

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.)

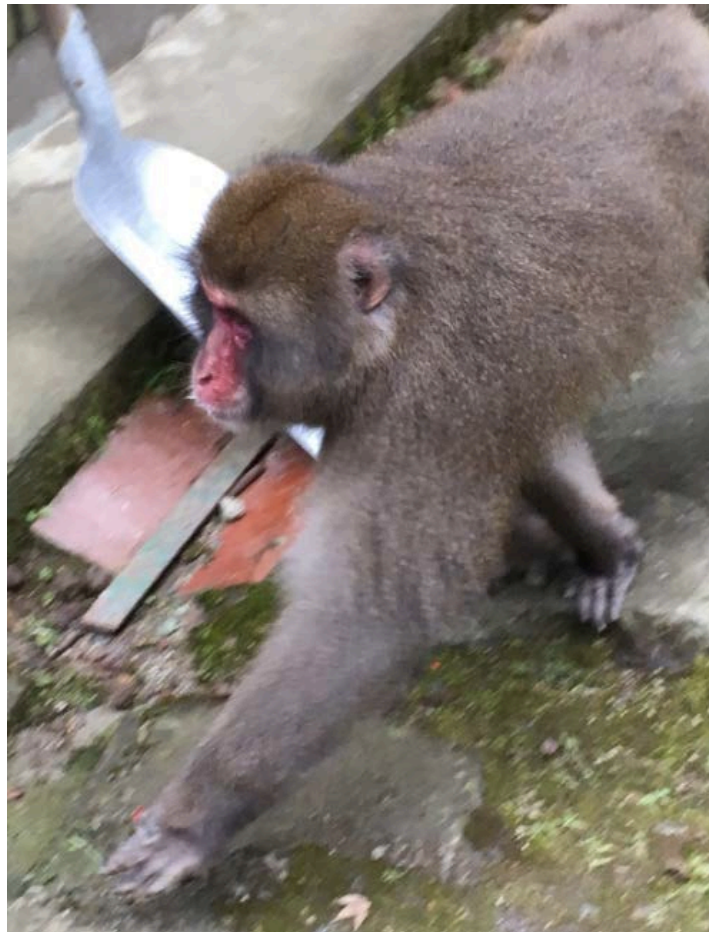
4 Jan 2018

Affiliation/Position	Primate Research Institute / M2
Name	Nelson Broche

1. Country/location of visit
Hyogo, Nagano, Chiba prefecture (Japan)
2. Research project
Salivary alpha-amylase enzyme as an acute biomarker of stress in Japanese macaques
3. Date (departing from/returning to Japan)
28 Dec 2017 – 2 Jan 2018 (6 days)
4. Main host researcher and affiliation
None
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.
<p>Schedule (6 days): 28 Dec 2017 = travel to Hyogo prefecture; Himeji City Zoo (visited by chance) 29 Dec 2017 = visit Funakoshiyama Monkey Park located in Ruriji temple 30 Dec 2017 = travel to Nagano prefecture 31 Dec 2017 = visit Jigokudani Monkey Park 1 Jan 2018 = travel to Chiba prefecture; visit Takagoyama Monkey Park 2 Jan 2018 = visit Ueno Zoo located in Tokyo; return to Inuyama</p> <p>For 6 days I was able to visit a variety of potential research sites. My masters work focuses on using salivary alpha-amylase (sAA) enzyme as a non-invasive biomarker of acute stress in Japanese macaques (<i>Macaca fuscata</i>). In order to collect saliva I have been working with housed monkeys at Kyoto University Primate Research Institute performing positive reinforcement training to increase cooperation of monkey subjects. Earlier in April of 2017, I was able to perform a small pilot study for collecting saliva from semi free ranging monkeys as part of a field course in Koshima (Miyazaki). Non-invasive success of saliva collection increased over 50% after three days of attempts. In addition to laboratory studies of sAA, I would like to develop a technique of saliva collection for field use. Now that the protocol and assay are validated from my captive study, the next step is to put this method to use in free-ranging animal populations to see the potential uses. This trip has been helpful in letting find places to put to the test. Therefore, I decided to visit a variety of parks and zoos to survey potential field sites for future studies.</p>

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Funakoshiyama Monkey Park:



Funakoshiyama Monkey Park is a part of Ruriji temple located in the town of Sayo, Hyogo prefecture. The monkey park can be found after a 30-minute walk from the base of the mountain. There is only one troop that visits this park from around 9:00 am until about 4:00 pm. I arrived around noontime and counted about 45 individuals, mostly adult females and juveniles. I identified one adult male who I assumed to be the alpha male of the troop since he was aggressive to conspecifics and didn't receive counter challenges for food. The monkey park area is relatively smaller than other monkey parks such as Arashiyama or Takasakyama. I was the only visitor in the afternoon. Despite the cold (around 2°C upon arrival), monkeys seemed in good health and very well habituated to humans. Monkeys stayed relatively close to the center of the park area and visibility was clear. For these reasons, I believe a study of these monkeys is possible and practical for saliva collection.

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Jigokudani Monkey Park:



I counted over 160 tourists during my visit.

Jigokudani Monkey Park is located in Yamanouchi, Nagano prefecture. There is a 30-minute walk to the monkey park site from the mountain entrance. The trail was covered in snow and ice (snow footwear is highly recommended). The monkey park relatively covers a large area and monkeys move freely. I counted over 75 individual monkeys with more age & sex diversity of group structure than Funakoshiyama. Monkeys seem in good health and are well habituated to humans. However, perhaps due to the popularity of Jigokudani there were over 160 tourists at the time of my visit. I believe this would be a challenge for an initial saliva study at this site. I've heard from others that the monkeys arrive about one hour before the park opens, so this is one potential strategy for such a study.

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Takagoyama Monkey Park



Takagoyama Monkey Park is located in Futtu City, Chiba prefecture. The park is about a 10-minute walk from the local bus station (Sekitoyo-eki). The park is comprised of two large open enclosures where tourists can feed monkeys sweet potatoes through a wire mesh fence. Between both enclosures I was able to count about 30 individuals, mostly adult females and juveniles. I could not clearly locate an adult male in the groups. The monkeys were very habituated to people, many approaching me from behind the wire gate cooing for sweet potatoes. This park also had relatively less tourist traffic during my visit (only two other families present). This site poses some challenges such as the lack of diversity of in-group structure but a saliva study seems very feasible here due to the high cooperation of the monkeys.



Monkeys are well habituated and approach humans.

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Zoological Parks

In addition to visiting monkey parks, I wanted to use this travel opportunity to visit two zoos. I study at the Primate Research Institute, Kyoto University that is located next the Japan Monkey Centre. I have had several opportunities to visit several zoos in the U.S. but I am not familiar with zoos in Japan. In addition to stimulating local economies and educating the public, zoos house many species from all over the world, which can be difficult to see in the wild. Some of my research interests include stress, animal welfare, and endocrinology. Given the appropriate conditions, zoos could provide new information on such topics across a variety of species in controlled environments. In Hyogo prefecture, I was able to visit Himeji City Zoo and while traveling through Tokyo I was able to visit Ueno Zoo.

Himeji City Zoo:



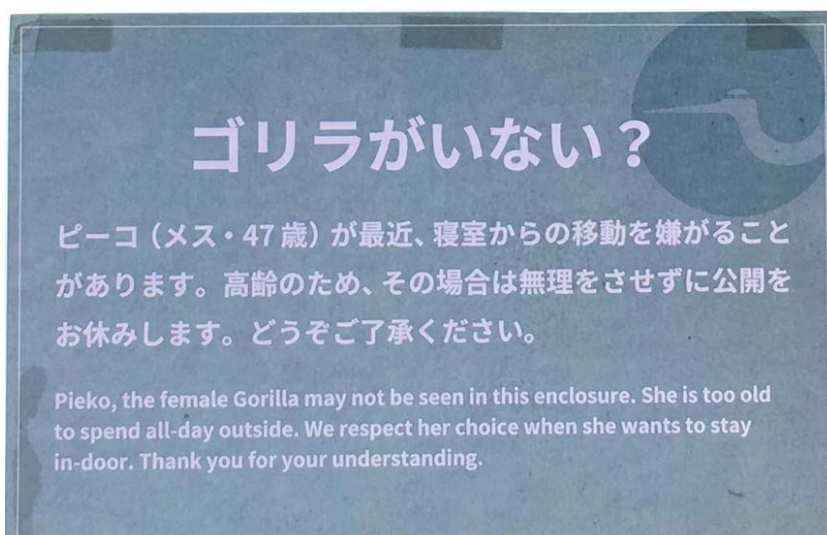
Himeji City Zoo is located next to the Himeji Castle. This zoo houses a variety of animals such as a giraffe, lions, a polar bear, and monkeys. Fences and gates were the common type of enclosure used. All animals appeared to be in good health and many species can be found in a relatively smaller zoo. One particular De Brazza's monkey (*Cercopithecus neglectus*) seemed especially inquisitive of visitors and did not display stereotypic behavior.

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Ueno Zoo:



Ueno Zoo is located in Tokyo. The day of my visit was the first day the park was open for this year (2018) so I believe this was one reason the park had a high traffic of visitors. One of the more famous animals housed here is a baby giant panda by the name of Xiang Xiang. Ueno Zoo is one of Japan’s largest zoos and exhibits many animals from around the world. I could sense some similarity to the San Diego Zoo, but was hoping to see more open enclosures replicating the animal’s natural habitat. While visiting the gorilla enclosure, I noted that the resident western lowland gorilla Piko could not be found. She chose to stay inside; I believe this is a smart practice.



Piko chose to stay in.

During this trip I was able to survey several potential research sites. This trip has given me the opportunity to better conceptualize future research at each respective site, which is necessary when creating a sound and practical research plan. I hope to begin field studies this new year.

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6. Others

This trip would not have been possible without the financial support of the Leading Graduate Program in Primatology and Wildlife Science (PWS), Kyoto University. Thank you for this opportunity.