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CROCODILES



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Summary of the Meeting

Professor Grahame Webb, CSG Chairman

The focus of the CSG Regional Species Meeting held at Mahidol University, Bangkok, Thailand (4-6 April 2011) was Siamese crocodiles *Crocodylus siamensis*. This species meets the IUCN Red List criteria for “critically endangered” and is on Appendix I of CITES. It is one of the relatively few crocodilian species whose status in the wild has declined rather than improved over the last forty years.

It is a measure of the interest in *C. siamensis* conservation, management and sustainable use that 74 participants from 17 countries attended the meeting (Australia, Brazil, Cambodia, France, Germany, Indonesia, Japan, Hong Kong Lao PDR, Malaysia, Philippines, Poland, Thailand, Viet Nam, Ukraine, United Kingdom, USA). Most participants were responsible for their own travel costs, with only limited assistance, to a few deserving delegates, from CSG funds.

Participants were welcomed by Dr. Apichart Termvichakorn (Fisheries Department of Thailand), Prof. Parntep Ratanakorn (Dean of Veterinary Science Faculty of Mahidol University) and Prof. Grahame Webb (CSG Chairman). Keynote addresses were given by Yosapong Temsiripong on the Biology of *C. siamensis* - wild and captive, the Hybridisation of *C. siamensis* and Reintroduction Programs and possibilities in Thailand. Dr. Dietrich Jelden, Deputy Chairman of the CSG, gave a presentation on what the CSG hoped to achieve at the regional meeting, and explained the preliminary guidelines developed for Working Groups. This was followed by Country Reports from Thailand (Mrs. Yoo-ee Getpech), Cambodia (Mr Heng Sovannara), Viet Nam (Mr Thai Truyen), Indonesia (Dr. Nandang Prihadi) and Lao PDR (Mr. Chanthone Phothitay) - the five Range States for this species. Presentations were also given on “Studies in Cat Tien N.P, Viet Nam” (Mr. Kristian Robert Pahl), Lake Mesangat in East Kalimantan (Dr. Roberty Stuebing) and the results of crocodile surveys in Lake Mesangat (Ms. Agata Staniewicz).

The draft Working Group goals were discussed and modified in Plenary. The main Working Group topic (A; see below) was advanced in Plenary, with full participation from all

participants. Other topics (B, C, D and E) were addressed separately in smaller Working Groups. The Working Group topics were:

- A. Conservation - Restoring and/or better protection of wild populations (Chair: Grahame Webb - compiling plenary contributions).
- B. Conservation - Strengthening enforcement capacities at all relevant agencies (Chair: Thai Truyen).
- C. Compliance with CITES (Chair: Dietrich Jelden)
- D. Captive production and industry - monitoring of crocodile holding facilities and manufacturing industry (Chair: Paolo Martelli).
- E. Captive production and industry - capacity building of stakeholders involved with captive management of the Siamese crocodile (Chair: Bill Magnusson).

On the afternoon of 6 April 2011, following presentation and discussion of each Working Group report, participants prepared a draft document that defined a series of actions that could be taken by the CSG and others, to address problems identified across the range of *C. siamensis*. This report constitutes a proposed regional CSG Action Plan for improving the conservation of *C. siamensis*.

The Chairman emphasized the need for fast action in addressing the identified problems, and suggested Range States and others report on progress made at the next CSG Working Meeting in Manila, Philippines (May 2012). The status of wild *C. siamensis*, throughout most of their range, is so poor that emergency action is needed.

The formal meeting finished on 6 April 2011, and on 7 April a field trip was conducted to Bung Borapet, Nakornsawan, so that participants could see first hand one of the potential reintroduction sites for *C. siamensis* in Thailand.

What We Want to Achieve - Development of a Regional Siamese Crocodile (*Crocodylus siamensis*) Management and Conservation Strategy

Dr. Dietrich Jelden
CSG Deputy Chairman

Introduction

- Summary Report of the IUCN-SSC Crocodile Specialist Group Review Mission to Cambodia - 2005: "Establish dialogue with neighbouring states, through a regional working group under an appropriate body (eg ASEAN wildlife trade initiative and/or Mekong River Sub-regional CITES Working Group), to address regional issues and problems with *C. siamensis*".
- Summary Report of the IUCN-SSC Crocodile Specialist Group Review Mission to Viet Nam - 2008: "Cross-border co-operation between neighbouring countries of the Mekong River basin is essential to improving the management and conservation of crocodile populations in the wild and in captivity, within and outside Viet Nam, particularly with Cambodia. A regional, international stakeholders workshop should be implemented as soon as possible to improve trans-boundary conservation efforts".
- Overarching Objective: Enhance Conservation of *C. siamensis* through strengthening regional cooperation on focused management and conservation issues.
- Development of a regional conservation and management strategy for *C. siamensis* with following objectives and possible benefits:
 - Overall enhanced crocodilian conservation, management and research.
 - Common crocodile conservation and management policy in the region.
 - Enhanced implementation and enforcement of national and international regulations for crocodile conservation and management.

Current Status

- *Crocodylus siamensis* within the region legally strictly protected (eg all CITES Appendix I).
- Commercial and non-commercial use widespread (eg hides, leather products, trade in live animals, meat and meat-products, pharmaceuticals, tourism, etc.).
- Thailand (22), Cambodia (6) and Viet Nam (7) have registered several crocodile farms (*C. siamensis*) under CITES provisions of Resolution Conf. 12.10 (Rev. CoP 15).
- In addition several thousand private holding facilities complicate significantly enforcement of conservation legislation.

- Few (re-introduced) populations are stable or recovering because of strict conservation measures and habitat set aside
- Other populations continue to decline due to poaching or habitat alteration.
- Long-term persisting utilisation in the region doesn't fit national and international legal obligations; eg cross-border illegal trade.
- Some regional co-operations do already exist (ASEAN-WEN) but significant scope for improvement of which many other wildlife species can benefit.

Guiding Discussions

- For drafting in a focused way a regional strategy at this meeting initial identification of several over-arching themes is helpful.
- Several overarching themes of relevance for this meeting had already been identified following the CSG missions to Cambodia and Vietnam.
 - National and international illegal trade in live Siamese crocodiles (C, W)
 - i. Capacity building of law enforcement agencies to combat illegal capture and illegal trade in *C. siamensis* and products derived from that species.
 - ii. Harmonization of national policies and laws relevant to conservation and management of *C. siamensis* within and across Range States where possible.
 - Improvement of monitoring and data management of crocodile holding facilities and manufacturing industry
 - i. Regular standardized inventories of all operations with live crocodiles in captivity (see Jenkins TRAFFIC report).
 - ii. Regular standardized inventories of crocodile leather production facilities such as tanneries and leather product manufacturing operations.
 - iii. Establishment of government controlled fora for exchanging information between and among range States for better monitoring farms, industry and trans-border shipments.
 - Improvement of CITES implementation and cross border co-operation
 - i. Implementation of national and international (ie CITES) legal requirements to provide for adequate penalties to deter illegal killing and illegal trade in *C. siamensis* and their products.
 - ii. Technical and policy exchanges among range states and amongst all levels of stakeholders (local communities to high-level decision makers) by means of training, special fora, meetings, mutual technical assistance and study tours among others to exchange lessons learned.
 - iii. Where possible use of bilateral, regional or multilateral agreements/conventions to enhance management and conservation of crocodilian

populations such as Asean, CITES, CBD, Ramsar, Wetlands International a. o.) Mekong River Sub-regional CITES Working Group and others.

- Strengthening enforcement capacities at all relevant agencies
 - i. Equipment of wildlife authority staff at the frontline of enforcement with appropriate tools to carry out their mission as effectively as possible.
 - ii. Recruitment & training of staff at all levels to combat poaching and illegal trade in *C. siamensis* and products made thereof.
 - iii. Establishment of a regional enforcement working group, if possible under Asean WEN.
- Restoring and/or better protection of wild populations
 - i. Awareness programs targeting at schools, local communities, policy makers, NGOs, business sectors, etc.
 - ii. Exploration of opportunities for expansion of *C. siamensis* range within, between and among range States.
 - iii. Identification and rehabilitation of suitable wetland habitat and dispersal areas for effective protection and or re-introduction of the *C. siamensis*.
 - iv. Development of mitigation strategies to reduce HCC.
- Training of all stakeholders involved with management of the Siamese crocodile.
 - i. Implementation of national Crocodile Management Plans.
 - ii. Establishment of state controlled fora for exchanging information between and among range States for better monitoring of industry, trans-border shipments and management of wild populations.
 - iii. Establishment of a regional forum for information sharing among stakeholders of the private sector (eg national crocodile farmers associations).
- Meeting attendants should be provided with a set of priority terms to guide and facilitate discussions towards drafting a regional strategy/work program in the afternoon of 6 April.

What Next?

- Strategy document should be drafted and communicated to all stakeholders in the region through IUCN-SSC CSG chair.
- It is believed that externally monitored regional strategy approaches can contribute in the medium-term to enhance conservation and management in shared *C. siamensis* populations in a more coordinated way.

Working Group Results

Professor Grahame Webb
CSG Chairman

The Working Groups were given suggestions about issues they may like to consider, but were not restricted to those issues - they had complete freedom to include other topics. In the final Plenary, the results of each Working Group were discussed, and different actions were proposed for overcoming the problems identified. There was overlap between Working Groups in some of the problems and proposed actions, and where appropriate, these have been combined in the report below.

Working Group Report A (Chairman: Grahame Webb)

Conservation - Restoring and/or better protection of wild populations

Draft Working Group Guidelines

Examples for possible discussion:

- Awareness programs targeting schools, local communities, policy makers, NGOs, business sectors, etc.
- Exploration of opportunities for expansion of *C. siamensis* range within, between and among Range States.
- Identification and rehabilitation of suitable wetland habitat and dispersal areas for effective protection and or re-introduction of *C. siamensis*.
- Development of mitigation strategies to reduce HCC.

General

The Chairman noted that improved conservation of wild populations of *C. siamensis* was the primary goal of the IUCN and thus the CSG. In the Working Group guidelines, this priority was stated as: "Identification and rehabilitation of suitable wetland habitat and dispersal areas for effective protection and /or re-introduction of *C. siamensis*." From a CSG perspective *C. siamensis* is one of the only species of crocodilian whose status was extremely poor when the CSG started in 1971, and whose status in the wild has declined much further during the 40-year history of the CSG. During this period there has been an exponential growth in closed-cycle captive breeding farming within Thailand, Cambodia and Viet Nam, but the economic benefits derived do not necessarily benefit the wild population. Some individual crocodile farmers have contributed significantly to conservation actions, but this is the exception rather than the rule.

The conservation of *C. samensis* was discussed country by country in Plenary on 4-5 April 2011, and actions to be taken were discussed again on 6 April 2011. The overall goal was to identify Actions that could be taken by Range States to directly improve the conservation of their wild populations of *C. siamensis*. A secondary issue was to determine how the CSG or nominated individuals could assist these national actions.

It was apparent that priority actions would vary between Range States, because the conservation context surrounding *C. siamensis* in each Range State is unique. Thus, conservation actions need to be tailored to each set of local circumstances. The priority conservation actions needed in a country where *C. siamensis* is essentially extinct in the wild (Thailand, Viet Nam) are different to those in which a wild population still exists, even though it may be seriously depleted (Cambodia).

C. siamensis Task Force

It was very clear at the meeting that individuals involved in different capacities with the conservation, management and sustainable use of *C. siamensis* were often isolated from each other. There was no easy way of contributing to, or benefiting from, the extensive knowledge-base on *C. siamensis* that exists. It is a problem that exists within and between countries. The meeting felt there may be room for National *C. siamensis* Task Forces, perhaps coordinated through an International *C. siamensis* Task Force, which could be constituted under the CSG or operated independently of the CSG.

ACTION 1: CSG to investigate options for improved networking and communicating about *C. siamensis* conservation activities within and between countries. This may be National or International *C. siamensis* Task Force/s, under the umbrella of the CSG or some other organisation.

[CSG Executive Officer to examine options with input from regional experts: within 2 months].

Thailand

1. *C. siamensis* largely extirpated from the wild (1945-1960), initially for skins and later to stock farms.
2. Phase 1 reintroduction (2004 and 2006) - Pang Sida National Park. Few people in area, upstream marginal habitat, government staff available to afford protection.
3. Phase 2 reintroduction proposed (2011):
 - a. Reintroduction Task Force required (Fisheries, Wildlife & National Parks, Industry associations such as CMAT, CCOT, and University researchers).
 - b. Site 1. Kaeng Krachan National Park (KKNP). Upstream habitat, which may not be optimal but downstream dammed areas for individuals to spread into and colonise; two indigenous communities living in KKNP; budget has been sought for this project; some potential for tourism. Survey by John Thorbjarnarson and Steve Platt in 2010 indicated very few crocodiles remain in the area; nest with infertile eggs found two years in a row.
 - c. Site 2. Bueng Boraphet (BB). Fisheries is the key agency for this area; it is believed that crocodiles were completely eradicated, but a population believed to have come from farm escapees now occurs there; wild crocodiles could contribute significantly to the local tourism industry; support from local people will be

critical to its success as a reintroduction site. It may be possible to advance this in 2011.

- d. Other potential release sites need to be investigated in terms of whether or not they contained *C. siamensis* historically, and whether local people would tolerate them if they were reintroduced.
- e. One potential site is the RAMSAR listed Thale Noi Non Hunting Area, involving 450 km² including 42.2 km² of swamp forest and 28 km² of open water with 60% cover of floating or shallow rooted aquatic vegetation) which is already a RAMSAR site.

ACTION 2: Help facilitate a Task Force approach to *C. siamensis* conservation within Thailand

[Dr. Parntep Ratanakorn is already doing this and will continue](see ACTION 1).

ACTION 3: Encourage start of reintroduction Phase 2 in BB in 2011 and KKNP in 2012

[Thai Task Force to advance and Dr. Parntep and Dr. Yosapong Tamsiripong to report progress].

ACTION 4: Investigate Thale Noi Wildlife Reserve in terms of historical presence of *C. siamensis* and potential as a future reintroduction site.

[Thai Task Force to advance as time permits but considered a lower priority. It can be postponed until later, unless an opportunity for a student or researcher arises].

Lao PDR

1. The population of *C. siamensis* in Lao PDR may never have been great.
2. Recent surveys have confirmed *C. siamensis* in some wetlands. National population may be around 70 animals.
3. A project linked to community development and livelihoods has been initiated.
4. A mining company (Mineral Mining Group - MMG) is involved (possibly an Australian company).
5. Benefits of crocodiles to people in the project assumed to come via tourism (not farming), but potential for the site to meet the other criteria needed for sustainable tourist development are unclear.
6. A CSG review in collaboration with Lao crocodile experts is needed to gain a clearer understanding of conservation threats and opportunities, and ways the CSG and regional neighbours can assist Lao PDR consolidate the conservation of their small, but important, national population of *C. siamensis*.

ACTION 5: Investigate with government the desirability and possibility of a CSG Review during 2011.

[CSG Executive Officer to liaise with Lao PDR authorities about possibility of conducting a review during 2011].

Viet Nam

1. Population in the wild believed to have been highly depleted but extirpated during the 1990s to stock farms.
2. Phase 1. Restocking - A national restocking programme at Cat Tien National Park has been very successful, with a breeding population now sustaining a small but apparently viable wild population, despite some losses due to the activities of local people.
3. It was suggested that reasonably modest investment in an additional Forest Ranger Station may reduce the impact of local extraction on this successful restocking programme.
4. Phase 2. Restocking could be built on success of Phase 1:
 - a. Select other sites. Krong Trai Nature Reserve is a possibility.
 - b. Survey habitat and general social and biological context for a release site.
 - c. Follow procedures used at Cat Tien N.P. (DNA analyses to avoid release of hybrids, etc.).
 - d. Solicit Industry cooperation with conservation.
 - e. It was noted that during the CSG Review of Viet Nam, that the local crocodile farmers accepted responsibility to start a Viet Nam Crocodile Farmers Association to help government with conservation obligations. It apparently was never done.

ACTION 6: CSG agreed to write to Viet Nam about the international recognition of the success of the Cat Tien (Phase 1) project, and to:

- i. encourage the establishment of an extra Forest Ranger Station at Cat Tien N.P. to ensure the wild population is better protected;
- ii. encourage planning for Phase II of the reintroduction program (perhaps at Krong Trai Nature Reserve); and,
- iii. encourage the formation of a Vietnamese Crocodile Farmers Association to assist with conservation work.

[CSG Executive Officer to write to the Vietnamese CITES Management Authority concerning these issues].

Cambodia

1. Cambodia is to be congratulated for retaining the largest population of wild *C. siamensis* in mainland Southeast Asia, and perhaps in the world (the size of the population in East Kalimantan, Indonesia, is unknown at this stage).
2. The population has been heavily depleted for breeding

stock and trade.

3. There is a large number of village level farms (satellite farms) involved in captive breeding but they create a potential illegal market for wild crocodiles caught incidentally (and sometimes deliberately) which further depletes the wild population.
4. Restocking has long been considered a potential option for rebuilding the wild population generally, but care should be taken not to release Cuban crocodile hybrids.
5. There remains scientific uncertainty about the merits of different restocking strategies (hatchlings, juveniles, sub-adults) in populations depleted to varying degrees, which creates a strong need to test different restocking strategies and measure their success, rather than relying on theory.
6. A major perceived difficulty is the possibility of released crocodiles being illegally recollected for farms and/or trade at a level that may match the rate of restocking, thereby compromising the overall goal of rebuilding the depleted wild populations in some some areas.
7. Given that the goals of different stakeholders appear quite divergent, a strong case exists for an informal Reintroduction Task Force to reach consensus on the different approaches that may be taken.
8. The development of a Cambodian Crocodile Farmers Association could help get industry ownership and involvement in the conservation program.
9. A positive contribution towards the conservation of wild populations could enhance Cambodia's position while more effective implementation of CITES is being achieved with international cooperation.

ACTION 7: Cambodian stakeholders to:

- i. Consider forming an informal National Task Force to discuss release strategies and consider the strengths and weaknesses of the available scientific data underpinning them (see ACTION 1);
- ii. Identify approaches to rebuilding the wild populations that can be undertaken in the short term, and prioritise; and,
- iii. Identify how and if the CSG can assist to expedite such actions.

[Mr. Heng Sovannara to advance and coordinate government, NGO and other expert advice, with a view to developing a proposed action plan. Liaise with the CSG Executive Officer as required. CSG Executive Officer to report on progress in 2 months].

10. Concerns were raised about the impact of proposed new dams in Cambodia on some existing wetlands known to contain remnant populations of *C. siamensis*. Some NGOs are currently involved in capturing and relocating some of the crocodiles in these areas before the dams

are constructed and the habitats flooded. Despite the precautionary nature of such efforts, it should not be assumed that dams will automatically result in adverse impacts on the crocodiles. Dam projects around the world have often created significant new habitat for crocodiles, that did not previously exist, and boosted the national population significantly: eg *C. palustris* in Sri Lanka, *C. niloticus* in Egypt and Mozambique, *C. johnstoni* in Western Australia. With planning, new opportunities for conserving wild *C. siamensis* populations could be created through the dam projects.

Reaching consensus among meeting participants about Cambodia.

It became apparent during Plenary that within and between the various representatives from Cambodia (Government, private sector farmers, NGOs) there were differing opinions on virtually all issues raised about the conservation, management and sustainable use of *C. siamensis* within Cambodia. Furthermore, there were often differing opinions between CSG members about some proposed NGO actions.

For example, it was questioned whether a proposed release strategy was truly based in science from a problem-solving perspective. For a country that produces over 400,000 hatchlings annually from captive breeding, formulating a conservation release strategy involving 20-30 hatchlings or raised juveniles being released annually, produced from an NGO captive raising facility, may be at the wrong level of scientific resolution to have any effect on the size of the wild population. That is, that even if the release were carried out in accordance with the best scientific practice, the extent of release maybe at a completely different level of resolution to the management goal, which is to rebuild the wild population.

The Chairman requested participants interested specifically in Cambodia to meet separately and try to establish a list of issues, many of which had been discussed in plenary, that could be more or less agreed by consensus among them.

This meeting took place, and a list of 12 points were presented to plenary, but they were not discussed further due to time constraints:

1. The CSG should establish a Task Force on Siamese Crocodile Conservation (see ACTION 1) to help coordinate advice and information-exchange between all groups working to reintroduce *C. siamensis* and conserve existing wild populations in Southeast Asia. We believe there are useful lessons that we can learn from each other.
2. In Cambodia, MAFF should coordinate the formation of an informal National Cambodian Task Force. The Task Force members should include key staff from MAFF (FiA and FA), the Cambodian Crocodile Farmers Association currently being developed, and collaborating NGOs. The goal is that Cambodian members meet regularly, within Cambodia, to exchange information and develop joint activities.

3. The conservation priority should continue to be focussed on securing the remaining depleted wild stocks, especially sites still known to contain breeding populations. In Cambodia, community-based protection has proved to be an effective way of stabilising remnant some *C. siamensis* populations, preventing and/or reducing poaching, human-croc conflict and habitat loss.
 4. Expand, complete and agree to a reintroduction and reinforcement plan for Cambodia. A draft plan is currently available which follows guidelines from the Reintroduction Specialist Group, and is based on small releases. The draft plan describes at least 8 potential reintroduction sites in different parts of Cambodia, and is expected to be signed off by Government, at a senior level, before the end of 2011.
 5. As part of (4), the first site will be identified for a pilot release in 2012 (not later than 2013). This release should be at a site that is protected by law and where there is agreement and support from local communities (if present). Some sites that meet these criteria are known in the Cardamom Mountains, the Tonle Sap and the Northern Plains. It is anticipated that the survival of released animals at these sites will be monitored.
 6. One reintroduction site is not considered enough to meet conservation goals. The draft plan proposes additional sites, which will be addressed sequentially over the next 10-15 years. Together these sites may be able to support thousands of individual *C. siamensis*.
 7. For each initial site it is proposed to experiment with releasing animals of different sizes (eg hatchlings in one, metre-long in another), to determine objectively which methods have the best success and cost-efficiency.
 8. Release stock can come from three sources in Cambodia:
 - a. The captive-breeding facility in Phnom Tamao Wildlife Rescue Centre, which will continue to produce stock suitable for released from known pure-bred parents.
 - b. To increase the numbers of crocs available for release, cooperation from farmers is needed to provide additional captive bred stock. Funds must be sought to test the crocs to confirm that they are pure *C. siamensis* and not hybrids.
 - c. A small number of *C. siamensis* may also be individuals confiscated from poachers or rescued from sites, which may otherwise be destroyed. They would need to be tested to determine whether they were pure bred.
 9. All crocodiles released to the wild, or captured in the wild for research purposes, should be clearly marked, with a marking system that the Task Force and Cambodian Government agrees is robust. This will help ensure that these individuals can be traced if they are caught and find their way onto farms.
 10. All of the above activities need to be underpinned by raising public awareness, capacity building, strengthening law enforcement, and community-based management.
 11. A Cambodian Crocodile Farmers Association will be established to enhance the sustainability of the crocodile industry in a way balanced with conservation requirements and goals.
 12. Systematic monitoring of wild populations is required to evaluate the effectiveness of conservation initiatives and activities, and to provide early detection of new and unforeseen threats.
- Indonesia
1. Historical records indicate that there may have been a population of *C. siamensis* in Java historically. If so, it is likely that it is extinct. However, every effort should be made to verify the historical and present status of *C. siamensis* in Java.
 2. *C. siamensis* in Kalimantan was only recently rediscovered and one site where the presence of a viable population has been confirmed is Lake Mesangat in East Kalimantan.
 3. Large areas of wetland exist upstream of Lake Mesangat, and the status of *C. siamensis* in these areas, should be a research priority.
 4. Lake Mesangat has been included in an oil palm concession with development covenants on the land. The corporation responsible has made a strong commitment to conserving Lake Mesangat for *C. siamensis* and Gharials (*Tomistoma schlegelii*). Lake Mesangat and associated wetlands appears to be a primary site within which Indonesia can achieve its biodiversity goals for *C. siamensis*.
 5. Improving the conservation status of Lake Mesangat and its crocodile populations will require support from the concessionaire, local government, provincial government and national government.
 6. To start the process, the survey report prepared by Agata Staniewicz, presented to this meeting, should be sent to the concessionaire, local government, provincial government and national government, with a recommendation that the area be assigned a very high conservation priority.
 7. This needs to be followed by a comprehensive survey and plan, which would head towards a major international workshop, to assess issues such as possible recognition and listing by RAMSAR as a wetland of international significance.
 8. If a Task Force of stakeholders could be established to share information on this site, it would be beneficial. In addition to government, a lead NGO may need to be identified, plus key CSG members, to encourage the development and seek outside promotion and funding (see ACTION 1).

9. CSG should summarise the recommendations of this meeting to the Director General of Forests in Indonesia.

ACTION 8: Establish a National Task Force and lead NGO Agency for Indonesia.

[Mr. Rob Stuebing to coordinate].

ACTION 9: Establish the feasibility of the NGO agency developing an action plan for the National Task Force, assess resource implications, and develop an Action Plan.

[Mr. Rob Stuebing in cooperation with the CSG Executive Officer].

Conservation awareness programs targeting schools, local communities, policy makers, NGOs and the business sector

1. Dr. Parntep Ratanakorn advised that Thailand already delivers a range of suitable training courses that could perhaps meet the needs of other countries within the region.
2. There are many good documents available on crocodilian conservation that if translated into other languages, could be of benefit to other countries. The book produced by FFI linking crocodiles with Buddha appeared to be an excellent public education document.
3. The CSG website could be better used to distribute information on conservation.
4. Robert Pahl volunteered to assist the CSG with the further development of the current CSG website, to provide more conservation educational materials.

ACTION 10: To investigate ways in which the CSG could play a bigger role in collecting, collating and distributing conservation education materials

[CSG Executive Officer to provide a plan within 2 months].

Mitigation strategies to reduce Human Crocodile Conflict

1. Human Crocodile Conflict (HCC) does not in itself appear to be a major problem with *C. siamensis*, but this may arguably be because the wild populations are so critically depleted and/or located in remote areas where there are few people.
2. The degree to which *C. siamensis* can and will attack people is largely a matter of theoretical discussion, but males do grow to 3-4 m long, and it is hard to accept that they would not pose a problem to people if in sufficient numbers, where people were exposed to them, by using

the same waters in which they reside for washing and swimming.

3. Regardless of the real risks of attack, it is highly likely that the public do fear crocodile attacks and that these fears may turn out to be serious impediments to reintroducing *C. siamensis* into areas where they occurred historically. Where local people have become accustomed to crocodiles not being present, they may be more reluctant to agree to them being reintroduced. This problem was encountered with *C. mindorensis*, a much smaller crocodilian species, in the Philippines.

ACTION 11: Information on Human Crocodile Conflict (HCC) available to the CSG needs to be made readily available on the CSG website

[CSG Executive Officer to examine and report].

Hybridisation

1. Hybridisation between *C. siamensis* and both *C. rhombifer* (introduced from Cuba) and *C. porosus* (possibly of local origin but also perhaps introduced from Indonesia or Malaysia), is a confounding problem with the conservation of *C. siamensis*.
2. It is unclear whether *C. porosus* and *C. siamensis* hybridised naturally, in the historical past, as the two species were both present across SE Asia. In Cuba, *C. rhombifer* and *C. acutus* hybridise naturally in the wild, so the possibility cannot be rejected. In the case of *C. siamensis* and *C. rhombifer*, the opportunity for natural hybridisation does not occur, so the hybridisation reported in Viet Nam and Cambodia is a consequence of maintaining them together in captivity.
3. A reasonably high percentage of crocodiles tested in Cambodia by FFI were hybrids (not pure *C. siamensis*), although it was unclear whether they had hybridised with *C. porosus* and/or *C. rhombifer*. Regardless, as crocodiles from Cambodia have been imported into Thailand, the possibility exists that hybrids are more widespread in the captive population of *C. siamensis* generally than is currently realised. Where crocodiles have escaped from farms, it would also seem likely that hybrids are now established within the wild population in Cambodia.
4. The costs and logistics of DNA testing are reasonably high and involve delays, which can constrain conservation action. The degree to which hybrids can be discerned from external morphological characteristics remains unclear but needs to be clarified.
5. If the ability to engage in trade involving hybrids is restricted by CITES, then this restriction may have implications for conservation.

ACTION 12: To develop a better understanding of the degree to which hybrids can be discerned from external morphology (morphometrics, scale and colour phenotypes), a cooperative research project needs to be initiated, perhaps in Thailand, Cambodia and Viet Nam.

[CSG Executive Officer and Yosapong Temsiripong to determine from the CSG membership who may be interested in this research, and/or to explore cooperation with Range States and other options for advancing].

ACTION 13: The actions undertaken in ACTION 12 may be the first step in quantifying the distribution and abundance of hybrids among farms (and in the wild?) in Range States, which is considered a management priority.

[CSG Executive Officer and Mr. Yosapong Temsiripong to examine options for advancing].

ACTION 14: International trade in hybrids, for both live animals and skins, theoretically needs to be carried out in accordance with CITES regulations

[Dr. Dietrich Jelden, CSG Deputy Chairman, to summarise what these restrictions are].

Working Group Report B (Chairman: Thai Truyen)

Conservation - Strengthening enforcement capacities at all relevant agencies

Draft Working Group Guidelines

Examples for possible discussion

- Equipment of wildlife authorities at the frontline of enforcement with appropriate tools to carry out their mission as effectively as possible.
- Recruitment and training of staff at all levels to combat poaching and illegal trade in *C. siamensis* and products made thereof.
- Establishment of a regional enforcement working group.

General

Strengthening enforcement was identified as an important priority in most Working Groups. Working Group B attempted to define some of the larger questions needed to underpin such initiatives.

Basic Questions: What are we enforcing?

1. Enforcement can and should contribute to improving the conservation of remnant populations of *C. siamensis* in the wild.

2. Enforcement can and should play an important role in ensuring that trade in *C. siamensis* is legal, sustainable and verifiable.

Basic Questions: Perceptions of enforcement by relevant stakeholders.

In the absence of education and a united vision for the conservation, management and sustainable use of *C. siamensis*, stakeholders may view increases in enforcement activities and capacities in different ways:

1. Negative: poor people, fishermen, some land-owners (government, private, concessional holders), dam construction companies (government or private).
2. Positive: law enforcement agencies, scientific management authorities, NGOs, conservation agencies, farm operators, food suppliers, some land owners (governmental, private, concessional holders).

Basic Questions: Conflicts between sectors and departments:

For a variety of reasons, it does not automatically follow that increased enforcement will be uniformly welcomed because there may be internal conflicts, sometimes about legislative jurisdictions and the allocation of resources, and at other times about the commercial and non-commercial values attributed to *C. siamensis*. For example:

1. National domestic legislation versus enacting legislation for CITES.
2. Resources needed at the domestic level versus those needed for CITES.
3. Different potential or perceived costs and benefits to conservationists and scientists versus crocodile farmers.

Challenges

Throughout the Range States in which *C. siamensis* exist, or did exist, there is fierce competition for resources within Government. Wildlife laws and trade have not historically been a high priority, and even though this has changed greatly in recently years, the problems are very large (eg border control). There is a general lack of the resources, staff training and equipment needed to meet the levels of enforcement that appear to be expected internationally, and specifically, to meet those required by CITES. This is a serious challenge for most Range States.

What needs to be done?

1. Review the current status of wildlife enforcement activities in each Range State, as they are likely to impact on *C. siamensis*.
2. Co-operate with ASEAN-WEN, Interpol, World Custom Organization (WCO) and some wildlife trade NGOs, like TRAFFIC and SMS.

3. Establish country-WEN offices for Cambodia, Viet Nam, Lao PDR, Thailand.
4. Encourage regional Range State co-operation between Cambodia, Viet Nam, Lao PDR, Thailand and Indonesia, involving government agencies and industries
5. Training - there is a general need for enforcement training, and options need to be examined from enforcement professionals. Organisations such as CITES can provide advice. Some NGOs have experience relevant to enforcement.
6. Staff - there is a general need for more dedicated enforcement staff and basic staff equipment, such as offices and especially field equipment, if enforcement activities are to be increased.
7. Equipment - there is a general need for more equipment dedicated to enforcement activities:
 - a. for customs: identification guides, in the form of books, pamphlets, brochures, posters, websites,, ideally in local language. Microchip readers to check on live animals in trade with microchips, X-ray machines to increase the probability of detecting hidden animals.
 - b. for rangers: better equipment to allow them to better do their job, and better pay to improve their social status, so that they can command more respect.
8. Education - there is a need to educate school children about conservation, management and sustainable use, so that they can better understand and appreciate why laws are in place, and be better motivated to reject illegal activities.
9. Public awareness - there is a general need to improve public awareness of conservation, management and sustainable use, as a mechanism for discouraging illegal activities.
10. Monitoring re-introduced populations is a mechanism that attributes importance to a re-introduction program and reduces the likelihood of local people taking the animals.
11. It is important that activities undertaken to assist in or improve enforcement concentrate on the need to conserve habitat and not just *C. siamensis* in isolation.
12. Improve the information flow between the agencies, experts, farms, linked government departments and NGOs.
13. Control and management of small farms (eg registration) is a priority if enforcement activities are going to be effective.
14. Enforcement is likely to have more conservation significance with wild crocodiles if concentrated in sites that still contain natural populations of *C. siamensis*.

15. At least some communities can be encouraged to play a proactive role with enforcement, particularly in remote areas, and mechanisms to provide incentives and empower people to take more definitive actions should be investigated.

ACTION 15.

- i. Options for enforcement training with regard to *C. siamensis* need to be investigated taking into account the points raised by the working group.
- ii. Make more materials readily available on conservation and enforcement (eg Colombian morphometric study, Cambodia public education materials, “Croc Wise” program documents from the Northern Territory, Zoos Education Group).

[CSG Executive Officer to develop a program for soliciting information from CSG members and others, and placing the materials or references to where they can be obtained on the CSG website].

Working Group Report C (Chairman: Dietrich Jelden)

Compliance with CITES

General

Improvement in CITES implementation, particularly in the use of correct permit procedures, and improving regulation of cross border traffic, are required to ensure trade is legal and verifiable - to counter illegal trade. International trade in live *C. siamensis* to China, for food, is significant, as is trade in *C. siamensis* hatchlings between Cambodia, Viet Nam and to a lesser extent Thailand.

Problems with CITES implementation as perceived by participants

1. Laundering of wild animals across borders. This appears to often involve exports without CITES certificates, with the animals becoming the legal property of a farm, in the importing country, who claims it was produced by captive breeding on-site.
2. Some crocodile farms registered by CITES as commercial captive breeding farms for Appendix-I species appear to have no maternal stock (raising facilities only), or minimal maternal stock, or stock that can only be used to explain raising stock numbers if production statistics exceed those known to apply to *C. siamensis*.

ACTION 16. Information available on the general production characteristics of farms, that can be used to detect whether raising stock on a farm are broadly consistent with known production levels of adults, through captive breeding, should be made readily available to Range States.

[CSG Executive Officer to ensure these results are distributed].

3. Relatively few farms in each country are included in the CITES Register of operations that breed Appendix-I animals for commercial purposes (especially in Cambodia and in Viet Nam). There appears to be many farms involved in captive breeding, but few which can export legally.
4. In response to point 3 above, it should be noted that after its review missions to Cambodia (2005) and Viet Nam (2008), the CSG considered it unlikely that farms in either country could comply with the requirements of CITES, as outlined in Resolution Conf. 12.10 (Rev. CoP15). The CSG recommended both countries consider their implementation policy, with a view to rejecting the conditions of Resolution Conf. 12.10 (Rev. CoP15), and in its place, establishing national registers. This would mean that exporting establishments do not need to be CITES-registered under the provisions of Article VII of the Convention

ACTION 17: Governments of Range States for *C. siamensis* to be requested to streamline the registration of farms, and to introduce a policy to tighten approval of new operations. Give consideration to cutting down the numbers of small farms if possible.

[Representatives of Range States to advise the CSG Executive Officer whether this is possible and if so, if it could be implemented].

5. Village farms are considered the most likely gateway through which illegally caught wild animals, or illegally imported captive-bred animals, enter the legal production chain. Although wild animals may contribute a very, very low proportion of all animals in trade, those small numbers taken may be significant to the survival chances of the small remnant wild populations from which they came..
6. Lack of staff in CITES administrations (eg there is only one person to sign permits), is a major constraint on improving compliance with CITES.

Potential solutions to the perceived problems with CITES compliance

1. Ensure that in addition to customs officials, Wildlife, Fisheries and Forestry Administrations should be involved in inspections at borders, including airports, to try and strengthen the expert knowledge base required to detect and differentiate between legal and illegal trade.

ACTION 18: Determine the degree to which Range States have Wildlife, Fisheries and Forestry officials involved with border checks now, and if not, the feasibility of incorporating this in the short- and long-term future.

[CSG Executive Officer to investigate].

2. To allow clear differentiation between wild and captive-bred hatchlings and raising stock in the future, hatchlings produced by captive breeding in different countries (Viet Nam, Cambodia and Thailand) should be scute-marked with the country of origin. This occurs in Argentina and was recently introduced in Colombia. It would assist in identifying the source of hatchlings and raising stock on farms. For adults, the use of microchips for marking could be investigated, and all breeding stock should be scute-marked.

ACTION 19: The concept of scute marking to improve compliance with CITES, with details of the methods recommended by the CSG, to be provided to Range State governments.

[CSG Executive Officer to implement].

3. Hatchlings intended for re-introduction to the wild should be clearly marked in a completely different way (multiple scute marks) to the national hatchling marking system, and possibly marked on the belly as well, to ensure their skin is unsuitable for commercial trade.

ACTION 20: Provide Range States with guidance about how hatchlings and raising stock to be released in the wild could be marked for easy identification.

[CSG Executive Officer to implement].

4. If Range States agree with the national hatchling marking system, and the system for marking animals released into the wild for rebuilding wild populations, then a time period will need to be agreed to allow regional legislation to be enacted, if necessary, to make the system work.

ACTION 21: If Range States agree to implement the marking systems recommended, then investigate whether legislation would need to be changed and if so, how long would this take.

[CSG Executive Officer to advance as appropriate].

5. Malaysia has recently introduced severe penalties and fines for illegal wildlife trade. In Thailand, penalties tend to reflect the value of the product. In any overview, penalties can be a strong incentive to comply with laws. Punishment for wildlife crimes should ideally be harmonised across the region and made more severe (eg shutting down operations, confiscation of stock) where non-compliance with national and international CITES provisions is detected. ASEAN-WEN could be involved for a harmonization process. Awareness-raising and education of the public about CITES is perceived to be important so that public opinion sees that wildlife crimes

are of a very serious nature. This is especially required, for example, in Cambodia, Lao PDR and Viet Nam.

ACTION 22: Review existing penalties for illegal trade in wildlife (particularly *C. siamensis*) within Range States, and determine the degree to which harmonisation may be possible.

[Range States to provide advice on this at the next CSG meeting in Manila, 21-25 May 2012, as coordinated by the CSG Executive Officer].

- Continuation of dialogue under appropriate regional bodies such as the ASEAN-WEN wildlife trade working group, Mekong River Sub-regional CITES Working Group on Implementation of CITES, is beneficial to improving compliance with CITES. Use of bilateral, regional or multilateral agreements/conventions should be considered, such as the CBD, CITES and Ramsar. The CSG is committed to enhancing the conservation, management and sustainable use of crocodilians around the world.

ACTION 23: Assemble information on which regional and international bodies that different Range States are or could be liaising with to help improve compliance with CITES.

[Range States to provide advice on this at the next CSG meeting in Manila, 21-25 May 2012, as coordinated by the CSG Executive Officer].

Working Group Report D (Chairman: Paolo Martelli)

Captive production and industry issues - monitoring of crocodile holding facilities and manufacturing industries

Draft Working Group Guidelines

Examples for possible discussion

- Regular standardized inventories of all rearing/captive breeding operations with live crocodiles (see Jenkins TRAFFIC report)
- Regular standardized inventories of crocodile leather production facilities such as tanneries and leather product manufacturing operations.
- Start or enhance exchange of information between and among Range States, a. o. for better monitoring farms, industry, trans-border shipments.

What is the goal of monitoring?

- To ensure legality, accountability and verifiability of numbers, sources, place of origin and destination.
- Lack of objective monitoring with transparent reporting favours poaching, can help introduce corruption into the processes, can threaten the remaining depleted wild populations of *C. siamensis*, and can reduce confidence in the degree to which trade (even if conducted with CITES

permits) is legal.

Legislation and reporting

- After a country by country description of existing regulations, with their strengths and weaknesses, it was apparent that there was a licensing system for the possession, transfer, domestic trade, and international trade (import and export) in each Range State.
- Differences exist in rates of reporting of farm stocks in different Range States. Thailand requires two reports per year, the Philippines four reports per year, and Cambodia and Indonesia both require 12 reports per year (monthly).
- All Range States have the legislative ability to carry out random checks, and do so from time to time, although the degree of accuracy and diligence involved is unclear.
- In some countries, and in different parts of the same country, and in different administrations within a country, increases in permit requirements can be motivated by gratuity rather than real incentives to comply with rules and laws about ensuring conservation, management and sustainable use are carried out responsibly.
- It was recognized that for monitoring to achieve its goals, it often requires a well-staffed professional law enforcement structure, which is respected, to be in place. This is not always the case.

Marking crocodiles

- Marking all crocodiles of legal origin on farms would potentially be an excellent initiative for detecting the involvement of farms in legal versus illegal practices. CSG can play an important role here, by recommending the types of marking that may be appropriate for different management contexts to the relevant national and international governments, and agencies and associations involved.
- Some strengths and weaknesses of different marking systems are:
 - Microchips: this is something of a gold standard in animal identification, but it can be expensive and laborious to check, and it involves extensive databases. It is also open to fraud, and it is potentially problematic when inserted into tissues that subsequently are used for human food.
 - Scute cutting of hatchlings can be undertaken to reflect country of origin or even individual farms or different age stock on farms. However, reading the cut scutes can be problematic and prone to errors as numbers get larger, and so it is most effective if very simple systems are used (country of origin). The manner in which the scute is cut will determine whether it is retained throughout life or regrows.

- c. The CSG could advise the task force established to advance *C. siamensis* conservation.
- d. The system implemented should ideally be agreed by all Range States.

(see ACTIONS 19, 20 and 21)

Farmers associations

1. Not all Range States for *C. siamensis* have farmers associations. The Associations operating in Indonesia and Thailand have been very effective and have made major contributors to in-country conservation action.
2. Farmers associations provide a mechanism through which the farming industry can be improved, through the dissemination of industry information, and through which Government can explain the broader obligations it has of ensuring crocodile resources are conserved. Trade in crocodiles, even from captive breeding, is not in itself detrimental to the survival of species.
3. Each country should consider the merits of a national farmers association. Range States without farmer associations (Cambodia and Viet Nam) can get guidance from those with associations (Thailand and Indonesia).
4. Crocodile Farmers Associations from different countries have long been involved with the conservation of crocodiles through the CSG, and they bring important and realistic perspectives that are important to reaching compromises that can work. Industry involvement is important to CITES, the IUCN, the CBD and to many NGOs. It is difficult for conservation programs to work if industry and conservation interests do not respect each other.

ACTION 24: Information on farmers/industry associations in Thailand, Indonesia and other countries should be compiled by the CSG to assist Cambodia and Vietnam and other CSG members interested in this issue.

[Mr. Yosapong Tamsiripong and Mr. Erick Wiradinata to collate information on farmer/industry associations in Thailand and Indonesia respectively, John Caldwell to investigate which other associations on which he may have details, and the CSG Executive Officer to solicit other information from the CSG membership. Within one month of compiling these assessments, the CSG Executive Officer to ensure details are forwarded to Cambodia and Viet Nam, and are available for other interested parties].

Hybrids

1. Hybridization between *C. siamensis* and both *C. porosus* and *C. rhombifer*, and possibly all three species, is causing serious complications to conservation plans for *C. siamensis*.

2. The increased costs of genetic analyses, criticism about risks of releasing hybrids, delays and impeding action are serious constraints.
3. There is little consensus on what can or should be done or even on the extent of the problem in terms of relevance to conservation and prevalence of hybrids in captivity.
4. The issue only applies to Cambodia, Thailand and Viet Nam.
5. In any overview, hybridisation is not considered in the best interests of conservation or sustainable use and should ideally be stopped. Farms should not be allowed to keep *C. siamensis* with either *C. rhombifer* or *C. porosus* together, in the same ponds.
6. A number of farms in each range countries should be certified as containing pure *C. siamensis* based on valid scientific evidence, so that their progeny can be used for restocking without needing DNA checks.
7. The results of the genetic tests done at the FFI facility in Cambodia indicated 50% (35/69) were hybrids between *C. siamensis* and *C. porosus*, and 9% (6/69) were hybrids between *C. siamensis* and some other *Crocodylus* species (assumed to be *C. rhombifer*). This suggests a huge hybridization problem.
8. Results reported by Yosapong demonstrated that 100% of animals tested (50/50) from a farm suspected to have been stocked originally only with wild *C. siamensis* from within Thailand, were indeed pure *C. siamensis*.
9. The possibility that most stock on farms in Thailand are pure *C. siamensis* needs to be verified, as the history of crocodile movements for farming over the last two decades would suggest a high probability that many animals from Cambodia have been introduced into farm stocks in Thailand.
10. On a minor note, the working group found that the use of the word "farm" to designate any type of operation from breeding farm to contract growers to village operations was confusing.

(See ACTIONS 12, 13 and 14)

ACTION 25: Establishing the levels of hybridisation in farm stocks within Thailand may be possible.

[Mr. Yosapong Tamsiripong to investigate feasibility of clarifying this issue].

Monitoring Products in International Trade:

1. In terms of international trade and CITES, all "products" involving tissues from a species listed on the Appendices of CITES need to be regulated, and subject to permits (often

import and export permits), unless a formal exemption exists.

2. Exemptions exist for four items of personal products (belts, wallets, handbags etc) that may be carried on a person or in luggage that is accompanying a person in travel, which does not apply to personal products sent separately - they require full permitting. All commercial shipments of crocodile products require permits.
3. For *C. siamensis*, all skins in international trade must be tagged according to the CITES tagging resolution. However, the extensive international trade in live *C. siamensis*, hatchlings and raised animals for food, even adults for breeding, is problematic in terms of ensuring trade is legal, accountable and verifiable at both source and destination. China began importing *C. siamensis* from Thailand in 1997, from Cambodia in 2000 and from Viet Nam in 2003. As shown in Table 1, China has imported over 451,000 live specimens from these countries in the 10-year period 2000 to 2009. Thailand has also exported live animals to Cambodia, Egypt, Hong Kong, Japan, Malaysia, Philippines, the Republic of Korea, South Africa, Taiwan-Province of China, and Viet Nam since 2005. It should be noted that Cambodia has 6 crocodile farms registered with the CITES Secretariat for the commercial production of *C. siamensis* through captive breeding, whereas Thailand has 22 and Viet Nam has 7 registered farms.
4. The Working Group did not consider processed products and byproducts (leather, teeth, blood, meat, etc.) further and concentrated on the live animal trade.
5. All live *C. siamensis* in trade should ideally be individually identified as are skins of all sizes. Microchips, identification tags (webbing or in tail scutes) are methods deserving consideration. Tags are probably more practical and easier to monitor at borders, and glass-encased microchips may be problematic for food animals. Formal tags for small hatchlings may be difficult and scute-marking as a method for identifying such small animals to the level of individuals is error prone if large numbers are involved.
6. Tags should be developed, using recommendations from the CSG in consultation with these four concerned Range

Stattess: Thailand, Cambodia, Viet Nam and China.

ACTION 26: There is a need to review options for identifying live *C. siamensis* in trade, within SE Asia and between SE Asia and China, to improve compliance with CITES.

[Dr. Paolo Martelli on behalf of CSG to establish a regional Task Force to discuss this issue and advise the CSG on possible courses of action].

Working Group Report E (Chairman: Bill Magnusson)

Capacity building of stakeholders involved in captive management

Draft Working Group Guidelines

Examples for possible discussion

- Implementation of national Crocodile Management Plans.
- Establishment of state-controlled fora for exchanging information between and among range States for better monitoring of industry, trans-border shipments and management of wild populations.
- Establishment of a regional forum for information sharing among stakeholders (eg meetings of national crocodile farmers associations).

Who are the stakeholders?

1. The principle stakeholders involved with the conservation, management and sustainable use of *C. siamensis* are: crocodile farmers; government officers; food suppliers and zoo keepers.
2. NGOs and groups such as the CSG are clearly interested in the degree to which captive management is improved, but are not direct stakeholders.
3. In cases where NGOs are directly involved in captive production of crocodiles for conservation or educational purposes, as planned for Cambodia, capacity building in captive management may be required.

Table 1. China's import trade in live *Crocodylus siamensis* 2000-2009 (compiled by John Caldwell from UNEP-WCMC database).

Exporter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cambodia	13,000	16,572	34,809	640	5,000	0	0	0	1,500	1,600
Thailand	26,475	13,179	10,898	17,300	30,250	23,696	58,793	47,180	23,600	16,600
Viet Nam	0	0	0	7,700	3,200	9,300	13,000	24,050	41,400	11,137
Total	39,475	29,751	45,977	25,640	38,450	32,996	71,793	71,230	66,500	29,337

Stakeholders - Crocodile Farmers

1. In Thailand (22 CITES accredited farms and >700 satellite farms) new farmers tend to learn techniques from existing farms and farmers. Small (satellite) farms require training in information handling and reporting obligations. All farmers would benefit from training in marketing. Training for managers of larger farms, to better understand CITES and the regulation of trade in accordance with CITES would be highly beneficial. Basic training in crocodilian biology and conservation, that makes allowances for species specific traits, would be of benefit to everyone.
2. CMAT and the Department of Fisheries in Thailand, already run training courses in crocodile management that could be made available to participants from other countries.
3. In Cambodia (6 CITES-accredited farms; 561 registered satellite farms and 500-600 unregistered satellite farms). Training in information handling and reporting is needed, along with general training in farm husbandry and veterinary techniques. There is a particular need to learn to identify hybrids, and to adopt procedures that reduce the risk of farm crocodiles, perhaps containing hybrids, being accidentally released to the wild. Training in production chains, beyond hatchlings, would be beneficial. Incubation techniques, marketing, crocodile biology and conservation are needed. Managers of larger farms need to better understand CITES regulations and the need for compliance.
4. In Viet Nam (7 CITES-accredited farms; 1100 registered farms, together holding some 500,000+ *C. siamensis*). Training in information handling and record-keeping, farm management, veterinary techniques, markets and marketing would be beneficial. Training about hybrids, how to recognise them, and obligations for responsible ownership would assist future management.

ACTION 27: Determine whether there is any financial support available from organisations such as FAO to support training workshops for crocodile farmers and provide materials and expenses for them to attend.

[CSG Executive Officer with assistance from Dr. Parntep Ratanakorn to investigate].

Monitoring wild Populations

1. There is a need to ensure that the status of remaining wild populations of *C. siamensis* are subject to continual checking and reporting (perhaps annually), to ensure they did not decline and become extinct. This requires a commitment to monitoring.
2. Monitoring can be conducted in different ways, depending on the habitat and various other factors.
3. Different monitoring and survey programs are operating in different parts of the range of *C. siamensis* now, although there is no compilation of results.

ACTION 28

- i. It would be useful if Range States could report on what survey and monitoring programs have or are being conducted in their countries.
- ii. It would be useful if information on monitoring techniques for *C. siamensis* were compiled and distributed.

[Rob Stuebing to advise CSG Executive Officer what is currently and may in the future be possible for C. siamensis in Indonesia; CSG to liaise with Boyd Simpson and Charlie Manolis about publications and/or reports on monitoring techniques; CSG Executive Officer to assess whether information on monitoring techniques could be included on the CSG website].

4. Capacity building/training (training of trainers), especially where legal matters are involved, may need additional staff and equipment in all Range States. Some external organisations that may be able to assist with advice and training are: UNEP, TRAFFIC SE Asia, SMS, ASEAN-WEN Working Group on Implementation of CITES *et al.*

ACTION 29: The current status of capacity-building in different Range States, and future aspirations and needs, ideally needs to be quantified.

[Range States to be asked by the CSG Executive Officer to report on capacity-building].