Final Report

The small-clawed otter (*Aonyx cinerea*) in a human-disturbed landscape: home range and conflict with fish farmers

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Leader:

Aadrean

Team members:

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6 June 2017

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Persons

- Nisikawa Usio. Kanazawa University. Supervisor of Aadrean
- Wilson Novarino. Andalas University. Lent us two camera traps. Supervisor of Mahfud Huda,
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- Hidayat Sutrisman. Fish farmer group Taruko Jaya
- Ahmadin. Coordinator of field staffs of Fishery department Padang Pariaman regency

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General Introduction

Otters are top predator in wetland habitat. Otters have important role in wetland. As top predator, they has function on controlling prey population. Otters also forage on invasive species, such as fish (Porciuncula & Quintela, 2010), crab (Weber, 2008), and snail (Aadrean, Novarino, & Jabang, 2011). Otter has function as nutrient cycle (Ben-David, Bowyer, Duffy, Roby, & Schell, 1998). Indicators of wetland health, when DDT pesticide was used intensively in Europe and North America, most otters nearly disappeared (Macdonald & Mason, 1994). This animal can be used as a flagship for wetland management and conservation.

However, otters faces many problematic threats. Rivers and water systems in Indonesia are contaminated by heavy use of pesticides in agriculture, the dumping of toxic wastes from factories, and domestic wastes and detergents from human settlements. This contamination appear as severe threats to the entire aquatic food chain, including otters. In addition, the draining of wetlands in Sumatra and Kalimantan for agriculture and human settlement destroys important otter habitats and results in a decline in prey species (Pat Foster-Turley, Macdonald, & Mason, 1990).

Among all 13 species of otter in the world, there are four species of otter in Sumatra: *Lutra lutra*, *L. sumatrana*, *Lutrogale perspicillata*, and *Aonyx cinereus* (Corbet & Hill, 1992). The first two species are protected by Indonesian law, law no 5 year 1990. However, small-clawed otter (*Aonyx cinereus*) is not protected yet.

Small-clawed otter is the smallest otter species in the world. IUCN registered this species as Vulnerable species in their RedList. Although famous in Zoo (Wright, 2003), information about its basic ecology in the wild is largely lacking. This species inhabits various types of inland waters including rivers, stream, peat swamps, brackish waters, coastal areas, and human-made wetland habitats such as rice fields (Hussain, Gupta, & DeSilva, 2011).

Based on published paper, small-clawed otter occurrence in rice field were recorded in Malaysia, Thailand, Philippines, and Indonesia (Aadrean, Salmah, Salsabila, Rizaldi, & Janra, 2010; Patricia Foster-Turley, 1992; Gonzales, 2010; Kanchanasaka & Duplaix, 2011), and were reported used rice field as latrine-site. Study of small-clawed otter in irrigated lowland rice field in Indonesia has been initiated since 2008 (Aadrean et al., 2010), with some records on latrine-site occurrence. In 2010, research continued (Aadrean, 2011), and found that this species foraged on pest species golden apple snail and use rice field as latrine-site.

Records of small-clawed otters in rice field suggested the opinion that this species may survive in human-disturbed landscape. However, we don't have enough data to judge this statement. Based on this background, we conducted a project in human-disturbed landscape to explore habitat use, home range and conflict of this species. We performed the following activities: social surveys, latrine-site surveys, radio telemetry, camera trapping, education projects.

Study site

This project was conducted in landscape of Batang Anai river, Padang Pariaman regency, West Sumatra, Indonesia (Fig. 1). Batang Anai river lays along 46 Km from mountain, pass through 13.640 Ha agriculture area, human settlement and coastal area as a contiguous landscape. Gravel mining in upside and sand mining in downside was common in this river. Rain highly affect the river. Water level fluctuate as soon as rain fall. This river and its tributaries cover many type of habitat from protected (Lembah Anai Nature Reserve) in upper area to human disturbed area in lower area. In this project, we mainly focused on rice field irrigated by Anai-dam as example of human-disturbed landscape.

The rice fields have planting-cycle 2 – 3 times a year. Farmers may start their farming cycle anytime. In consequence, we may find different planting cycle in the landscape. Owners of rice field are individual farmers, there was no corporate rice field. Farmers used chemical pesticide and artificial fertilizer, with some of them used organic fertilizer or mixed with artificial one. Farmers used simple plow machine only. Planting, harvesting, fertilizing, other activity was conducted using human labors. There were several major pests: rats, planthoppers, golden-apple snails, and birds (Estrildidae and Ploceidae). Recently, rice field area has been decreased, particularly in lower part, converted to be corn plantation, palm-oil plantation, and human settlement.

The study site laid on tropical climate region without significant seasonal variation. Based on climate data extracted from BPS-Statistics Indonesia (year 2010-2013), Padang Pariaman regency has average temperature 25.39°C (22.7 – 27.3°C), average humidity 86.95% (82.3 – 91.2%), and average of monthly rain fall 372.3 mm (138.0 – 853.2 mm) (Fig. 2).

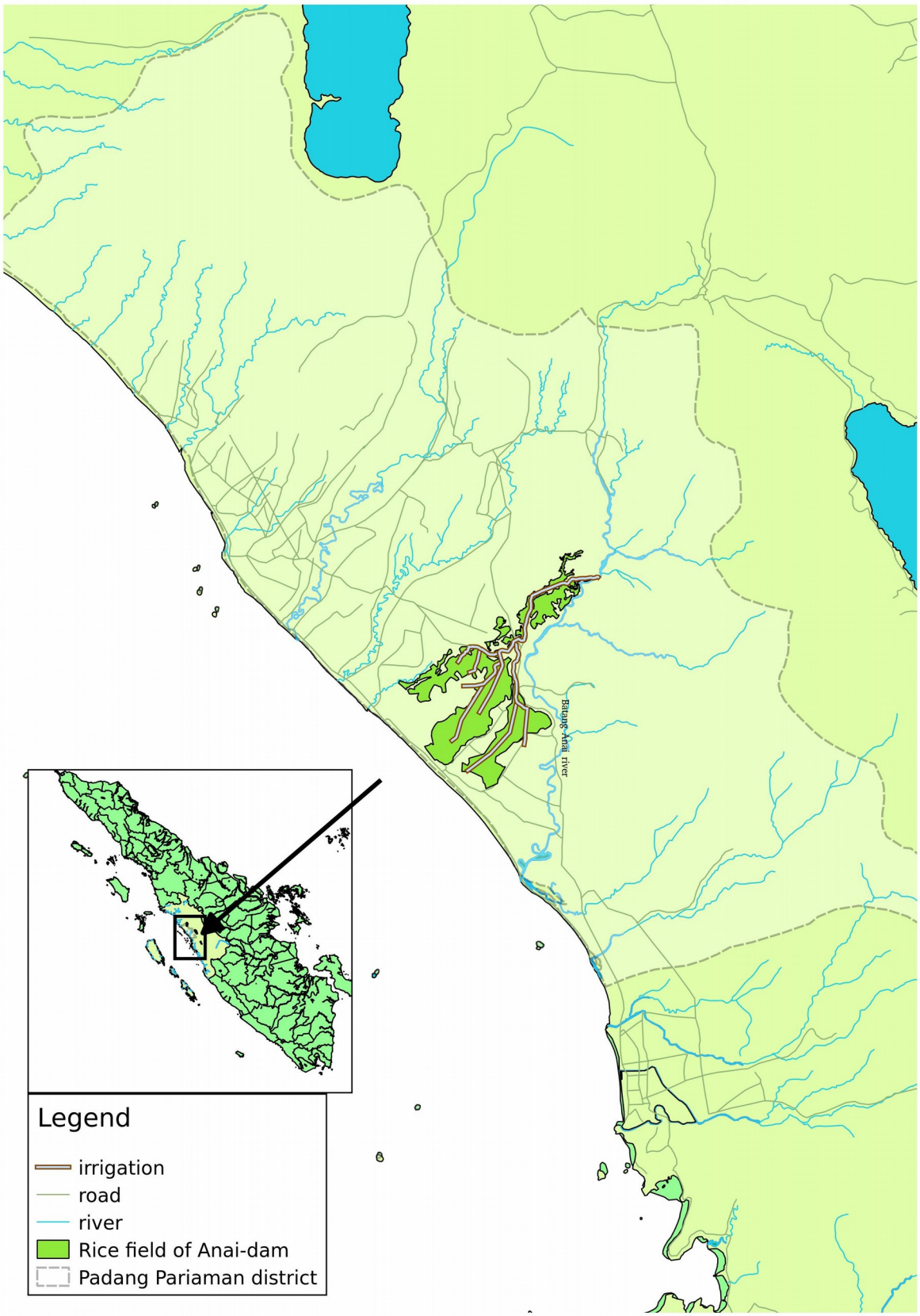

Fig. 1: Map of study site

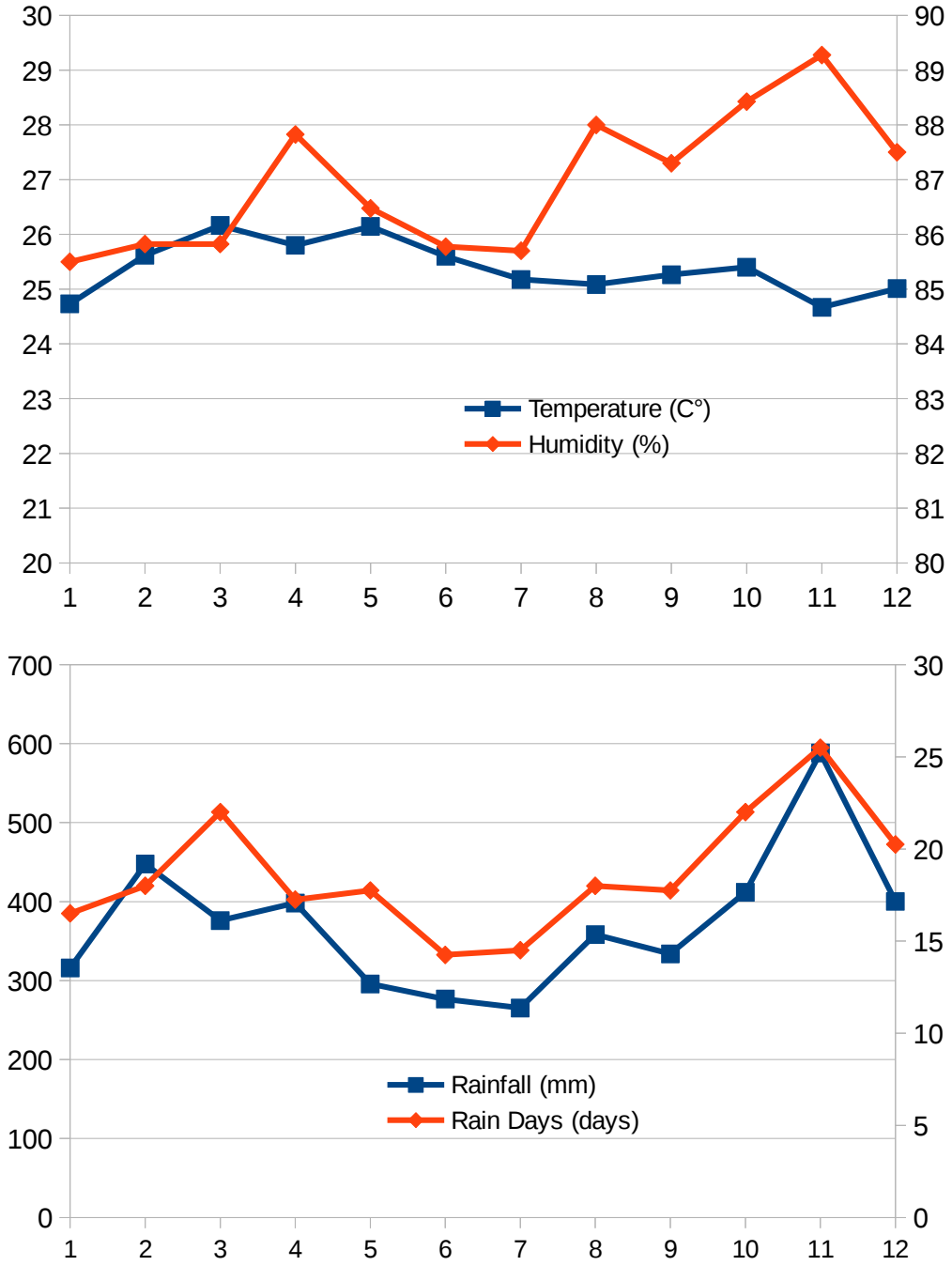

Fig. 2: Climate condition of Padang Pariaman regency. Average of data from 2010 to 2013. Source: Book of "Padang Pariaman in figures", 2011, 2012, 2013, 2014.

Small-clawed Otter and Fish Farms in Padang Pariaman regency

Background

Conflict between otter and fish farmer become common phenomenon in Europe (Poledníková, Kranz, Poledník, & Myšiak, 2013). In our study site, otter was regarded as pest by fish farmers. But, when we requested data to fishery department of Padang Pariaman regency, record of the otter conflict was unavailable. In this study we want to collect and quantify data on conflict of otter and fish farmers.

Methods

We provided questionnaires (Appendix 1 and 2) to field staff of fisheries department of Padang Pariaman regency. There were approximately 100 groups of fish farmers. This group is called as “Pokdakan”, as abbreviation of Kelompok Pembudidaya Ikan (group of fish farmer).

We requested field staffs to distribute the questionnaire when they visit each Pokdakan. Some of the Pokdakan were no more active recently. We got only 52 Pokdakan returned the questionnaire.

We questioned fish farmers on:

- their knowledge on otter species
- how frequent otter visited their fishponds?
- what they do to protect their fishponds?
- if otter is killed or trapped, what will they do next?
- suggestion to fishery department and university

We also wanted to know their perception on otters. We asked their opinion in Likert scale 1 to 5. from highly disagree to highly agree for the following statements:

- otter is pest species on fishery
- if otter extinct, profit of fishery business will be increased
- if otter extinct, river quality will be decreased
- otter as indicator of healthy river
- otter can survive although in human-disturbed landscape

- otter should be protected

We also asked their willingness to do otter-friendly fish farming system

- Do you agree we need to make fish farm system that economically benefit and safe for otter (otter-friendly farming)?
- Would you want to use otter-friendly fish farmer system?
- Do you agree to not kill otter while they come to the fishpond?
- Would you spare your fishpond or water area unprotected, then leave it for otters?

Results

Based on our questionnaire, we found 63.46% of Pokdakan's fish ponds have been visited by otters. Only 18.18% of visited-fishponds have been visited by otters recently (in 1 month ago) (Fig. 4).

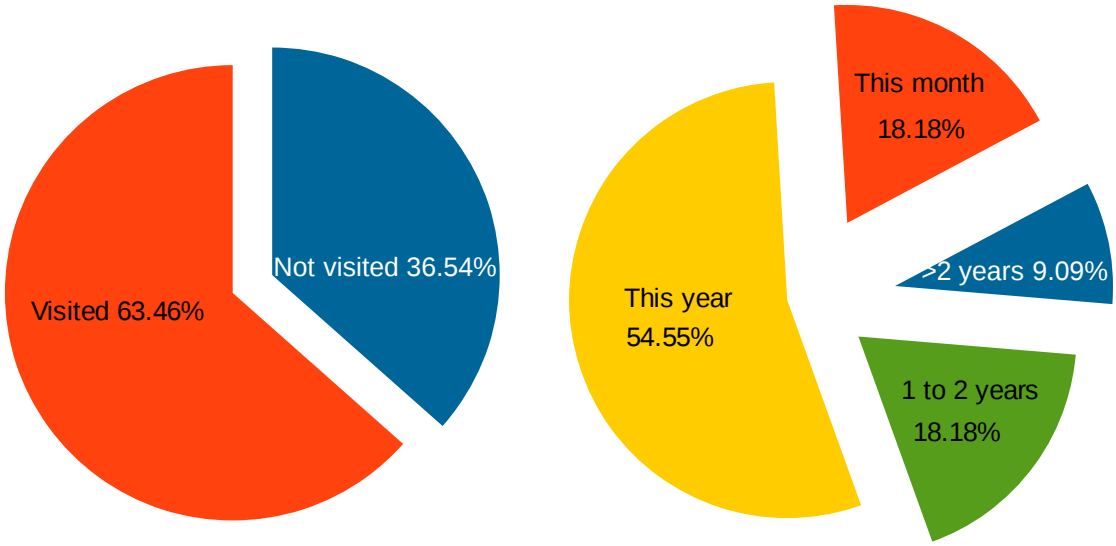

Fig. 3: Left: otter visitation to fish ponds. Right: last otter visitation

Otter come from afternoon to early morning. Most visited-time is in midnight. Interestingly, fish farmers said that, 68.42% otter come to fishponds related to rain condition (Fig. 4).
Fish farmers believe that number of otter visitation to their fish pond was increased (Fig. 5)

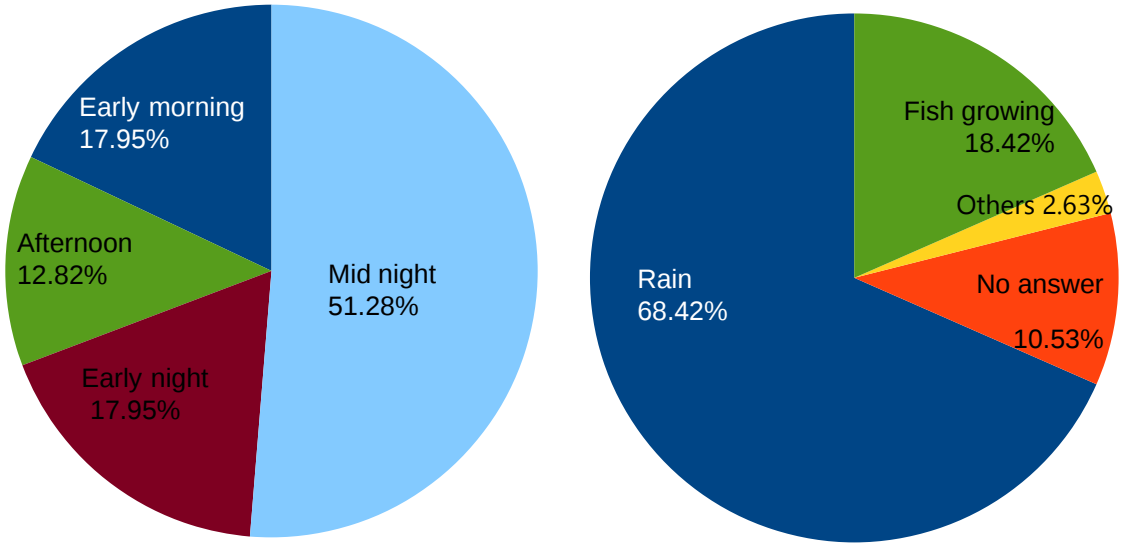

Fig. 4: When otters come to fishponds? Left: daily time condition. Right: environmental condition

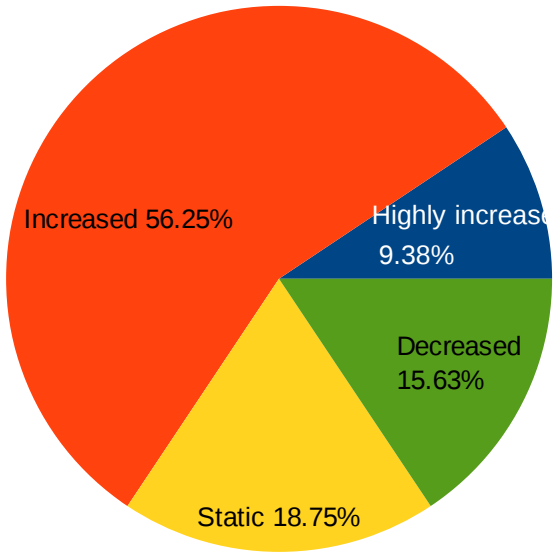

Fig. 5: Trend of otter visitation based on fish farmers' opinion

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For more detail results and discussions, we will compile it as a research article.

Latrine site characteristic and visitation rate

Backgrounds

Latrine-site were a common place to study ecology of many Mustelid species; polecat, minks, marten, badger and otter (reviewed in Hutchings and White (2000). Latrine sites are used to communicate and territory marking. Although semi-aquatic animal, otters have latrine-site on conspicuous places on dry ground (Kruuk, 1992). This distinct feature promoted latrine-site survey to be a standard method for survey of otter occurrence (Reuther et al., 2000). Because of high visitation on the site, latrine-sites were also used as place to trap otter (Blundell, Kern, Bowyer, & Duffy, 1999), to set up camera trap (Day, Westover, Hall, Larsen, & McMillan, 2016), place to collect non invasive DNA matter extracted from feces, and the best place to collect hair using hair trap (Johnson, Hodder, & Crowley, 2013).

To explain otters and habitat relationship, many studies analyzed latrine-sites in both spatial and temporal aspects, as been applied for river otter (Crowley, Johnson, & Hodder, 2012; Olson, Serfass, & Rhodes, 2009), Eurasian otter (Prenda & Granado-Lorencio, 1996), Neotropical river otter (Carrillo-Rubio & Lafon, 2004), smooth coated otter (Shenoy, Varma, & Prasad, 2006), and small-clawed otter (Perinchery, Jathanna, & Kumar, 2011). The researches revealed important factors for otter occurrence such as vegetation cover, lack of human disturbance, fish availability, water depth, sand and rock for grooming, stream order and altitude. Although surveying spraint (otter scat) in latrine-site was regarding as “old style method”, recently there was a new insight that proposed mucus occurrence in latrine-site as indication of status of food availability (Roberts et al. 2016).

Study of small-clawed otter in irrigated lowland rice field in Indonesia has been initiated since 2008 (Aadrean et al., 2010), with some record on latrine-site occurrence. In 2010, research continued (Aadrean, 2011), and found that this species foraged on pest species golden apple snail and use rice field as latrine-site. Interestingly, several old latrine site still occupied. In order to give new insight on how otter use their latrine site, we need to monitor visitation of small-clawed to their latrine site.

Methods

Occurrence of latrine-site in this study site were already studied in 2008 (Aadrean et al., 2010), and 2010 (Aadrean, 2011). In addition to previous data, we re-survey them and searched more latrine sites in February to April, and August to September 2015, following previous method by walking along ditches and levees. There are total 40 latrine-sites, including latrine sites of previous study. Habitat of several latrine-sites have been changed, converted to dry land such as; palm oil plantation, shrubby area and road.

To record otter visitation data, we surveyed 25 latrine-sites weekly for one year, from April 12nd 2015 to April 10th 2016, for total 53 weekly data. We recorded presence of new spraint (otter scat). To make sure the spraint is new, we collected and removed old spraint when we visited them. In addition, in the nearest rice field, we recorded planting cycle condition, water depth of nearest rice field, and weight of golden-apple snail in small plot 20 cm x 200 cm.

Results

After we monitored weekly for a year, we found that maximum visited-week is 29 (or 54.72%) (Table 1), with average for all latrine-site is 11.88 (or 22.42%) visited-weeks. One old latrine-site was not used by small-clawed otter anymore. In addition, four old latrine has only one visited-week in a year.

Long-time use of latrine-site was recorded in this study. At least, 10 from 13 of the 2008's latrine-sites and 7 from 14 of the 2010's latrines-sites still be used until recently. There is no significant difference number of otter visitation based on year of first found (Kruskal-Wallis rank sum test, $p = 0.70$ (Fig. 7)

Results of this topic have been submitted as a research article to Ecological Research, entitled "Small-clawed otters (*Aonyx cinereus*) in Indonesian rice fields: latrine-site characteristics and visitation frequency". Authors of the article are Aadrean and Nisikawa Usio.

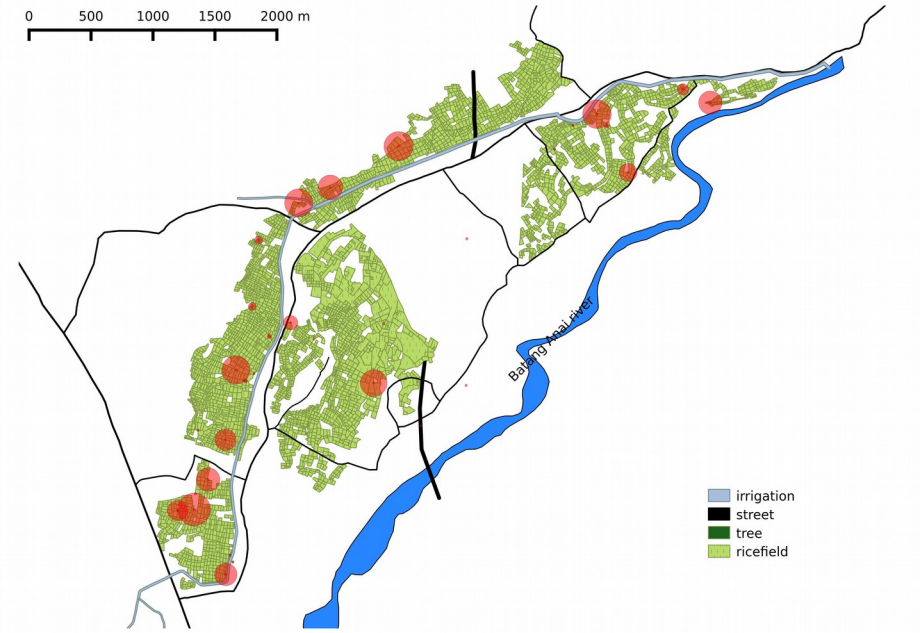

Fig. 6: Visitation rate. Red circle is position of the latrine-sites. Diameter of circle shows visitation rate, bigger circle means more visitation rate

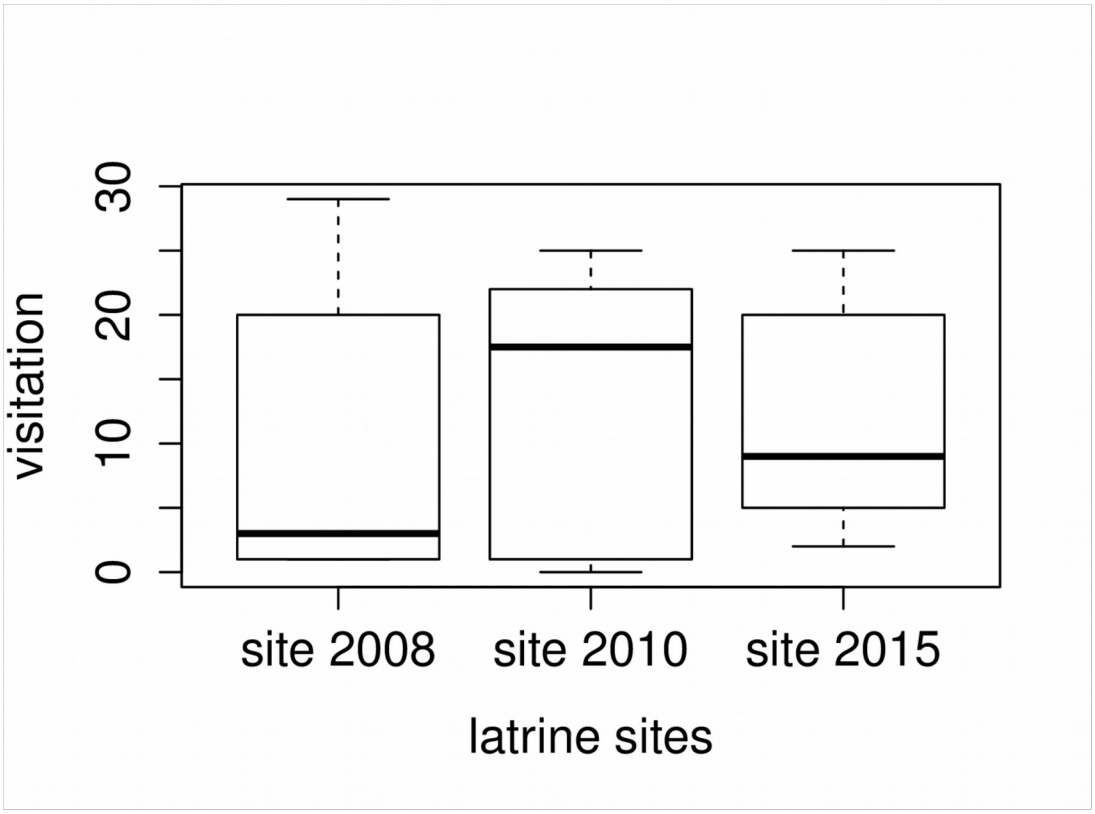

Fig. 7: Boxplot of visitation between year of first-found. There was no significant difference in the number of otter visits between the site 2008, 2010, and 2015 (Kruskal-Wallis rank sum test: p = 0.70

Table 1: Latrine-site condition based on year-of-discovery (2008, 2010, 2015), and number of otter visitation

Site	Year of discovery			Visited-week
	2008	2010	2015	
LS1	✓		✓	2
LS2	✓		✓	1
LS3	✓		✓	20
LS4	✓	✓	✓	29
LS5	✓	✓	✓	20
LS6	✓		✓	1
LS7	✓		✓	4
LS8	✓	✓	✓	23
LS9	✓			*
LS10	✓			**
LS11	✓			**
LS12	✓		✓	1
LS13	✓		✓	2
LS14		✓	✓	17
LS15		✓		0
LS16		✓	✓	22
LS17		✓	✓	25
LS18		✓	✓	**
LS19		✓		*
LS20		✓		**
LS21		✓	✓	1
LS22		✓	✓	18
LS23		✓		**
LS24		✓	✓	**
LS25		✓		*
LS26		✓		*
LS27		✓		*
LS28			✓	5
LS29			✓	2
LS30			✓	24
LS31			✓	7
LS32			✓	25
LS33			✓	9
LS34			✓	20
LS35			✓	4
LS36			✓	15
LS37			✓	***
LS38			✓	***
LS39			✓	***
LS40			✓	***

Otter visitation is a number of weekly survey that found new spraint in the latrine-site
* = habitat was changed, excluded from the analysis
** = out of map coverage, excluded from the analysis
*** = analyzed in occurrence model only, no enough data in otter visitation

Telemetry studies on small-clawed otter

Introduction

Data on home range of the animal is needed for conservation of wild life. Such kind of data is very important to describe relationship between species and habitat. Home range for several species of otters are already available. However home range of small-clawed otter is still unknown to date.

In this study, we tried to assess home range of small-clawed otter using radio telemetry. This is the first effort of using telemetry for small-clawed otter. This is also the first effort of using telemetry for otter in Indonesia.

Otter Trapping

Trapping effort

In this study, we used two type of traps; leg hold traps and box traps. Leg hold has two variants; one spring and two spring (Fig. 8). Box trap also has two variants: wired-box trap and wooden box trap (Fig. 9). Leg-hold traps were failed to trap otter for several time. Wired box trap was not suitable for otter (Fig. 10), the animal could broke the wire.

We have conducted total 355 night traps as trapping effort (Table 2).

Table 2: Trapping effort

Trap type	Efforts
Leg hold trap	252 night traps
Wired box-trap	12 night traps
Wooden box-trap	91 night traps

Fig. 8: Leg-hold trap. Above: product picture from Sakae industry in amazon.co.jp. Below: trap condition in the field

Fig. 9: Wired-box trap, and wooden box trap. Above: showing structure of the traps. Below: trap condition in the field.

Fig. 10: Trap failed to get otter. Left: some hairs of small-clawed otter remain in leg hold trap. Right: the otter broke the wire and escaped

Trapped individual and transmitter installation

We got two individuals (Table 3). First individual (M1) was trapped using leg hold trap. The trap caught left arm of the M1. We released the trap and put the M1 in cat cage. We brought to to animal clinic using car. In the animal clinic, veterinarians started to implant transmitter. Unfortunately, the animal was died on surgery table. While the veterinarians were closing the surgery, hear beat suddenly stopped (Table 4). After this incident, we made a post-mortem review. We found several injuries in arm, teeth and chin because of high effort of the animal to escape from the trap (Fig. 13). Actually, the injuries was not so severe. The veterinarians conclude that death was caused by high level of stress. High level of stress could explain why the heart beat was suddenly stopped.

Because of the death case, we decided to avoid leg hold trap. We constructed box trap. Using the box trap we got second animal (M2). The M2 was installed implant transmitter successfully. After installation, veterinarians stated that the M2 was in good conditions.

Fig. 11: Trapped individual. Left: M1, after died on surgery table. Right: M2, trapped in wooden box trap.

Table 3: Data of trapped-otters

Date	Name	Sex	Weight (Kg)	Total length (cm)	Tail length (cm)	Dental formula
2016-03-04	M1	Male	3.01	73	28,5	3 1 2 2 3 1 2 3
2016-08-15	M2	Male	2.6	68	24	

Table 4: Chronologies of transmitter installation

M1		M2	
Duration	Steps	Duration	Steps
~ 09:28	Transport, keep in pet box	~ 13:22	transport and keep in box trap
09:28 – 09:37	sedative	13:22 – 13:24	Sedative
09:37 – 10:03	anesthesia	13:24 – 13:31	anesthesia
10:03 – 11:00	surgery	13:31 – 14:02	surgery
10:43	Implanting transmitter	13:42	Implanting transmitter
10:50	Heart beat stop / coma	14:02	Surgery finish
10:55	Injecting epinephrine	14:02 – 17:15	Rest in box trap
11:00	Declare dead	16:45 – 18:20	Transport to release site
13:00	Sent to Museum of Zoology	19:38	releasing

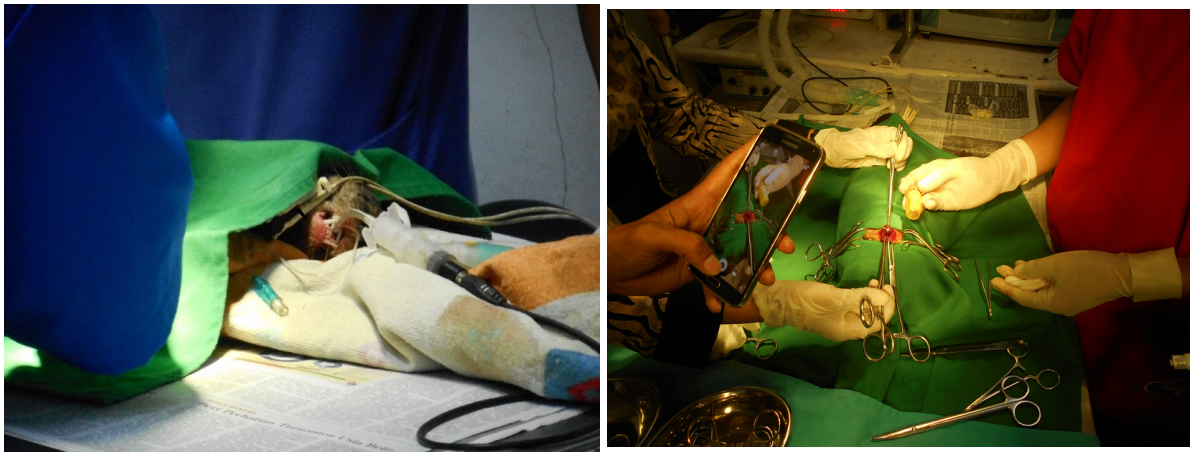

Fig. 12: Installing transmitter

Fig. 13: injuries of M1, Left: wound in left fore arm, no fracture. Center: broken lower premolar. Right: wound between neck and chin

Releasing the otter

After we installed the transmitter successfully inside M2 body, we released back the animal to its latrine site in early night. We recorded releasing process in a video. The video available in YouTube https://www.youtube.com/watch?v=59YTHuxOd6w.

The M2 ran to a shrubby abandoned-fishpond. We assumed that there is temporary holt available in the area.

Radio Tracking

We tracked the M2. Unfortunately, we could track it for two days only. After release, the animal hid in shrubby abandoned fishpond. In the midnight, we could track it. The M2 was still in same site. In early morning, we still recorded signal in same position. After we got three direction for triangulation, the signal lost. We tried to search around, but still undetected. We assumed that, the animal hid to deep holt because sunrise coming.

In second night, we could track it again. We recorded that the animal moved about 120 m down following the rice field ditch (Fig. 14). However, when we check to the source of signal, we could not get any signal again. This record is our last record. We have tried our best effort to find it. We searched four times a day for a week, and after that every week (Appendix 3). But, the animal was still lost.

We assume that there are three possibilities:

- The animal still alive, but battery is emptied
- The animal still alive, but go far away
- The animal was died in deep hole or drift away to river

Fig. 14: Map of movement

Fig. 15: Otter tracking in the field

Camera trapping of small-clawed in rice field

Backgrounds

Although famous in zoo, ecological information of small-clawed in natural habitat is lacking. Information on activity patterns of small-clawed otters in their latrine site still unavailable to date.

Currently, camera trapping is the common method to record animal occurrence and activities.

Methods

We used camera trap to record activity of small-clawed otter in their latrine site in rice field landscape. From July to September 2016, we set two camera traps, one camera trap in each LS4 and LS17. After project extension, we set three camera traps from November 2015 to June 2017, one camera trap in each LS4, LS17 and LS30. We selected the three latrine sites, because the latrine sites were the most visited latrines based on a year weekly monitoring.

Results

After rapid check to thousands images and videos, we found up to 10 individuals recorded in one frame of image of video. The animal mostly visit latrine site in night (nocturnal). We recorded scent marking activities, such as “sprainting dance” and rubbing their body on coconut trees. We found also juveniles. Example recorded images in Fig. 16. Example video showing juvenile and big family: https://www.youtube.com/watch?v=CFllJQDwaic. We also got pictures and videos of farmers and other animals. We will analyze the images and videos.

Fig. 16: Example pictures recorded by camera traps

For more detail results and discussions, we will compile it as a research article.

Home range of Small-clawed Otter: Synthesis and hypothesis

After we conducted telemetry project, unfortunately we could not successfully record movement of small-clawed otter. Based on this result, we could not measure home range and territory of the animal.

Using data of latrine-site monitoring, we found two type of latrine sites; latrine sites that have more than 15 weekly-visitation, and latrine sites that have less than 10 weekly-visitation. Furthermore, we installed camera traps in the most visited latrine sites.

Using data of latrine-site monitoring and camera traps, we propose following hypothesis and future analysis to reveal home range of small-clawed otter:

- There are two type of latrine sites; main latrine sites and transit-only latrine sites
- There are more than one group in our study sites. This hypothesis will be proven if we found two groups recorded by camera traps in same time.
- Weekly-survey of latrine-sites can be used to estimate home range of otter. This statement can be realized if data of long time monitoring is analyzed using current and newest computation method, such as machine learning. We are inviting scientists to make collaboration and solve it.

We have collected the data. We will analyze it.

Education and Conservation Activities

1. Presentation: Lecture on Otters' Biology

We managed a short lecture for fish farmers, in 10 September 2016, in hall of fishery department. The department provide us this room. The short lecture was attended by fish farmers and field staff of fishery department.

We explained biology of otters in Indonesia, and more about small-clawed otter. We also explained what we have done for research and conservation activities. We invited the participant to give more respect to otters,

Fig. 17: Presentation lecture on biology of otters

2. Focus group discussion

In the afternoon, we conducted Focus Group Discussion among fish farmers. Field staffs from fisheries department also attended this event. We collected all of available methods on how to protect fish ponds from otter. Then, we determined the best way on how to protect fish pond from otter. We gave score to each method in three aspects; effectivity, money efficiency, and

otter safety. We used Likert score from 1 to 5; higher number is the best score. We collected various methods, from scientifically sound methods to myth-like methods (Table 5).

Fig. 18: Focus Group Discussion on method how to protect fish ponds

Table 5: List of methods to protect fishponds, and score of effectivity, efficiency and otter safety

methods	effectivity	efficiency	otter safety
Create wall and fences	5	1	5
Install metal grating in water intake and water output	3	2	5
Provide enough light and lamp	5	4	5
Protect by guard dog	5	4	5
Plant spiny pandan around the ponds	3	5	5
Bury dead black cat in pond’s bank	4	5	5
Plant lemon grass around the ponds	1	5	5
Put twigs and branches of bamboo inside ponds	5	5	5
Direct protection, by human	5	1	5
Make a noisy sound	5	2	5
Create barrier using net	3	2	5

Using thread net in upper surface of the pond	1	2	5
Air shotgun	5	2	1
Provide special ponds for otter	5	1	5
Electric fence	5	4	5
Using guard geese	5	5	5
Keep water depth more than 60 cm	5	5	5

Based on this discussion, we determined the following methods as the best methods:

1. for large scale, intensive fish ponds
    - create wall surrounding fish pond areas. The wall prevent the theft from human as well
2. for small scale business
    - provide light
    - guard dog protection
    - keep water depth more than 60cm
3. for traditional family fishponds
    - put twigs and branches of bamboo inside the pond. Otters will find it difficult to catch fish

3. Leaflet “How to protect fish ponds from small-clawed otter”

Based on best methods from FGD, we designed a leaflet on how to protect fish ponds from small-clawed otters. There are two version of this leaflet; Bahasa version and English version. For Bahasa version, we printed and distributed them to fishery department and fish farmers.

In addition, we also shared both version as online version in in website http://berang-berang.com and Facebook page of Supportive Environments for the Region’s Otters (SERO), http://www.facebook.com/seroberangberang. We will share it to various social media.

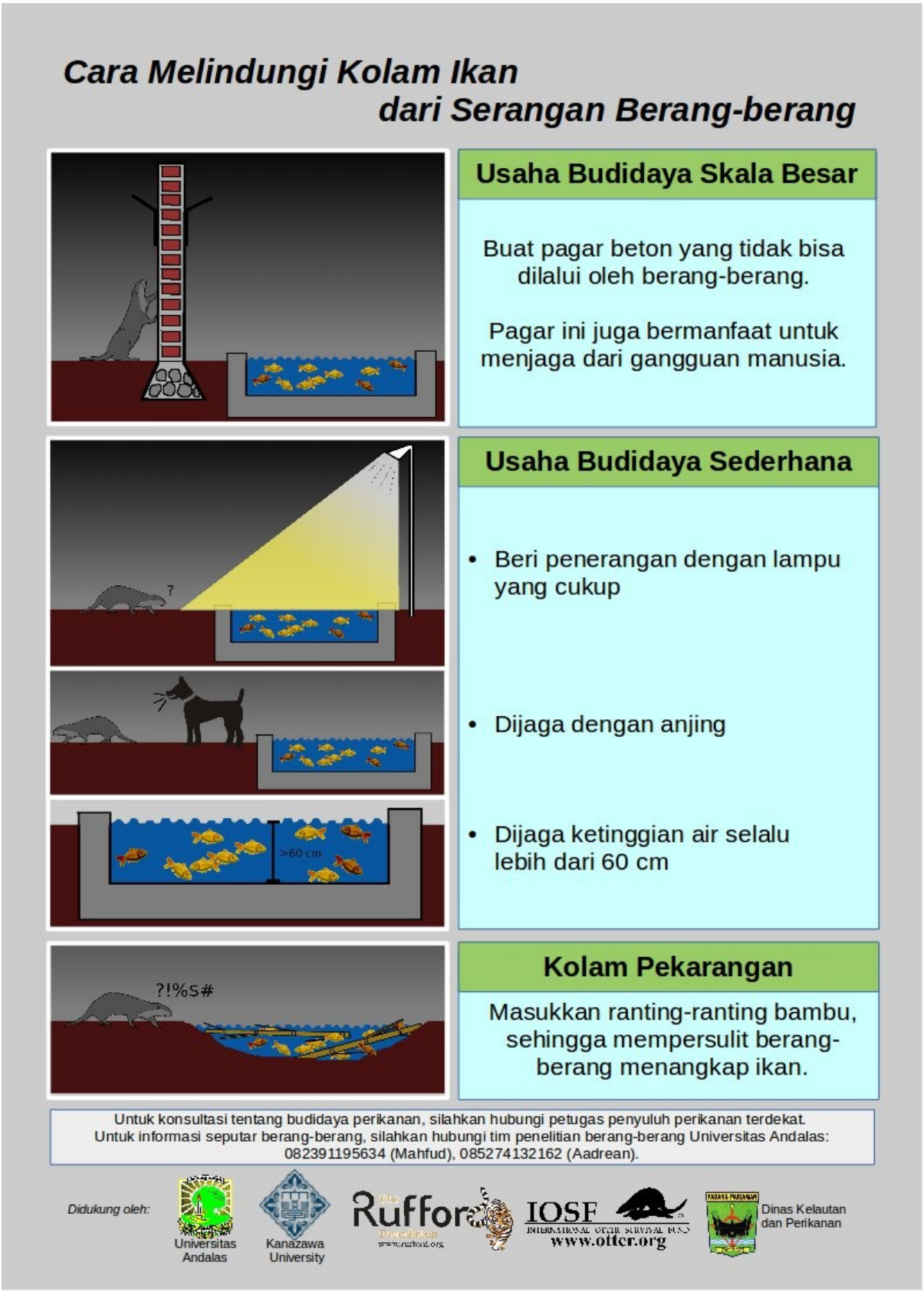

Fig. 19: Leaflet on how to protect fish pond from small-clawed otter (in Bahasa Indonesia)
Print out of this leaflet have been distributed to fish pond owners and fishery department

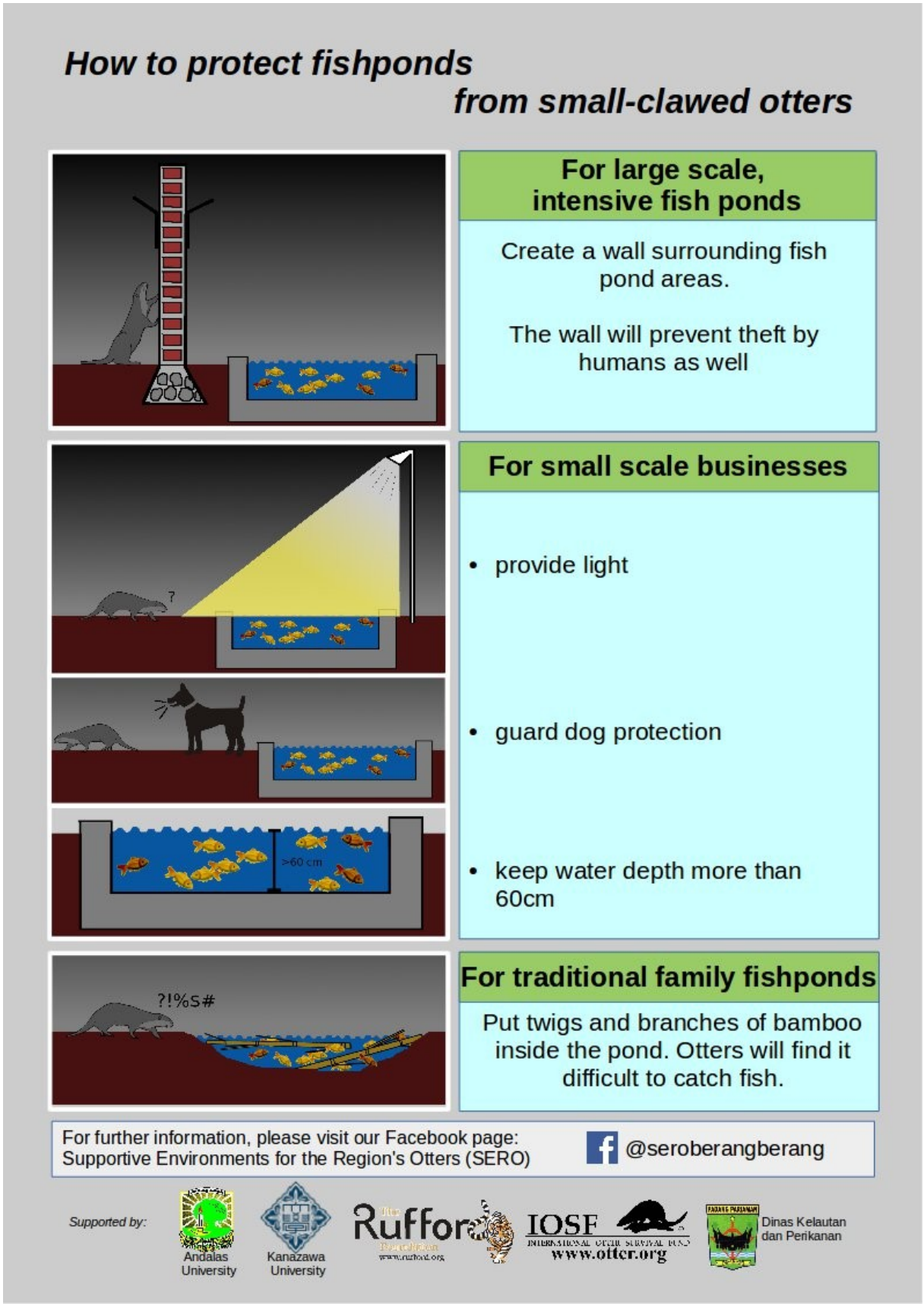

Fig. 20: Leaflet on how to protect fish pond from small-clawed otter (English version)

Fig. 21: Leaflets submission to head of fishery department.

Fig. 22: Leaflet distribution to fish farmer

4. Student training on how to use radio tracking equipments

We trained students of Biology department of Andalas University on how to use radio tracking equipments. After this training, we selected several students as supporting field assistants.

This equipments was the first radio tracking equipments available in our department.

Fig. 23: explaining basic concept of radio tracking and how the equipments work

5. Website berang-berang.com

We created website berang-berang.com. Website berang-berang.com is the first website available in Indonesia language for otter. As compliment, we created also Facebook page for berang-berang.com. The page is available in http://www.facebook/infoberangberang.

BERANG-BERANG.COM

Pusat informasi berang-berang di Indonesia

Cari ...

ARTIKEL TERBARU

Mengatasi masalah berang-berang di kolam ikan

Hari berang-berang sedunia (31 Mei 2017)

Lutra sumatrana terfoto di Kedah, Malaysia

Berang-berang Lutrogale berkerabat dekat dengan Aonyx cinereus

Selamat datang di berang-berang.com

Apa itu berang-berang.com?

berang-berang.com hadir dengan visi menjadi sumber segala informasi tentang berang-berang, khususnya yang ada di Indonesia. Situs ini sebagai bukti cinta kami pada berang-berang, dengan mengajak partisipasi masyarakat semuanya.

Apa saja jenis berang-berang di Indonesia?

Dari 13 jenis berang-berang di seluruh dunia, ada empat jenis berang-berang di Indonesia

- Berang-berang cakar kecil (*Aonyx cinereus*)
- Berang-berang bulu licin (*Lutrogale perspicillata*)
- Berang-berang hidung berbulu (*Lutra sumatrana*)
- Berang-berang utara (*Lutra lutra*)

Cari informasi terbaru?

Fig. 24: Screenshot of berang-berang.com

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Appendix

Appendix 1. Questionnaire on otter and fishfarm, as original form in Bahasa Indonesia

Kuisioner

Berang-berang dan kolam ikan

Kuisioner ini bertujuan mengumpulkan data tentang konflik berang-berang dan kolam ikan. Kuisioner ini murni untuk tujuan penelitian. Tujuannya adalah untuk mengetahui seberapa besar konflik dan kerugian yang terjadi antara berang-berang dan budidaya perikanan, serta untuk mengetahui apa tindakan yang dilakukan oleh petani ikan ketika berang-berang datang ke kolamnya. Dengan adanya hasil penelitian ini diharapkan bisa menjadi data dasar, untuk pertimbangan pengembangan cara budidaya ikan yang menguntungkan dan lebih ramah terhadap berang-berang ke depannya.

Jika ada pertanyaan lebih lanjut dapat menghubungi kontak person sebagai berikut:

Aadrean, M.Si

Laboratorium Ekologi Hewan

Jurusan Biologi Universitas Andalas, Padang, Sumatera Barat.

No HP: 085274132162 Email: aadrean@fmipa.unand.ac.id

Nama Petugas Pewawancara :

Nama responden :

Jabatan di kelompok :

Profil Kelompok

Nama kelompok :

Ketua :

Jumlah anggota : orang

Luas kolam : m^2

Jenis ikan :

Produksi pertahun : ton / ekor*

Tipe kelompok : Pembenihan/pendederan/pembesaran*

Lokasi

Kecamatan :

Nagari :

Korong :

Jorong/Dusun :

Nama sungai terdekat :

****

Jenis berang-berang

Data jenis ini berdasarkan pengetahuan yang beredar dalam masyarakat, baik itu yang dilihat atau dialami sendiri maupun hanya dari cerita turun temurun. Silahkan jawab sesuai dengan apa yang Bapak/Ibu pahami.

Sepanjang pengetahuan bapak/ibu berapa jeniskah berang-berang yang ada?

…..... jenis

Jelaskan ciri-ciri masing jenis pada tabel berikut. Jika lebih dari 3 jenis, tambahkan kolomnya

	Jenis		
	1	2	3
Nama (dalam bahasa lokal)			
Panjang total tubuh & ekor	<75cm/ 75-100cm/ >100cm*	<75cm/ 75-100cm/ >100cm*	<75cm/ 75-100cm/ >100cm*
Warna tubuh			
Punya anus kah?	Ya / tidak *	Ya / tidak *	Ya / tidak *
Merusak rumpun padi kah?	Ya / tidak *	Ya / tidak *	Ya / tidak *
Jumlah per kelompok	ekor	ekor	ekor

* coret yang tidak perlu

Pertanyaan-pertanyaan berikut ini dijawab berdasarkan pengalaman yang dialami oleh anggota kelompok.

Konflik

1. Apakah pernah kolam kelompok Bapak/Ibu dikunjungi oleh berang-berang?
   a. Ya pernah
   b. Tidak pernah *Jika tidak pernah, lanjut ke pertanyaan no 11*
2. Jika pernah, kapan berang-berang mengunjungi kolam Bapak/Ibu? (jawaban boleh lebih dari satu)

a. Dalam satu bulan ini
b. Dalam satu tahun ini
c. 1-2 tahun yang lalu
d. Lebih dari 2 tahun yang lalu

Berikan perkiraan tanggal detailnya jika diketahui.....

3. Kapan saja berang-berang datang ke kolam? (jawaban boleh lebih dari satu)
   a. Dini hari (02:00 - 06:00)
   b. Pagi (06:00 - 10:00)
   c. Tengah hari (10:00 - 14:00)
   d. Sore (14:00 - 18:00)
   e. awal malam (18:00 - 22:00)
   f. tengah malam (22:00 - 02:00)
4. Berapa ekor jumlah berang-berang yang pernah terlihat datang ke kolam? (jawaban boleh lebih dari satu)
   a. 1
   b. 2-5
   c. 5-10
   d. lebih dari 10

   Berikan jumlah detailnya jika diketahui.....
5. Apakah berang-berang datang ke kolam secara teratur?
   a. Ya teratur, setiap.....
   b. Tidak teratur
6. Apakah ada kondisi-kondisi tertentu, ketika berang-berang datang ke kolam?
   (Misalnya: kondisi cuaca, ketinggian air, siklus pertumbuhan ikan, jenis ikan, kondisi sosial atau kegiatan tertentu dan kondisi lainnya)
   ….....
7. Apakah berang-berang pernah memakan ikan anggota kelompok Bapak/Ibu?
   a. Iya
   b. Tidak
8. Dari seluruh anggota kelompok Bapak/Ibu, berapa jumlah anggota kelompok yang ikannya pernah dimakan berang-berang
   Jumlah total anggota:.....
   Jumlah yang pernah: ….....
9. Dalam 2 tahun terakhir berapa banyak kehilangan ikan? Mohon dituliskan perkiraan waktu dan jumlahnya
   Tahun/Bulan/Tanggal:…....., ... Kg
   Tahun/Bulan/Tanggal:…....., ... Kg
   Tahun/Bulan/Tanggal:…....., ... Kg

10. Bagaimana trend jumlah kedatangan berang-berang dari tahun ke tahun?
    a. Sangat bertambah banyak
    b. Agak bertambah banyak
    c. Tetap
    d. Agak semakin jarang
    e. Sangat semakin jarang
11. Pernahkah berang-berang menyerang manusia di kolam Bapak/Ibu?
    a. Tidak pernah
    b. Pernah, tapi hanya sekedar mengancam saja
    c. Pernah dan menggigit

Penanganan konflik

12. Bagaimana cara melindungi kolam ikan Bapak/Ibu dari serangan berang-berang? (jawaban boleh lebih dari satu)
    a. Membangun pagar. Terbuat dari.....
    b. Memberikan penerangan lampu
    c. Dijaga pakai anjing
    d. Pakai pagar listrik
    e. Dengan suara gaduh
    f. Dengan ranting-ranting bambu yang dimasukkan ke dalam kolam
    g. Perangkap/jerat
    h. Ditembak
    i. Pakai ramuan atau bahan penangkal. Yaitu.....
    j. Ditanam tanaman tertentu. Yaitu.....
    k. cara lain.....

Penangkapan

13. Pernahkah anggota kelompok Bapak/Ibu menangkap berang-berang?
    a. Ya pernah
    b. Tidak pernah
14. Berapa ekor?

    …..... ekor
15. Apa alat yang digunakan untuk menangkap berang-berang? (jawaban boleh lebih dari satu)
    a. Dengan jerat tali
    b. Dengan perangkap kotak
    c. dengan jaring

d. lain-lain.....

16. Setelah berang-berang tertangkap, apa yang anggota kelompok Bapak/Ibu lakukan? (jawaban boleh lebih dari satu)
    a. Memeliharanya
    b. Membunuhnya
    c. Menjualnya
    d. lain-lain ….....
17. Jika memeliharanya, apakah berang-berang yang masih bayi atau sudah dewasa? (jawaban boleh lebih dari satu)
    a. bayi
    b. anak-anak
    c. dewasa
18. Sampai berapa lama anggota Bapak/Ibu memeliharanya?
    …..... hari/bulan/tahun
19. Jika berang-berang mati, apa yang Bapak/Ibu lakukan setelahnya ? (jawaban boleh lebih dari satu)
    a. Dibuang
    b. Diambil bagian tubuhnya
    c. Dijual
20. Jika berang-berang dijual, bagaimana cara menjualnya? (jawaban boleh lebih dari satu)
    a. Dalam keadaan hidup
    b. Dalam keadan mati utuh
    c. Bagian tubuhnya saja, yaitu:.....

Pemanfaatan

21. Apakah ada manfaat positif dengan adanya berang-berang di daerah Bapak/Ibu
    a. tidak ada
    b. ada, yaitu.....
    …...
22. Apakah pernah memanfaatkan bagian tubuh berang-berang?
    a. Tidak pernah
    b. Pernah, yaitu
        1. bagian …..... untuk.....
        2. bagian …..... untuk ….....
        3. bagian …..... untuk.....
23. Apakah pernah memanfaatkan kotoran berang-berang?

a. Tidak pernah
b. Pernah, yaitu untuk.....

Saran dan Harapan

24. Apa saran dan harapan Bapak/Ibu, terkait dengan berang-berang?
    a. Untuk Dinas Kelautan dan Perikanan

       ….....
    b. Untuk universitas dan lembaga penelitian

       ….....

Appendix 2. Questionnaire on perception of fish farmers toward otters, as original form in Bahasa Indonesia

Persepsi Petani Budidaya Ikan Terhadap Berang-Berang

Isian ini hanya untuk mengetahui persepsi dari Bapak/Ibu. Tidak ada jawaban yang lebih benar atau salah. Silahkan jawab sesuai dengan apa yang Bapak/Ibu pahami.

Apakah Bapak/Ibu setuju terhadap kalimat pernyataan berikut ini?

Jawab dengan melingkari: 1) Sangat tidak setuju, 2) Tidak setuju, 3) biasa saja, 4) Setuju, 5) Sangat setuju

	Pernyataan	Jawaban				
1	Berang-berang adalah hama bagi budidaya perikanan	1	2	3	4	5
2	Jika berang-berang punah, maka keuntungan usaha budidaya perikanan akan meningkat	1	2	3	4	5
3	Jika berang-berang punah, maka kualitas sungai/perairan kita semakin buruk	1	2	3	4	5
4	Keberadaan berang-berang adalah sebagai indikator sehatnya lingkungan perairan	1	2	3	4	5
5	Berang-berang masih bisa hidup nyaman walaupun di lingkungan yang banyak aktifitas manusia	1	2	3	4	5
6	Berang-berang harus dijadikan hewan yang dilindungi	1	2	3	4	5

Apakah Bapak/Ibu setuju dan adanya keinginan untuk melakukan usaha-usaha berikut ini?

Jawab dengan melingkari: 1) Sangat tidak setuju, 2) Tidak setuju, 3) Biasa saja, 4) Setuju, 5) Sangat setuju

	Pernyataan	Jawaban				
1	Berusaha mempelajari cara budidaya yang menguntungkan secara ekonomis dan juga tidak merusak/membuat punah berang-berang (Budidaya ikan ramah terhadap berang-berang)	1	2	3	4	5
2	Menggunakan cara budidaya ikan yang ramah terhadap berang-berang	1	2	3	4	5
3	Tidak akan menangkap/membunuh berang-berang	1	2	3	4	5
4	Berbagi, membiarkan sebagian lahan budidaya tidak dilindungi. Sehingga berang-berang bebas untuk menggunakannya sebagai tempat cari makan	1	2	3	4	5

Appendix 3. Data of radio tracking

date	time	Coordinate of receiver	Signal quality	direction	Center of triangulation
15/08/2016	19:38	Release location S 0.64187°, E 100.32053°			
15/08/2016	19:40	S 0.64187°, E 100.32048°	strong	350°	S 0.64152° E 100.32054°
	19:45	S 0.64170°, E 100.32041°	strong	24°	
	19:48	S 0.64165°, E 100.32050°	strong	309°	
	23:27	S 00.64130°, E 100.32117°	strong	245°	S 0.64164° E 100.32044°
	23:32	S 00.64172°, E 100.32007°	strong	80°	
	23:37	S 00.64194°, E 100.32040°	strong	345°	
16/08/2016	06:09	S 0.64130°, E 100.32117°	medium	245°	S 0.64162° E 100.32042°
	06:25	S 0.64172°, E 100.32007°	medium	80°	
	06:30	Loss signal			
	13:35-14:00	Lost signal			
	20:30-21:30	Lost signal			
17/08/2016	00:00	S 0.64239°, E 100.31948°	weak	180°	S 0.64266° E 100.31943°
	00:30	S 0.64248°, E 100.31937°	weak	170°	
	00:44	S 0.64253°, E 100.31921°	weak	90°	
18/08/2016	Lost signal				
19/08/2016	Lost signal				
20/08/2016	Lost signal				
21/08/2106	Lost signal				
22/08/2016	Lost signal				
27/08/2016	Lost signal				
3/09/2016	Lost signal				
9/09/2016	Lost signal				
17/09/2016	Lost signal				
1/10/2016	Lost signal				
18/11/2016	Lost signal				
28/11/2016	Lost signal				

Appendix 4. List of equipments

Name	Quantity	Condition
Receiver	1	Fair
Antenna	1	Fair
Head set	1	The cord was broken. Now already be fixed
Transmitter	1	Installed in the animal. The animal is lost
Transmitter	1	Off, without signal
Transmitter	11	Ready to use
Pocket digital camera	2	Fair
Camera trap	3	Fair