

# CAT

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# news





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# Does the fishing cat inhabit Laos?

**No fishing cat *Prionailurus viverrinus* record from Laos is supported by specimen or photograph. Historical reports derive only from works replete with major errors. Recent reports based only on tracks and/or villagers' reports cannot be assessed for reliability. Of three recent field sightings, one was probably a leopard cat *P. bengalensis*, one was seen too poorly for identification, but one was seen well and characters noted fit fishing cat. It was in a fast river through degraded hill evergreen forest. This habitat may be atypical for the species and the site may be unusually far inland: a critical review of South-east Asian distribution is needed. Typical 1990s-2000s mammal surveys in Laos were probably unsuited to detecting fishing cat: Lao status will remain unclear pending targeted survey. Further claims of this cat in Laos – indeed, inland South-east Asia – require documentation of evidence for identification.**

Fishing cat, Endangered on the IUCN Red List of Threatened Species (Mukherjee et al. 2008), inhabits mainland tropical Asia and the large islands of Sri Lanka, Java and, perhaps, Sumatra (e.g. Corbet & Hill 1992; Duckworth et al. 2009). Here we collate information from Laos, including recent reports and records, widely used in secondary compilations, which have however entered 'common knowledge' without public availability of their basis for identification. Laos covers a landlocked 236,800 km<sup>2</sup> of mostly rugged terrain. Other than streams, natural wetlands are almost restricted to the plains beside the River Mekong and its major tributaries. These plains are heavily farmed, with productivity intensifying,

and human population density matches the regional average. Until 1950 mammals were collected only patchily in the country, and little reliable information was generated between 1950 and 1988. During 1989-1998, many areas were surveyed for large mammals (including small carnivores), birds and habitat condition (Duckworth et al. 1999); surveys continue at reduced levels.

## Historical information

Early standard reviews of Indochina's (Laos, Cambodia and Vietnam) mammals (Osgood 1932; Delacour 1940) recorded fishing cat only from South Annam and Cochinchina (southern Vietnam). No Lao specimen has ever been

reported by an international museum and A. Wilting's extensive recent search traced none (Table 1).

Cheminaud (1942) wrote ten pages on the species in Laos, mostly irrelevant to evaluating its Lao status, comprising a discussion of the inadequacy of its common names, corrective comments on its degree of piscivory, adulation at such a small beast's ferocity, legends about domestic cats from the then king of Louangphabang, and other anecdotes. He stated that while hunting around Pak-Ou (20°03'N/102°13'E), he shot a sun bear *Ursus malayanus* and a fishing cat fighting on the Nam (= River) Ou's bank, and that the then British governor of the Shan States (Myanmar), whom he met in Chiang Saen, Thailand (over the Mekong opposite Laos, at 20°16'N/100°05'E), told him that he had raised a pet fishing cat since infancy, which produced three beautiful offspring with a Burmese cat. He also spoke of a captive fishing cat in Xaignabouli province, giving no opinion on its origin. He wrote (p. 135; in translation) that this species inhabited "the thick jungles of the north-western Indochinese peninsula". His only primary detail on its appearance is a gory discussion on the damage to the fighting fishing cat from the bear: irrelevant to assessing the species concerned.

Apparently only on this basis, Deuve & Deuve (1963) listed fishing cat for Laos, in the process converting the conversation in Chiang Saen to a locality record, the other side of the Mekong, around Ban Houayxai (Laos). They cautioned that, without specimens, confirming this cat for Laos was premature, and noted that Cheminaud's (1942) Lao name for fishing cat, *sua hay*, meant any wild cat in Khammouan province. Deuve (1972) abandoned these admirable cautions, simply stating that fishing cat, *sua hay*, was known in Laos from Pak-Ou and the Mekong banks round Houayxai.

## Modern information

*Nam Theun Extension proposed National Protected Area, 1996*

According to WCS (1996: 9), "while crossing the Nam Pan, a fishing cat was observed swimming across the river". This cat was observed by JW at ca.13h00 one sunny day in mid-January 1996, beside the Nam Pan, in this stretch a boulder-strewn mountain river in a rather steep-sided valley within a hill evergreen forest-swidden mosaic. The site lies at about 18°28'N/104°59'E (580 m asl), ca. 2 km from an (unmapped) Hmong village. Ongoing inability to find the extensive notes taken at

**Table 1.** Museums surveyed by A. Wilting (in litt. 2010) for fishing cat specimens.<sup>1</sup>

### Museum

American Museum of Natural History, New York, USA  
 Institut Royal des Sciences Naturelles, Brussels, Belgium  
 Museum National d'Histoire Naturelle, Paris, France<sup>2</sup>  
 Staatliche Naturhistorische Sammlung Dresden, Museum für Tierkunde, Germany  
 Naturhistorisches Museum der Burgergemeinde Bern, Switzerland  
 National Museum of Natural History (Naturalis), Leiden, Netherlands  
 Senckenberg-Museum Frankfurt, Germany  
 Staatliches Museum für Naturkunde, Stuttgart, Germany  
 National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA  
 Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany  
 Museum für Naturkunde, Berlin, Germany  
 Zoologisch Museum, University of Amsterdam, Netherlands  
 Raffles Museum of Biodiversity Research, Singapore  
 Zoologische Staatssammlung München, Germany  
 Zoologisches Institut und Zoologisches Museum, Universität Hamburg, Germany

<sup>1</sup>In addition, the Natural History Museum, South Kensington, U.K. is also known to hold none from Laos (JWD).

<sup>2</sup>One 1929 Delacour specimen is labelled merely 'Indochine', so may conceivably have originated in Laos.

the time means that the following is written from memory, vivid despite the 14-year lapse. Some 40 m from him, a grey-buff coated cat emerged from a verdant water's-edge tangle into the turbulent water. It swam directly across the river between the boulders, a distance of ca. 15 m, apparently unaware of JW. It was rather stocky and quite densely spotted, looking so large that leopard *Panthera pardus* was contemplated. It kept its tail dry, held at least 10 degrees above the water surface. The clearly visible, dark-ringed, tail was obviously short relative to the animal's body compared with a leopard's, and the dark blotching just visible along the spine had a rather linear pattern, not the more randomly arranged rosettes of a leopard. Immediately on gaining the far bank the cat disappeared into dense vegetation. JW already knew leopard cat *Prionailurus bengalensis* and jungle cat *Felis chaus* in the field, and has subsequently observed various wild leopards. The features noted fit only fishing cat among South-east Asian species, although habitual tail posture when swimming seems not documented. A short film on the Internet ([http://www.youtube.com/watch?v=\\_yqRYvXRARM&feature=related](http://www.youtube.com/watch?v=_yqRYvXRARM&feature=related)) shows a fishing cat swimming, which holds its tail horizontal, at the water surface; but the exposure is too brief to be taken as an indication of 'standard' behaviour for the species.

#### *Xe Xou lowlands, Dong Ampham National Protected Area (NPA), 1997*

Davidson et al. (1997: 28) stated that "one seen briefly in January, flushed from the banks of the Xe [= River] Xou, ca. 7 km east of Ban [village of] Antoum [14°44'22"N/107°16'15"E] soon after midday... confirms its presence in Dong Ampham". This was observed by RT on 12 January 1996, who wrote: "Mammal. Very large house cat size with a short stout tail seen running from riverside through vegetation. Tail was half a house cat size and thicker. Appeared greyish in coloration [the animal; not just the tail]. Very brief view 12.47". Appended later is "Fishing Cat?". It was seen from a boat motoring upstream at ca. 14°45'N/107°17'E (130 m asl). The Xe Xou is a wide all-year river amid lowlands originally of deciduous dipterocarp forest; at the sighting scrub and secondary growth with much bamboo grew both sides of the river. RT, with no previous experience of fishing cat, based identification upon the lack of other candidates for a grey-toned, cat-shaped, animal of such a size with a tail of such relative length. While what was seen

is consistent with a fishing cat and it may well have been one, it is inadequate for treatment as a certain record.

#### *Xe Sap NPA, 1999*

Steinmetz et al. (1999: 49) stated that a fishing cat was seen at 09h30 on 6 March 1999 in bamboo thicket near the Aboutl swamp (1,250 m). This flat marshy area with slow-flowing streams lies at 16°07'40"N/106°56'45"E, near an abandoned village now grassland and secondary forest, amid hill evergreen forest. The observer, TS, was uncertain of identification: the lack of caveat in the report was an editorial error. The sighting was at ca. 4 m range for only 5-10 seconds, showing a golden coat (light conditions were ideal to judge pelage tone) with chocolate-brown spots, a body looking 'long' (ca. 60 cm?), and a tail similar in length to, possibly slightly shorter than, the body. The ears were small and rounded, the eyes dark (grey-green?). The animal stood ca. 20-30 cm off the ground, and moved in a 'slinking' way. The ear-shape suggests fishing cat, but the golden pelage and relative tail-length almost rule out this species; it was probably a leopard cat, a species common in Laos (e.g. Duckworth 1997, Johnson et al. 2009).



Fig. 1. Northern South-east Asia, showing sites mentioned in the text.

#### *Other reports*

A dead cat suggested at the time to be a fishing cat was found in the Nam (= River) Sang, Phou Khaokhoay NPA, in June 1996, by M. Watson. Exhaustive searches (by SW, A. Watson and P. D. Crees) have failed to find any photographs or field notes: its identity thus cannot be evaluated. Duckworth et al. (1999: 192) referred to a "provisional record" from Nam Kan NPA citing J.-F. Reumaux (in litt. 1998), for which no information is now available.

#### **Discussion**

Duckworth et al. (1999: 192) gave reports (all as provisional, irrespective of designation in the original source) from various areas additional to those above, all based on signs and/or village interviews. Although Round (1998) gave measurements of one set of footprints (of nine assigned provisionally to the species), no others described the signs observed. Over 30 species of the order Carnivora inhabit Laos, and few data for confusion species' signs in Laos exist, cautioning any sign-based claim of fishing cat (Steinmetz et al. 1999). Assessments of sign record reliability generally reveal overconfident species identification, even in much simpler carnivore communities (e.g.

Davison et al. 2002; Janecka et al. 2008, Evans et al. 2009). Sign-based claims are therefore all open to serious doubt. Village information is also untenable: it is impossible to interpret consistently and reliably to species for small cats in Laos (Steinmetz 1998, Duckworth et al. 2005). Hence, these reports are not detailed here.

McKelvey et al. (2008) discussed several North American cases where 'common-knowledge' acceptance of a species's occurrence arose through piecemeal accumulation of reports, each unproven on its own, but giving an appearance of mutual corroboration; yet a rigorous analysis found acceptance in error. Fishing cat is known in Laos by just such an accumulation, begging the question of whether it occurs there at all: as a precedent, the generally accepted presence of this readily misidentified species on the entire island of Sumatra may be an artefact, although the island remains too poorly surveyed for a firm decision (Duckworth et al. 2009).

Historical fishing cat 'records' from Laos are valueless. Cheminaud's (1939, 1942) stated Indochinese distribution, in the north-west but not, implicitly, elsewhere, is surprising for a species then known in the region only from the coastal lowlands (which define the peninsula to the east, south and south-west). He discussed eight mammal species never reliably recorded from Laos, with various other statements highlighting his ignorance of the Lao fauna, and his information must be discarded (Duckworth, in press): selective acceptance is illogical because he wrote watertight first-hand accounts of hunting followed by close examination of such biogeographic improbabilities as chital *Axis axis* and sloth bear *Melursus ursinus*. It would be rash to refute, absolutely, the possibility of any particular species's presence, but that all eight inhabited Laos is impossible. For his stated role of educating the French about Lao animals, Cheminaud evidently wrote a series of parables, enhancing readability through free imaginative rein (Duckworth, in press).

J. and M. Deuve, in a series of 1960s papers in their self-edited *Bulletin de la Société Royale d'Histoire Naturelle du Laos*, presented Cheminaud's records, but only after deleting species they considered unlikely to inhabit Laos, thereby denying their readers the context of Cheminaud's extraordinary Lao bestiary. The Deuves' screening retained several species unknown from Laos (e.g. a musk-deer *Moschus sp.*, Asian tapir *Tapirus indicus* and red panda *Ailurus fulgens*) and

their own purportedly primary information was riddled with mistakes; they even utterly mis-portrayed the douc *Pygathrix nemaeus* (Timmins & Duckworth 1999: 480), an animal which would seem unmistakable.

Each 1990s claim of fishing cat in Laos was presented without detailing what was observed, preventing readers assessing its reliability. Then-standard works mostly included Laos, without any caveat, within fishing cat range (e.g. Lekagul & McNeely 1977; Corbet & Hill 1992; Nowell & Jackson 1996). Observers could assume that their fishing cat records had parochial, but not national or global, interest, and may have been less critical of their identifications.

Laos might be assumed to support fishing cat, because it inhabits neighbouring Vietnam (Nguyen Xuan Dang et al. 2004: from U Minh Thuong Nature Reserve, photographs examined by JWD), Cambodia (Rainey 2010) and Thailand (Cutter & Cutter 2009). But unlike Laos these countries have coastline, and on Java Melisch et al. (1996) considered fishing cat strongly associated with coastal habitats; although in India and Nepal the species occurs far from the coast (e.g. Sunquist & Sunquist 2009, and references therein), it should not be assumed that fishing cats in mainland South-east Asia necessarily use habitat more like their conspecifics in South Asia than in Java. The specific records cited here from these mainland South-east Asian countries are not open to doubt, but the available 'general picture' of range (e.g. various sources' maps shading in entire countries) has never received critical review. How much in South-east Asia fishing cat extends inland into habitats as found in Laos is unknown: but Cutter & Cutter (2009) investigated four Thai localities with recent reports, two interior and two coastal, and found the cat at only the two coastal sites. Single specimens from the Dawazup (26°35'N/96°15'E) in far north-western Myanmar (Carter 1943; AMNH 113496) and from Tak province, Thailand (NMNH 253538, per A. Wilting in litt. 2009, inferred ca. 17°11'N/98°54'E) prove penetration far inland in South-east Asia but not to a general enough pattern sufficient to assume that the species inhabits Laos.

The record most indicative that fishing cat might inhabit Laos is of one camera-trapped in Cambodia at 14°05'01"N/104°35'13"E, in deciduous dipterocarp forest, close to floodplain grassland (Rainey 2010). Somewhat similar habitat, but now lacking extensive floodplain grassland, extends across much of northern Cambodia and into southern Laos:

the Xe Xou lowlands form its eastern extent. These habitats have never been intensively camera-trapped in Laos, and surveys in Cambodia towards the Lao border have been limited (H. Rainey in litt. 2009). Whether fishing cat occurs in the Lao parts of this landscape cannot be assessed.

Camera-trapping in Laos (e.g. Johnson et al. 2009) has mostly been in closed hill forest far from the floodplain habitats generally assumed to support fishing cat. The Nam Theun Extension sighting was in such hill forest, but there seems no independent evidence of the species in this habitat. The lack of any Lao record in trade or a village indicates, given the regularity with which forest cats are found (Duckworth et al. 2005), that fishing cat is at best rare in Laos. As a habitat specialist, a low total population would indeed be expected, so large numbers in human possession are unlikely, as in Java (Duckworth et al. 2009).

We recommend the Nam Theun Extension sighting be considered valid and the Xe Xou sighting hypothetical, but recognise that some will consider both hypothetical. Anyone finding a fishing cat in Laos should publish full details, a message needing wide dissemination: modern secondary sources all list/map the species for Laos without caveat (Duckworth et al. 1999, Wozencraft 2005, Francis 2008, Mukherjee et al. 2008, Parr 2008, Sunquist & Sunquist 2009). The southern lowland plains warrant priority searches, but future hill-forest camera-trapping should set some cameras beside wider rivers: perhaps fishing cat's use of such habitats is much under-assumed. Standing wetlands and lowland streams are under rapid conversion throughout the country and support high levels of hunting (e.g. Claridge 1996, Duckworth & Evans 2007, Bezuijen et al. 2008). Few national protected areas support extensive such habitats (Robichaud et al. 2001) and awareness of the need for conservation management of remaining areas is uneven. If fishing cat inhabits Laos, without specific action it may not do so for much longer.

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#### References

- Bezuijen M. R., Phothitay C., Chanrya S., Rasphone A. & Hallam C. D. 2008 (for 2007). Wetland resource use in Xe Pian National Protected Area,

- Lao PDR, in 2005. Natural History Bulletin of the Siam Society 55, 223-234.
- Carter T. D. 1943. The mammals of the Vernay–Hopwood Chindwin expedition, northern Burma. Bulletin of the American Museum of Natural History 82, 99-113.
- Cheminaud G. 1939. Mes Chasses au Laos [tome I]. Payot, Paris.
- Cheminaud G. 1942. Mes Chasses au Laos, tome II. Payot, Paris.
- Claridge G. F. 1996. An Inventory of Wetlands of the Lao P.D.R. IUCN–the World Conservation Union, Bangkok.
- Corbet G. B. & Hill J. E. 1992. The Mammals of the Indomalayan Region. Natural History Museum Publications, Oxford University Press, Oxford.
- Cutter P. & Cutter P. 2009. Recent sightings of fishing cats in Thailand. Cat News 51, 12-13.
- Davidson P., Robichaud W. G., Tizard R. J., Vongkhamheng C. & Wolstencroft J. 1997. A Wildlife and Habitat Survey of Dong Ampham NBCA and Phou Kathong Proposed NBCA, Attapu Province, Lao PDR. CPAWM/WCS, Vientiane.
- Davison A., Birks J. D. S., Brookes R. C., Braithwaite T. C. & Messenger J. E. 2002. On the origin of faeces: morphological versus molecular methods for surveying rare carnivores from their scats. Journal of Zoology, London 257, 141-143.
- Delacour J. 1940. Liste provisoire des mammifères de l'Indochine française. Mammalia 4, 20–29, 46–58.
- Deuve J. 1972. Les Mammifères du Laos. Ministère de l'Éducation Nationale, Vientiane.
- Deuve J. & Deuve M. 1963. Contribution à la connaissance des mammifères du Laos: deuxième partie. Bulletin de la Société Royale des Sciences Naturelles du Laos 9, 35-46.
- Duckworth J. W. 1997. Small carnivores in Laos: a status review with notes on ecology, behaviour and conservation. Small Carnivore Conservation 16, 1-21.
- Duckworth J. W. in press. Records and reports of Red Pandas *Ailurus fulgens* from areas with warm climates. In Glatston A. R. (ed.) The Forgotten Panda: the Biology and Conservation of the Red Panda. Academic Press, London.
- Duckworth J. W. & Evans T. D. 2007. First records of White-browed Crake (*Porzana cinerea*) for Laos and its current range in Southeast Asia. Wilson Journal of Ornithology 119, 253-258.
- Duckworth J. W., Salter R. E. & Khounboline K. (compilers) 1999. Wildlife in Lao PDR: 1999 Status Report. IUCN–The World Conservation Union / Wildlife Conservation Society / Centre for Protected Areas and Watershed Management, Vientiane.
- Duckworth J. W., Poole C. M., Tizard R. J., Walston J. L. & Timmins R. J. 2005. The jungle cat *Felis chaus* in Indochina: a threatened population of a widespread and adaptable species. Biodiversity and Conservation 14, 1263-1280.
- Duckworth J. W., Shepherd C. R., Semiadi G., Schauenberg P., Sanderson J., Robertson S. I., O'Brien T. G., Maddox T., Linkie M., Holden J. & Brickle N. W. 2009. Does the fishing cat inhabit Sumatra? Cat News 51, 4-9.
- Evans J. W., Evans C. A., Packard J. M., Calkins G. & Elbroch M. 2009. Determining observer reliability in counts of River Otter tracks. Journal of Wildlife Management 73, 426-432.
- Francis C. M. 2008. A Field Guide to the Mammals of South-east Asia. New Holland, London.
- Janecka J. E., Jackson R., Yuquang Z., Diqiang L., Munkhtsog B., Buckley-Beason V. & Murphy W. J. 2008. Population monitoring of snow leopards using noninvasive collection of scat samples: a pilot study. Animal Conservation 11, 401-411.
- Johnson A., Vongkhamheng C. & Saitongdam T. 2009. The diversity, status and conservation of small carnivores in a montane tropical forest in northern Laos. Oryx 43, 626-633.
- Lekagul B. & McNeely J. A. 1977. Mammals of Thailand. Association for the Conservation of Wildlife, Bangkok (1988 printing).
- McKelvey K. S., Aubry K. B. & Schwartz M. K. 2008. Using anecdotal occurrence data for rare or elusive species: the illusion of reality and a call for evidentiary standards. Bioscience 58, 549-555.
- Melisch R., Asmoro P. B., Lubis I. R. & Kusumawardhani L. 1996. Distribution and status of the fishing cat (*Prionailurus viverrinus rhizophoreus* Sody, 1936) in West Java, Indonesia (Mammalia: Carnivora: Felidae). Faunistische Abhandlungen Staatliches Museum für Tierkunde Dresden 20, 311-319.
- Mukherjee S., Sanderson J., Duckworth W., Melisch R., Khan J., Wilting A., Sunarto S. & Howard J. G. 2008. *Prionailurus viverrinus*. In IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. <www.iucnredlist.org>. Downloaded on 23 February 2010
- Nguyen Xuan Dang, Pham Trong Anh, Nguyen Minh Tam & Le Hong Tuyen 2004. Mammals. In Sage N., Kutcher S., Nguyen Xuan Vinh, Wilson P., & Dunlop J. (Eds). Biodiversity Survey U Minh Thuong National Park. Agriculture Publishing House, Ho Chi Minh City, pp. 85-103, 133-138.
- Nowell K. & Jackson P. 1996. Wild cats: Status Survey and Conservation Action Plan. IUCN, Gland, Switzerland.
- Osgood W. H. 1932. Mammals of the Kelley-Roosevelts and Delacour Asiatic Expeditions. Publications of the Field Museum of Natural History, Zoology Series 18(10), 193-339.
- Parr J. no date [2008]. [Handbook to Mammals of Lao PDR]. No publication details (available through WWF and WCS Lao offices). (In Lao.)
- Rainey H. 2010. A fishing cat observation from northern Cambodia. Cat News 52, 8-9.
- Robichaud W., Marsh C. W., Southammakoth S., & Khounthikoumanne S. 2001. Review of the National Protected Area System in Lao PDR. Lao–Swedish Forestry Programme, Vientiane.
- Round P. D. 1998. Wildlife, Habitats and Priorities for Conservation in Dong Khanthung Proposed National Biodiversity Conservation Area, Champasak Province, Lao PDR. WCS/CPAWM, Vientiane.
- Steinmetz R. 1998. A Participatory Biodiversity Assessment of Khammouan Limestone National Biodiversity Conservation Area, Khammouan Province, Lao PDR. WWF Thailand Project Office, Bangkok.
- Steinmetz R., Stones T. & Chan-ard T. 1999. An Ecological Survey of Habitats, Wildlife, and People in Xe Sap National Biodiversity Conservation Area, Saravan Province, Lao PDR. Final report. WWF–Thailand Programme Office, Patumthani, Thailand.
- Sunquist M. E. & Sunquist F. C. 2009. Family Felidae (cats). In Handbook of the mammals of the world, vol. 1, carnivores. Wilson D. E. and Mittermeier R. A. (Eds). Lynx Edicions, Barcelona, pp. 54-168.
- Timmins R. J. & Duckworth J. W. 1999. Status and conservation of Douc Langurs (*Pygathrix nemaeus*) in Laos. International Journal of Primatology 20, 469–489.
- [WCS] Wildlife Conservation Society 1996. Additional Surveys and Recommendations on the Birds and Mammals for the Nam Theun II Hydropower Project, with Emphasis on the Proposed Corridor and Reservoir Islands Areas. Wildlife Conservation Society, Vientiane.
- Wozencraft W. C. 2005. Carnivora. In Mammalian Species of the World. A Taxonomic and Geographic Reference, 3rd edition. Wilson D. E. and Reeder D. M. (Eds). Johns Hopkins University Press, Baltimore, U.S.A., pp. 532-628.

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