2.	$21.96 \leq INP \leq 42.66$	Medium importance
3.	$INP < 21.96$	Low importance

### III. ACTIVITY IMPLEMENTATION

#### A. Tools and Materials

Table 3.1 Prey Animal Population Monitoring

No	Name of Tools and Materials	Usage
1.	Work Map	As a reference for the location and location of prey animal population monitoring.
2.	GPS	A tool to determine the location of the Komodo monitor lizard population monitoring location.
3.	Compass	Determination of transect direction
4.	Transect Rope	A 150-meter long transect rope, which has been marked every 5 meters, can be made from fishing line.
5.	Stationery and Tally Sheet	To record transect results

Table 3.2 Monitoring of Komodo monitor lizards (*Varanus komodoensis*)

No.	Name of Tools and Materials	Usage
1.	Work Map	As a reference for the location and determination of the location of monitoring the Komodo monitor lizard population.
2.	GPS	Saving the geographical coordinates of the Komodo monitor lizard population monitoring location.
3.	Compass	Determination of cardinal directions
4.	Digital Camera	Documenting the results of the activity
5.	Camera Trap	Documenting every Komodo dragon recorded by a camera with a PIR (Passive infra Red) sensor with triggers in the form of movement or heat with the type of Bushnell
6.	Binoculars	View the condition of the monitoring area population of Komodo dragon lizards
7.	Tallysheet and field notebook + writing pad	Documenting field data
8	Meat Feed	As bait to bring komodo lizards to the observation site
9	Nylon Rope	To tie the bait wrapped in plastic
10.	Plastic bags and bait boxes	To store the meat and spread the foul smell of the meat to attract Komodo dragons.
11.	Timer	To determine the observation time

Description:

- a) *Camera trap*, the type of *camera* commonly used in the BBKSDA NTT working area is the *Blaze Video A-252* model.
- b) GPS, this tool is needed to know and mark the location where the camera trap is permanently placed, so that it will be useful for long-term population monitoring programs.
- c) Map, required for guidance in *camera trap* positioning and sampling design activities.
- d) Bait (meat), For each *camera trap* monitoring location, 2 Kilograms of bait meat is allocated. Bait is needed to attract Komodo lizards around the *camera trap* location and also to attract Komodo dragons to the *camera trap* position, so that their presence can be detected by the *camera trap*.
- e) Plastic bags for hanging bait, plastic bags are needed to store pieces of bait meat and then hang, to help decompose the meat and spread the stench of rotting meat to attract Komodo monitor lizards, preferably chosen in striking colors, so that later it is easier to recognize the location in the process of taking *camera traps*.
- f) Bait box, a small box, a place to store bait in front, serves to attract Komodo Dragons to the front of the camera trap. It is recommended that the box size is not too small and made of strong material so that it cannot be eaten by Komodo monitor lizards and is not easily damaged / rusted.

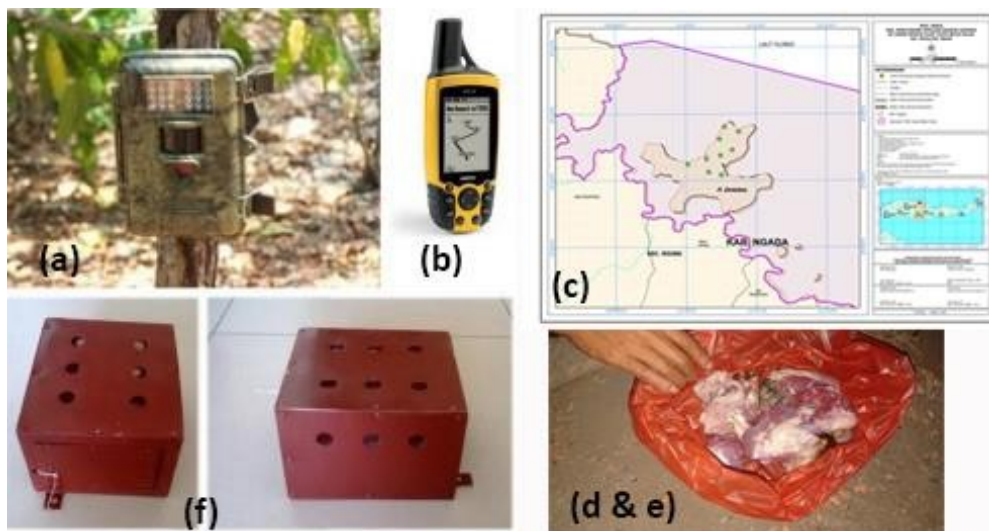
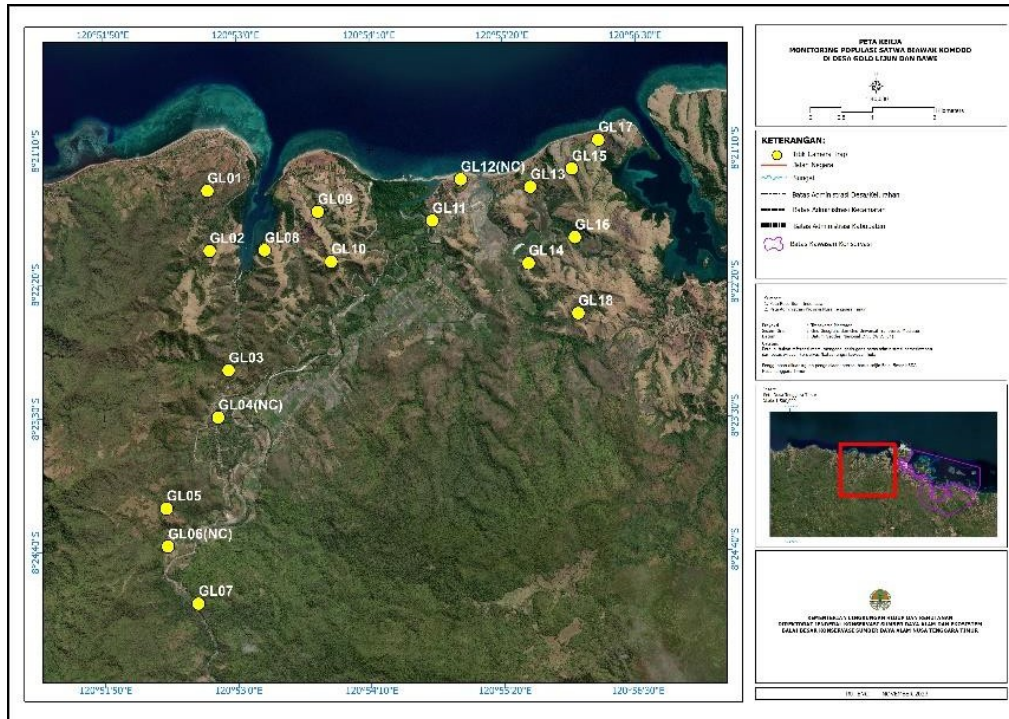


Figure 1. Tools and Materials

## B. Location

The location of the Komodo monitor lizard (*Varanus komodoensis*) population monitoring activities was carried out in the Golo Lijun Village and Nanga Buntal Village areas, which are administratively located in Elar District, East Manggarai Regency, East Nusa Tenggara Province.



Map of the location of the Komodo monitor lizard monitoring activity in Golo Lijun, East Manggarai Regency.

## C. Implementation Team

The personnel implementing this activity are planned to be 12 (twelve) people as listed in table 1 below:

No	Name/NIP/Rank/Group	Position
1	2	3
<b>I</b>	<b>KSDA Region II Division</b>	
1.	Beatrix Luisa Wisang, S.P. 19731006 200112 2 002	Junior Expert PEH in the KSDA Region II Division
	Dionisius Bruno Contends, S.Pi/ 19941009 202321 1 020	First PEH Expert at Riung Resort
2.	Yoseph R. Rangga Wea, A.Md./ 19911204 202321 1 021	Skilled PEH at Bajawa Resort
	Saverius Arifianto Djematu/ 19920827 202421 1 024	Manggala Agni at Watunggong Resort

No	Name/NIP/Rank/Group	Position
1	2	3
3.	Wahid Fortuna Anwar/ 19991019 202203 1 002	Beginner PEH at Bajawa Resort
4.	Marselinus Helmanto/ 19871011 202421 1 007	Manggala Agni at Riung Resort
5.	Manasye M. Manu / 19870501 202421 1 011	Manggala Agni at Riung Resort
6.	Yustina Imun, S.IP. -	PPNPN at Region II Conservation Division

Table 2. Activity Implementation Personnel

#### D. Cost

The cost of implementing prey animal population monitoring activities and monitoring the Komodo monitor lizard population amounted to **Rp. 73,870,000 (Seventy Three Million Eight Hundred Seventy Thousand)** with the following details:

Sub Keg/MAK	Sub-Activity/Type of Expenditure/Details of Expenditure	Volume	Unit Cost (Rp.)	Total (Rp.)
2	3	4	5	6
521211	Material Expenditure			14,570,000
	- Tools and Materials	1 Keg	6,220,000	6,220,000
	- Duplication and binding of reports	7 Ex	50,000	350,000
	- Personal Use	12 pcs	250,000	3,000,000
	- Preparation meeting consumption	20 OH	50,000	1,000,000
	- Consumption of result discussion meeting	20 OH	50,000	1,000,000
	- Food for laborers [10 people x 6 hr x 1 keg]	60 OH	50,000	3,000,000
521219	Other Non Operational Goods Expenditure			6,000,000
	- Labor wages [10 people x 6 days x 1 keg]	60 OH	100,000	6,000,000
522141	Rental Expenditure			3,000,000
	- Vehicle rental	1 KEG	3,000,000	3,000,000
524111	Ordinary Office Travel Expenditure			59,300,000
	<b>&gt; Travel from Fields and Sections</b>			<b>34,800,000</b>
	- Daily allowance for personnel from the Field / Section [6 people x 10 days]	60 OH	400,000	24,000,000
	- Lodging expenses for personnel from the Division/Section [6 people x 9 days]	54 OH	200,000	10,800,000
	<b>&gt; Travel from Resort</b>			<b>15,800,000</b>
	- Daily allowance for personnel from Resort [4 persons x 10 days]	40 OH	170,000	6,800,000
	- Lodging expenses for personnel from Resort [4 persons x 9 days]	45 OH	200,000	9,000,000
	<b>&gt; Travel for Supervision</b>			<b>8,700,000</b>
	- Daily allowance [2 persons x 5 days x 1 keg]	10 OH	430,000	4,300,000
	- Lodging expenses [2 persons x 4 days]	8 OH	550,000	4,400,000
	- Transportation costs [2 people x 1 keg]	2 OT	5,000,000	10,000,000
	<b>Jumlah : A</b>			<b>73,870,000</b>

### E. Time and Schedule of Activity Implementation

The implementation of monitoring will be carried out for 8 (eight) days from August 28 to September 4, 2024 as per the following schedule:

No	Implementati on Stage	Activity Implementation Time										
		December										
		13	14	15	16	17	18	19	20	21	22	23
1.	Preparation of RPK											
2.	Preparation of tools and materials											
3.	Activity Implementati on											
4.	Recapitulation and data analysis											

Table 3. Activity Implementation Schedule

### F. Report

The report is prepared by the Implementation Team as documentation of the results of the activity and as an accountability material for the implementation of the activity.

#### IV. ACTIVITY RESULTS

##### A. Monitoring of Komodo monitor lizards

From the results of the installation of camera traps at 20 points of the location, it is known that as many as 1 point of the camera trap captured the presence of Komodo dragons, as shown in the table below:

#### TALLY SHEET DATA CAMERA TRAP

Lokasi : Golo Lijun

Tahun: 2024

No	ID Camera	16 Desember 2024		17 Desember 2024		18 Desember 2024	
		pagi	sore	pagi	sore	pagi	sore
1		0	0	0	0	0	0
2	GL 02	0	0	0	0	0	0
3	GL 03	0	0	0	0	0	0
4	GL 04	0	0	0	0	0	0
5	GL 05	0	0	0	0	0	0
6	GL 06	0	0	0	0	0	0
7	GL 07	0	0	1	0	0	0
8	GL 08	0	0	0	0	0	0
9	GL 09	0	0	0	0	0	0
10	GL 10	0	0	0	0	0	0
11	GL 11	0	0	0	0	0	0
12	GL 12	0	0	0	0	0	0
13	GL 13	0	0	0	0	0	0
14	GL 14	0	0	0	0	0	0
15	GL 15	0	0	0	0	0	0
16	GL 16	0	0	0	0	0	0
17	GL 17	0	0	0	0	0	0
18	GL 18	0	0	0	0	0	0
19	GL 19	0	0	0	0	0	0
20	GL 20	0	0	0	0	0	0

Data on the presence of Komodo lizards

The Komodo dragon population, although still difficult to find in Golo Lijun. Until now, the distribution area is in Golo Lijun with the following map:

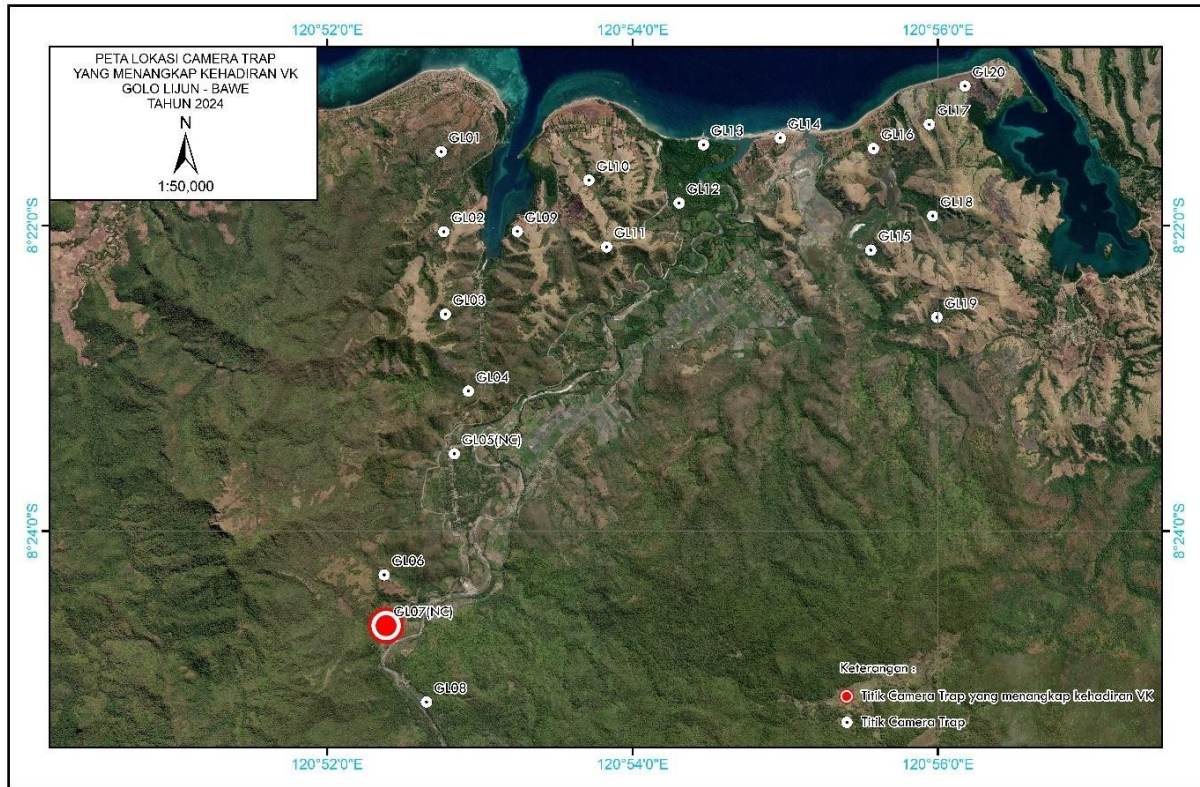


Figure 7. Map of the distribution of Komodo monitor lizards caught by camera traps.  
There are some images of Komodo lizards that were captured by camera traps:



Capture of a Komodo dragon lizard

## Analysis Results

The estimated density of Komodo monitor lizards per camera trap has a value of 0.1142. The estimated value of the proportion of Komodo monitor lizard occupancy area in the Golo Lijun study area is 0.1079. While the estimated value of Komodo monitor lizard abundance in the Golo Lijun study area showed 2.28 and the estimated probability of detection was 0.0730.

The number of camera traps installed is 20 cameras with a distance of 500 meters between camera traps. Komodo dragon olfactory distance is 500 meters, with the detection distance of each camera overlapping and not overlapping each other, the camera detection radius is  $\pm 500$  meters.

From the results of camera capture, it can be seen that Komodo lizards in Golo Lijun are relatively healthy, this is shown through photos at the base of the Komodo lizard's tail that looks fat (convex) not concave. As is known, based on several studies, the base of the tail of the Varanidae lizard family (monitor lizards) (including Komodo lizards) is a storage place for fat reserves (Ariefiandy et al, 2012). However, security of the Komodo monitor lizard population area is still considered to maintain the survival of the lizards.

## Discussion

Of the 20 camera trap installation points, there was 1 point that detected the presence of Komodo monitor lizards.

The results of the Presence analysis show that the estimated average density of Komodo dragons per camera trap during monitoring at the Golo Lijun study site in 2024 is  $0.11 \pm 0.12$  with a 95% confidence level and the confidence interval value ranges from 0.01 - 1.2. While the estimated proportion of Komodo dragon occupancy area in the Golo Lijun study area during monitoring is  $0.11 \pm 0.12$  with a 95% confidence level, the confidence interval value ranges from 12% - 25%. Thus, about 47% or almost half of the study area in the Golo Lijun study site was occupied by Komodo dragons at the time of monitoring.

The detection probability value is  $0.07 \pm 0.10$  with a 95% confidence level, so during the activity the possibility of detecting the presence of dragons in each session is only 1% - 12%. This means that 11% of the area inhabited by komodo dragons during this activity, if a camera trap is installed for 6 sessions (3 days) of monitoring, the possibility of seeing komodo dragons around is only 7%. While the estimated population abundance of komodo lizards during this activity was  $2.28 \pm 2.74$  individuals with a 95% confidence level, the total population ranged from 0 to 5 individuals. This shows that the Komodo monitor lizard population in the Golo Lijun study area is relatively difficult to find directly. However, periodic monitoring is needed to obtain population trend data so as to reach a conclusion on the condition of the Komodo monitor lizard population in Golo Lijun.

The minimum number of Komodo dragon individuals known from monitoring activities carried out in the Golo Lijun study area in 2024, obtained from the data tabulation form in Form 2. Individual Estimation where direct counting of each individual Komodo dragon caught by the camera trap is done. The minimum number of individual Komodo dragons in this activity is 1 Komodo dragon consisting of 1 juvenile Komodo dragon.

## B. Monitoring of Komodo monitor lizards' prey animals

From the results of camera trapping, it can be seen that there are several animals that have the potential to become food animals for Komodo monitor lizards, including wild boar (*Sus sacrofus*), long-tailed monkeys (*Macaca fascicularis*), cattle (*Bos taurus*), and civets (Figure 10).



Wild Boar (*Sus sacrofus*)



Monkey (*Macaca fascicularis*)



Cattle (*Bos taurus*)



Civet Figure 9.

Potential prey animals of Komodo dragons.

Using the faecal count method (counting groups of animal feces on plots along the transect line. From 40 transect lines with a length of 150 meters, divided into 30 plots/transect with a plot area of 3.14 m<sup>2</sup>. From a total of 1200 plots, several types of animal dung were found, such as cow dung with a density/hectare of 90.2 ± 28.6, wild boar dung with a density/hectare of 77.0 ± 19.0, monkey dung with a density/hectare of 108.8 ± 24.8.

### C. Vegetation Analysis

Sampling intensity is a number that describes the ratio between the number of samples and the total population. Sampling intensity depends on the level of accuracy desired and the heterogeneity of the population at hand (Madyana, 1989). Boon and Tideman (1950) explained that forest groups with an area of 1,000 ha or more should use a sampling intensity of 2%, while if less than 1,000 ha, the sampling intensity used should be 5-10%.

Based on the predetermined IS, which is 5% of the area of 1 ha, one path is determined for each camera trap point with a total of 200 plots or measuring plots:

No	Tree species	INP value			
		Seedling	Stake	Pole	Tree
1	Reeds	4,63%	-	-	-
2	Forest Grapes	3,47%	-	-	-
3	Ara	-	-	0,86%	2,91%
4	Acid	0,58%	5,37%	6,53%	38,93%
5	Bakatula	-	6,13%	1,33%	-
6	Bakol	0,58%	-	-	-
7	Balad	1,16%	2,36%	5,08%	-
8	Bansik	-	6,45%	17,68%	28,15%
9	Bansul	0,58%	-	0,46%	-
10	Bawe	0,58%	5,09%	2,68%	1,54%
11	Stripes	1,74%	-	-	-
12	Banyan	-	-	-	2,11%
13	Bidara	5,80%	9,10%	5,81%	3,83%
14	Damer	-	4,21%	-	2,16%
15	Dangkalasu	1,16%	-	-	-
16	Dangkas	-	3,14%	10,37%	3,72%
17	Derung	-	1,24%	-	-
18	Feri	-	5,14%	9,69%	10,08%
19	Gamal	4,06%	17,09%	16,63%	2,42%
20	Cashew	-	1,47%	2,59%	1,80%
21	White Teak	2,90%	-	6,19%	11,10%
No	Tree species	INP Value			
		Seedling	Stake	Pole	Tree

22	Valve	-	0,92%	-	-
23	Kapok	-	-	-	1,73%
24	Kawak	-	-	1,40%	-
25	Kazubakok	-	1,65%	-	-
26	Kebok	0,58%	-	-	-
27	Kedondo	-	8,94%	35,02%	58,75%
28	Kemuning	1,16%	3,49%	0,88%	-
29	Kerinyu	-	1,59%	-	-
30	Kerkoak	0,58%	-	-	-
31	Kesambi	<b>38,60%</b>	12,83%	15,87%	37,16%
32	Ketang	-	1,38%	0,83%	-
33	Kiki	2,03%	-	-	-
34	Kore	3,19%	-	-	-
35	Kukulaku	1,45%	-	-	-
36	Kukun	2,61%	11,83%	20,83%	-
37	Laerusa	0,87%	0,97%	-	-
38	Lamtoro	19,05%	<b>54,61%</b>	<b>49,92%</b>	34,24%
39	Langa	1,73%	1,94%	1,29%	-
40	Lasuruang	2,03%	3,71%	-	-
41	Ledu	-	2,08%	1,26%	1,54%
42	Legi	2,03%	-	0,97%	-
43	Leken	3,76%	1,05%	-	-
44	Leti	-	1,05%	-	-
45	Lili	1,73%	-	-	-
46	Lingkuwangkok	1,16%	11,65%	25,94%	19,00%
47	Liti	1,16%	1,87%	-	-
48	Loi	1,16%	-	0,87%	-
49	Loka	1,16%	8,83%	-	-
50	Lontar		-	-	3,39%
No	Tree Type	INP Value			
		Seedling	Stake	Pole	Tree

51	Mango	0,58%	-	-	3,69%
52	Mardo	0,58%	-	-	-
53	Marlede	2,90%	-	-	-
54	Marongge	-	1,49%	-	-
55	Matawara	0,58%	6,37%	1,96%	-
56	Mbaring	-	1,44%	-	-
57	Mbizar	-	5,73%	2,21%	-
58	Mbrama	-	1,16%	-	-
59	Noni	-	4,91%	0,97%	1,51%
60	Mera	-	1,16%	1,01%	4,02%
61	Mes	-	-	-	2,21%
62	Mili	0,58%	-	-	-
63	Moa	-	1,20%	0,86%	-
64	Moles	1,16%	2,39%	-	-
65	Mondo	1,16%	-	-	1,71%
66	Monggot	1,16%	-	-	-
67	Nila	-	5,10%	2,85%	3,07%
68	Ntoda	1,16%	-	-	-
69	Nunang	1,16%	0,92%	-	-
70	Pampa	3,19%	17,56%	8,87%	3,94%
71	Parlede	1,45%	-	-	-
72	Paryan	0,58%	-	-	-
73	Pasi	0,58%	5,80%	4,93%	-
74	Permau	2,61%	-	-	-
75	Plots	2,31%	-	-	-
76	Pia	1,45%	-	-	-
77	Piras	0,58%	-	2,27%	-
78	Pizor	-	3,94%	1,21%	-
79	Porang	-	-	-	-
No.	Tree Type	INP Value			
		Seedling	Stake	Pole	Tree

80	Men	0,58%	-	-	-
81	Princess Malu	1,73%	-	-	-
82	Radas	-	1,59%	-	-
83	Rakot	0,58%	-	-	-
84	Rengit	1,16%	6,21%	5,10%	5,60%
85	Resa	-	1,29%	1,29%	-
86	Rinu	-	-	5,45%	-
87	Sala	0,58%	-	3,49%	-
88	Sambiroto	2,61%	2,77%	2,31%	-
89	Sareong	3,77%	1,88%	4,01%	10,78%
90	Sarmate	3,47%	1,98%	-	-
91	Sasor	4,34%	1,00%	-	-
92	Census	12,14%	-	-	-
93	Solawu	0,58%	-	-	-
94	Songga	2,31%	4,08%	5,58%	-
95	Sui	2,61%	2,25%	-	-
96	Sukut	-	6,36%	-	-
97	Taizara	1,73%	-	-	-
98	Rope	2,03%	0,92%	-	-
99	Taraa	-	1,33%	-	-
100	Teke Londe	-	0,97%	-	-
101	Eggplant	-	4,15%	0,84%	-
102	Flour	0,58%	-	-	-
103	Tride/Kaweng	19,62%	2,21%	-	-
104	Warlede	2,90%	-	-	-
105	Warang	-	-	1,50%	-
106	Waru	-	-	0,92%	-
107	Waso	4,34%	-	2,18%	1,83%
108	Wazewura	0,87%	-	-	-
No.	Tree Type	INP Value			
		Seedling	Stake	Pole	Tree

109	Wele	-	4,66%	-	-
110	Weri	0,58%	-	-	-
111	Wuntun	0,58%	-	-	-
112	Wurtede	1,16%	-	-	-
113	Wuru Wara	1,16%	-	-	-
114	Wutwawi	0,58%	-	-	-

Table 10: Vegetation Analysis Data

The composition of plant species at the **seedling** level was found to be 76 plant species. Of these 76 species that have the highest Index of Important Value (INP) is Kesambi with a value of 36.80%. The composition of plant species at the **sapling** level was found to be 60 tree species. Of these 60 species that have the highest Index of Importance (INP) is Lamtoro with a value of 54.61%. The composition of plant species at the **pole** level was found to be 46 tree species. Of the 46 species that have the highest Index of Importance (INP) is Lamtoro with a value of 49.92%. The composition of plant species at the **tree** level was found to be 29 tree species. Of these 29 species, the one with the highest Index of Importance (INP) is Kedondo with a value of 58.75%.

The results of vegetation analysis show that the dominant vegetation in the Golo Lijun study area is in the **tree** phase (Kedondo) with an Importance Index Value (INP) of 58.75%.

## V. CONCLUSIONS AND SUGGESTIONS

Of the 20 cameras installed, 1 camera captured the presence of Komodo monitor lizards, meaning that the distribution of the Komodo monitor lizard population can be found in the study area in Golo Lijun. The proportion of occupied area in the study area in Golo Lijun is  $0.11 \pm 0.12$  (95% CI = 0 - 35%) which means that one tenth of the study area is inhabited by Komodo lizards with a detection probability of  $0.07 \pm 0.10$  (95% CI= 0 - 59%) which means that each session the probability of detecting Komodo lizards is around 7%. The mean density of Komodo dragons in each camera trap was  $0.11 \pm 0.14$  (95% CI = 0.01 - 1.20) and the estimated abundance of Komodo lizards in the study area was  $2.28 \pm 2.74$  (95% CI = 0 - 5). = 0 - 5 lizards).

±In the study area, there are animals that have the potential to feed Komodo monitor lizards, namely monkey feces with a density/hectare of  $108.8 \pm 24.8$ , cow dung with a density/hectare of  $90.2 \pm 28.6$ , civet feces with a density/hectare of  $26.5 \pm 9.1$ . While there are animals that have the potential to become predators of Komodo monitor lizards competitors from the results of camera capture, namely dogs (*Canis*) and water lizards (*Varanus salvator*).

In the study area, vegetation analysis was also carried out in 200 plots where the composition of seedlings found 76 tree species with the highest importance index value (INP) in the form of Kesambi with a value of 36.80%, the composition of saplings found 60 tree species with the highest importance index value (INP) in the form of Lamtoro with a value of 54.61%, the composition of poles found 46 tree species with the highest importance index value (INP) in the form of Lamtoro with a value of 49.92%, the composition of trees found 29 tree species with the highest importance index value (INP) in the form of Kedondo with a value of 58.75%.

Potential threats to Komodo dragons in the Golo Lijun habitat study are dogs and water monitor lizards as competitors for food availability and as predators for komodo monitor lizard pups, and habitat fragmentation due to land clearing by the community.

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Appendix

Appendix 1. Raw Data Form 1.

TALLY SHEET DATA CAMERA TRAP

Lokasi : Golo Lijun

Tahun: 2024

**FORM 1 : DATA MENTAH**  
( diisi lengkap dengan jam )

No	ID Camera	Tanggal	Tanggal	16 Desember 2024		17 Desember 2024		18 Desember 2024	
		Pasang	Ambil	pagi	sore	pagi	sore	pagi	sore
1	GL 01	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
2	GL 02	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
3	GL 03	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
4	GL 04	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
5	GL 05	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
6	GL 06	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
7	GL 07	15 Desember 2024	19 Desember 2024	0	0	9,44	0	0	0
8	GL 08	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
9	GL 09	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
10	GL 10	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
11	GL 11	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
12	GL 12	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
13	GL 13	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
14	GL 14	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
15	GL 15	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
16	GL 16	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
17	GL 17	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
18	GL 18	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
19	GL 19	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
20	GL 20	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0

## Appendix 2. Individual Estimates

### TALLY SHEET DATA CAMERA TRAP

Lokasi : Golo Lijun

**FORM 2 : ESTIMASI INDIVIDU**  
*(diisi urut dengan kode alfabet, A, B dst...)*

No	ID Camera	Tanggal	Tanggal	16 Desember 2024		17 Desember 2024		18 Desember 2024	
		Pasang	Ambil	pagi	sore	pagi	sore	pagi	sore
1	GL 01	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
2	GL 02	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
3	GL 03	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
4	GL 04	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
5	GL 05	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
6	GL 06	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
7	GL 07	15 Desember 2024	19 Desember 2024	0	0	A2	0	0	0
8	GL 08	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
9	GL 09	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
10	GL 10	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
11	GL 11	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
12	GL 12	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
13	GL 13	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
14	GL 14	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
15	GL 15	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
16	GL 16	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
17	GL 17	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
18	GL 18	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
19	GL 19	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0
20	GL 20	15 Desember 2024	19 Desember 2024	0	0	0	0	0	0

Estimasi jumlah individu tertangkap kamera :

Jumlah individu

Anak :	0
Remaja :	1
Dewasa :	0
Total :	1 individu

Occupancy data

TALLY SHEET DATA CAMERA TRAP

Lokasi : Golo Lijun

Tahun: 2024

<p><b>FORM 3 : DATA OCUPANCY</b></p> <p><i>( diisi data kehadiran komodo, 0= tidak ada, 1 = ada. )</i></p>
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No	ID Camera	16 Desember 2024		17 Desember 2024		18 Desember 2024		Monyet	Salvator	Anjing	Babi	Kucing	Tikus	Musang	Ayam	Landak	Burung Gosong	Puyuh	Delimukan	Sapi
		pagi	sore	pagi	sore	pagi	sore													
1		0	0	0	0	0	0	1	1	1										
2	GL 02	0	0	0	0	0	0				1	1								
3	GL 03	0	0	0	0	0	0						1							
4	GL 04	0	0	0	0	0	0		1	1				1						
5	GL 05	0	0	0	0	0	0			1					1					
6	GL 06	0	0	0	0	0	0			1										
7	GL 07	0	0	1	0	0	0		1	1						1	1			
8	GL 08	0	0	0	0	0	0													
9	GL 09	0	0	0	0	0	0													
10	GL 10	0	0	0	0	0	0		1										1	
11	GL 11	0	0	0	0	0	0						1			1			1	1
12	GL 12	0	0	0	0	0	0		1				1							
13	GL 13	0	0	0	0	0	0		1											
14	GL 14	0	0	0	0	0	0			1										
15	GL 15	0	0	0	0	0	0		1	1										
16	GL 16	0	0	0	0	0	0		1										1	
17	GL 17	0	0	0	0	0	0												1	
18	GL 18	0	0	0	0	0	0													1
19	GL 19	0	0	0	0	0	0													
20	GL 20	0	0	0	0	0	0													