

Final Project Report

**FACILITATING AVIAN CONSERVATION IN POST-LOGGING LOWLAND RAINFOREST OF
SUMATRA, INDONESIA
(CLP PROJECT ID: 0242810)**

Fangyuan Hua, Muhammad Nazri Janra, Aadrean

Host Country:	Indonesia
Project Site:	Harapan Rainforest, Jambi Province, Sumatra
Fieldwork time:	October 2010 ~ October 2011 (13 months)
Supporting Institutions:	Harapan Rainforest; Burung Indonesia; Andalas University; Indonesian Institute of Sciences (LIPI)
Overall Project Aim:	Facilitating forest and avian biodiversity conservation through research, education, and capacity building at Harapan Rainforest

Author Contact Information:

Fangyuan Hua:	Program in Science, Technology and Environmental Policy (STEP) Princeton University, New Jersey, U.S.A. fhua@princeton.edu / slcyane@gmail.com
Muhammad Nazri Janra:	University of Kansas, Kansas, U.S.A. & Andalas University, Padang, West Sumatra, Indonesia; mjanra@ku.edu / mjanra@gmail.com
Aadrean:	Andalas University, Padang, West Sumatra, Indonesia; a2dreas@gmail.com

July 2013

TABLE OF CONTENTS:

Acknowledgements	4
Section 1	5
Summary	5
Introduction	5
Project members	6
Section 2	8
Aims and objectives	8
Methodology	8
Outputs and results	9
Achievements and impacts	13
Section 3	16
Conclusion	16
Problems encountered and lessons learnt	16
In the future	17
Section 4	19
Appendix 1: details of avian survey protocols	19
Appendix 2: List of birds captured and banded at each study location tallied over three field surveys	21
Appendix 3: List of diurnal raptors at each location during two field surveys	24
Appendix 4: List of owls observed at each location during night-time survey	25
Appendix 5: List of training workshop contents, instructors and schedule	26
Appendix 6: Synthesis of SWOT analysis results	27
Appendix 7: List of in-class activities for project's education component	28
Appendix 8: List of recommendations for HRFI for improving community school education	29
Appendix 9: List of field equipment donated to Harapan Rainforest's research	

department	30
Appendix 10: Details of capacity building design, implementation and results	31
Appendix 11: Details of education program	45
Appendix 12: Full account of expenses	57
Appendix 13: Reprint of publication produced from project	59
Appendix 14: Photographic samples of project documentation	60
Bibliography	64
Addresses and links	65
Distribution list	65

ACKNOWLEDGEMENTS:

We thank our field site Harapan Rainforest and its leadership for generously providing critical logistic support and immense assistance in every aspect of our project throughout its duration. Our project would have not have been possible without the unfailing support of Harapan Rainforest, from generous in-kind financial support in the form of free lodging, transportation, financial management, and personnel assistance, to substantial input and involvement in our project planning and implementation. We owe our deepest gratitude to this wonderful rainforest and its audacious program leadership and staff. We thank our host organization Burung Indonesia for sponsoring our project and generously providing critical assistance with permits and other paperwork, and for its unfailing support throughout. We thank the Indonesian Institute of Sciences (LIPI) for sponsoring the research component of our project, providing valuable comments on our project design, overseeing our mist-netting research and providing standard bird rings. We thank the Indonesian Government, in particular the Ministry of Research and Technology (RISTEK) and Ministry of Forestry for kindly granting FH research permits and research visa. We thank Andalas University, particularly its Biology Department, for providing generous support for our project, in multiple ways including granting MNJ and Aadrean repeated leave of absence for carrying out project duties, and granting undergraduate and graduate students the research and outreach opportunities of working with our project. We thank various government and non-government organizations for providing generous assistance to the capacity building component of our project: the Wildlife Conservation Society Indonesia Program, Kerinci National Park, and the State Forest Fast Response Bureau. We are indebted to numerous colleagues for their generous support and valuable assistance: Debby Berthania, Elva Gemita, Debbie Martyr, Wilson Novarino, Soerya Poernama, Dewi Prawiladilaga, Ria Saryanthi, Kim Worm Sorensen, and Belry Zetra. We thank numerous field assistants for arduous assistance with field work: Nurhidayata B.S, Liza Meini Fitri, Dafid Pirnanda, Aldino Fauzil Fanani, Junaidi, Rahmat Dwi Cahya, Rahma Fitri Nur, Dewi Chandra Rini and other students from Biology Department, Andalas University; Eki Susanto, Reza Sabri, Beny Aulia Saputra, from Biology Department, University of Bengkulu, Bengkulu, Indonesia; and the many patrol staff members of Harapan Rainforest. Finally, we thank the Conservation Leadership Programme for kindly providing project funding, and the International Foundation for Science for providing supplemental funding.

SECTION 1:

SUMMARY:

Harapan Rainforest in Sumatra, Indonesia is an extensive area of post-logging lowland rainforest that encompasses an Important Bird Area, represents a critically endangered ecosystem, and hosts a pioneering conservation program the Harapan Rainforest Initiative. With the guiding vision of facilitating Harapan Rainforest Initiative's conservation efforts by helping to address some of its top priorities, our project aimed to provide scientific basis for future conservation planning in Harapan Rainforest and immediate conservation support for capacity building and education. Over a 13-month period, we generated robust baseline data collected by a mix of standardized methodology on the richness and abundance of several important forest avian groups, conducted a comprehensive, highly successful capacity building program for Harapan Rainforest's patrol staff that contributed significant positive impacts, and provided much needed assistance to Harapan Rainforest Initiative's education-based community outreach efforts by diversifying and augmenting Harapan Rainforest's community elementary school education. Our comprehensive research, capacity building, and education activities united under a clearly-defined central theme successfully achieved our original project aims and objectives, produced a suite of additional positive impacts such as facilitation of Harapan Rainforest's networking with other conservation organizations, and significantly fostered team members' professional growth.

INTRODUCTION:



Fig. 1. Project field site Harapan Rainforest, Sumatra, Indonesia.

As pressures on tropical forest continue to soar, degraded forest habitats are becoming an increasingly important frontline of global conservation (Putz et al. 2001; Edwards et al. 2011). This is especially true for highly threatened ecosystems such as the lowland rainforest of Sumatra, Indonesia, whose original area has declined by ~90% since early 1900s due to rampant forest destruction (FAO 2005). As one of Sumatra's few remaining lowland rainforest, the post-logging Harapan Rainforest (HRF) in Jambi and South Sumatra Provinces (Fig. 1) is of high global conservation significance.

Managed under the Harapan Rainforest Initiative (HRI) with joint efforts from several national and international

conservation organizations, it is Indonesia's first forest restoration project, aiming to conserve and restore ~100,000 ha of post-logging production rainforest while pioneering an innovative model of biodiversity conservation outside Indonesia's protected area system. Success in HRF is of global significance, and is closely watched by the Indonesian government and the global conservation community.

While much has been achieved and continues to be done in HRF, at the time of our project, there remained a considerable scope for conservation facilitation due to acute needs and limited resources. As a team of field biologists and conservation practitioners that had previously collaborated with HRFI, our team thus designed the current project with the guiding vision of facilitating HRFI's conservation by helping to address some of its top priorities. Based on our experiences at HRF and communication with HRFI, we identified the following focal efforts.

(1) Collecting robust baseline data on avian biodiversity (research component): at the time of our project, HRFI's biodiversity monitoring was focused on vegetation and mammals. Robust avian biodiversity baseline data would provide important basis for HRFI's conservation success evaluation.

(2) Building professional capacity for forest patrol staff (capacity building component): although a suite of professional capacities are critically needed for HRFI's patrol staff, at the time of our project, they had received no formal professional training. A comprehensive training program tailored to the professional needs of patrol staff was therefore an urgent need for HRFI.

(3) Assisting with school education of indigenous children (education component): at the time of our project, students in HRFI's community schools had a very limited curriculum and faced a severe lack of teaching resources. An education program that introduces diverse education contents and approaches promised to greatly improve school education quality.

We worked closely with HRFI's leadership, in particular several of its departments that provided critical information and support for our project: Research Department, Patrol Department, and Conservation Outreach Department. We worked closely with the Indonesian Institute of Sciences (LIPI), which oversaw part of our avian survey activities. We additionally involved a number of academic institutions, government agencies and conservation organizations in providing critical assistance to our research and capacity building activities, including Andalas University, Kerinci National Park, WCS Indonesia Program.

PROJECT MEMBERS:

Muhammad Nazri Janra: project leader

At the time of project, Muhammad was a lecturer in the Biology Department at Andalas University, West Sumatra, Indonesia. He has had extensive field experiences working on forest birds, amphibians, mammals, as well as on conservation outreach with local communities. Prior

to the current project, Muhammad had conducted around three months of fieldwork in Harapan Rainforest, collaborating with project co-leader Fangyuan Hua (see below) on assessing the understory avian community structure in an effort to understand how avian community structure is affected by forest degradation. For the current project, Muhammad co-led the research component and education component, and assisted with the capacity building component, while carrying out general operational duties of the project as a project co-leader. Muhammad is now a Ph.D. student in the Department of Ecology and Evolutionary Biology at University of Kansas, working on phylogenetic and biogeography of birds in the group of Niltavinae.

Fangyuan Hua: project co-leader

At the time of project, Fangyuan was a Ph.D. Candidate in the Department of Wildlife Ecology and Conservation at the University of Florida, U.S.A. For her Ph.D. dissertation, she aimed to understand how forest birds respond to anthropogenic habitat disturbances such as selective logging, particularly via behavioural mechanisms involving their perceived and actual risk of predation from predators that may profoundly influence their behaviour and in turn lead to fitness and demographic consequences. Prior to the current project, Fangyuan had conducted around four months of fieldwork in Harapan Rainforest, assessing the understory avian community structure using a variety of techniques in an effort to understand how avian community structure is affected by forest degradation. For the current project, Fangyuan co-led the research component, led the capacity building component, and assisted with the education component, while carrying out general operational duties of the project as a project co-leader. Fangyuan is now a Postdoctoral Research Fellow in the Program in Science, Technology and Environmental Policy at Princeton University, working on the ecology and conservation of forest birds and forest habitat in Sichuan Province, China.

Aadrean: project member

At the time of project, Aadrean was a Master's student in the Biology Department at Andalas University, West Sumatra, Indonesia. For his Master's thesis, he aimed to understand how small-clawed otter (*Aonyx cinerea*) uses and persists in cultivated rice fields in West Sumatra, and how management practices could be improved to benefit this endangered species. Because of his active role in the research and conservation outreach of the species, Aadrean became a member of the IUCN Otter Specialist Group in 2009. For the current project, Aadrean co-led the education component, and assisted with the research component and other aspects of the project. Aadrean is now a lecturer in the Biology Department at Andalas University.

SECTION 2:

AIM AND OBJECTIVES:

The project aimed to provide scientific basis for future conservation planning in Harapan Rainforest and immediate conservation support for capacity building and education, in an effort to facilitate biodiversity conservation of Harapan Rainforest. To achieve this, the project had three objectives:

- (1) To collect quantitative baseline data on a focal group of avifauna in HRF and help build basis for long-term avian monitoring, by conducting robust survey of richness and abundance using a mix of techniques.
- (2) To facilitate capacity-building for the forest patrol staff of Harapan Rainforest, by providing a comprehensive training program on core patrol skills. (Adaptations from original statement: following discussions with HRFI, in particular leadership of HRFI's Patrol Department, the original training focus on biodiversity knowledge and research skills was significantly expanded to general skills most urgently needed by the staff's patrol duties.)
- (3) To facilitate school education for indigenous students enrolled in HRFI's community schools, by designing and implementing school modules and donating library books and pedagogical tools. (Adaptations from original statement: following discussions with HRFI, in particular leadership of HRFI's Community Outreach Department, the original education focus on biodiversity conservation was significantly expanded to general elementary school education most urgently needed in the schools.)

METHODOLOGY:

Objective 1 (research component):

We focused survey efforts on the richness and abundance of understory birds and raptors at two forest locations with varying degrees of habitat degradation (namely, Camp and SPAS locations). We used mist-netting to survey understory birds in December 2010, February 2011 and October 2011, in a 400 x 600 m² plot at each location. We used 30 mist-nets (12 m long and 2.6 m tall) between 0600 and 1700 daily over a nine-day period at each location for each survey. We used vantage point watching to survey diurnal raptors in December 2010 (only for Spas location) and February 2011, on watching towers above forest canopy that allowed visual coverage of a radius of about 1 km, between 0900 and 1300 daily for three days at each location for each survey. We used playback-assisted night-time point count to survey small-bodied owls, in a 1 x 1.25 km² plot at each location. We focused on four owl species: brown hawk-owl (*Ninox scutulata*), oriental bay owl (*Phodilus badius*), collared scops-owl (*Otus lempiji*), and reddish scops-owl (*Otus rufescens*). We conducted survey between 1900 and 0200 on evenings with full moon in June 2011 (Fuller and Mosher 1987), at survey points spaced 500 m apart. All survey methods

followed standard procedures on days without strong wind or rain (Bibby 2000). Additional details are provided in Appendix 1.

Objective 2 (capacity building component):

We conducted the training program in two steps: a pre-training SWOT (strength, weakness, opportunity, and threat) analysis in March ~ April 2011 to inform training design, and a three-day training workshop in May 2011. The SWOT analysis was conducted over one month during which we introduced the SWOT analysis concept, engaged patrol staff in within-team discussion, and convened a presentation of each team's discussion results. Based on SWOT analysis results and discussions with leadership of HRFI's Patrol Department, we finalized training contents along with a list of internally- and externally-invited instructors capable of delivering training contents (Table 1). We conducted the training workshop between May 11th and May 13th, 2011. Additionally, to assess the effectiveness of the training program and inform future training programs, we conducted pre- and post-training tests on and sought training evaluation from all workshop participants. Additional details are provided in Appendix 2.

Objective 3 (education component):

Following a preliminary visit in October 2010 to refine program plan, we implemented education activities between April ~ October 2011 that involved resource donation and three school visits. Education resources we donated included age-appropriate textbooks, story books, and nature-themed books, and teaching tools for Bahasa Indonesia and mathematics. School visits focused on diversifying schools' teaching approaches while introducing students to nature and conservation topics, realized in multiple ways such as use of multimedia and interactive in-class activities. We also introduced to teachers a set of teaching guide widely used in cities and reviewed their curriculum. Additionally, we conducted survey of students and teachers at program end to evaluate program effectiveness. Additional details are provided in Appendix 3.

OUTPUTS AND RESULTS:

Objective 1 (research component):

Mist-netting: Over three surveys, we carried out 279 mist-netting hours at each study location, and banded 464 individuals belonging to 64 species (Appendix 1). Detailed banding records have been submitted to the Indonesian National Banding Scheme (available upon request). **Vantage point watching:** Over two surveys, we conducted 12 and 24 hours of vantage point watching at Camp and Spas, respectively. List and abundance of raptor and hornbill species recorded are presented in Appendix 3. **Playback-assisted point count survey:** Over one survey, we covered six point count stations along two 1.2-km transects at each study location. List and abundance of focal owl species recorded are presented in Appendix 4.

Objective 2 (capacity building component):

Pre-training SWOT analysis produced very important information on the status of HRFI's patrol staff (Appendix 6), as perceived by staff members that work at the forest protection frontline combating pressing illegal activities. Between May 11th ~ 13th 2011, we organized a training workshop that accommodated over half of the patrol staff (50 out of 96 members) and that was

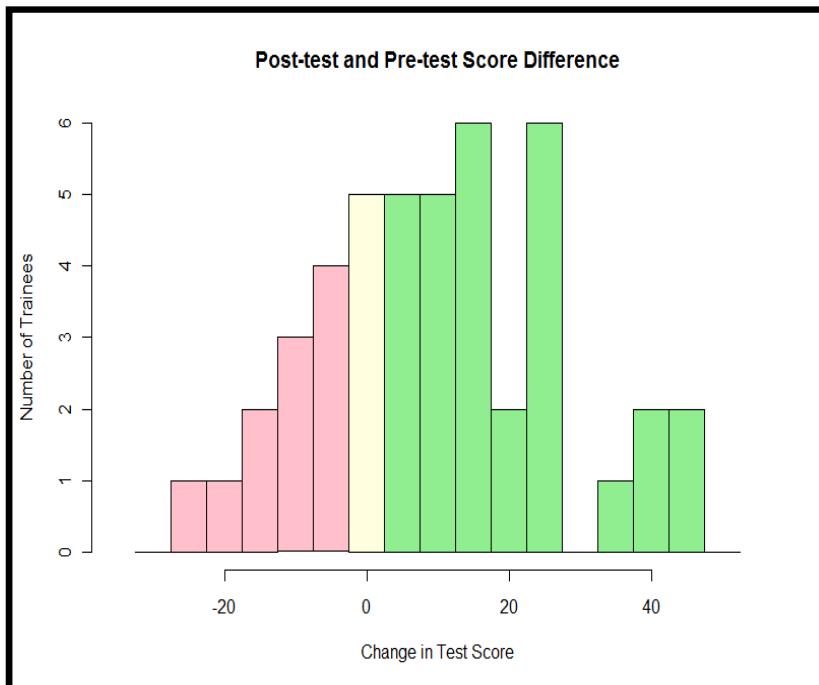


Fig. 2. Difference between trainees' post-training test and pre-training test scores.

delivered collectively by a total of 10 instructors (four internally-invited and six invited from external agencies). We did not invite all patrol staff members due to funding limitations. Comparison of trainees' pre-and post-training test performance in key aspects of training contents suggested a notable improvement after training (Fig. 2). Trainees gave predominantly positive evaluation of the training program (Fig. 3), and also provided valuable suggestions for future improvement (Fig. 4). Further details are provided in Appendix 3.

Objective 3 (education component):

We donated two sets of in-class teaching tools (one set each for teaching Bahasa Indonesia and mathematics), 80 textbooks, 60 extra-curricular books (story books and nature-themed books), and some additional audio / video materials to HRFI's Conservation Outreach Department for school use. These books formed the basis of the schools' first, circulating library. We conducted a suite of in-class activities to diversify teaching approach (Appendix 7) with total 49 students and three teachers as program participants (we give in detail account on it in Appendix 3 of this report). At the end of program, we evaluated the effectiveness of donated teaching tools and books as measured by students' interest in them. We additionally compiled a list of recommendations for school improvement based on questionnaire survey of students and teachers and our observations (Appendix 8).

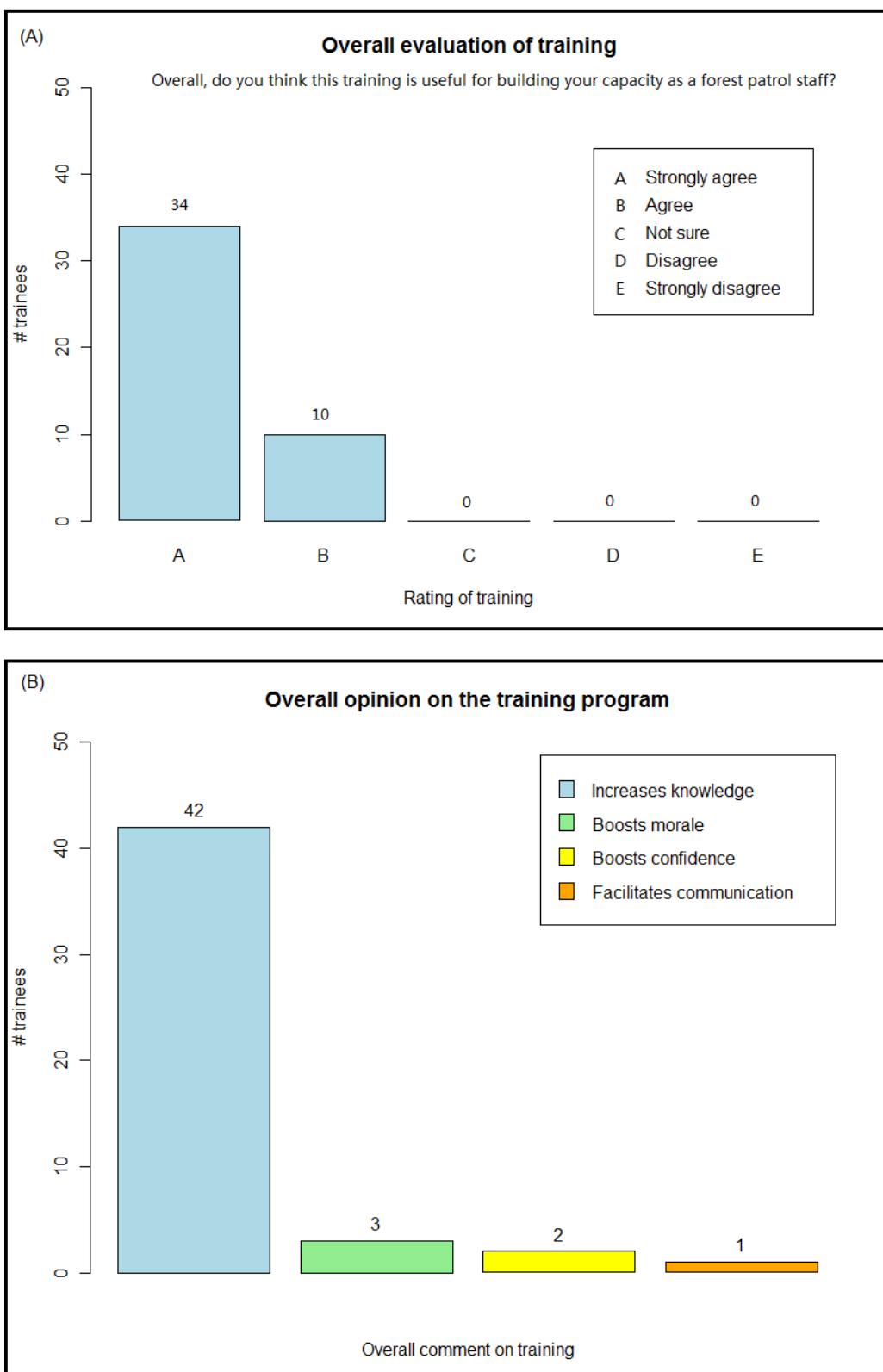


Fig. 3. Trainees' overall evaluation of the training workshop.

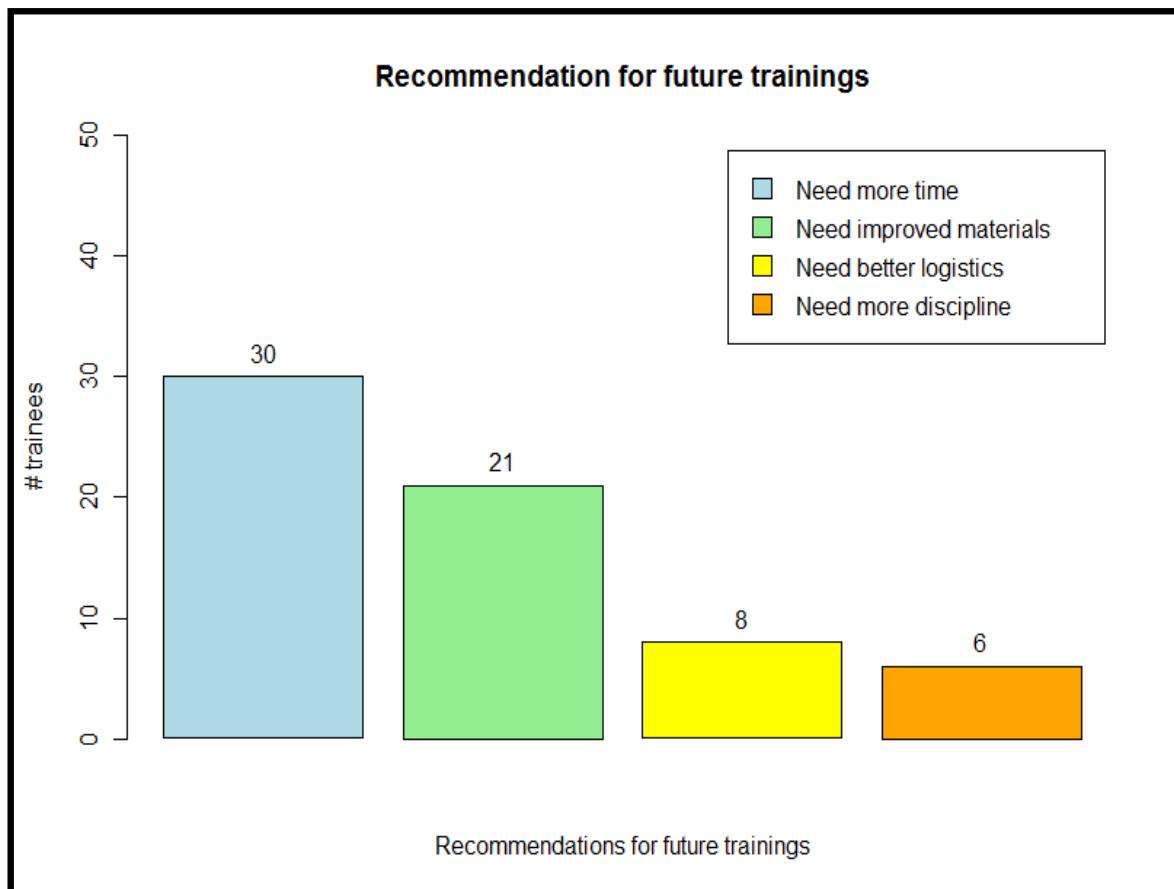


Fig. 4. Trainees' improvement recommendations for future training programs.

Other outputs and results:

In addition to fulfilment of three objectives, our project also produced four other important outputs. (1) We donated a large quantity of research field equipments to the Research Department of HRFI (Table 8). (2) We facilitated the formalization of long-term collaboration between Harapan Rainforest and Andalas University, one of Indonesia's oldest and most prestigious universities. (3) We facilitated and strengthened the networking of HRFI with other important conservation players in Sumatra, particularly through our reaching out to many governmental and non-governmental organizations to invite instructors for our capacity-building workshop. (4) We produced one publication in the internationally recognized journal Forktail based on our research results in Harapan Rainforest (Hua et al. 2011), with more to follow.

ACHIEVEMENTS AND IMPACTS:

Overall, our 13-month project successfully achieved the original aims and objectives, and contributed significant positive impacts to the research and conservation endeavors of the Harapan Rainforest Initiative. We discuss these achievements and impacts separately below.

Research component:

Our research efforts generated robust baseline data collected by standardized methodology on the richness and abundance of two important forest avian groups, i.e., understory birds and raptors. These avian groups are generally considered as important targets of biodiversity monitoring because they are either sensitive to habitat disturbances and therefore can serve as indicator species (e.g., understory birds; Thiollay 1992; Lambert and Collar 2002; Barlow et al. 2006), or are important functional groups playing key roles in sustaining the health of forest ecosystems (e.g., raptors as predators). Our data on the population status of these avian groups therefore will serve as a critical foundation for the long-term monitoring efforts of Harapan Rainforest's avifauna, which is an important measure of HRFI's success as HRFI carries out its long-term conservation and restoration programs. Because our survey methodology followed standard protocols and is straightforward, replicated monitoring over the long term is highly amenable, either by our team, which plans to maintain a long-term research presence in and collaborative relationship with Harapan Rainforest, or by HRFI's own researchers and / or other researchers.

Capacity building component:

Our capacity building program was highly successful as evaluated by trainees' feedbacks, and contributed substantial positive impacts to the capacity building of HRFI's Patrol Department in several important ways. (1) It generated a robust SWOT analysis of the patrol staff, which had been a much needed piece of information for the leadership of Patrol Department on the status of the patrol staff but had never been carried out until our program. In addition to informing the design of our capacity building workshop and illuminating the status of HRFI's patrol staff for their better management, this team exercise also sparked communication from within the patrol staff, and promoted the critical self-assessment of patrol staff members from the perspective of responsible employees. (2) It effectively transferred critical knowledge and skills essential for the fulfillment of professional duties of patrol staff members, at a time when such professional capacity was urgently needed due to a lack of previous training, the sustained surge of conservation threats from illegal logging and land encroachment at the time of our program, and the seemingly ineffective performance of patrol staff in the face of that surge. (3) It substantially boosted the morale of patrol staff members, and provided an excellent opportunity for the facilitation of communication, both among patrol staff members, and between the patrol staff and the leadership of the Patrol Department. This is an especially important positive impact, at a time of great challenges faced by HRFI's Patrol Department as a result of external threats and a lack of internal communication.

Education component:

Our education program provided much needed and much appreciated assistance to HRFI's education-based community outreach efforts. Our donation of library books and teaching tools considerably diversified the community schools' teaching approach, improved teachers' teaching efficiency, and expanded students' exposure to knowledge and information. Our repeated school visits and varied in-class activities helped to further diversify school teaching, and facilitated the introduction of new teaching resource use, both to students and to teachers. In addition, our communication with and assistance to teachers with regard to their curriculum design and implementation as well as use of mainstream teaching guide helped to improve their professional capacity. Finally, our compiled recommendations to HRFI's Community Outreach Department with regard to future improvement of community school education serve as a valuable input that was based on arduous observation and survey, and that was from external perspectives.

We keep maintaining our good relation with HRFI's staffs through internet communication post-project implementation. Currently, some changes have been applied to Harapan Besamo School; 1) Centralization of schooling activities in Simpang Macan, with improvement was made on physical infrastructures (building, class facilities). This arrangement will maximize the functions of the three teaching staffs in conducting learning activities for students. HRFI facilitates transportation for students from Camp 35 to go back and forth to Simpang Macan during active school period. 2) Adjustment for the length of class time and study load for students, in equal proportion to other regular schools in Jambi. This system will more proficiently prepare students to continue their study to higher education level after graduating Harapan Besamo School. 3) HRFI frequently invites other schools in Jambi and other cities in the province to come visiting its site and doing some outdoor activities in nature. To some extent, this event brings the students from Harapan Besamo School to interact with students from big cities and encourage them to get some insights about their future education (for further information, please visit HRFI's facebook page at <https://www.facebook.com/harapan.rainforest?ref=ts>). We believe that this encouraging progress is, in part, stimulated by some findings and suggestions we made during the project.

Other outputs:

Our additional project outputs other than those from the three original objectives also produced a myriad of positive impacts for HRFI's conservation efforts and beyond. (1) Our substantial donation of high-quality field equipments to HRFI's Research Department will play important roles in facilitating the research and particularly biodiversity monitoring efforts of HRFI. (2) The MOU we facilitated between Harapan Rainforest and Andalas University laid down the foundation for mutually beneficial long-term collaboration between the two institutions. Harapan Rainforest will serve as a key, intriguing field site (from both biological and social perspective) for the teaching, research and other practice training activities of Andalas University, while Andalas University will provide valuable and sustained support for the research and conservation efforts of Harapan Rainforest by conducting long-term biodiversity monitoring and research on

site as well as by promoting HRFI's reputation. (3) The networking we facilitated of Harapan Rainforest with other institutions such as the Kerinci National Park (one of Sumatra's most famous and well managed national parks), State Forest Protection Fast Response Bureau, and WCS Indonesia Program (one of Indonesia's most well known and successful conservation NGOs) not only brought in knowledge, expertise and fresh perspectives for our training program through colleagues from these organizations, but will also serve as an invaluable resource for HRFI both immediately and in the future. (4) Current and future scientific publication generated from our project will contribute valuable scientific information in both an academic and an applied sense. Such a contribution is especially positive considering the fact that scientific understanding of the ecology and conservation of forest birds in the Greater Sundaland Region has thus far largely focused on forest ecosystems in Borneo, with comparatively much less attention paid to equally diverse and important forest ecosystems in Sumatra. (5) Last but not least, our project played an immensely positive role in fostering the professional growth of all three team members. Through the entire process of project design, field implementation, and outcome evaluation, we have obtained invaluable experiences and greatly honed our skills in multiple aspects of a complex, integrated conservation project. Such real-world practitioner's experiences are truly valuable assets that will continue to benefit our professional careers as conservation biologists.

SECTION 3:

CONCLUSION:

Our project successfully achieved our original aims and objectives of facilitating the research and conservation endeavors of Harapan Rainforest, a large area of highly endangered lowland Sumatran rainforest that has prominent conservation significance. Through a comprehensive suite of research, capacity building, and education activities, all of which closely revolved around the central theme of helping to address Harapan Rainforest Initiative's top conservation priorities, our project achieved the following, positive outputs and impacts:

- (1) We generated robust baseline data on the population status of several forest avian groups that are important targets of biodiversity monitoring. These data will serve as a critical and highly useful foundation for the long-term monitoring of Harapan Rainforest's avifauna.
- (2) We conducted a highly successful capacity building program for HRFI's patrol staff that promised to contribute multiple, highly positive impacts to their functioning both immediately and in the long run. Our program transferred critical, sorely needed professional knowledge and skills, and substantially boosted the morale and facilitated the communication of patrol staff.
- (3) We provided much needed assistance to HRFI's education-based community outreach efforts via education resource donation, school curriculum diversification, and teacher capacity support.
- (4) Our project implementation also produced multiple additional positive outputs and impacts, including donation of high-quality field equipment to aid HRFI's research and monitoring efforts, facilitation of formal collaboration of HRFI with a prestigious Sumatran university, facilitation of the networking of HRFI with other prominent conservation institutions, and generation of scientific publication of high academic and conservation value.

PROBLEMS ENCOUNTERED AND LESSONS LEARNT:

Which project activities and outcomes went well and why?

In general, all project activities and outcomes went well, thanks to the following conducive factors. (1) Project co-leaders both have previous field experiences at the field site and had established excellent collaborative relationships with site leadership, which conferred the project team critical understanding of the site's conservation context and an excellent support base. (2) Our project aims and objectives were well defined, realistic, of high conservation relevance, and in turn obtained the dedicated support of site leadership. (3) Throughout the project, we engaged in active, close communication with site leadership, which ensured that our project stayed highly relevant to the site's conservation needs, and that site leadership continued to provide excellent support. (4) We were willing to revise our project objective based on the real needs of the field site. (5) We took the initiative to act dedicatedly, firmly, boldly, and open-mindedly.

Please detail any problems that the project encountered or deviations from original project plans. Describe how these problems were addressed and what solutions were found to deal with these issues.

We made several revisions to the original project plans for two reasons: limitation of resources in terms of monetary funds, personnel, and time; and the realities of the most urgent conservation needs of the field site based on in-depth communication with site leadership after the project started. There were three main revisions of project plans. (1) We revised down the survey plan of forest birds and discarded the point count survey and transect survey methods (due to resource limitations). (2) We considerably expanded the capacity building program to cover the core skill set most needed by patrol staff, rather than focusing solely on biodiversity conservation knowledge and skills as originally planned (due to conservation need realities). (3) We considerably expanded the education program to address more general elementary school education, rather than focusing on biodiversity education as originally planned (due to conservation need realities). We did not otherwise encounter additional problems.

Briefly assess the specific project methodologies and conservation tools used.

We consider our project methodologies and conservation tools as generally effective and well suited for our aims and objectives. However, for the capacity building component, if we had more resources, we would have liked to involve all, instead of half, of the patrol staff in our training workshop, and expand the three-day workshop into five days so that some of the most important training topics could get more thoroughly covered, and trainees could have the opportunity to engage in more thorough interactions with the instructors. These ideal situations were hampered because of fund limitations.

Please state important lessons which have been learnt through the course of the project and provide recommendations for future enhancement or modification to the project activities and outcomes.

There are two main lessons / experiences that we learnt through the course of the project. (1) Open, thorough, and respectful communication and collaboration with the leadership and staff of the field site is critical to the successful design and implementation of a realistic, context-relevant, and impactful project. (2) Project implementation should follow an adaptive management approach: i.e., have open, flexible attitudes toward project implementation, with a readiness to revise plans according to the on-the-ground needs and realities.

IN THE FUTURE:

In the future, we plan to maintain a long-term research and conservation presence in Harapan Rainforest, building on the excellent foundation of work and collaborative relationship our current project has laid down, and continuing to work closely with HRFI in helping to address issues of its highest concern. Most immediately, we plan to continue each of the three current project components, because (1) we have a good understanding of these issues in the context of Harapan Rainforest, and our experiences have been significantly deepened after carrying out this

project; (2) there remains a considerable scope of improvement and increased conservation impact of these issues on the basis of what have already been done (e.g., both the capacity building and education programs have identified recommendations for future work).

SECTION 4:

APPENDICES:

APPENDIX 1: DETAILS OF AVIAN SURVEY PROTOCOLS

Mist-netting:

We used a total of 30 mist-nets, each 12 m in length and 2.6 m in height. Mist-nets were set up in three lines of ten, running head-to-tail for each line, resulting in a net line of about 120 m in length. Each net line was set up along one of three transects. For each survey, we operated the

mist-nets over a nine-day period. On days one to three, all three lines of nets were placed starting around 50 m from the northern end of all transects, running south. On days four to six, all net lines were shifted further south along the transects, with the beginning of net lines about 100 m from the end of the previous net locations. On days seven to nine, all net groups were again shifted, another 100m further down south. Thus, over a nine-day period, the mist-net groups have generally covered the 600 m x 400 m mist-netting subplot. Fig. A1-1 provides a schematic illustration of the design.

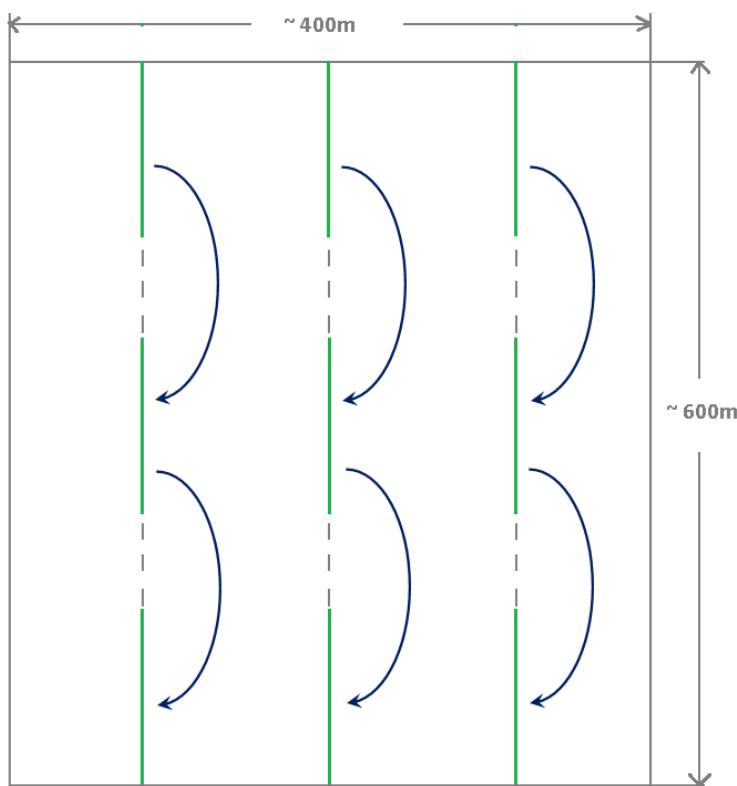


Fig. A1-1. Schematic demonstration of mist-netting sampling design.

Every day, the nets were opened at around 0600, and closed at around 1700, except for the third, sixth, and ninth days when the net groups were shifted, when the nets were closed at around 3 pm. All nets were checked once every hour, and birds captured in the net were extracted, brought back to a fixed banding station, and processed according to standard procedures. All birds were identified to species level, banded with an aluminum ring of the appropriate size, measured in terms of weight, body size, breeding status, and molting status, and then released. All recaptures are also noted, including for the birds that were caught and banded during the previous field sessions. All rings were provided by the Indonesian Institute of Sciences (LIPI).

Vantage point watching for diurnal raptors:

We watched for diurnal raptors from the towers between 0900 and 1300, for three days in a row during each field visit at each study location. We actively scanned the horizon and sky using binoculars and a telescope for any raptors flying by or perched nearby, and recorded the direction, distance, time of detection, and behavior for every individual.

Playback-assisted night-time point count surveys:

Playback-assisted owl surveys were conducted between 1900 and 0200 on evenings with full moon when owl activities are at their most active. Survey points were spaced 500 m apart along the second and fourth transects. Between-point distance was longer than point counts as playbacks at night could carry reasonably long distances, therefore count at each point could sample larger areas. We focused on four species of smaller-bodied owls: Brown Hawk-Owl (*Ninox scutulata*), Oriental Bay Owl (*Phodilus badius*), Collared Scops-Owl (*Otus lempiji*), and Reddish Scops-Owl (*Otus rufescens*). At each playback station (aka survey point), before the playbacks, survey began with a 2-min listening period to listen for spontaneously calling owls. Then territorial calls of the four owl species were played in the sequence of increasing body size. For each species, a ‘call bout’ of 1 minute with the species’ natural calling rate was played, followed by 30 seconds of silence. This was repeated for three times for each species, followed by a 1.5-min silence before the playback of the next species started. After all playbacks were finished, observers remained silent and listened for 5 minutes while visually searching the surrounding area with a spotlight (one million candle watt). Therefore, a total of roughly 30 minutes were spent at each count station.

APPENDIX 2: LIST OF BIRDS CAPTURED AND BANDED AT EACH STUDY LOCATION TALLIED OVER THREE FIELD SURVEYS.

Scientific name	English name	Camp location	Spas location
<i>Actenoides concretus</i>	Rufous-collared kingfisher	2	1
<i>Alcedo meninting</i>	Blue-eared kingfisher	1	-
<i>Alcippe brunnescens</i>	Brown fulvetta	3	-
<i>Alophoixus bres</i>	Grey-cheeked bulbul	5	4
<i>Alophoixus phaeocephalus</i>	Yellow-bellied bulbul	12	17
<i>Anthrreptes simplex</i>	Plain sunbird	2	-
<i>Arachnothera longirostra</i>	Little spiderhunter	42	14
<i>Blythipicus rubiginosus</i>	Maroon woodpecker	1	-
<i>Cacomantis sonneratii</i>	Banded bay cuckoo	-	1
<i>Calyptomena viridis</i>	Green broadbill	-	2
<i>Ceyx erithacus</i>	Oriental dwarf kingfisher	2	4
<i>Ceyx rufidorsa</i>	Rufous-backed kingfisher	6	9 (3 could be <i>C. erithacus</i>)
<i>Chalcophaps indica</i>	Emerald dove	7	-
<i>Chloropsis cyanopogon</i>	Lesser green leafbird	-	1
<i>Cyornis caerulatus</i>	Sunda blue flycatcher	2	-
<i>Dicrurus paradiseus</i>	Greater racket-tailed drongo	2	3
<i>Enicurus leschenaultia</i>	White-crowned forktail	6	-
<i>Harpactes duvaucelii</i>	Scarlet-rumped trogon	2	1
<i>Hyperthymus azurea</i>	Black-naped monarch	1	-
<i>Hypogramma hypogrammicum</i>	Purple-naped sunbird	10	4
<i>Kenopia strata</i>	Striped wren-babbler	-	3
<i>Lacedo pulchella</i>	Banded kingfisher	1	-
<i>Lanius tigrinus</i>	Tiger shrike	1	-
<i>Luscinia cyane</i>	Siberian blue robin	3	21
<i>Macronous pilosus</i>	Fluffy-backed tit-babbler	2	-
<i>Malacocincla malaccense</i>	Short-tailed babbler	5	7
<i>Malacocincla vanderbilti</i>	Vanderbilt's babbler	1	-
<i>Malacopteron affine</i>	Sooty-capped babbler	3	-
<i>Malacopteron albogularare</i>	Grey-breasted babbler	-	5

APPENDIX 2: CONTINUED

<i>Malacopteron cinereum</i>	Scaly-crowned babbler	8	19
<i>Malacopteron magnirostre</i>	Mustached babbler	3	12
<i>Malacopteron magnum</i>	Rufous-crowned babbler	2	6
<i>Meiglyptes tukki</i>	Buff-necked woodpecker	6	5
<i>Musci capa dauurica</i>	Asian brown flycatcher	1	7
<i>Orthotomus atrogularis</i>	Dark-necked tailorbird	-	1
<i>Orthotomus sericeus</i>	Rufous-tailed tailorbird	1	-
<i>Pellorneum capistratum</i>	Black-capped babbler	7	-
<i>Philentoma pyrhopterum</i>	Rufous-winged phillentoma	2	4
<i>Phylloscopus borealis</i>	Arctic warbler	-	2
<i>Picus mentalis</i>	Checker-throated woodpecker	2	1
<i>Picus miniaceus</i>	Banded woodpecker	1	-
<i>Pitta granatina</i>	Garnet pitta	-	1
<i>Pomatorhinus montanus</i>	Chestnut-backed scimitar-babbler	-	1
<i>Prionochilus maculatus</i>	Yellow-breasted flowerpecker	-	3
<i>Prionochilus percussus</i>	Crimson-breasted flowerpecker	5	3
<i>Prinia familiaris</i>	Bar-winged prinia	1	-
<i>Pyronotus atriceps</i>	Black-headed bulbul	1	-
<i>Pyronotus brunnneus</i>	Red-eyed bulbul	3	-
<i>Pyronotus erythroneurus</i>	Spectacled bulbul	2	-
<i>Pyronotus melanoleucus</i>	Black-and-white bulbul	-	2
<i>Pyronotus simplex</i>	Cream-vented bulbul	3	2
<i>Rhinomyias olivacea</i>	Fulvous-chested jungle-flycatcher	6	16
<i>Sasia abnormis</i>	Grey-cheasted jungle-flycatcher	-	8
<i>Stachyris erythroptera</i>	Rufous piculet	5	2
<i>Stachyris leucotis</i>	Chestnut-winged babbler	6	-
<i>Stachyris maculata</i>	White-necked babbler	3	1
<i>Stachyris poliocephala</i>	Chestnut-rumped babbler	2	11
<i>Terpsiphone atrocaudata</i>	Grey-headed babbler	7	1
<i>Terpsiphone paradisi</i>	Japanese paradise flycatcher	1	7 (1 not 100% sure)
<i>Trichastoma bicolor</i>	Asian paradise flycatcher	3	11 (1 could be <i>T. atrocaudata</i>)
<i>Trichixos pyrrhopygus</i>	Ferruginous babbler	2	4
	Rufous-tailed shama	2	5

APPENDIX 2: CONTINUED

<i>Tricholestes criniger</i>	Hairy-backed bulbul	15	4
<i>Turdus obscurus</i>	Eyebrowed thrush	6	-
Total number of bird individuals		228	236
Total number of species		53	42

APPENDIX 3: LIST OF DIURNAL RAPTORS AT EACH LOCATION DURING TWO FIELD SURVEYS

Avian group	Scientific name	English name	Camp location		Spas location	
			Survey 1	Survey 2	Survey 1	Survey 2
Diurnal raptors	<i>Circus spionotus</i>	Eastern marsh harrier	2			
	<i>Microhierax fringillarius</i>	Black-thighed falconet	1			
	<i>Nisaetus albociniger</i>	Blyth's hawk eagle	3			1
	<i>Nisaetus nanus</i>	Wallace's hawk eagle	1			
	<i>Pernis ptilorhyncus</i>	Oriental honey buzzard	5			
	<i>Spilornis cheela</i>	Crested serpent eagle	5		3	6
	-	Unidentified raptor	10			9
	<i>Leptoptilos javanicus</i>	Lesser adjutant	1			
	<i>Ciconia stormi</i>	Storm's stork		1		

APPENDIX 4: LIST OF OWLS OBSERVED AT EACH LOCATION DURING NIGHT-TIME SURVEY

Scientific name	English name	Camp location	Spas location
<i>Ninox scutulata</i>	Brown hawk owl	6	6
<i>Otus lempiji</i>	Collared scops-owl	1	2
<i>Otus rufescens</i>	Rufous scops-owl	0	1
<i>Phodilus badius</i>	Oriental bay owl	0	0

APPENDIX 5: LIST OF TRAINING WORKSHOP CONTENTS, INSTRUCTORS AND SCHEDULE

Day	Content	Instructor	Instructor affiliation and title	Hours
05/11/2011	All about Harapan Rainforest	Yusup Cahyadin	Harapan Rainforest; Executive Director	2.0
	Biodiversity conservation	Kim W. Sorensen	Harapan Rainforest; Executive Manager	2.0
	Management Information System (MIST)	Donny Gunaryadi	WCS Indonesia Program; Conservation Officer	6.0
05/12/2011	Law and regulation of state forest	Khusnual Zaini	Independent Law Consultant	6.0
	Roswendi		State Forest Protection Fast Response Bureau	
	Management and patrol strategy in conservation areas	Johan Simorangkir	Kerinci Seblat National Park; Senior Ranger	2.5
	Najimuddin		Kerinci Seblat National Park; Conservation Officer	
05/13/2011	Conflict resolution	Yulius	Harapan Rainforest; Director of Conservation Outreach	3.0
	Forest and land fire control	Nurdin Chaeriana	Harapan Rainforest; Director of Patrol	2.0
	First aid	Ade Juli Kurniawan	Panerokan Clinic; Senior Nurse	1.5

APPENDIX 6: SYNTHESIS OF SWOT ANALYSIS RESULTS

Analysis Category	Identified feature [†]	Number of team votes [‡]
Strengths	Dedication of patrol staff members	6
	Patrol action has strong legal basis	6
	There is adequate patrol personnel	4
	Adequate funding is available	1
	Good infrastructure is in place	1
Weaknesses	Patrol equipments are inadequate	8
	Patrol staff lacks professional capacity	6
	Patrol Department leadership provides poor support	5
	Lack of communication between leadership and field staff	4
	Poor attention paid to the southern region of Harapan Rainforest	2
	Lack of well-defined management boundary gives rise to disputes	1
	Lack of communication between Patrol Department and Community Outreach	1
	Department undermines patrol work	1
	There is a strong community support base	8
	There is strong support from the legal authorities	7
Opportunities	There is strong support from the Indonesian government	6
	HRFI has good partnership with other conservation NGOs	1
	HRFI makes good use of media tools	1
	Patrol staff has the help of some informants that were previous perpetrators	1
	Land encroachers are very powerful in funds, equipments, and organization	7
Threats	Perpetrators of illegal activities have the back of powerful connections	5
	Government largely neglects problems occurring on the ground	2
	The likelihood of perpetrators of illegal activities depends on timber	1
	(Note: [†] : Each strength / weakness / opportunity / threat feature was identified by patrol staff members through within-team discussion and eventually a plenary discussion between teams. We synthesized their results and lumped similar features under the same description. [‡] : Number in this column refers to the number of teams that identified the strength / weakness / opportunity / threat feature in question.)	

APPENDIX 7: LIST OF IN-CLASS ACTIVITIES FOR PROJECT'S EDUCATION COMPONENT

Time	Activity
April 2011 (4 days)	Introducing teaching tools and extra-curriculum story and nature books Movie watching: Turtle World
May 2011 (4 days)	Introducing interactive multimedia for self-learning Practicing story-telling as a method of building conservation awareness
October 2011 (4 days)	Questionnaire and interview on effectiveness of books, teaching tools Evaluation of students' learning progress

APPENDIX 8: LIST OF RECOMMENDATIONS FOR HRFI FOR IMPROVING COMMUNITY SCHOOL EDUCATION

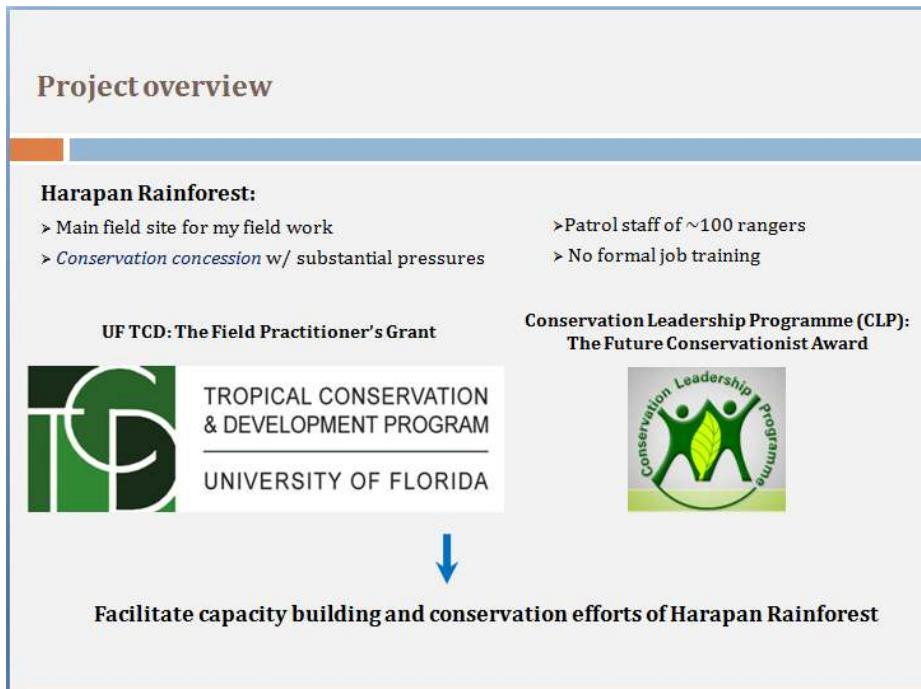
No.	Recommendation
1	Increase qualified teaching staff with expertise in elementary school education.
2	Develop and use a standard curriculum tailored to the needs of indigenous children.
3	Remodel classrooms to separate mixed grades during class in order to reduce distraction.
4	Expand collection of text books and library books.
5	Provide book and stationery storage space and carrying tools for students to avoid their loss.
6	Free school teachers of non-teaching, non-school activities.
7	Provide school teachers with capacity building opportunities for skill improvement.

APPENDIX 9: LIST OF FIELD EQUIPMENT DONATED TO HARAPAN RAINFOREST'S RESEARCH DEPARTMENT

Item	Quantity	Utility
Bushnell Binoculars	3 pairs	Essential equipment for wildlife research
Mist-nets and poles	30 sets	Mist-netting of (mostly) understory birds
Sennheiser ME-62 omni-directional microphone	1	Recording of bird sounds and other audios
Olympus LS-11 voice recorder	1	Recording of bird sounds and other audios
Field Guide to the Birds of Borneo (by Susan Myers, 2008)	1	Field guide for bird identification
Speakers	2	Playback equipment
Camping equipment	One set	Camping for field trips

APPENDIX 10: DETAILS OF CAPACITY BUILDING DESIGN, IMPLEMENTATION, AND RESULTS

This appendix attaches a presentation on the capacity building component of our project that provides all the important details. This presentation was made by Fangyuan Hua at the Program of Tropical Conservation and Development at the University of Florida in November 2011.



I. Background: In and around Harapan Rainforest

Harapan Rainforest: the 'Forest of Hope'

- > ~100,000 Ha of lowland rainforest
- > Matrix of oil palm plantations
- > Logging concession → conservation concession
- > Indonesia's first forest restoration project

BirdLife INDONESIA **RSPB** **BirdLife INTERNATIONAL**

I. Background: In and around Harapan Rainforest

Harapan Rainforest: the 'Forest of Hope'

I. Background: In and around Harapan Rainforest

Harapan Rainforest: the 'Forest of Hope'



- Project started in 2007
- Has developed into a multi-faceted conservation endeavor

Program Head Officers

Forestry Forest Patrol Research Community Development

Data Management Supporting Structure

I. Background: In and around Harapan Rainforest

Conservation threats of Harapan Rainforest



I. Background: In and around Harapan Rainforest

Harapan's patrol staff

- 12 teams x 8, plus supporting structure
- Mostly 'local' people living nearby
- Mode of work: routine patrols + special circumstances

- No systematic job training
- A series problems with the patrol department in general
 - Serious pressures and seemingly ineffective management
 - Widespread divide



A 'conversation' and a comprehensive training project seem to be needed.

II. Design and preparation of the training project

Original design and its subsequent evolution

Ideas my team went to the field with:

- 3 workshops in camp
- Field training of a selected subset of workshop participants
- Focus of training: biodiversity conservation (*we* would be the teachers)

Crucial factors that drastically shaped our original plan:



The resultant training design turned out to be:

- A close collaboration with Harapan Rainforest
- A much broadened scope
- Reduced coverage (funding limitations)
- A different structure and process

II. Design and preparation of the training project

Preparation: laying out training design (February ~ March 2011)

Beginning discussions between Sorensen and Hua → Full discussion among a core planning committee



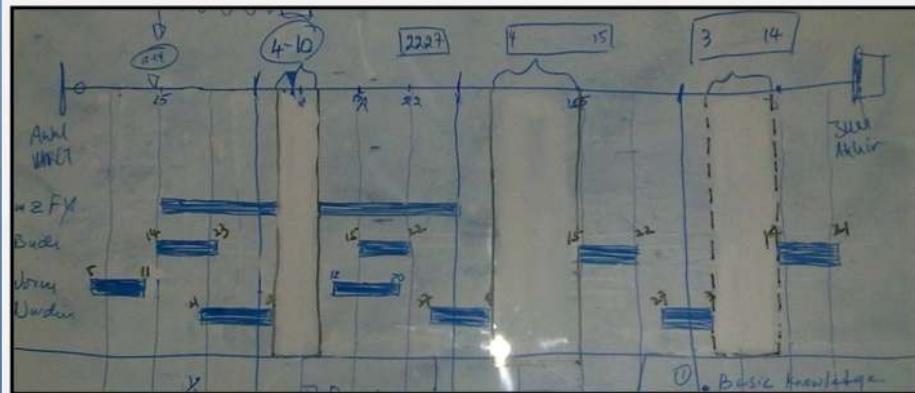
Sorensen
Vice Head (HRF)
Hua
Researcher (UF)



Isura
Researcher (University)
Nurdin
Head of patrol (HRF)
Budi
Community specialist (HRF)
Svarif
Mapping specialist (HRF)

II. Design and preparation of the training project

Preparation: laying out training structure and curriculum



II. Design and preparation of the training project

Preparation: laying out training structure and curriculum

TOPIC	II	"GIRUL" WCS - INDO.	Duration	Module/Time
MIST	II	LURU	→ FY + M	1 DAY
BIODIVERSITY	I	WLM, FY, W, W		2 HRS
BOUNDARY(+) PATROLS	III	LURU, SPORC	→ Nurdin	2-3 HRS
CONFLICT RESOLUTION	II	DLM	Yudina / BD	4 HRS
SOPs (incl Data collection)	IV	DLM	Bunti, W, Nurdin	1 DAY
BACKGROUND/HRF (Local information)	I	DLM	W, Yudina	2 HRS
FIRE FIGHTING	II	DLM	Nurdin	2-3 HRS
2 AW = MURKIN	III	LURU, SFORC Husnul	→ Mandiri → W.	5 HRS
WILDLIFE CRIME	II	LURU, WCS	→ FY + M	2-3 HRS
OTHER FA:	I	LURU	• Munies S. • DSO • Bulet Banua • Gomong Lawang	2x → FY + M 2-3 HRS

Danture + 1 mg x 13 = 26
 2mg SWFT
 13/3 ← dimer PA → 2.4
 2.4 mg
 50 mg
 5-day course (inc above)
 9-14/5 → 10/5

SCHEDULE	
I	9/5
II	10/5
III	11/5
IV	12/5
V	13/5

SWOT analysis → finalize design → invite trainers → one integrated training session

II. Design and preparation of the training project

Preparation: SWOT analysis (March and April 2011)

- "Strengths, weaknesses, opportunities, and threats"
- To know where we were, and what we needed
- Step 1: take-home assignment
- Step 2: group presentations

Involved **all** members of field patrol staff – presentations were attended by a subset of them



II. Design and preparation of the training project	
Preparation: SWOT analysis results	
+ 'S':	'O':
Dedication (6) Legal basis (6) Adequate personnel (4) Good funding (1) Local basis of personnel (3) <i>Full structure</i>	Community partnership (8) <i>Media tools</i> Support - legal sector (7) Support - government (6) NGO partnership (1) Converted facilitators (1)
- 'W':	'T':
Inadequate facility (8) Inadequate capacity (6) Poor management support (5) Poor coordination (4) Poor management action (3) Partnership misuse (1) Poor attention to southern region (2) <i>Poorly defined boundary</i> <i>Inadequate treatment</i>	Powerful encroachers (7) Powers behind illegal activities (5) Government negligence (2) Livelihood dependence on timber (1) Other potential interests on the forest (2)

II. Design and preparation of the training project	
Preparation: SWOT analysis results	
+ 'S':	'O':
Dedication (6) Legal basis (6) Adequate personnel (4) Good funding (1) Local basis of personnel (3) <i>Full structure</i>	Community partnership (8) <i>Media tools</i> Support - legal sector (7) Support - government (6) NGO partnership (1) Converted facilitators (1)
- 'W':	'T':
Inadequate facility (8) Inadequate capacity (6) Poor management support (5) Poor coordination (4) Poor management action (3) Partnership misuse (1) Poor attention to southern region (2) <i>Poorly defined boundary</i> <i>Inadequate treatment</i>	Powerful encroachers (7) Powers behind illegal activities (5) Government negligence (2) Livelihood dependence on timber (1) Other potential interests on the forest (2)
SWOT results →	
> Informed management improvements > Confirmed envisioned value of training > Finalized training design	

II. Design and preparation of the training project

Preparation: finalized training structure and curriculum

- Training was scheduled for a five-day, one-time session (5/9~5/13), in Jambi (Provincial Capital)
- Organizational decisions: 50 trainees (half of field staff); shared fund source

Content	Trainer	Hours
1 All about Harapan Rainforest	<u>Yusup Cahyadin</u> (<i>Harapan Rainforest</i>)	2.0
2 Biodiversity conservation	Kim Worm Sorensen (<i>Harapan Rainforest</i>)	2.0
3 Management Information System (MIST)	Donny Gunaryadi (<i>WCS Indonesia Program</i>)	6.0
4 Law and regulation of state forest	<u>Khusnual Zaini</u> (<i>Law Consultant</i>) <u>Roswendi</u> (<i>State Forest Protection Fast Response Bureau</i>)	6.0
5 Management and patrol strategy in conservation areas	Johan Simorangkir (<i>Kerinci Seblat National Park</i>) Najmuddin (<i>Kerinci Seblat National Park</i>)	2.5
6 Conflict resolution	<u>Yuliuss</u> (<i>Harapan Rainforest</i>)	3.0
7 Forest and land fire control	<u>Nurdin Chaeriana</u> (<i>Harapan Rainforest</i>)	2.0
8 First aid	Ade Juli Kurniawan (<i>Panerakan Clinic</i>)	1.5

➤ Invitation of external trainers

➤ Arranging for logistics

II. Design and preparation of the training project

Preparation: course package



III. Implementation of the training project

Implementation: general arrangement

Official title of training: **Training on MIST and Law Enforcement**

- 52 trainees
- 3-day training session
- Training location: a resort in Jambi City
- Pre-test, post-test, and course evaluation

The poster features the logo of Restorasi Ekosistem Indonesia (REI) on the left and the Harapan Rainforest logo on the right. The main title is 'HARAPAN RAINFOREST' with the subtitle 'MENEBAR TUNAS MENUAI HARAPAN'. Below the title, it says 'PELATIHAN M.I.S.T DAN PENEGAKAN HUKUM' and the date '11 - 13 MEI 2011, TRAINING CENTER MITRA AKSI, PIJOAN, JAMBI'. Logos for Burung Indonesia, RSPB, BirdLife International, COPERNICUS, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, kfw, and Tropical Conservation & Development Program are included. The website 'www.harapanrainforest.org' is at the bottom.

III. Implementation of the training project

Implementation: the 3-day training course



III. Implementation of the training project

Implementation: certification (turns out to be important!)

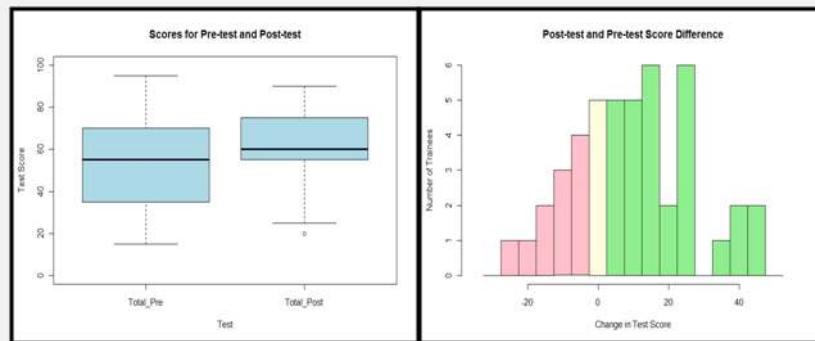


IV. Impacts, experiences and lessons from the training project

Impacts on trainees' professional knowledge: pre- & post-tests

Total of 20 multiple-choice questions

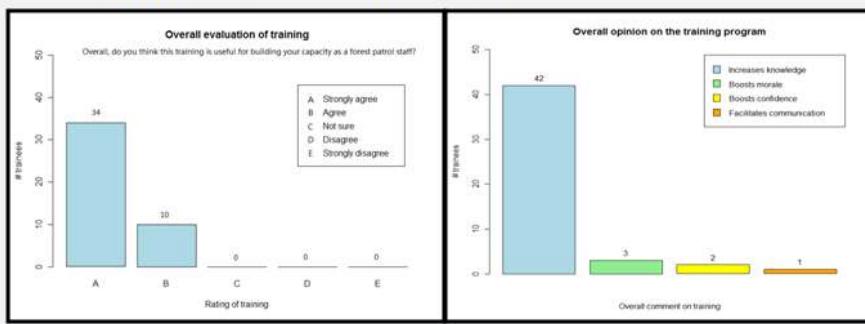
- 6 on Harapan and biodiversity conservation
- 3 on MIST
- 3 on legal status of forest
- 2 on restoration
- 3 on fire fighting
- 3 on conflict resolution



IV. Impacts, experiences and lessons from the training project

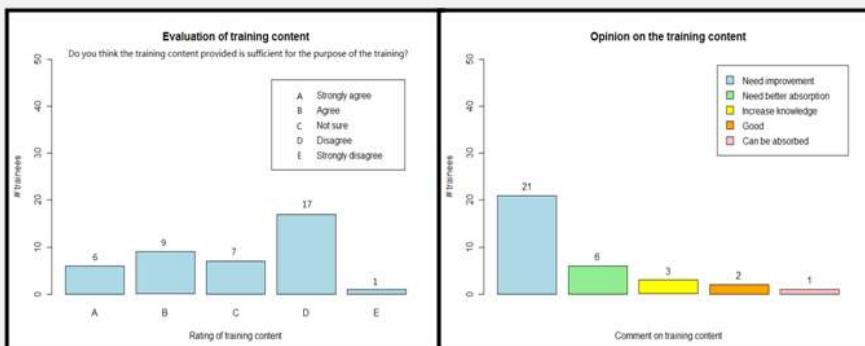
Trainees' evaluation of training project: overall evaluation

- Course evaluation was conducted at the end of the 3-day training
- Evaluation was focused on:
 - Overall usefulness of training
 - Content, schedule of training
 - Quality of individual contents (materials and lectures)
 - Trainees' suggestions on improvement for future training projects like this
- Obtained 44 valid evaluations (out of 52 total trainees)



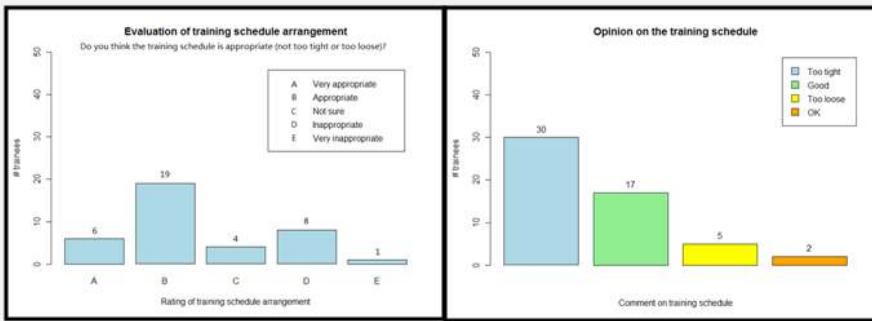
IV. Impacts, experiences and lessons from the training project

Trainees' evaluation of training project: training content



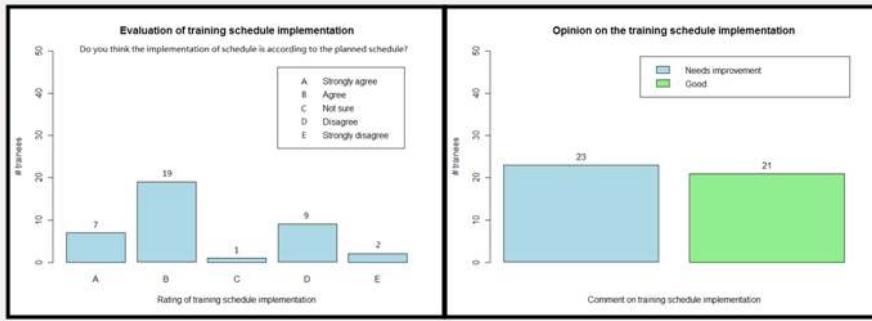
IV. Impacts, experiences and lessons from the training project

Trainees' evaluation of training project: training schedule design



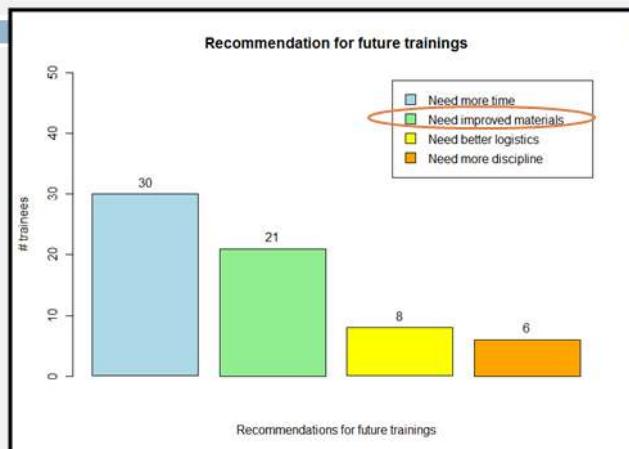
IV. Impacts, experiences and lessons from the training project

Trainees' evaluation of training project: training schedule implementation



IV. Impacts, experiences and lessons from the training project

Trainees' evaluation of training project: overall recommendations

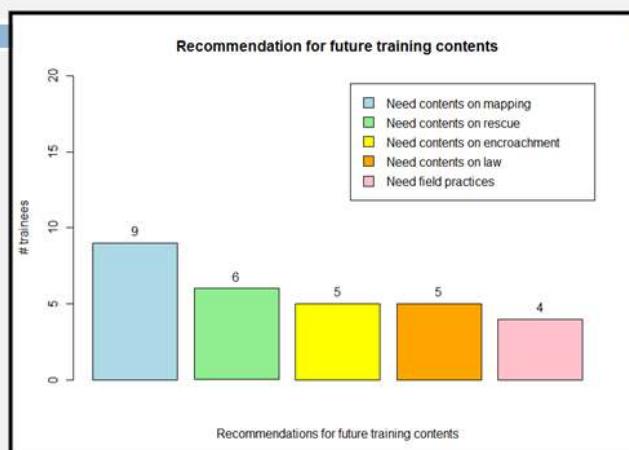


Some other recommendations on future training (proposed by <=3 trainees):

- Training should involve all patrol staff member (2) ➤ There should be follow-up training (1)
- Trainers should be more professional (2)

IV. Impacts, experiences and lessons from the training project

Trainees' evaluation of training project: recommendations for contents



Some other recommendations on contents that should be added (proposed by <=3 trainees):

- Forestry and restoration (3)
- Equipment use (2)
- Reporting and computer use (2)
- Ethics (1)
- MIST (1)
- Experience sharing from other places (1)

IV. Impacts, experiences and lessons from the training project

Conclusions, thoughts and lessons



- Total cost: ~ 4,500 USD (Our projects provided 2,100 USD)
- Improved the knowledge, although not ideal. (Better designed tests?)
- Promoted conversation, boosted morale.
- Legal issues and conflict resolution topics are particularly valued.
- Pointed directions for future improvements.
- Upcoming work: modules; follow-up training.

APPENDIX 11: DETAILS OF EDUCATION PROGRAM

This appendix attaches a compiled synthesis of the education component of our project that provides all the important details. The appendix is prepared by M. N. Janra and Aadrean.

Education Component of CLP Project

1. Condition of School Infrastructures

There are two schools aided by Harapan Rain Forest (later on referred as HRF). The locations are in Simpang Macan about 10 km from HRF main camp, and Camp 35 in adjacent to the settlement of staff patrol and local people. These schools were built as social responsibility of HRF to improve local people education. The schools named as “Sekolah Bersamo (Joint School) SD Harapan Rainforest” which have been then registered to educational agency and have been stated as remote class of SDN 49 Bungku. Having this registered status, students will be able to get the formal certificate after graduation. This formal certificate make them eligible to apply higher educational level, just as students in urban area.



Figure A11-1. Infrastructure condition in Simpang Macan school.

In Camp 35, school building originated from the remnant of small wooden mosque. The school process use several lower tables without chair and one cabinet for keeping books and other

education tools. In Simpang Macan, school building was made from wooden materials, and its floor was from rough cement. Formerly, this building was a local people hut, and then after donated to be school facility, it was repaired by HRF. In such way, we notice that learning process is available, at least, in the minimum requirement. Both schools were lacking facilitated. There is no wall barrier between classes. Class was differed by only the direction of white board.

2. Teachers

The schools have three teaching staffs; Azloha, teacher who also serves as principal, Muhammad Usman specializes as Islamic educator, and Son Haji. Son Haji was used to be Harapan research staff who then served as first educator for local children before Harapan schools formally established. As then he moved to Harapan's Community Partnership Division, he visited each hut to teach the learning participant how to read and calculate, as it is useful for their future. After school institution established, local children have been getting the formal education.

These teachers are HRF staffs who serve under the supervision of Community Partnership Division. In this term, their job description is not only to perform education; however, they are also responsible for other tasks. Although all of them having bachelor degree (S1), but none retain formal background in children education.



Figure A11-2. All teaching staff were portrayed with their students in Simpang Macan school building.

3. Students

In total, 49 students are registered in both Harapan's schools within period of 2010-2011. They are divided according to age grade, started from 7 to 15 years old. Over the course of education run, this number has gradually decreased. Some of them refused to continue their study without any clear reason, while some others choose to help their parents extracting forest resources. On average, they only attended the school for several days in a week. Moving to other place following their parents is another reason to not attend school. During the implementation of education program, no more than dozen students attend class sessions.

4. Social Culture

The local peoples in Harapan Rainforest area vastly consist of indigenous Batin Sembilan's tribe, known as Suku Anak Dalam (SAD) as majority component of local people and the minority group are composed by immigrant from outside area. They came from Aceh, Kerinci, Palembang in South Sumatra, as well from some parts of Java. It is obviously that the displacement was reasoned by the operational of oil palm plantation in Asiatic Persada company that located in contiguous to HRF protected area. Yet they were not accepted as staffs of the plantation, they tend to wander around while seek opportunity to open some part of forest for oil palm plantation on their own. In this mean time, they immensely depend on forest resources to keep their survival. They usually bring their family to this area as they can be used for additional labourer or marry indigenous people.

Generally, Batin Sembilan's peoples firmly maintain their traditions and cultures. They do occultism rituals frequently in their small hut, for example in healing health problem. They still retain believing that evil spirit can impose bad impact to physical creature. This ritual can be lasted through the night, frequently got over in the next morning. If this is the case, less student will come to school because the ritual processions and noisy disrupt their night rest and then make them tired and drowsy in the morning. Although they have strong culture and tradition, their social aspect have been dynamically influenced by modernism, along with the development of information facilities (television, mobile phone, etc.) and electricity and, in some extent, induced by their open interaction with outsiders.

5. Economic condition

Most of Batin Sembilan householders were qualitatively classified as poor. Their main income derived from collecting scattered loosing oil palm seeds (called as "brondol") after regular harvesting by company employee. Company will buy this "brondol" lower than market price. To supplement their income, Batin Sembilan people also extract the resin of jernang (tapping from some species of wild rattan) or dragon's blood (*Daemonorops* sp.), processed into traditional medicines, which then they sell to the nearest market.

Since the establishment of restoration program by HRF, local people were invited as conservation partner which gave them opportunity to increase their income. Using their indigenous knowledge, they were employed to collect seed of trees in local forest, then plant and nurture it. After growing into a steady seedling, HRF authority buy it. Other form partnership scheme will be potentially developed based on local wisdom.

6. Study activity

During the program implementation, both Harapan schools divide into three class groups; 1st , 2nd and 4th grade. In actual practice, first and second grade joined together, regarding low number of participants. This situation enact the teachers to conduct learning process with personal approach to each student. Learning materials are focused on the ability of reading and calculating.

The schools use formal national curriculum set by government, on support of formal education agency in Muaro Bungo-Jambi, however, the subject materials could not be delivered in total entity. This problem appeared because of time limitation, level of student understanding, and other technical problems.

In initial conducting, at least one teacher paid visiting on one school during the day. After thorough evaluation, this implementation was potentially considered giving problem especially after the schools added their capacity into three classes. One teacher would not be able to handle three classes in same time. Therefore, the system was modified along with the employment of one additional teaching staff. Two teachers should be the minimum number when visiting each school to perform their class session. For class timing, students in Camp 35 will have their class from morning until noon and then the teachers move to Simpang Macan, giving their class materials until afternoon. This system was considered as the effective way, in order to accommodate resources available in this education aspect. The other benefit through this system is the teaching staff will able to effectively put their overall tasks in a better arrangement and have more flexible time to shift their day off.

For students in Camp 35, having proximity with Harapan main camp, with sufficient electricity access, gives them opportunity for additional learning time in the night. Quran reading and Islamic study, usually take place after maghrib (sunset) praying, once a week in the mosque of the main camp.

7. Student capabilities

In general, according to our observation during the project, students in the first grade do not have proper reading ability. The higher grade show more proficiency in reading skill. In early time of Harapan school establishment, students were graded based on their reading capabilities. Those who showed advanced reading skill were put in third grade, and those who did not would be in the first grade. After a year of school ran, first grade students move up to second grade, while the third grade became the fourth grade students, and the first grade filled with fresh pupils. With this arrangement, the third grade have no attendant.

In the real life, Batin Sembilan children have already well known with money and its function for trading transaction, which involved a straight calculation. It is probably a reason for their better calculating ability in compare to their reading skill, simply through their daily practice in money transaction.

Another interesting fact observed, that the children who lived in natural condition with lack of modern facilities, have developed more robust physic. They are usually able to walk tens kilometers a day, as in the time they go with and help their parent gathering forest resources. During the class break, sports and outdoor games become interested subjects for the children.

Teachers use this time to bring students into some games as variation between class sessions. Including some sport plays that have been introduced such as football, track race, long jump, and high jump. As far we assessed this activity, these students' physical capability are considerably far beyond average urban children have. We supposed that such potency should be supported by sufficient nutrition and directional training in order to see the best result on that. It is quiet worrying anytime HRF supply them with extra food supplement such as milk, cereal, and multivitamin, it seemed children were not really interested because of they are not familiar with that supplementary foods.

Beside of playing, singing is one of the favorite means. Telecommunication medias, television and mobile phone, give the children a real time singing and art practices. Many contemporary songs were familiar for children as they sang it well.



Figure A11-3. Students play street soccer.

8. Project activities

Education activities in this project based on the peoples and environments condition we involved in. Objectives of this project consist of as bellow:

- 1) Providing education based-conservation values, and introducing environmental friendly attitudes: this objective was gained by optimizing the use of environmental theme books we provided, learning tools (APE), and movie. Story telling was also introduced within

the students to deepen their cognitive ability to know the effects of such learning methodology.

- 2) Improving the process and system of learning: curriculum materials, interactive media for self-learning of teacher, and various learning methods were supplied to the teacher based on our direct interaction with students and feedback they gave during project implementation.

Education activities during the implementation of project:

- 1) First visit (April 6th – 8th 2010)
 - a. Problem identification, familiarizing with targeted people and environment, discussion with HRF's community and social staffs to get overview regarding current education conditions and introduce our concept in educational part
 - b. Initial interaction with students in both schools and get some sense about their daily learning situation.
 - c. Introducing learning tools for basic subjects such as Reading, Math, Natural Science, and environmental issue
 - d. Supplying books: text book of formal studies and environmental issue reading materials, supplemented with children folklore books.
 - e. Watching movies which later proceed with discussion on movie contents.
- 2) Second visit (May 12th -15th 2011)
 - a. Reviewing and improving syllabus and curriculum material as teaching guide for the teachers
 - b. Providing interactive media for students' self-learning, giving training to the teachers on how to deal elementary children by using those media
 - c. Practicing to use learning tools in class
 - d. Applying story-telling as one of learning methods on conservation education and character building
- 3) Third visit (October 17th -20th 2011)
 - a. Questionnaire and interview
 - b. Evaluation on performance and effectiveness of books and learning tools used during class session and its impact to student improvement
 - c. Evaluation on learning development progress

Watching conservation-themed movie

The movie entitled “Turtle Word”. HRF helped us by providing in focus projector, laptop and electricity connection to school facility in Camp 35. For technical reason, we brought the children from Simpang Macan to see the movie along with students from Camp 35. The movie itself told about monkey society living on the shell of a giant turtle roaming in a big air space. The monkeys were analogous to human and the turtle with its shell as the earth. The shell is covered by dense trees. For supplying their life style, the monkeys cut off the tress, which then this intensified logging activity lasted until the last tree remained. Far beyond after that, the monkeys also dig the shell in searching for the valuable materials. It caused bad impact to the turtle. The turtle was suffered bearing all activities of the monkeys and then died. The turtle fall down, and bring all the monkeys sank drown into the sea.

This movie was interesting for the students. By doing post movie discussion, we noticed that the values of the movie were well delivered to the children. Enthusiast responds and talkative audience were gained after that. Within this activity, we know that utilization of movies is reasonably recommended to deliver A certain value to the students, which in this particularly is conservation issue. The students were interested to the movie because according to them the story was a resemblance to their daily live; it talked about their home, forest and landscape. They can understand the point about future consequent if they loss their forest because of logging activity. Not to mention, the students felt attracted because the movie used catchy audio and visual that they do not have in their regular class session.

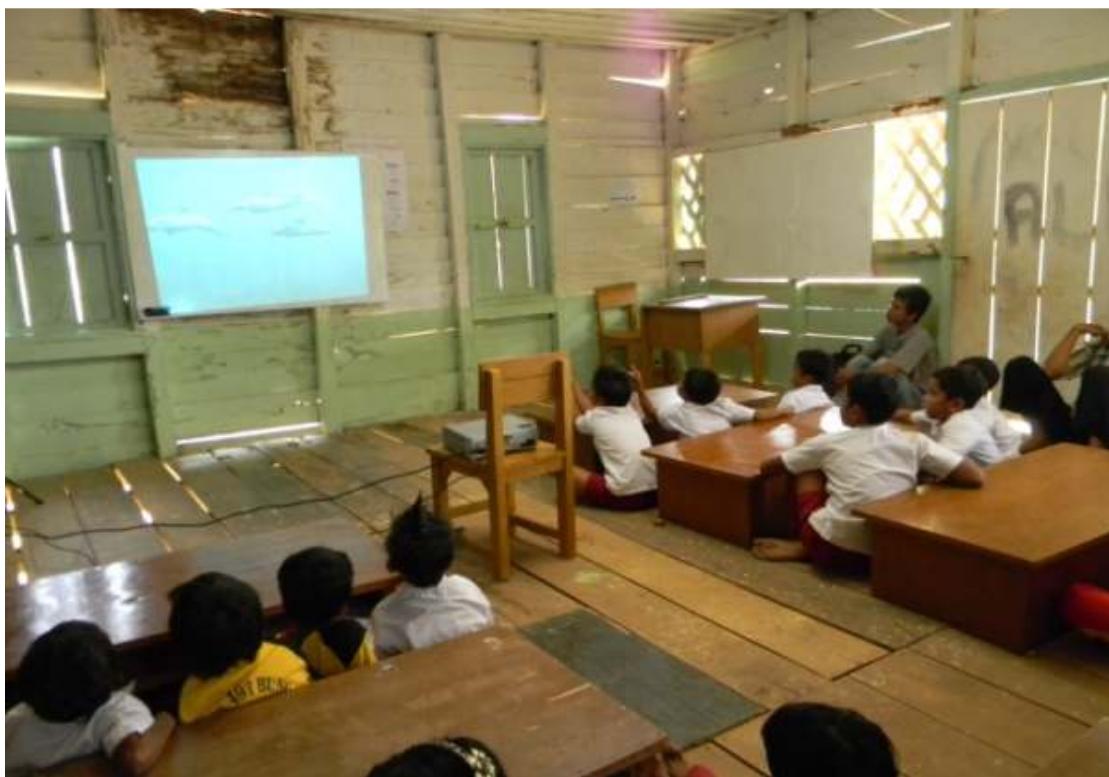


Figure A11-4. Students are watching conservation movie with their full enthusiasm.

Educational demonstration tools

Various learning tools had been introduced to Harapan schools during the project. Initially, learning tools was interested objects for the children. After they got used with it and learn how to solve the problem provided by these learning tools several times, then it became the bored activity. At this point we can see that students' interest started to decrease.

Along with the teachers who participated in class activity, we agree that the students need a dynamic tools that able to accommodate their curiosity. They should be durable, made from non hazardous material and aligned with education material provided in classroom.

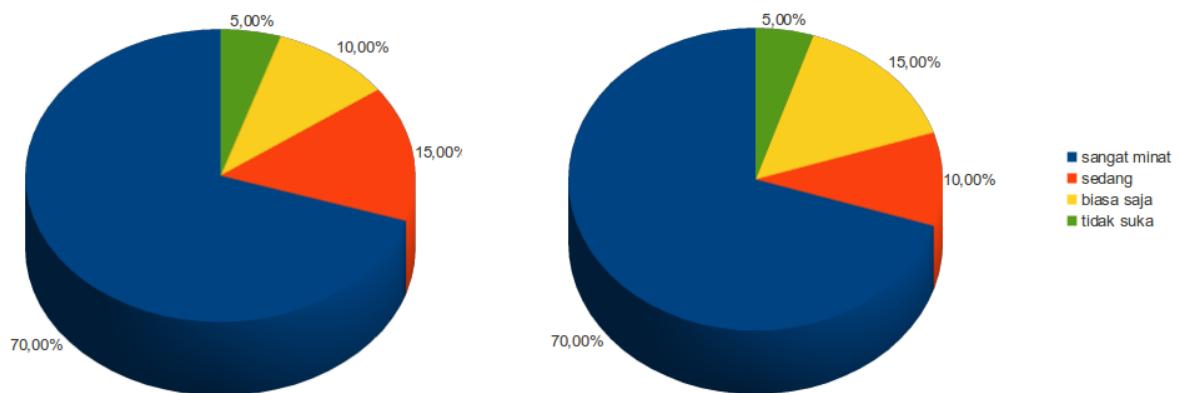


Figure A11-5. Students' interest toward educational tools. Left: Simpang Macan. Right: Camp 35; Blue: very interested, Orange: moderate, Yellow: ordinary, Green: not interested.

Using questionnaires we applied at the end of the project, we ranked the type of educational tools that are favoured by the students. The tools the students interested most were puzzle, math card, and syllable card. Students played puzzle repeatedly, tried to solve it by using various stacking possibility until they can rearrange it again. After that they take other puzzle versions to solve, as well increasing the level of difficulty. They can always return to previous puzzle type, because they can not exactly remember the sequence to resolve it. Meanwhile, playing with syllable cards to make meaningful readable words and sentence has more challenging level to the students. In this part, they can discuss to each other what letters or syllables they put together to make a word or sentence. There is no rigid rule to the way of word or sentence arrangement, which give the students more flexible way to think various words in their mind or to compromise other word proposed by other students in the class.



Figure A11-6. Using syllable cards in making words and sentences.

Book use

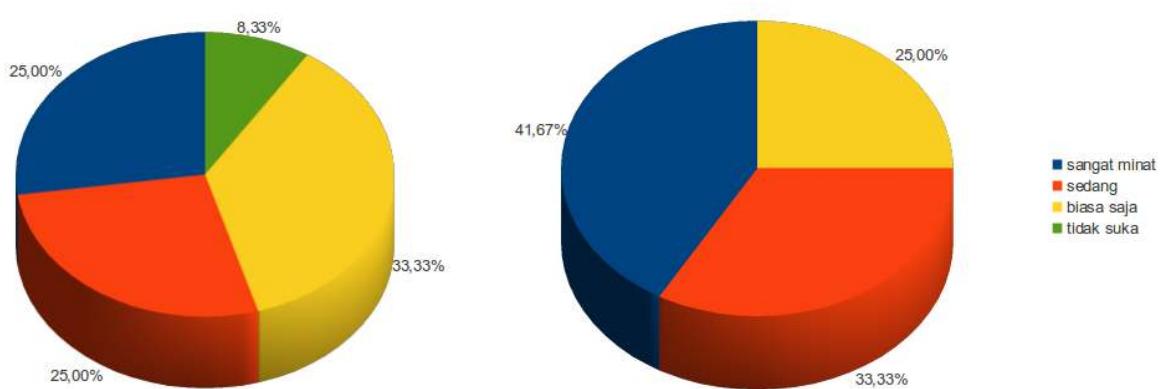


Figure A11-7. Students' interest in provided educational books. Left: Simpang Macan, Right: Camp 35; Blue: very interested, Orange: moderate, Yellow: ordinary, Green: not interested.



Figure A11-8: A student tries to imitate tiger figure in his reading book.



Figure A11-9. Team member Fangyuan Hua assisting students to understand pictures in their books.

The students had more their interest to the pictorial books that have many colorful pictures and simple structure of sentences. Based on our observation, most of students enjoying the picture in the book rather than reading its contents. They were also observed tried to imitate the picture on the reading books into their book. The children were interested by book, although they only saw pictures and interpreted the story by themselves. In this way, we see that using book through the story-telling class will be more effective to deliver reading contents, instead of asking students to read the books in their own way.

The students frequently loss their book during their time at home or with their parents working in the forest, so the teachers always give them papers and a pencil before starting the class and then teacher retrieve them back after class.

Overall, the effective methods in delivering class material are learning with singing and playing. This method can overcome boredom amongst students.

9. Constraints and Problems

The Harapan school is not properly equipped with steady infrastructures such as permanent building, comfort learning table and chairs for students, interactive media and other facilities. Sociocultural of SAD people restrict their children to have proper education. Most children prefer to help their parents than to study, because lack of adult labor in their family. In this way, children spend more time outside in the forest, not in the school which obstruct them getting education which they need for future. Otherwise, the poor economic problem which hit their family will also burden them with responsibility to overcome it.

10. Teachers' and students' expectation for future education system

This part was drawn from questionnaires we developed and circulated amongst the education participants in Harapan School, in hoping that we can depict what issue to be solved to give them a better educational system.

- 1) For government educational agency: providing proper school equipments and school building, adding more teaching staff
- 2) For community: support from community was greatly needed. Children need motivation from the community and their family. The school also needs the same support from community.
- 3) For students' families: keep and maintain school building, support their children to study and do homework at home, motivate their children to study in school
- 4) For oil palm company: provide job for students parents, more attention for SAD economy and education, probably by purchasing "brondol" from them with reasonable price
- 5) For Harapan Rain Forest management: participate in the community economic improvement, collaborate with government, and company for enhancing education system for SAD children, giving more facilities to the teachers' welfare and keep maintaining their current support to the students.

Most needed resources and improvements:

- 1) School text books

- 2) Interactive learning media (e.g., educational movie)
- 3) Training and education for their parent; how to motivate the kids to school
- 4) Proper school building
- 5) Transportation to accommodate students mobilization
- 6) Uniform

11. Recommendations

On behalf of the project team, which be based on our direct interaction, observation and discussion with any involved parties in Harapan School, we recommend several points to be taken into account as decision for education in Harapan Rainforest be made.

- 1) Harapan should add more teaching staff whose at least education for elementary school education. It is to anticipate the increasing of class participant in the future and give more flexibility for the teachers to arrange their teaching schedule.
- 2) There should be a standard curriculum in teaching to accommodate the educational needs from SAD children
- 3) Giving a separator between classes to avoid distraction from other class grade.
- 4) Enrich text books and reading books
- 5) Teacher should set target in their educational purpose
- 6) Teacher should give a continuum lesson in class, there should be connection between a certain class material with its previous and afterward class.
- 7) Book and stationery that were provided by HRF, was often lost by the children. This problem can be solved by providing a cabinet. Every student was given book and stationary with printed name, proceed to any class session, the class equipments are given to them and then recollected after class finished.
- 8) The schools need teachers focusing on learning activity only. Currently, they also involved in other of non-educational activity within Harapan management.
- 9) The teachers need skill improvement, probably through workshop and training. Government regularly conduct workshop and training for teacher, but this information were not known by the teachers in remote area. HRF management need to coordinate with education stake holders in Jambi Province to get a factual update about program information that can be used to increase their teachers' capacity.
- 10) Students in Harapan School need education that based on their local wisdom as it is easy for them to understand it.

APPENDIX 12: FULL ACCOUNT OF EXPENSES

	Total CLP requested (USD)	Total CLP used (USD)
PHASE I - PROJECT PREPARATION		
Itemized expenses		
Administration		
Communications (telephone/internet/postage)	100.00	
Books and printing journal articles/materials	100.00	
Insurance	400.00	
Visas and permits		
Team training	200.00	
Reconnaissance		
None		
Equipment		
Scientific/field equipment and supplies (mist-nets, banding gear, binoculars, recorders, etc.)	1,460.00	1,474.15
Photographic equipment		
Camping equipment (tarp, cooking utensils, backpacks, etc.)		
Field guides		
Maps		
Boat/engine/truck		
Fuel		
Other (batteries, stationery, books and teaching tools donated to community schools)		
PHASE II – PROJECT IMPLEMENTATION		
Administration		
Fees charged by hosting organization for various expenses, including insurance and vehicle use.	426.97	
Miscellaneous administrative cost, including photocopy for data backup, and medical expenses	85.56	
Food and lodging expenses		
Food and lodging	3,360.00	2,766.72
Salaries		
Salaries for field assistance	2,000.00	3,010.94

Transportation				
International transportation cost	1,000.00	422.47		
Transportation	500.00			
Customs and port duties	100.00	2,097.01		
Workshops				
Cost for implementing capacity building workshops (in the form of budget transfer to Harapan Rainforest)	2,650.00	2,112.36		
Printing and photocopying cost		3.82		
PHASE III - POST-PROJECT EXPENSES				
Administration	500.00			
Report production and results dissemination				
Other				
Total	12,470.00	12,500.00		

APPENDIX 13: REPRINT OF PUBLICATION PRODUCED FROM THE PROJECT

We have published one journal article based on research results from this project. Reprint of the article (Hua et al. 2011, Forktail) is attached with the report.

Globally threatened Sunda Blue Flycatcher *Cyornis caeruleatus*: synthesis of global records and recent records from Sumatra

FANGYUAN HUA, WILLIAM MARTHY, DAVID LEE & MUHAMMAD NAZRI JANRA

The Sunda Blue Flycatcher (or Large-billed Blue Flycatcher) *Cyornis caeruleatus* is endemic to Borneo and Sumatra and classified as globally Vulnerable (BirdLife International 2011). Its ecology remains poorly known, although it is characterised as an insectivorous lowland rainforest specialist occupying the mid-strata, usually recorded up to 500 m asl (BirdLife International 2001, Myers 2009). There are also suggestions that it is generally uncommon, rather patchily distributed, with a strong preference for primary forest habitat and highly sensitive to forest disturbance such as logging and fragmentation (Lambert 1992, BirdLife International 2001, Slik & van Balen 2005). Current records are heavily clustered in Borneo (particularly north Borneo), with only six published records from Sumatra, of which only two are post-1930 (BirdLife International 2001). Here we synthesise records of the Sumatran subspecies *C. c. albiventer*, including field reports from conservation/forestry organisations and birdwatchers, as well as records from museum collections. We also report on six recent records of this species from fieldwork in southern Sumatra.

Fieldwork was conducted in the Harapan Rainforest ecosystem restoration site, which spans the border between Lambi and South

and November 2010, 231 points along transects were surveyed across another three locations (some points were revisited, resulting in 387 total point counts). In December 2010, 198 mist-netting hours (over 18 days) with 360 metres of nets were completed across two locations. While some of these survey locations were near each other, none overlapped. In all cases, points along transects were spaced at least 200 m apart, mist-nets were set up in a continuous line, and any parallel net lines were spaced at least 130 m apart. Captured birds were ringed and measured according to standard procedures (Redfern & Clark 2001).

The vegetation structure of points along transects and mist-netting locations was measured according to established protocols (BBIRD 2008). Vegetation measurements were recorded in 5 m radius circular plots centred on each transect point and mist-net pole location. The following measurements were taken: canopy height and cover; understorey density (measured as the percentage of a 50 × 50 cm plate held 2 m vertically above the ground at the plot centre that was covered by understorey vegetation, as observed from four directions 10 m away); leaf-litter depth; ground cover (measured as the percentage of ground covered by vegetation at 0–50 cm above

APPENDIX 14: PHOTOGRAPHIC SAMPLES OF PROJECT DOCUMENTATION

Team members:



Muhammad Nazri Janra with a banded pitta (*Pitta guajana*) in hand



Aadrean, in searching for otters' tracks



Fangyuan Hua with students of HRFI's community school

Project photos:



Typical mist-net set-up



Fangyuan Hua banding birds at banding station.



College student field assistant Aldino Fauzil Fanani conducting vantage point watching.



Introducing the concept of SWOT analysis to patrol staffs during the pre-training session of capacity building program. Speaking in photo is the then Head of Patrol Department Nurdin Chaeriana (left in background); to his right is the Executive Manager of HRFI Kim Worm Sorensen.



Patrol teams presenting their SWOT analysis results.



Muhammad Nazri Janra (foreground) taking notes on HRFI community school visit. In the background, school teacher Son Haji was teaching first grade students while second grade students (to the left back) were doing homework assignment in the same classroom.



Aadrean and college student assistant Nurhidayata B.S (first and second on left) discussing with HRFI community school teachers and Community Outreach Department communications officer (third on right) about education program.

BIBLIOGRAPHY:**Cited references:**

- Barlow J., Peres C. A., Henriques L. M. P., Stouffer P. C., and Wunderle J. M. 2006. The responses of understory birds to forest fragmentation, logging and wildfires: an Amazonian synthesis. *Biological Conservation*, 128:182-192.
- Bibby C. J., Burgess N. D., Hill D. A., Mustoe S., Lambton S. 2000. Bird census techniques. London, UK: Academic Press.
- Edwards D. P., Larsen T. H., Docherty T. D. S., Ansell F. A., Hsu W. W., Derhe M. A., Hamer K. C., and Wilcove D. S. 2011. Degraded lands worth protecting: the biological importance of Southeast Asia's repeatedly logged forests. *Proceedings of the Royal Society B – Biological Sciences*, 278:82-90.
- Food and Agriculture Organization, United Nations (FAO). 2005. Global forest resources assessment: progress toward sustainable forest management. FAO, United Nations.
- Fuller M.R., and Mosher J. A. 1987. Raptor survey techniques. In: Raptor management techniques manual (eds Pendleton B. G., Millsap B. A., Cline K. W., and Bird D. M). U.S. Geological Survey, Scientific and Technical Series 10. National Wildlife Federation, Washington D. C., U.S.A.
- Hua F., Marthy W., Lee D., Janra M.N. 2011. Globally threatened Sunda Flycatcher Cyornis caeruleatus: synthesis of global records and recent records from Sumatra. *Forktail*, 27:83-85.
- Lambert F. R., and Collar N. J. 2002. The future for Sundaland lowland forest birds: long-term effects of commercial logging and fragmentation. *Forktail*, 18:127-146.
- Putz F. E., Blate G. M., Redford K. H., Fimbel R., and Robinson J. 2001. Tropical forest management and conservation of biodiversity: an overview. *Conservation Biology* 15:7-20.
- Thiollay J. M. 1992. Influence of selective logging on bird species diversity in a Guianan rainforest. *Conservation Biology*, 6:47-63.

ADDRESS LIST AND WEB LINKS:

Harapan Rainforest:

Dusun Kunangan Jaya, Desa Bungku, Bajubang, Kabupaten Batanghari, Jambi Province, Indonesia.

www.harapanrainforest.org

Burung Indonesia:

Jalan Dadali 32, Bogor, West Java 16161, Indonesia

www.burung.org

Indonesia Institute of Sciences (LIPI):

Gedung Widya Sarwono Jl. Jend. Gatot Subroto No. 10. Jakarta 12710, Indonesia

www.lipi.go.id

Andalas University (Universitas Andalas):

Kampus Limau Manis, Pauh, Padang 25163, West Sumatra Province, Indonesia

www.unand.ac.id

Indonesian Ministry of Research and Technology:

Gedung II BPP Teknologi Lt. 5, 6, 7, 8, 23, dan 24 – Jl. MH Thamrin 8, Jakarta 10340, Indonesia

www.ristek.go.id

DISTRIBUTION LIST:

None.