

Ecology & Recovery of the Gaur in Thailand



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1. Bovids in Thailand

- Six species of wild Bovids are found in the country:
 - 1. Gaur (*Bos gaurus*)
 - 2. Banteng (*Bos javanicus*)
 - 3. Kouprey (*Bos sauveli*)
 - 4. Wild water buffalo (*Bubalus bubalis*)
 - 5. Serow (*Naemorhedus sumatraensis*)
 - 6. Goral (*Naemorhedus goral*)
- Four species above are classified as the Thai National Reserve species

Banteng (*Bos javanicus*)



K. Wathanyakan

- Banteng are found in Tropical Dry Forests
- Cows, juveniles and calves stay in herd ranging from 5-20 animals.
- Bull is staying in a single way of life and enters into a herd for mating.
- Habitat destruction and illegal hunting doom population to decline.
- There are now only 4 Protected Areas that can be found Banteng



Kouprey (*Bos sauveli*)

This Indochinese wild ox formerly occurred along Thai-Cambodia border, the last seen in Thailand was reported in 1983. It would be possibly extinct!

Wild water buffalo (*Bubalus bubalis*)



Only one population with sixty of them are existing in Huai Kha Khaeng Wildlife Sanctuary, World Heritage site in Western Thailand.



Goral (*Naemorhedus goral*)

Goral is very rare and is known to distribute only on the high mountain range in the Northern Part of Thailand.

Serow (*Naemorhedus sumatraensis*)



Serow is found along cliffs of steep and high Limestone mountain habitat of South-east Asia Mainland and nearby Islands.

2. Gaur & its distribution

- Gaur is divided into 3 subspecies:
 - Indian gaur (*Bos gaurus gaurus*) India, Nepal,
 - Indochina gaur (*Bos gaurus laosiensis*) Myanmar, Thailand above Kra, Southern China and Indochina
 - Malaysian gaur (*Bos gaurus habacki*) Peninsular Thailand and Malaysia
- Indian and Indochinese gaur being found in Tropical Dry and Evergreen forest habitats
- Malaysian gaur live in Tropical evergreen forest on Peninsula



Young adult bull has a single way of life. When it become adult and more stronger, it may move in and out the herd particular for mating.

3. Ecology



Thailand has two subspecies of gaur: 1) Indochinese gaur (*Bos gaurus laosiensis*) are found in Huai Kha Khaeng, and 2) Malaysian gaur (*B. g. habbacki*) are found in Peninsular Thailand. They inhabit in various types of forest and grassland along wider altitudinal range from sea level up to the highest peak of Doi Inthanon (2565.34 m).



In dry season, gaur feed in burn area which is covered with *Imperata cylindrica* Beauv., and they movement along riparian habitat where is abundant of forage species.



In the wet season, gaur (*Bos gaurus laosiensis*) usually feed in an open habitat, such as old clearing or man-made grassland. Gaur's browsing sign



1) Grazing area and saltlick surround with Dry forest of Huai Kha Khaeng Wildlife Sanctuary, Western Thailand, and 2) Grassy plain on mountain top provide good forage species and water supply for gaur and ungulates.



Gaur visit many sites of saltlick during the wet season to obtain macro and micronutrients. Tracks of gaur herd inside the natural saltlicks can show the frequency of their uses.



Khao Angrunai WS

Herd of gaur (*Bos gaurus laosiensis*) are licking soil at "Pong Nok" saltlick in Khao Angrunai Wildlife Sanctuary, Eastern Thailand



The famous water holes in the Dry dipterocarp forest in Huai Kha Khaeng WS, gaur come to drink during the dry season while they come to graze in the wet season. These sites are good for observing on gaur and other large mammals.



Herd of gaur (*B.g. laosiensis*) are feeding and resting in Dry deciduous forest during the wet season.

Malaysian gaur (*Bos gaurus habbacki*)



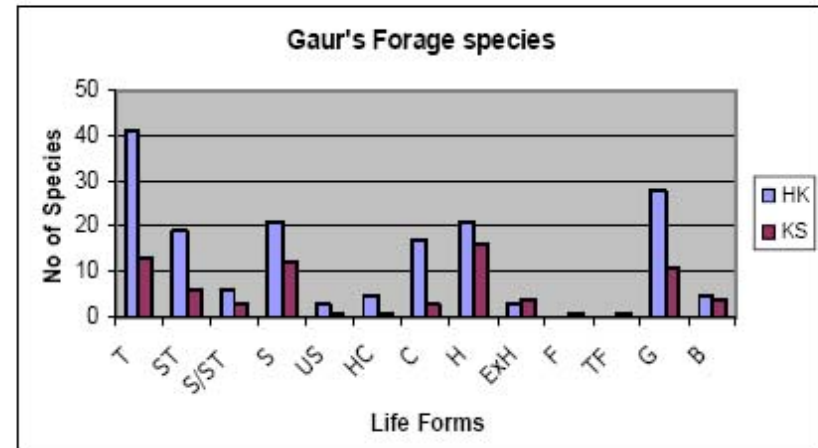
Gaur (*B.g. habbacki*) feed on Pong Aoi grass, *Panicum auritum* Presl. (1) which found along drawdown area of the Racha Prapha Reservoir in Khlong Saeng Wildlife sanctuary, Southern Thailand



Gaur (*Bos gaurus habbacki*) come out to graze on open drawdown area and use escape cover in evergreen forest at the background.



Low down of water level from 5-10 m was so helpful in manipulating new grass, namely *Paspalum auritum* and *P. conjugatum* for gaur grazing along the drawndawn area of Rachphapha Dam, Southern Pinnensular Thailand.



Due to habitats are more diverse, Gaur in Huai Kha Khaeng browse and graze on 169 plant species while the gaur population in Klong Saeng use 76 species of plant.

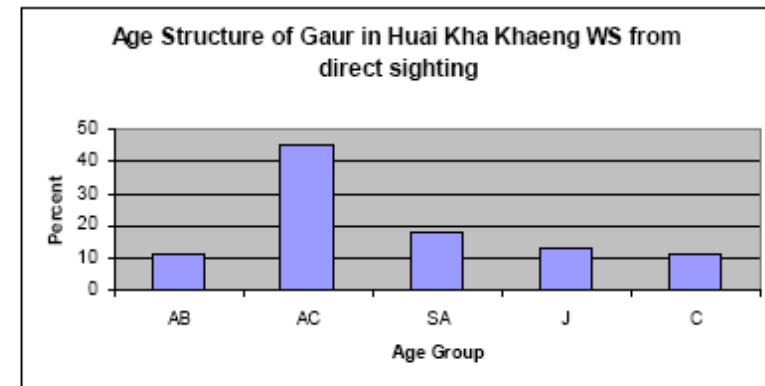
4. Population Structure

- Social Organization
 - Bull living alone/few young adult bull form a Bachelor herd
 - Basic unit is clan: Cow & calf; Cow, juvenile & calf
 - Several clans form herd
- Gaur will form a special large herd in feeding during the dry season
- Age structure are studied from direct seen & bed size
- Average Herd size
 - Huai Kha Khaeng
 - 8.15 animals/herd (range 2-42, S.D. 6.23, N = 40)
 - Klong Saeng WS
 - 6.55 animals/herd (range 2-13, S.D. 3.53, N = 11)



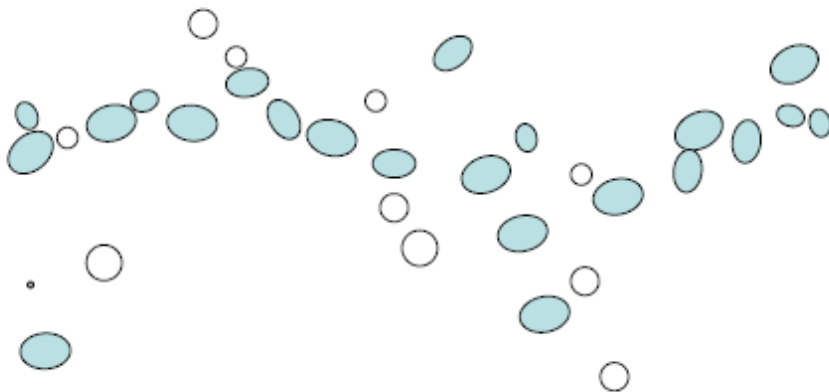
Gaur in Huai Kha Khaeng WS (1) and Gaur in Klong Saeng WS (2) produce offspring through out the year. Calf has brown coloration for 4 or 5 months before changing to dark brown.

- Huai Kha Khaeng WS is more available living space for gaur than Khlong Saeng WS which is composed of very small pockets of land in limestone mountain.
- Density was applied from Dung counts on line transects.
- Gaur Density & available habitat in the two study sites:
 - Huai Kha Khaeng
 - 454.1 dungs/km²
 - 0.53 animals/km²
 - 63.6 animals in 120 km²
 - Khlong Saeng
 - 1583.5 dungs/km²
 - 2.68 animals/km²
 - 50.6 animals in 21 km²



Age structure of the gaur population from direct sighting shown bull: cow sex ratio is 1:4

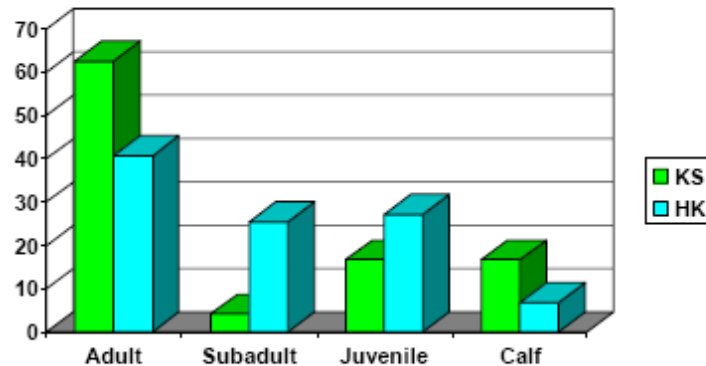
Gaur Beds at Khlong Kor in Huai Kha Khaeng WS



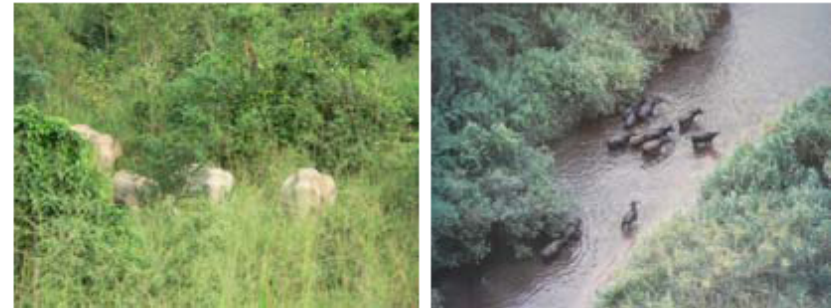
Gaur Bed Size

Age Group	Width (cm)	Length (cm)	Area (m ²)
Adult	110-150	140-200	1.32-2.36
Subadult	100-115	130-160	1.02-1.30
Juvenile	80-100	120-140	0.92-0.99
Calf	80	100	0.63

Gaur Herd Structure (%) from Track and Bed Identification



5. Competition



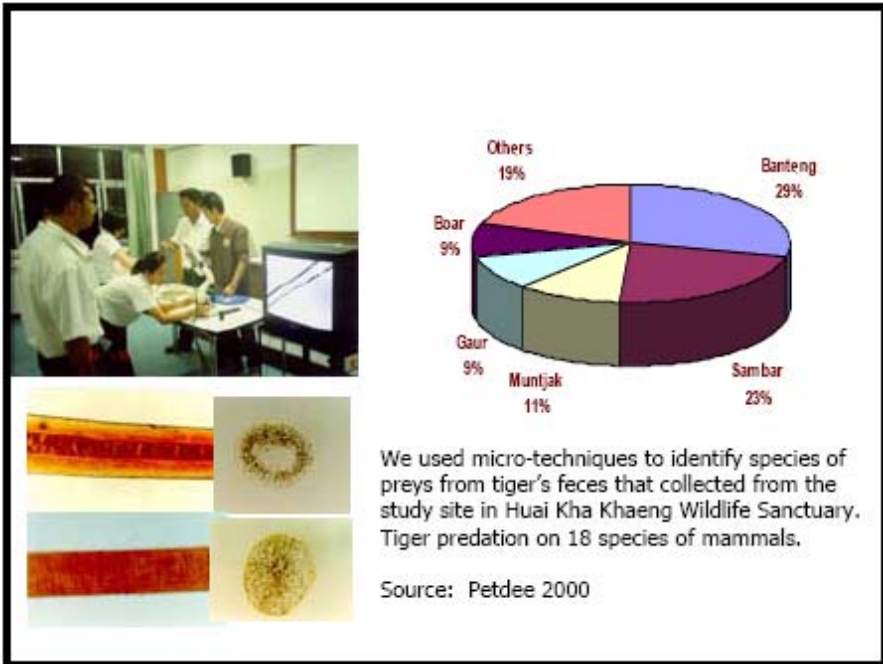
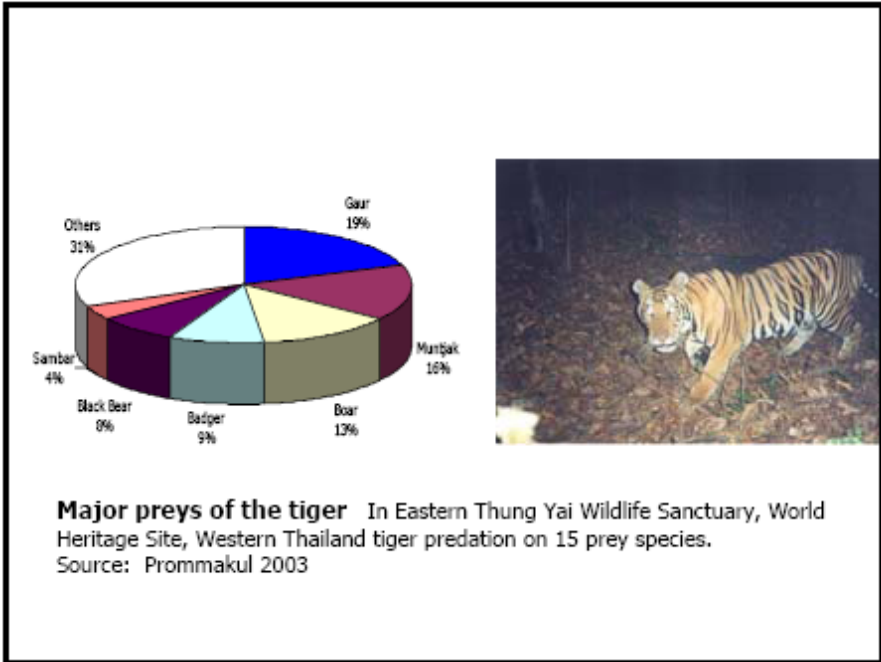
Gaur generally used more overlapping habitat and resources with **Wild elephant** in Evergreen forest. We found that gaur share their living spaces with **Banteng** in Dry forest, and they share utilizing riparian habitat with **Wild water buffalo** (2).

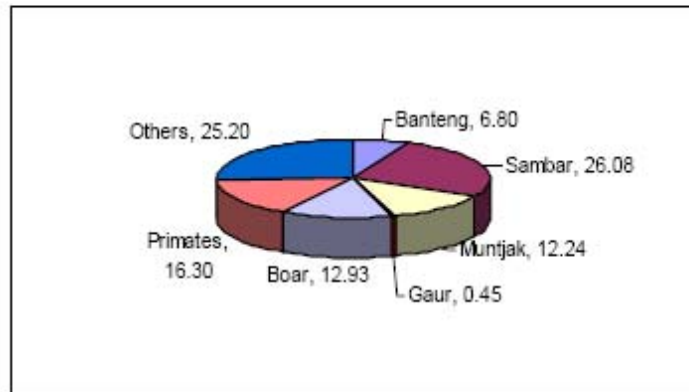


Banteng are found in the Dry forest habitats *i.e.* Dry dipterocarp and Mixed deciduous forests only in lowland area. While, **gaur** used overlapping Dry forest habitat and resources *i.e.* forage species (17.85%), saltlick, resting cover, living space with Banteng mostly during the wet season.

6. Predation and Other

- From direct sighting, natural enemy of gaur, banteng and wild water buffalo are tiger, dhole and leopard.
- Tiger and leopard feces were collected and examine for those remain hairs comparing with the Known hair references to fine out the prey species.





Major preys of the leopard or panther (%)

Leopard and panther in Huai Kha Khaeng WS are predation on 22 species of mammal which are composed of ungulates in 72% and primates in 16.3%, respectively.

Source: Simcharoen 2008



Pack of Dholes and tiger are mainly predator to control gaur and banteng population in the Western Forest Complex, while jackal (right side) has no ability to kill large mammals. But jackal did visit to feed on carcass.

Other mortality



Carcass of bull gaur was bitten by poisonous King cobra (งู). At least three records for gaur and one for wild elephant from three parks.

7. Causes of Threat



- Habitat loss
- Wildlife poaching
- Livestock raising
- Human activities:
 - fishing
 - collecting forest minor products by local people



Banteng cow was illegal hunt for values of their bush meat.



Wildlife poaching

Gaur trophy (1), turtle and some hunting materials from arrested poachers (2) also the dangerous shotgun (3).



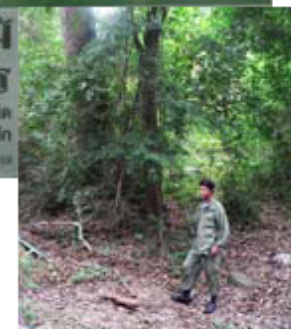
Snare hunting / Patrolling System

Wild elephant calf, gaur and other wildlife caused injury or death from leg snare trap. Park Ranger and soldier patrol and remove several snares to save wildlife of Khao Ang Runai Wildlife Sanctuary.

Thairath's Headline, 6 August 2005

เทียบเท่ากับระเบิด
คชค. ขาขาด 2 ข้าง

ขณะเข้าไปยิงผี
ที่ชายแดนเขมร
พล.ตรีระวีราช เทียบกับระเบิด
ขาขาด ส่วนเท้าและเท้าขวาหัก
2 คน อธิการสารพัด



Our friend, a border police step on land mine near Cambodia border while he helped Park rangers in patrolling and removing land mine in Ta Phraya NP.

Livestock Raising in forest habitat in the parks



Large herd of domestic cattle, water buffalo and goat are raising nearby the parks and sometime they were driven into the parks. Ecological competition for food, water, cover and living space (right picture). Livestock can transmit diseases and parasites to wild ungulates.

8. Protection

- Law Enforcement
 - Wild Animal Reservation and Protection Act 1960
 - National Park Act 1961
 - Wild Animal Reservation and Protection Act 1992
- Protected Area Establishment (22.5% of country land)
 - 55 Wildlife Sanctuaries
 - 81 National Parks
- Increasing no of Forest Guard Stations and Warden System
- Strengthening of Patrolling System to minimize threats

9. Recovery

- Habitat manipulation for gaur
 - Feeding ground
 - Water source
 - Man-made saltlick
 - Measure of success
- Mitigation on gaur and people conflicts
- People involve conservation
- Future benefits of gaur
 - Genetic resources
 - Gaur and local communities in ecotourism aspect

Habitat Manipulation: Study case in Ta Phraya National Park



Use of prescribed burning in gaur feeding site in Taphya National Park to create fresh biomass ofalang grass (*Imperata cylindrica* Beauv.) for gaur.



1



2

Water ponds were impoundment by trucker with water tank. Forestry students were checking track and signs of gaur visiting each water site (1) or they could observe on the hind out on a tree (2).



Man-made saltlick

Eight saltlicks with their IDno were made by adding NaCl to the selected spots and monitoring.



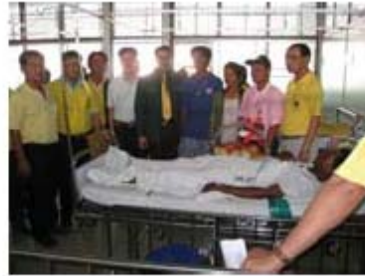
Hindout platform on tree is used for our observing gaur visiting man-made saltlick and water source in .



Ta Phraya National Park. Fast increasing in number of premature gaur population with in nearly 8 years, from few adults are increase to more than 40 animals.

**What will happen when the gaur population increase?
Young adult bull disperse out.**

We will have to learn how to mitigate people and gaur conflicts!



When gaur population trend to increase, they start to do crop raid *i.e.* corn and cassava. Also, it sometime cause injure to local people. Mostly from bull disperses out off sanctuary or park.



Dispersal of Young adult bull out of sanctuary

Young adult gaur moving out of Huai Samran - Huai Tap Tan WS and it was illegal short by people near Thai-Cambodia border, 30 July 2008



Daily News



Daily News

**Local people involve
conservation of gaur and wildlife**



Klong Pla Kang Forest Gard Station

Leader of villagers was explaining to forestry students from National University of Laos to realize how to work with Khao Yai National Park and to carry out his ecotourism.



Klong Pla Kang Forest Gard Station

Wildlife watching tower and the large herd of 47 gaur at Klong Pla Kang Forest Gard Station, Khao Yai NP

Local people and Ecotourism in Kui Buri National Park



Kui Buri National Park

Not only wild elephant but also gaur that are attractive to visitors to see them in the wild. Elephant and gaur at the man-made saltlick in the Royal Project for Recovery Elephant Site near Kui Buri National Park, South-western Thailand. Local people support as guide and managing their houses for home stay.

10. Conclusion

- Thailand has two subspecies of guar:
 - *B.g. laosiensis* in the Upper country, and
 - *B.g. habbacki* in the Southern Peninsular.
- Ecology & Population
 - Gaur was one of the threatened wild bovid found in South & South-east Asian countries.
 - Cow gaur and juveniles stay in herd ranging from 2-42 individuals while bull was normally solitary. Average herd size of the is 8.15 for *laosiensis* and 6.55 individuals for *habbacki* population.
 - Gaur use tropical dry forest and rainforest habitats for foraging, traveling, resting. Their habitat are overlapping with wild elephant, banteng and wild buffalo.

- Protection
 - Law enforcement and Protected Area System (22.4% of the total country area) were significant to achieve goal of gaur and other wildlife conservation
 - Protected Areas play the role of the In situ conservation.
 - Good patrolling system is to strengthen
- Recovery
 - To minimize threats to support recovery of gaur population and also to minimize people and gaur conflicts in some areas.
 - Habitat manipulation are applied in some protected areas. Gaur population trend showed increasing.
- Future Benefit
 - Genetic resources
 - Local people involve in gaur conservation and receive benefit from ecotourism activities.

Acknowledgement

- Huai Kha Khaeng Wildlife Sanctuary
- Khlong Saeng Wildlife Sanctuary
- Khao Ang Ru Nai Wildlife Sanctuary
- Oyoiborn Sangtien, Former chief of Ta Phraya NP

Thank you for your attention