Conservation of dwarf gibbons (*Hylobates*) and siamangs (*Symphalangus*): Status, challenges and opportunities.

Summary report of workshop held on Wednesday 22nd June, 2011, Jakarta, Indonesia.

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Introduction

On 22nd June 2011, the Arcus Foundation hosted a one-day meeting at the Gran Mahakam Hotel in Jakarta, Indonesia for conservation practitioners and scientists working with the gibbon or small ape genera dwarf gibbons (*Hylobates*) and siamangs (*Symphalangus*). The objective of the meeting was to bring together a group of experts to identify challenges and priorities and explore possibilities for enhancing the conservation of these gibbon species.

This report is a summary of the results of the workshop discussions, which were intended to provide a useful snapshot, rather than an exhaustive overview, of the conservation challenges facing these two genera of gibbon. The aim was for key relevant issues and key geographic landscapes to emerge from the discussions, and for this to be made available to agencies engaging in conservation across the habitats of these genera. This report is divided into three sections covering the main areas of discussion:

1. Key *Hylobates* and *Symphalangus* landscapes with detail on location; number of species, and estimated numbers of individual apes present; approximate size of landscape; threats and institutions known to be operating the area.
2. Current conservation action in areas where the participants were most active and knowledgeable [Java, Sumatra, Kalimantan, Laos, Thailand and Cambodia] to gauge the level of conservation activity on the two genera [whilst acknowledging that this was not a comprehensive assessment].
3. Gaps and priorities for conservation action that had emerged from these discussions.

Background

There are currently 17 known gibbon species, compared to a total of 6 great ape species. They are the most typical modern-day apes, and Asia is, therefore, home to the largest number of non-human ape species. On balance, gibbon species receive fewer resources and media attention than other ape species[1] despite facing similar threats to orang-utans and African ape species. Of the current 17 known gibbon species, four[2] are critically endangered, eleven[3] are endangered, one species, *Hoolock leuconedys*, is considered to be vulnerable[4], and one species, *Nomascus annamensis*, is not officially rated yet.

[1] Susan Lappan & Danielle J. Whittaker. 'The Gibbons: New Perspectives on Small Ape Socioecology and Population Biology' Springer, New York, 2009
[2] *Nomascus concolor, Nomascus hainanus, Nomascus leucogenys, Nomascus nasutus*
[3] *Hoolock hoolock, Hylobates agilis, Hylobates albibaribis, Hylobates klossii, Hylobates lar, Hylobates moloch, Hylobates muelleri, Hylobates pileatus, Nomascus gabriellae, Nomascus siki, Sypmhalangus syndactylus*
[4] The IUCN Red List of Threatened Species 2011

The Arcus Foundation Great Ape program's initial focus was on supporting the conservation of apes from the Homininae family: specifically, chimpanzees and bonobos (genus *Pan*), gorillas (*Gorilla*), and orang-utans (*Pongo*). This remit was expanded when the Foundation explicitly decided to include gibbons in its conservation portfolio in October 2007. Since then, the Foundation has worked to increase the understanding of the diversity of conservation challenges facing gibbons. Arcus' actions have included supporting two workshops focussed on the gibbon genera *Nomascus* and *Hoolock* at the 2010 International Primatological Society [IPS] conference. The outputs from these meetings, which were facilitated by Fauna and Flora International [FFI], have been published in two editions of the Gibbon Journal (No. 6 – May 2011 and forthcoming No. 7).

This report is the result of a third workshop intended to compliment the previous two IPS conferences and focus on the remaining two gibbon genera, *Hylobates* and *Symphalangus*, and was facilitated by Arcus staff.

The aim of all of these gibbon workshops has been to collate existing knowledge, identify priority areas of investment for conservation, and analyse the effectiveness of conservation efforts to date. The intended audience for the resultant reports includes a diversity of organizations/stakeholders whose interests range from conservation of natural habitat, to welfare of gibbons species, and human livelihoods in gibbon range-states. Conservation organisations, NGOs, local and national governments as well the donor community can all play important roles in improving the conservation status of gibbon populations but only if the relevant information is made available to them.

1. Key *Hylobates* and *Symphalangus* landscapes

The key product of the Jakarta meeting was a "Priority landscape matrix for *Hylobates* & *Symphalangus*".

The Arcus Foundation – as part of its ongoing collection of information on important landscapes for all ape species across the globe – had begun to compile information on specific areas that are known to hold populations of *Hylobates* and *Symphalangus*.

Meeting participants helped to improve this information by adding their knowledge into the matrix [shown overleaf]. Areas that hadn't been included in previous iterations were identified and added in, as was additional detail on specific protected areas, distribution and density of gibbons, threats, and conservation institutions working within the landscapes in question.

The matrix is not exhaustive but does indicate possible priority geographic areas for gibbon conservation interventions. It also indicates where further work is required to generate better information on existing populations and their conservation status.

Priority landscape matrix for *Hylobates & Symphalangus* gibbons[5]

Landscape area	Subareas	Number of ape species present	Number of individual apes estimated present[6]	Size of landscape	Threats	Institutions present
Western Forest Complex, Thailand [WEFCOM]	Huai Kha Khaeng Wildlife Sanctuary (HKK), Thung Yai East and West Wildlife Sanctuary [TY]	1	Unknown.	> 1,800,000 ha [18,000 km^2]	Low	National & International
WEFCOM includes 8 wildlife sanctuaries and 11 national parks with over 80% forest cover. It is by far the largest protected area complex in Thailand and across this species' range Could subdivide the landscape by sub-species but insufficient information to do so[7].		White-handed gibbon (*Hylobates lar*)	15-20,000 estimated in whole of Thailand (Brockelman in Geissman *et al* 2007[8]). WEFCOM, & Kaen Kracheng complex, largest tracts of protected habitat in Thailand and likely to harbour largest populations of *H. lar*. No specific information from contiguous Myanmar habitat but could contain *H. l. yunanaensis* [recorded as extinct] as well as *H. l. carpenteri.*		Good potential for long-term conservation and government support. Large area.	WCS, working with the DNP in HKK and TY. WWF also present in the wider WEFCOM; functionality and coordination quite good with strong government support for anti-poaching; considerable potential and political will to expand and intensify efforts across wider WEFCOM.
Central - Northern Thailand Complex	Phu Khiew Widlife Sanctuary, Tabo-Huiyyai, Phu Pang Daeng and Pha Pheung Wildlife Sanctuary; Tad Mog, Phu Pha Man	1	Unknown	>3,274 km^2	Unknown	Unknown
Names for some of these PAs seem to vary in the literature, those cited herein are in line with the World Database on Protected Areas [WDPA] http://protectedplanet.net [and there are also several other PAs to the northeast, including Nam Nao National Park, that could be counted as part of this landscape].		White-handed gibbon (*H. lar*). This area might be particularly important if it contains the northern subspecies *H. l. carpenteri.*		Minimum size from combined areas of Phu Khiew 1574.44, Tabo-Huiyyai 648.81, Phu Pang Daeng 231.07, Phu Pha Man 359.4, Pha Pheung 176.59; Tad Mog 283.98 [sizes from WDPA].	?	?
Southern Tenasserims – Thailand and Myanmar	Kaeng Krachan [KK] Forest Complex, Thailand Thaninthayi Nature Reserve, Myanmar	1	Unknown	> 607,300 ha [6,073 km^2]	Low	National & International
This landscape is still contiguous with WEFCOM, with which it could, theoretically be combined. Thailand's KK forest complex includes Kaeng Krachan National Park, Kui Buri National Park and Mae Nam Pachi Wildlife Sanctuary, which are connected by relatively intact forest corridors, and is contiguous with Thaninthayi Nature Reserve and surrounding forest reserves across the border in Myanmar.		White-handed gibbon (*H. lar*). This area also contains the Isthmus of Kra, where T. Geissman *pers. comm.* notes *H. lar* are much larger, and might prove to be taxonomically different.		This is just the size of the individual protected areas, [Kaeng Krachan National Park, Kui Buri National Park and Mae Nam Pachi Wildlife Sanctuary in Thailand] but together with forest corridors, total size of landscape could be > 12,000 km^2	Insecurity in this region of Myanmar, as well as low levels of infrastructure, suggest a probably relatively low level of threat.	Institutions are working on the ground on both sides of the border: WCS and WWF, working with the DNP in Kaeng Krachan Complex, Thailand. WCS and the Myanmar Forestry Department through a 4-year technical support program in Thaninthayi, Myanmar.
Eastern Thailand Forest Complex	Khao Yai National Park; **Tab Lan NP; Pang Sida NP**; Tha Phraya NP, Dong Yai WS	2	7,100	6,000 km^2	Medium	Unknown

[5] Compiled by E. Bowen-Jones with post-meeting inputs from participants: T. Geissmann, Clare Campbell, and Matt Nowak, as well as significant additional inputs from Susan Cheyne of Wild CRU [Conservation Research Unit], Oxford University; and Emma Stokes and Tom Clements Wildlife Conservation Society

[6] Estimated from best/ latest survey data; or, % of range and estimated overall population.

[7] From Red List 2011: The only geographically well-separated subspecies is *H. l. vestitus*, which is found on Sumatra; despite its (relatively recent) isolation, however, it is not highly distinct phenotypically (W. Brockelman pers. comm.). The taxonomic status of all the *H. lar* subspecies, and specifically *H. l. yunnanensis*, requires further investigation.

[8] Geissmann, T. (2007). Status reassessment of the gibbons: Results of the Asian Primate Red List Workshop 2006. *Gibbon Journal* **3**: 5-15.

Khao Yai and Tab Lan are also separated by a road and 'several km of agriculture' but are here regarded as part of one fragmented landscape. Extending west to Phanom Dongrak there are other PAs with smaller gibbon populations not included in this landscape since they are separated by large areas where they are absent [according to Phoonjampa & Brockelman 2008].		Principally pileated gibbon (*H. pileatus*), with small area of white-handed gibbon (*H. lar*) in far western element of landscape [in western third of Khao Yai Park]	Conservative estimate based upon Phoonjmmpa & Brockelman 2008[9]'s estimated total populations for Khao Yai, Pang Sida and Tab Lan National Parks [not adding any *H. lar* or *H. pileatus* in smaller PAs].	Approximate area of PAs derived from *total* areas of reserves listed left – realising that much of Khao Yai appears unoccupied by *H. pileatus* according to [Phoonjampa & Brockleman 2008] but taking into account the additional presence of *H. lar* in its western third.	Hunting and habitat fragmentation/ loss remain significant threats to the large populations that would otherwise be viable.	The western side of this landscape is a Tiger Conservation Unit, but the institutions present aren't known.
Peninsular Malaysia	Endau Rompin	1	Unknown	350,000 ha [3,500 km^2]	Low-Medium	National & International
Endau Rompin Johor National Park, Endau Rompin Pahang State Park and surrounding logging concessions		White-handed gibbon (*H. lar*) [Issue of missing info on *H. lar lar*]	Gibbons confirmed in landscape but no systematic surveys yet conducted [last work by Chivers[10] in 1970s]. Status of gibbons unknown but this area relatively inaccessible – thought to have good potential. Population estimates for *H. lar* in general (and Malaysia in particular) are currently very poor with surveys needed.	Includes prime lowland rainforest in the Endau Rompin Johor National Park (~500 km^2) and Endau Rompin State Park in Pahang (~400 km^2), surrounded by federal and state forest reserves.	Important tracts of suitable habitat remain fairly remote; hunting for local consumption and habitat fragmentation are likely the single biggest threats facing gibbons.	Complex group of stakeholders across a multiple-use landscape, including WCS, Johor National Parks Corporation, state and federal authorities, police and private oil concession holders.
Southern Cambodia	Cardamom & Elephant mountains	1	20,000	>2,000,000 ha [20,000 km^2]	High	National & International
		Pileated gibbon (*H. pileatus*)	Estimated by Traeholt et al. 2005[11]	Central Cardamom Mountains including Phnom Sankos and Phnom Auora, linking to the Elephant Mountain Range w Kirirom and Phnom Bokor NPs	B. Rawson reports that much of the Cardamom Mountains is being degraded for charcoal, plus that mining and 'economic land' concessions are being issued in south Bokor NP as well as Phnom Aurora, which are being clear felled as a result. He suggests that enforcement is minimal in all but the Central Cardamoms where there is a smaller threat from dams, but less chance of concessions.	Various including FFI, & Cambodian Ministry of Environment; CI & Forestry Admin in the central Cardamoms [402, 000 ha] which seems to be relatively well protected
Northern Plains, Cambodia	Kulen Promptep Wildlife Sanctuary, Preah Vihear Protected Forest and surrounding land concessions	1	<1000	5,580,000 ha [5,580 km^2]	High	National & International
		Pileated gibbon (*H. pileatus*)	Reduced estimates of 200-1000 [B. Rawson, *pers. comm*.] although previous information has suggested a population of 1-2,000 individuals	This total landscape area includes 154,000 ha (1,540 km^2) of suitable gibbon habitat	Escalating threats from land clearance, mining concessions, military activities etc, plus relatively low government capacity.	Strong collaborative conservation work being undertaken by WCS and several local NGOs.
Central Eastern Cambodia	Prey Long	1	>10,000	3, 600,000 ha [3,600 km^2]	High	National & International

[9] Phoonjampa, R., and Brockelman, W. Y. (2008). Survey of pileated gibbon *Hylobates pileatus* in Thailand: Populations threatened by hunting and habitat degradation. *Oryx* 42(4): 600-606.
[10] Chivers, D. J. (Ed.). (1980). Malayan forest primates: Ten years' study in tropical rain forest. Plenum Press, New York.
[11] Traeholt, C., Bonthoeun, R., Rawson, B., Samuth, M., Virak, C., and Sok Vuthin (2005). *Status review of pileated gibbon, Hylobates pileatus and yellow-cheeked crested gibbon, Nomascus gabriellae, in Cambodia*, FFI Cambodia Programme Office, Phnom Penh, 59 pp.

Ungazetted, potential REDD [Reduced Emissions from Degradation and Deforestation] site due to status as one of last lowland peat swamps in the region.		Pileated gibbon (*H. pileatus*)	Guesstimate from Traeholt's (2005) estimated 2,475 groups; B. Rawson suggests that this is the second biggest population in Cambodia.	Area cited on REDD Monitor http://www.redd-monitor.org/2011/03/02/can-redd-protect-prey-long-forest-in-cambodia/	Falls under Forestry – who are - B. Rawson reports involved in capacity building for 'avoided deforestation' [REDD] although threats include mining, illegal logging, plantations, dams, power lines and forest is being bulldozed to make way for rubber plantations.	Conservation International, Cambodian Forestry Administration
Leuser Ecosystem	East & West Leuser, Taumon-Singkil plus Tripa Swamp	3	81,624	2,600,000 ha [26,000 km^2]	Medium	National & International
		Sumatran orangutan (*Pongo abelii*), white-handed gibbon (*H. lar*) and siamang (*Symphalangus syndactylus*)	Orangutans = approx 5,705; estimated number of siamang = 45,224 [20% of area - lower elevations, x 2.23 group/km^2, x 3.9 individuals/group - from Bukit Barisan] & white-handed gibbon estimated at 36,400 [50% area mid-altitude x mean group size 4 x lower end densities of 0.7 individuals/km^2 from mainland Malaysia] [Matt Nowak notes that unpublished results from Ryan Palombit (1994) suggest that the siamang population in certain areas e.g. Ketambe, may have been reduced significantly, and this should be borne in mind. He also notes a serious lack of data outside the Ketambe area.	Most forested, although fragmented in some areas	The situation is mixed. M. Nowak notes that there is significant encroachment in several areas including Ketambe; serious hunting and trade issues everywhere; institutional conflict exists over 'ownership' of the National Park, and, in 2011, Tripa swamp has been subject to burning ahead of oil palm planting.	Leuser Management Unit (Leuser International Foundation), Leuser Ecosystem Management Authority [BPKEL], PanEco Foundation, Yayasan Ekosistem Lestari, Sumatran Orangutan Conservation, WCS (in N. Sumatra)
Northern Sumatra	Batang Toro	3	6,045	136,000 ha [1,360 km^2]	Medium	National & International
Both East & West blocks now proposed for protection forest; high watershed importance for 132,000 people.		Sumatran orangutan (*P. abelii*), white-handed gibbon (*H. lar*) and siamang (*Symphalangus syndactylus*)	M. Nowak's preliminary vocal survey data gives a max of **9,355** [100-**400** orangutans; siamang at (3.58 groups per km^2, group size 2.78 individuals and agile gibbons at (5.32 groups per km^2, group size 3.08 individuals) in a conservative 25% of the area i.e. 340km^2]. His line transect data: agile gibbons at 5.95 indiv/km2 & siamang at 1.86 indiv/km2 gives a minimum of **2,755**. A median of these 2 estimates is used herein.	M. Nowak's data from 2011 Think Group	Petition to extend logging rights in Western block; mining company causing land trafficking; proposed roads key threat – existing road in valley almost severing forest connection.	YEL; PanEco sudy site interest; now thinking about getting further involved; local livelihood NGOs not being supported separately as yet; SOCP also interested.
Central Sumatra	Kerinci-Seblat complex	2	37,848	1,379,100 ha [13,791 km^2]	Medium	National & International
		Agile gibbon (*H. agilis*) & siamang (*S. symphalangus*)	Agile gibbon estimate = 13,860 [group size 3 in Kerinci; group density 0.67/km^2; area suitable - mid-elevation -estimated at 50%]; siamang estimate = 23,988 [20% area; 2.23 group/km^2 & 3.9 individuals/group]		Road key threat; still being fought – new government regulations on roads in national parks may be of use. Logging is also a major issue still [in terms of fragmentation] no enforcement of existing standards.	FFI, PHPA, LIPI; University of Padang; possible Japanese research team in the south
South Sumatra	Bukit Barasan Selatan National Park	2	26,869	210,000 ha [2,100 km^2]	Low-Medium	National & International

Part of larger landscape with potential for connection [the **Bukit Balai Renjang landscape** – different PAs in each province]		Agile gibbon (*H. agilis*) & siamang (*S. symphalangus*)	From surveys reported in O'Brien et al 2004[12]. Lowland forests in BBS particularly important for siamang	The figure given is available habitat in BBSNP alone. Potential for linkages to Bukit Balai Rejang forests to the north mean that this area could be increased to 3,500km^2. This would contain the largest tracts of protected lowland forest in Sumatra.	Fragmentation of habitat is main threat, although relict gibbon populations remain in damar plantations [harvested for incense] & shade coffee. Both species occur in secondary forest where encroachment and hunting area are major issues. The other reserves are under district government control.	WCS, International Rhino Foundation, WWF, local NGOs and government partners. On-site activities include anti-poaching, community awareness, land-use planning with emphasis on retaining key corridors and maintaining connectivity in the landscape.
Central Kalimantan	Sebangau PA + Mawas & Katingan Sampit	2	111,100	>1,243,511 ha [12,435 km^2]	Medium-High	National & International
Ex-Mega Rice project remaining fragments could be included in this landscape (1245 km^2 with estimated population of 7,385 gibbons and 1,146 orangutans). Area highly fragmented but OuTrop/ WildCRU/CIMTROP partnership planning to trial creating corridors in this area		Bornean orangutan (*P. pygmaeus wurmbii*) & white-bearded gibbon (*H. albibarbis*)	16,000 estimated orangutan population in areas listed; guestimated gibbon population of 95,000 if a low end estimate of 7 individuals/km^2 is used for whole area (Cheyene) *pers. comm.* that "this is a valid estimate for peat-swamp densities based on extensive work by Orangutan Tropical Peatland Project [OuTrop]")	Not including areas in between [these being the main areas from Red List estimates] - Sebangau 568,700 ha; most of rest of landscape unprotected; total areas could be up to 5,500,000 ha. Connectivity limited by rivers but these areas are part of the same main peat dome (the deepest being in Sebangau).	Fire, degradation of peat and encroach-ment, and oil palm	Orangutan Tropical Peatland Project [OuTrop], WWF, Borneo Orangutan Survival [BOS] & Wetlands International
Central Kalimantan	Tanjung Puting PA	2	25,000	>399,489 ha [3,994 km^2]	Medium-High	National & International
		Bornean orangutan (*P. pygmaeus wurmbii*) & white-bearded gibbon (*H. albibarbis*)	5,000 estimated orangutan population in areas listed; guestimated gibbon population of 20,000 if a low end estimate of 7 individuals/km^2 is used for whole area [as detailed above].	Little/no connectivity with areas above, also isolated by oil palm	Fire, degradation of peat and encroach-ment, and oil palm	WWF, Orangutan Foundation International, Yayorin [an Indonesian NGO], BOS & Wetlands International
Central Kalimantan	Murung Raya area	2	125,000	>1,400,000 ha [14,000 km^2]	Medium-High	National & International
Part of Heart of Borneo initiative, includes the Barito Ulu research area		Müllers gibbon (*H. muelleri muelleri*) and only hybrid population of *H. mulleri* and *H. albibarbis*. No wild orangutans in this area	Initial population density data from the BRINCC Expedition (July-Sept 2011) suggests that, taking a precautionary approach [by using lower-end average densities of 2.22 groups/km2, with 4 gibbons per group, and not accounting for lone males] there are likely to be at least 125,000 gibbons in this landscape [there being no observed significant differences in density between Muller's and hybrid gibbons].	The forest area has a variety of status' ranging from production forest to protected areas. The landscape is not yet fragmented but the land status does mean that there are many varying pressures on this landscape.	Logging and mining	Project Barito Ulu, FFI, WWF
NW Kalimantan, Malaysia border	Danau Sentarum, Betung Kerihun NP, Batang Ai , Lanjak Entimau Wildlife Sanctuary Sarawak.	2	15,900	>992,700 ha [9,927 km^2]	Low-Medium	National & International
T. Geissmann notes that recent DNA analysis suggests that the three subspecies of *H. muelleri* may deserve species recognition (with *H. m. abbotti* from this area being the most distinct in		Bornean orangutan (*P. pygmaeus pygmaeus*)& Mueller's gibbon (*H. muelleri abbotti*)	Estimated population of orangutan in PAs = 3,500 (inc. minimum of 1,175 to 2,582 individuals in the Batang	This being the minimum area (of the three principle protected areas of BKNP, BANP and	Very little seems to be known in terms of current threats, but unlikely to be severe.	FFI and 2 local NGOs in Denau Sentarum, WWF in Betung Kerihun & working on corridor, WCS in

[12] O'Brien, T. G., Kinnaird, M. F., Nurcahyo, A., Iqbal, M., and Rusmanto, M. (2004). Abundance and distribution of sympatric gibbons in a threatened Sumatran rain forest. *International Journal of Primatology* **25**: 267-284.

fur colouration)			Ai/ Lanjak Entimau complex) with additional habitat in proposed extensions that have not been surveyed, but where rapid assessments have indicated important orangutan populations; plus perhaps 5% of total gibbon population = 12,500 individuals.	LEWS), which is probably larger if non-protected forest included, however, 90,000 ha seemingly badly degraded [from google earth, checked 22.9.2009].		Batang Ai/ Lanja Entimau undertaking threats assessment, community outreach and law enforcement and surveys planned for 2011 to revise PA boundaries. Real potential for transboundary coordination - WCS, together with the Sarawak Forestry Corporation and ITTO have prepared a draft transboundary orang-utan strategic action plan across the three PAs with WWF input.
West Kalimantan	Gunung Palung, Belantikan	2	>22,420	600,000 ha [6,000 km^2]		
		Bornean orangutan (*P. pygmaeus wurmbii*) & white-bearded gibbon (*H. albibarbis*)	8,500 orangutans in both protected & non-protected areas; Marshal's 2009[13] suggestion that montane forest in the park acts as a sink for gibbons suggests use of a median his lower-end density estimates (2.32 indiv/km2) to give a precautionary minimum of 13,920 gibbons [which also allows for ongoing threats to lowland forest].		Illegal logging, palm oil, and weak PA management.	Health & Harmony, OFI, FFI Andy Marshall Kalaweit project.
Northeast Kalimantan	Sangkulirang karst area	2	16,800	800,000 ha [8,000 km^2]	Low-Medium	National & International
		Bornean orangutan (*P. pygmaeus morio*) & Bornean gibbon (*H. muelleri*)	an estimate of 2,800 orangutans; [this is out of a total estimated population 50,000 i.e. 5.6%]; no data on gibbons but estimated 2% of population [as per % orangutans] gives 14,000 gibbons [in line with Rodman in 1970's[14]]	800,000 ha Sankuliran karst area in Berau & East Kuta; plus separate Lesan & Wehea areas	Oil palm concessions [which have now largely destroyed Kutai] although Sangkulirang should be less attractive to this industry.	TNC, local authorities Hunter College; small number of local NGOs in East Kalimantan
Eastern Sabah	Upper & lower Kinabatangan, Upper Segama [including Danum Valley], Tabin, & Kulamba	2	34,200	>698,000 ha [6,980 km^2]	Low-Medium	National & International
		Bornean orangutan (*P. pygmaeus morio*) & Bornean gibbon (*H. muelleri funereus*)	9,200 orangutans in both protected & unprotected elements listed; unknown but probably comparable number of gibbons, i.e. conservative 10% of population - since might be less tolerant of oil palm = 25,000 individuals	Forest areas interspersed with palm oil, larger than the totals of the areas listed, and including the Yayasan Sabah Forest Management Area.	The planning framework for Sabah should, theoretically, mean that no new habitat is lost to oil palm, etc. [Ancrenaz *pers. comm.*]	Hutan, LEAP & Malaysian Forest Department
Western Java	Gunung Halimum, Gunung Salak, Gunung Gede-Pangrango	1	<2,000	>54,000 ha [540 km^2]	Medium	National & International
		Javan gibbon (*H moloch*)	2006 figures (by Nijman, 2006)[15] might be over-estimate if previous authors found to be right.	PAs now linked in landscape of 135,000 ha according to Supriatna 2006	Ongoing degradation of remaining areas of forest.	Javan Gibbon Centre, Ministry of Forestry, Conservation International, Java Primate Conservation Project [Bandung, Aspinal Foundation]
Central Java	Gunung Kendeng PF, Dieng Plateau	1	<1000	9,000 ha [90 km^2]	Medium	National & International

[13] Marshall A. (2009). Are Montane Forests Demographic Sinks for Bornean White-bearded Gibbons Hylobates albibarbis? BIOTROPICA 41(2): pp257–267.
[14] Rodman, P. S. (1973). Synecology of Bornean primates: I. A test for interspecific interactions in spacial distribution of five species. *American Journal of Physical Anthropology* **38**: 655-659; and, Rodman, P. S. (1978). Diets, densities and distributions of Bornean primates. In Montgomery, G. G. (ed.) *The ecology of arboreal folivores*, Smithsonian Institution Press, Washington, D.C., pp. 465-478.
[15] Nijman, V. (2006). *In-situ* and *ex-situ* status of the Javan gibbon and the role of zoos in conservation of the species. *Contributions to Zoology* **75**(3/4): 161-168.

		Javan gibbon (*H moloch*)	Setiawan, 2010[16] estimates – Supriatna 2006 estimated half this number.	According to Supriatna 2006	Central areas low levels of protection – might be that there's lower hunting/ topography	Gajah Mada University; Indonesian Primate Rescue Centre
Mentawai islands	Siberut & Siberut National Park	1	20,000	>192,600 ha [1,926 km^2]	Medium	National & International
		Kloss's gibbon (*H klossii*)	data from Action Plan for Primates of Mentawai [Whittaker 2006]	total forest area in Siberut was 2,400 km^2 in 2005	Logging a major threat, together with internal pet trade.	PHPA & intermittent project presence. German Primate Centre; FFI may be looking to establish a project.

2. Current conservation action

Whilst the "Priority landscape matrix for *Hylobates* & *Symphalangus"* highlights specific threats to gibbons in particular landscapes, at a more macro level the group agreed that key underlying drivers compromising gibbon conservation were rural poverty, unsustainable economic development, poor management of protected areas and enforcement of wildlife law, as well as a lack of awareness of issues concerning gibbons.

This tallies with an analysis of key threats in the countries and regions with which the participants were most familiar [i.e. which, as noted on page 1, is not therefore meant to be an exhaustive list], and provided an interesting comparison with those conservation actions that they knew are being implemented.

[16] http://www.4apes.com/science/Hope-for-Javas-Silvery-Gibbon-After-Lost-20110401.htm

Illustrative threats and conservation actions from across the distribution of *Hylobates* and *Symphalangus*

	Key threats	Current actions
Java	encroachment and mineral and oil exploration & extraction	• community awareness & engagement; • school & community education; • advocacy & lobbying with National Park & Ministry of Forests in Jakarta; • increased active confiscation & reintroduction (currently being piloted); • up-coming plans to increase law enforcement in specific gibbon protection units comprising of local communities and national park staff
Sumatra	infrastructure development (in particular roads), industrial agriculture plantations, mining, hunting/trade	• law enforcement (Wildlife Crime Unit (WCU) in partnership with Ministry of Forests (local Forest Protection & Nature Conservation Unit)); • awareness raising via mobile education units and WCU of Judiciary & Police; • technical advice on agroforestry in corridor areas of south Sumatra; • WARSI[17] is doing advocacy with local government & awareness raising with local communities; • WCS is working on advocacy at national level; • Kalaweit gibbon project is working on rehabilitation and confiscation.
Kalimantan	infrastructure, mining, industrial agriculture, encroachment, logging, forest fires	• survey work ongoing; • research conducted by Andrew Marshall & Susan Cheyne; • Kalaweit in central Kalimantan with successful awareness-raising in particular through the use of radio programs
Laos	Mining	• WCS Laos putting money into offsetting; empowering local resistance [which worked in the case of the logging company PD Lestari]; • conservation incentives are being piloted by Conservation International e.g. provision of fuel wood for stoves
Cambodia	commercial land concessions, mining	• campaigning against concession allocations
Thailand		• Smart patrolling – using adaptive management of patrols to improve enforcement

3. Gaps and emerging priorities

The previous exercises highlighted the enormous information gaps around **status, density and distribution** of *Hylobates* and *Symphalangus*, as well as some areas where there is also a lack of required information and activity to counter threats.

One clear threat of which there seems to be relatively little understanding, in terms of its extent or impacts, is **trade**, which was identified as requiring additional investigation. It was recommended that a meta-analysis of trade data be carried out to better understand geographic hotspots, trade routes, demand, and the extent of its impact on gibbon populations.

Participants also highlighted **lack of awareness** as a key constraint in being able to improve gibbon conservation. Key sectors identified as potential targets for awareness-raising were the private sector

[17] WARSI is an organizational network established in January 1992, with membership made up of twelve NGOs from four provinces in Sumatra (South Sumatra, West Sumatra, Bengkulu and Jambi), whose focus is biodiversity conservation and community development" [taken from http://www.warsi.or.id/]

(particularly mining companies) and major financiers such as the Asian Development Bank. Participants felt that there were still relatively few good models of **alternative economic development options for local communities** that meaningfully promote wildlife and habitat conservation, and that there was a particular need for such models around gibbon-compatible tourism.

Institutional conflict within gibbon range state government is of critical importance. An example of this is where economic land concessions are allocated within protected gibbon habitat. Effective conservation approaches are urgently required to deal with the overlapping mandates and agendas of the national institutions involved.

Climate change was also seen as potentially damaging to gibbons in terms of biome shifts and the future effectiveness of protected areas. The participants debated the importance of REDD [Reduced Emissions from Degradation and Deforestation] to gibbon conservation, which they agreed might be limited[18], although still worthy of exploration. The group also discussed whether gibbons benefit as much as they could under **species-focussed conservation schemes for charismatic species** with which they overlap e.g. tigers, rhinos, elephants and orang-utans, given that [for example] drivers of hunting gibbons may be different from other animals and therefore require different responses. There was agreement that this situation could be improved through discussion and collaboration with said projects.

Finally, **Kloss' gibbon** (*Hylobates klossii*) was highlighted as a species that should be prioritised. Although it does not share its range with any other gibbon species it is sympatric with several other threatened primate species endemic to the Mentawai islands, and the impact of logging and hunting was considered to be more significant to its conservation.

The group welcomed the possibility of an **IUCN specialist group** that focuses on gibbons, increasing awareness of their plight, and improving capacity to conserve them. If formed, this group could focus on key issues e.g. surveying/ climate change/ trade and function as a platform to mobilize expertise through outreach programs, round tables, one-on-one training, and disseminating information.

[18] given that gibbon densities are much lower in montane forest than in lowland forest, that with almost no forest below 700 m remains in Indochina, and that this habitat contains relatively low levels of carbon.