Background

During 16th June – 29th June 2012, Derek Ho and Bill Ho participated in a 14-day conservation project of Komodo dragon (*Varanus komodoensis*) in Indonesia, through the University Student Sponsorship Programme (USSP), funded by the Ocean Park Conservation Foundation Hong Kong (OPCFHK). We joined the local conservation group, Komodo Survival Program (KSP), to conduct population surveys on Komodo dragon and its prey species in wild environment.

With a maximum body length of over three meters, Komodo dragon is the largest living lizard in the world. It is endemic to Komodo Island, Rinca Island and other smaller islands in Indonesia. Major islands are protected and designated as the Komodo National Park. Our field site, Wae Wuul Nature Reserve, is located on the West coast of Flores, which is the island outside of the Park boundary.

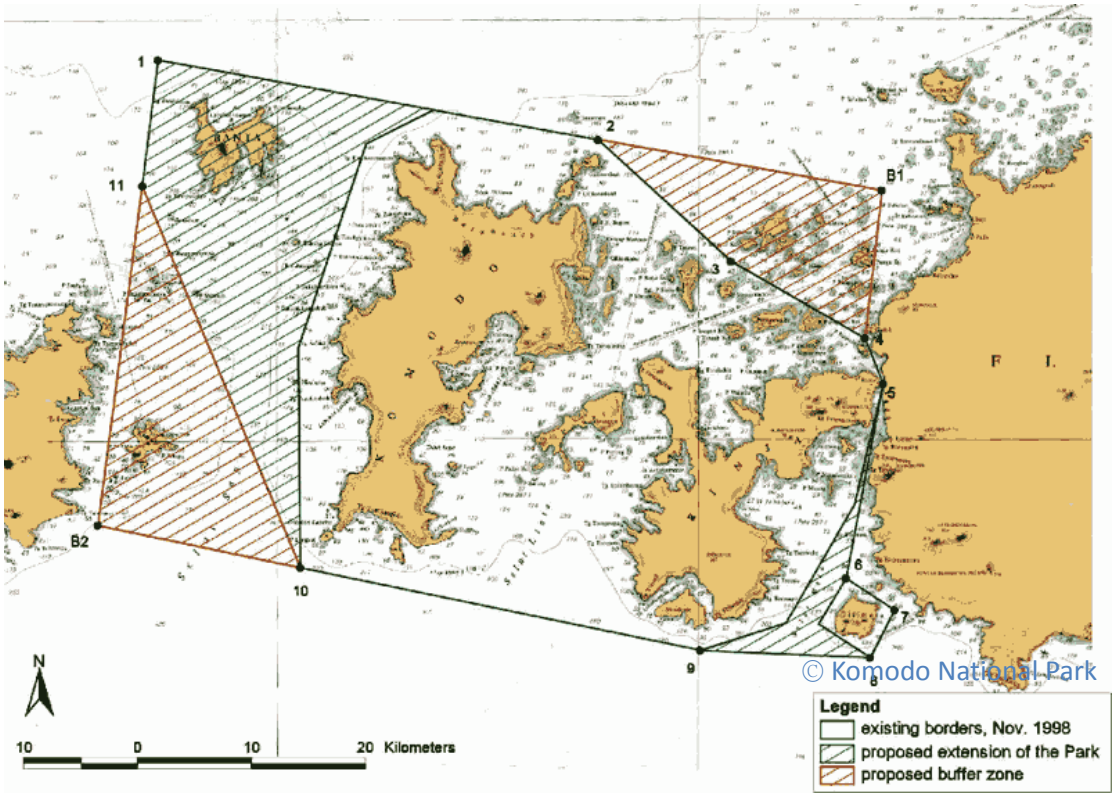

FIG. 1. Flores on the East of the Komodo National Park

Day 1-2 – Logistics

As told by KSP, Wae Wuul Nature Reserve was a challenging field site compared to those in Komodo National Park. This was because of its hilly landscape and logistics was difficult. Indeed, we spent two days carrying the food, drink and equipment to our camp site.

FIG 2. Waiting for the buffalos to carry the food, drinks and equipments

FIG. 3. A child leading the buffalo – he walked with bare foot and did not need a torch at night!

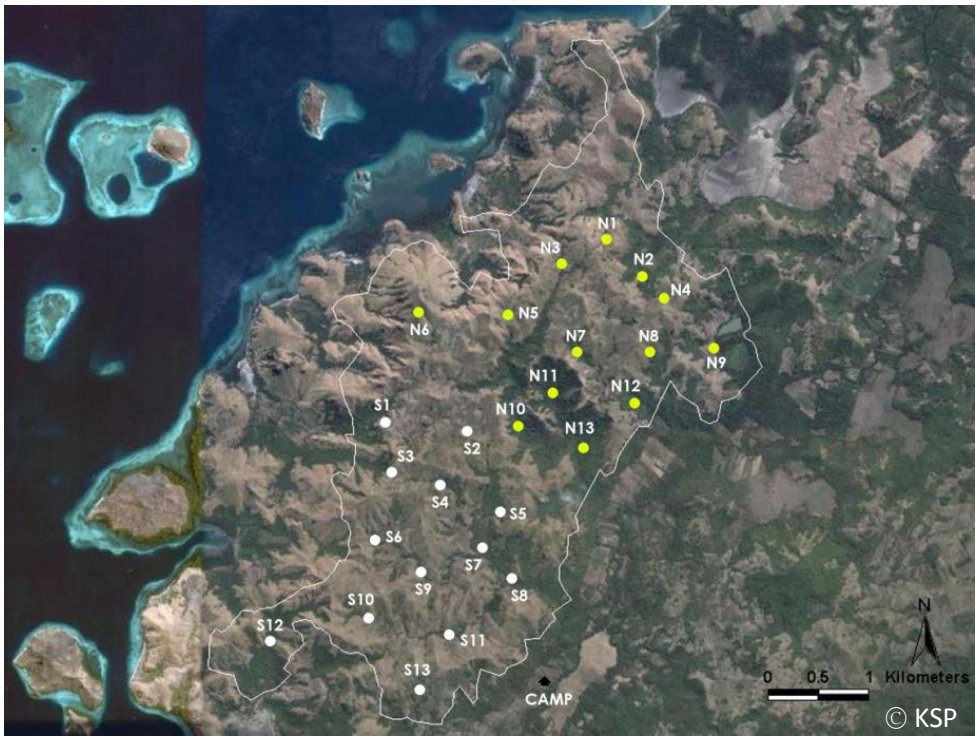

FIG. 4. A Map of the Wae Wuul Nature Reserve; the dots were the locations where we placed our traps; our camp site was at the south of the Reserve

FIG. 5. The post where rangers on duty stayed and where we stayed for the research; the post was originally dilapidated, KSP used part of its funds (from its sponsors from EAZA) to renovate it in 2008.

Day 3-4 – Prey species survey

On the 3rd – 4th days, we undertook prey species survey. The main prey species of Komodo dragon is Timor Deer (*Cervus timorensis*), although Komodo dragon can also take other species such as wild boar and buffalos if possible. The method we used was pellet counts of prey species on line transects. Pellet count is more efficient than direct observation because it does not require expensive equipment (e.g. binoculars) and is less reliant on the skills and attention of researchers. The first survey day, we finished 15 150-m long line transects, and on the second day, we managed to finish the remaining 27 line transects, a number almost double of that on the first day!

FIG. 6. Timor Deer (*Cervus timorensis*) was difficult to observe in the wild and it ran away immediately as it saw us.

FIG. 7. We counted pellets (faeces) within a circle of 1 meter-radius every 5 meters along a line transect; Deni (one of KSP's core members) is using a rope of 1 meter long for pellet counts.

FIG. 8. The faeces of Timor Deer

FIG. 9. Between transects, Achmad (one of KSP's core members) found a non-venomous snake and swiftly caught it for us to take photos.

FIG. 10. We also found the venomous Green Pit Viper (*Trimeresurus albolabris insularis*), closely related to Bamboo Pit Viper (*Trimeresurus albolabris albolabris*) in Hong Kong.

Day 5-14 - trap moving and trap monitoring

After prey species survey, we undertook mark and recapture of Komodo dragon by using baited traps. Typically, we spent 1-2 day(s) moving traps to designated positions of Wae Wuul Nature Reserve and three following days checking the traps. After three days of monitoring, the cycle repeated such that we moved the traps to other locations (1-2 days) and carry out the monitoring (3 days). The use of traps increased the chance of capture because Komodo dragon was secretive – the young dwell on trees while adults take shade in forests. An infrared camera was set besides each trap to detect any Komodo dragon passing (e.g. which may take the bait at the front section of the trap without entering the trap). On average, we walked about 15km each day in order to monitor the traps.

We had to monitor the traps once in the morning and once more in the afternoon. So we had quite a lot of time to interact with locals and even learnt to do some "craftwork" during the long lunch break (typically 1030-1330)! We also fit in with the local culture quickly. Besides learning Indonesian, for example, we woke up day by day from 6:30am at the beginning and shifted to 4:00am at the end just to have a cup of hot coffee or tea cosily before we started our busy day!

FIG. 11. Moving traps; each trap was composed of three trap sections, each weighing around 8-13kg.

FIG. 12. Achmad is setting an infrared camera; the trap was set under the shade of trees to prevent overheat of captured Komodo dragon.

FIG. 13. Derek is walking on the grassy savannah.

FIG. 14. Bill is trekking through the collapsed bamboo forest.

FIG. 15. During the break between the morning and afternoon monitoring of traps, a villager taught us how to make a basket using palm tree leaves.

FIG. 16. One such basket took us 2 hours to complete, although the villager could complete it using half an hour!

FIG. 17. Our chef, Jecko, not only cooked well but was also keen to teach us Indonesian words of common food.

Findings

During the 6 days of trap monitoring, we captured in total 3 Komodo dragons, with one being new capture and one about 2m long! According to Deni and Achmad, the highest record they could capture was as many as 13 individuals in one single day in Komodo Island, which is within the Komodo National Park. The number of captured dragons in the previous two years was 14 and 17. Therefore, 4 Komodo dragons (one more capture by KSP after we returned to Hong Kong) this year might reflect that the dragons were trap-shy (some dragons passed by the trap without entering the trap and were recorded by the infrared camera); more data will be required to understand the population density. Still, we were super excited about the sight and even touch of a wild Komodo dragon!

FIG. 18. Our first Komodo dragon captured – a juvenile recapture which was about 1.3m long and weighed 3.1kg.

FIG. 19. Our second Komodo dragon captured – an adult recapture of about 2m long and 23.1kg. It required at least three people to pull it out of the trap and tied it up for measurement of body parameters.

FIG. 20. Our third Komodo dragon – a new juvenile capture which was 1.1m long and weighed 1.9kg. A PIT (Passive Integrated Transponder) tag the size of a grain of rice was inserted into its thigh to give it a permanent identity.

FIG. 21. Water Monitor (*Varanus salvator*) is sometimes attracted to the baited trap as well.

FIG. 22. A photo taken by an infrared camera – A Komodo dragon attracted by the smelly baits but it was too shy to enter the trap to eat the third bait (at the other side) which triggers the closure of the trap door.

FIG. 23. A family photo!

Threats to Komodo dragon

Deni, the coordinator of KSP, told us that villagers in general respect and even fear Komodo dragon so they do not kill the dragon. It has been a taboo on the hunting of Komodo dragon on Komodo Island in particular because of the belief that Komodo dragon is the reincarnation of their relatives. However, the threats to Komodo dragon should not be overlooked, especially in Flores, outside the boundary of Komodo National Park.

In Flores, with the expansion of human settlements because of growing population, logging of trees and burning of savannah for slash-and-burn agricuture have been continuous threats to Komodo dragon. Although two reserves – Wae Wuul Nature Reserve on West Flores (~1500ha) and Wolo Tado Nature Reserve on the North Flores (~ 4000ha) have been set up, the areas covered are small. The reduction in forest coverage means shrinkage of habitat for Komodo dragon, which dwells in trees when young and takes shade under trees during adulthood. Also, its key prey species, Timor Deer, has been scarce due to poaching. The threats were more alarming outside Reserve, beyond which Komodo dragon are not protected by rangers' regular patrol. In Wae Wuul Nature Reserve, feral dogs have become pests and compete with Komodo dragon for prey by chasing Timor Deer and other prey species. They are also attracted to the baited traps intended for capturing Komodo dragon.

FIG. 24. Burning of savannah observed in Wae Wuul Nature Reserve

FIG. 25. A photo taken by an infrared camera – a feral dog was attracted by the bait (goat meat). Its entry into the trap undermines our effort to capture the targetted species, Komodo Dragon.

Conservation of Komodo dragon

Wild Komodo dragon now only lives on five islands – Komodo, Rinca, Gili Dasami, Gili Motang and Flores. In Indonesia, Komodo dragon is protected by law and within Komodo National Park, which was established in 1980 to conserve this charismatic species on Komodo, Rinca, Gili Dasami and Gili Motang islands. Internationally, with a wild population estimate of around 3000-4000, it is classified as “vulnerable” on the IUCN Red List and now listed on Appendix I of CITES.

To better devise conservation strategies on managing Komodo dragon population, sound information about the biology, ecology and population dynamics of Komodo dragon is indispensable. Komodo Survival Program (KSP), established in 2007, is the only Indonesian-based non-profit organization invovled in the study of the ecology and population biology of Komodo dragon. It also provides training to rangers and local villagers on the simple population monitoring tools, general aspects and conservation measures of the Komodo dragon. However, its running relies on the continuous support from international sponsors such as the Association of Zoos and Aquariums and Ocean Park Conservation Foundation.

Besides funding the research into Komodo dragon, it may be beneficial for sponsors or government bodies to send their personnel to get engaged in the field work so that they know more about the difficulties and progress of the project, and help spread the message to conserve Komodo dragon. Surely, as a member of the general

public, we can get to know more about Komodo dragon through different channels such as reading news and even visiting the Komodo National Park. A higher public awareness can draw more attention onto this umbrella species, thus contributing to the conservation of not only Komodo dragon, but also its habitats where numerous other species inhabit.

FIG. 26. Achmad is hanging up a banner to promote the conservation of Komodo dragon in Wae Wuul Nature Reserve

Feedback

We were very honored to be selected by OPCFHK to take part in this meaningful project. We do admit that this trip was physically challenging - walking about 15km a day, trekking through the collapsed bamboo forest, climbing steep savannah in the blazing sun, heading sloppy downhill with each step obscured by tall grass… However, it was surely a rewarding trip! It was cool to be able to see and even touch the awesome Komodo dragon. Also, KSP staff, rangers and local villagers were very welcoming and nice - we learnt a lot about the general aspects of Komodo dragon, sampling techniques as well as the local culture (their religions, food, languages etc.).

In the course of discussion with Dr. Claudio Ciofi and Dr. Tim Jessop, who are the KSP's scientific advisors, we learnt more about the ecology of the dragons and how to

put what we've learnt into practice. Sometimes we might have to change our strategies and efforts in face of different situations, for instance lengthening the monitoring time to allow the dragons to get into the traps since they were becoming a bit trap-shy. The experience would be important for us when we carry out conservation work in any other projects.

Also, we are deeply impressed us was KSP's dedication to the conservation of Komodo dragon. Deni and Achmad, who started studying Komodo dragon in 2001 and 2004 respectively, are the only two core members of KSP. We are amazed that the small two-person organization can do big! They have been contributing to continuous monitoring of population of Komodo dragon for about 10 years in about 10 sites in Komodo National Park by conducting mark and recapture. They also train the local expertise e.g. the rangers and organize awareness campaign in collaboration with local government. They admitted that they normally spend about half of their year in field, with each field study about 2-3 weeks. They need to work in the office between each field trip. So they sacrifice much of their time with family. Still, they would like to expand their research into Flores, where Komodo dragon populations are less well studied. In Hong Kong, it is not uncommon that we spend the day in field and after that, we can still go home, drink soft drinks, have dinner with our family, and connect with our friends via the Internet etc. Working with them has made us realize that we are "privileged" and we can do far more to conserve our biodiversity in Hong Kong!