Research Activity Report
Supported by "Leading Graduate Program in Primatology and Wildlife Science"
(Please be sure to submit this report after the trip that supported by PWS.)

	2024. 07. 01
Affiliation/Position	Wildlife Research Center/M2
Name	Negin Eslamibidgoli

1. **Country/location of visit**

JMC, Inuyama, Aichi, Japan

2. **Research project**

The Practical Course of Zoo Science

3. **Date (departing from/returning to Japan)**

2024. 06. 14 – 2024. 06. 16 (3 days)

4. Main host researcher and affiliation

Dr. Yamamot, Professor at Wildlife Research Center, Kyoto University
Mr. Shintaku, Mr. Takano, and Ms. Akami, curator at Japan Monkey Center

5. **Progress and results of your research/activity** (You can attach extra pages if needed)

Please insert one or more pictures (to be publicly released). Below each picture, please provide a brief description.

During this three-day course, I was introduced to a modern zoo's main responsibilities including **educating** the public on animal sciences and their conservation, creating extensive **collections** of live animals and their specimens (ex. skin, bones, etc.) to be used both for **research** purposes and to provide **exhibitions** for the public. Additionally, I had the opportunity to observe and participate in keeping and curating activities first-hand, which allowed me to have a better understanding of the critical details and considerations required in managing a zoo. In the current report, I will explain activities done on each day of the course, and what I gained at the end of each lesson.

Day 1: Introduction To The History of JMC and Zoo Management
(2024.06.14)

On the first day of the practical course of zoo science, we received lectures on the history of primatology in Japan, starting from the first expedition of wild monkeys in Koshima, and the role of the Japan Monkey Center (JMC) in the development and promotion of this field of science following its establishment in 1956. Also, we were given a tour around the zoo and visited all of the enclosures and species kept in JMC.

Although JMC was first established with a focus on Primate research, it became an entertainment center for several years until a change in its management in 2014, leading to the return of its purpose to research activities. Currently, JMC has a collection of 54 species of live animals, which makes it one of the largest collections in the world.

In managing a zoo, three main counterparts need to be taken into consideration: Animals, Visitors, and Keepers. These three groups have various needs that might sometimes conflict with each other. For instance, in designing the enclosures of the zoo, it is critical to consider their inhabitants' welfare in terms of space, enrichment, etc.; However, since one of the reasons people visit zoos is for recreation, it is also important to design the enclosures so that people can observe their species of interest. This can bring conflicts since animals might need places to hide from visitors from time to time, while the latter might not be appreciative of not being able to observe the animals.

Day 2: Observation Practice and Comparative Study, Specimen Collection
(2024.06.15)

One of the important research opportunities available at zoos is being able to conduct comparative studies between various species. Therefore, on our second day, we were tasked to conduct a comparative study in JMC on species and topics of choice. The students were put into two groups of four and were instructed to collect one hour's worth of data per group on their chosen research question and hypothesis. In this section, I will briefly explain my group's comparative study.

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- **Group members:** Sarv, Liu Liu, Nakamura, Negin
- **Study subjects:** Each person was tasked to observe two species of choice from Prosimians, Old World Monkeys, New World Monkeys, and Apes. **My subject animals were Red Tailed Monkeys and Toque Macaques classified as Old World Monkeys.**

Figure1 **From left to right: the observed individuals of Toque Macaques and Red-tailed Monkey**

- **Research question and hypothesis:** We investigated the reaction of subject animals to visitors in their first and second encounters to see if there would be any changes in their behavior as time progressed. The comparative points were between the two encounters of the same individual and between different species and primate classifications.
- **Sampling rules:** The one hour of focal observation was divided into two 30-minute sessions. In the beginning, the observer would approach the enclosure and stand in front of it as closely as possible, without making any noise or gestures that would grab the attention of the animals intentionally. The observer then would stand in their position for the next 30 minutes and wait for any reactions from the animals. In each session, the first individual to approach the observer or interact with them in any way was chosen. The observer would record any behaviors of the focal subject with regard to them (ex. eye contact, display, etc.) for 10 minutes. Then there would be a 7-minute break in data recording and another 10 minutes of observation. The purpose of this method of observation was to investigate whether the animals would get used to the observer's presence and hence, show any changes in their behavior. Our **hypothesis** was that there would be a change in the animal's behavior between the first and the second encounter as they get used to the observer's presence, and we also **predicted** that based on the types of enclosures and how exposed the animals are to visitors, there might be a difference in how they would react to visitors.
- **Results and discussion:** Based on our observations, we concluded that there is more than one factor important when comparing such behavior, including group size (the number of individuals that are living in one enclosure), the presence of hiding space inside the enclosures and how exposed the animals are to visitors and for how long, etc. For future studies, we suggest more controlled observation conditions and more well-defined behaviors, meaning that there must be clear definitions of what behavior is considered a reaction to the observer whether it is showing aggression, making eye contact, so on.

In addition to the comparative study practice, we also had the opportunity to visit the **specimen collections** kept in JMC, as well as observe the steps to preparing them. After forensic analysis of the dead zoo animals to investigate the reason for death and the presence of any potential diseases, the animal is ready to be dissected and prepared for preservation. Various specimens could be collected from one individual; Firstly, the **organs** are taken and kept separately in formalin. They could be preserved in formalin for extended periods without being frozen, but some organs are also stored in freezers without formalin for other usages and purposes. The **skin** could also be kept

separately in two ways; They could be processed and preserved just as they are, or they could be used to create taxidermies for the museum exhibition. After the organs and skin are separated, any remaining soft tissues such as muscles are removed so that the **bones** can be prepared for storage. There are multiple ways of cleaning the skeleton after this step including boiling them in water for 8 hours or a day, burying them under the ground, and just putting them in water for a few months. After the bones are cleaned, they are sorted based on their types, and then the entire skeleton of one individual is stored in boxes with identification numbers correlated with its dissection.

Figure2 **From left to right: Bones of a female macaque sorted based on their types; Boxes containing the entire skeleton of one individual and their labeles.**

Additionally, the museum also has other collections including parasites, infants, and cultural items (paintings, figures, etc.) that are used for various purposes.

Figure3 **From left to right: The skull of a gorilla, prepared in JMC; The skin of a lemur, prepared in JMC; An example of cultural collections in JMC.**

Day 3: Caretaking Practice, Visitor Survey Study
(2024.06.16)

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On the third day of the practical course of zoo science, we were divided into groups of two to help with caretaking activities and experience the keepers' responsibilities and efforts first-hand. I was tasked with helping keepers in the Chimpanzee, Gorilla, Barbary macaques, and Potto enclosures, as well as gathering vegetations and plants from the greenery inside JMC to be used as food for the animals.

Figure4 **From left to right: Plants collected from the vegetation inside JMC; The collected plants presented to Barbary Macaques to eat.**

1. **Chimpanzees:** There are 2 groups of chimps kept in JMC, which are separated from each other. The chimps have one outdoor and one indoor enclosure, and the two groups alternate between these two spaces to avoid encounters. Since chimps are dangerous animals, keepers move in pairs when caring for them and are never alone. Us students were not involved in caretaking of the chimpanzees.

2. **Barbary macaques:** Before entering the enclosures for any activities, we first ensured there were no animals inside the area we were entering. In this step, our activities included putting food items in the outdoor enclosure of Barbary macaques and doing the necessary health checks.

    a. The first step after entering the area is checking the fences for any broken parts and checking their strength in case of animals' displays. This was done by going around the cage and hitting the fences.

    b. While there are particular places for some food items, the rest need to be dispersed in a way that every individual can get a chance to eat. We also should make sure the food is scattered enough to make the animals move around and exercise.

    c. After finishing, the doors should be locked and double-checked to ensure safety.

    d. once the animals were released into the outside space, we observed them to make sure they could reach the food items and that everyone was eating. The keepers also checked them for injuries while providing the female individuals with birth control medicine.

3. **Potto:** Pottos are nocturnal animals; therefore, to provide the chance for visitors to observe them, the keepers keep their enclosures dark during the daytime and turn the lights on during the closing hours. While accompanying the keepers responsible for their enclosure, we took part in providing the one male and one female inhabitant with breakfast (10 crickets each plus pallets containing gum, calcium, vitamins, etc.) and lunch (pallets, vegetables, and gum).

4. **Gorilla:** Our activities concerning the gorilla enclosure included cleaning the indoor area and providing food items for Taro.

a. Before going inside the enclosure, in addition to ensuring the animal is not inside, other keepers must be informed that we're entering the area for safety reasons.

b. The steps to cleaning the gorilla enclosure were as follows: (1) Removing all the garbage from the floors; (2) Washing the floors with water; (3) Scrubbing the floor; and (4) Whipping away the excess water from the floor to the drains.

c. Important considerations for dispersing food inside the gorilla enclosure: If the food is placed in high places, Taro won't be able to find it. Therefore, food items were placed in accessible places from the ground. However, similar to barbary macaques, the food items were spread around the cage in a manner to make Taro move around and have some exercise.

Figure5 **From left to right: Taro the gorilla eating the food that was placed in his indoor enclosure by students after cleaning the area.**

Another activity conducted by the students was training for zoo education and visitor experience. Since one of the main visitors' expectations from zoos is recreation, it is important to carry out evaluations to ensure such expectations are met, as well as to investigate whether the zoo is successful in meeting its educational goals. There are various types of visitor survey methods, such as giving out questionnaires, conducting interviews, etc. During this training, we did a non-participant survey of visitors and their experience in an enclosure of choice. (Visitors' consent was obtained before conducting the survey)

The survey was observation-based, and we were supposed to listen to the conversations made by the visitors and take note of their reactions and behavior. The main objective of this survey was to investigate the main point of interest in people visiting our particular species and to suggest ways to improve the visitor experience. The content of my survey is as follows:

- **Subject species:** Marmosets and Tamarines
- **Predicted length of observation time:** 4 minutes for the entire enclosure area.
- **Visitors' interest:** Body size (How small the animals are)
- **Results and discussion:** Due to the language barrier, I was not able to investigate visitors' interests based on their conversations and as a result, I only observed their behavior and interactions with the animals. Overall, the average time spent in the entire enclosure by each visitor was around 4.5 minutes among 4 visitors. The majority of them did not speak throughout their visit and tended to have a quick walk around the cages and then come back again for a more detailed observation. Individuals who visited the enclosure during the feeding time were more interested in watching the keeper-animal interactions and thus, had a higher observation time. Based on this survey, I think the zoo is playing an important role in educating the public about animal species since some of the visitors seemed to be hesitant about entering the enclosure at

the beginning and then developed more interest in the marmosets and tamarins as time progressed. Moreover, some people seemed to experience an uncomfortable smell while observing the animals, so I would suggest more air conditioning if possible.

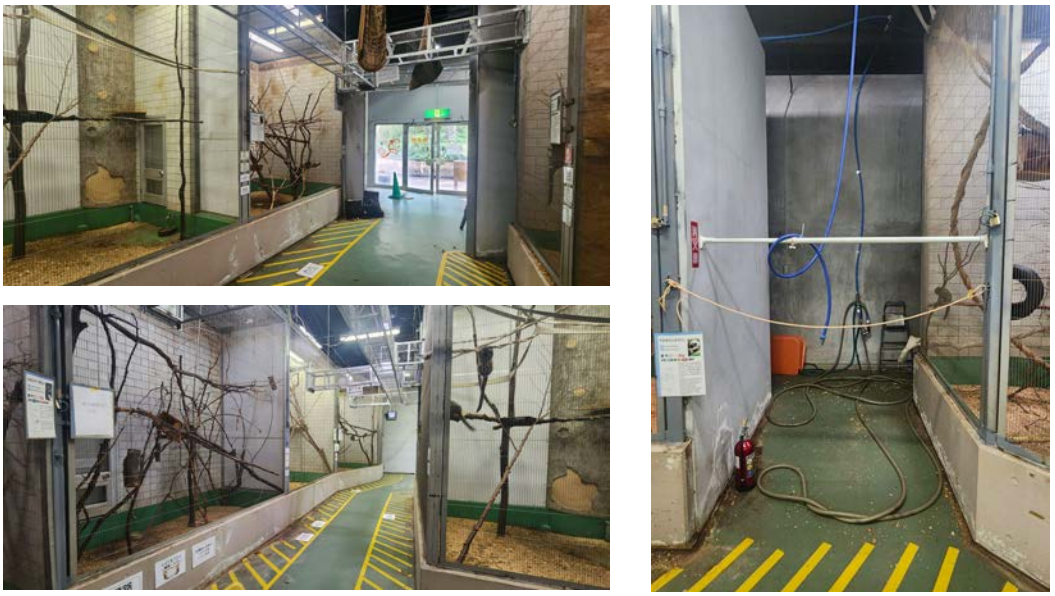

Figure6 **The two photos on the left demonstrate the inside of the Marmoset and Tamarin enclosure; The photo on the right shows the palace from where the observer (Negin) conducted the survey.**

At the end of the third day, we received a lecture on zoo collections and the differences between zoos in Japan and Europe. Due to the lecture being done in Japanese, I was able to understand some of the main concepts presented in the lecture. During this lecture, we learned about the 4 missions of zoos in more detail. For instance, as mentioned previously, one of the main activities of a zoo is creating and preserving collections, which encompasses both living animals and their specimen. These collections could be divided into two groups of Primary materials (the collection itself) and Secondary materials (information about the primary materials). On the other hand, we also learned about some of the important considerations regarding the education aspect of zoos and museums. As an example, since the target audience of the events, presentations, lectures, etc. that are held by zoos are people from a wide range of ages and scientific knowledge, it is necessary to adjust the language of these events according to their audience.

Over the course of these three days of combined lectures and trainings, I had the opportunity to expand my knowledge on the missions and purposes of zoos, particularly JMC, and how they operate, and experience the amount of detail and effort that goes into managing collections and visitors, while contributing to research and science as well. I believe that now I have a clearer vision of the importance of zoos, and their contribution to wildlife conservation.

*Please have your mentor check your report before submitting it to [report@pws.wrc.kyoto-u.ac.jp].