Research Activity Report
Supported by "Leading Graduate Program in Primatology and Wildlife Science"

	2017. 05. 31
Affiliation/Position	Wildlife Research Center/D1
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1. Country/location of visit
Kumamoto Sanctuary
2. Research project
UAV Lesson and monitoring of finless porpoise
3. Date (departing from/returning to Japan)
2017. 04. 22 – 2017. 04. 26 (5 days)
4. Main host researcher and affiliation
Prof. Naruki Morimura, Wildlife Research Center of Kyoto University
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.

One of the most crucial field equipment in the foraging behavior monitoring for Indo-Pacific Bottlenose dolphins is Unmanned Arial Vehicle (UAV). The use of UAV will provide both underwater and bird view of the dolphin behaviors. Previous field experience granted only a few occasions to operate Phantom 4. However, as the field which I will conduct has its share of challenges using such equipment such as heavy wind and salty atmosphere. Therefore when the opportunity to properly learn how to operate UAV and safety guidelines at Kumamoto Sanctuary I applied to attend. In this field project, I wanted to learn how to operate UAV but also the steps that should be taken to a field site to maximize the security while using the equipment.

This field project would have also provided a rare opportunity to observe finless porpoise behavior in the wild. In my field site, Jeju Island, the stranding of dead finless porpoise of two species are prevalent which sparked my interest in studying this unstudied species. Behavior monitoring or observation of the population in the wild is difficult due to their small body size, lack of dorsal fin and small group size. I hoped to implement the experience I will gain through this field project in field monitoring of finless porpoise in my future studies.

The operation manual of UAV is designed to be learned in a couple of hours, however truly mastering the flight is difficult. It takes many hours of practice due to countless opportunity for malfunction and troubles in mid-air. Beginning of the lesson we watched the video clips that were recorded in previous finless porpoise field. While watching the video of finless porpoise interesting behaviors were pointed out as well as an explanation of the safety of flying UAV. One of the first lessons were conducted both in Kumamoto Sanctuary and at the field site. I learned how to take off and maneuver the UAV while looking at both cell phone display and the actual drones. There were many lessons on how to maneuver including how to fly down slowly compared to fly up due to the strength of the machine. Also, another important lesson was how not to trust only the eye or the monitor but consider both when possible. Most importantly while flying UAV many safety measures instructed and learned through experience. After learning how to fly UAV, the field site was considered to be observed for the first time. Started at flying lesser distance and then increasing the vicinity as it was decided it was safe to fly certain places. This was an important lesson as each field site has different safe distance, duration, height and geographical range of flight. This technique will be used in first days of my own field work to assure safe flight in different areas of my field.

It is very easy for a flight to go wrong, and it is very important to understand the steps to take when an emergency rises during flight. Many measures are available during malfunction including turning off the connection between the UAV and the controller and turning it back on to gain a better connection to fly. One of the most important things, when something does go wrong during the flight, was to keep calm and think about the best next move. As the vehicle will stay in flight even without connection stopping any movement and understanding what is happening and making that next step is the best solution.

During the lesson, I was able to learn how to design and conduct automatic flights. I was only able to practice only once due to lack of available time.
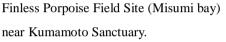
Kasumi and I conducted full day finless porpoise monitoring which typically between 8:00 and 20:00. The field site bay was visually monitored for the finless porpoise. There were a couple of challenges in finless porpoise that were discovered while visual monitoring. Counting the number of individuals were inaccurate and unstable, type of behavior is ambiguous, and focal sampling of one individual was impossible. First two problems could be solved by using a drone, however, the third one is more difficult to solve due to lack of directionality in their behavior in the bay.

I hope to go back to Kumamoto Sanctuary before starting field work in Jeju Island to gain more practice time under my belt. It is the best place to practice drone flights for me as its' geographical characteristic provide calm ocean. Also, if it is possible I would like to join the finless porpoise research in Kumamoto Sanctuary and perhaps use the data collected in Jeju Island.

Finless Porpoise Field Site (Misumi bay)

near Kumamoto Sanctuary.

A snapshot of group of finless porpoise

observed using UAV.

6. Others

I deeply appreciate the PWS, Kumamoto Sanctuary, and WRC for providing the means for me to attend this field project to gain a further knowledge on finless porpoise and learn how to operate UVA for my future studies. I especially thank Prof. Morimura for guiding and teaching me the ways of operating and using UAV in the field.