

Habitat associations of critically endangered big-headed turtles in northern Thailand: supporting grassroots river conservation



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Turtles are among the most imperiled vertebrates on Earth

BIOLOGICAL REVIEWS Cambridge Philosophical Society 640
Biol. Rev. (2022), **97**, pp. 640–663.
doi: 10.1111/brv.12816

The Sixth Mass Extinction: fact, fiction or speculation?

Robert H. Cowie^{1*}, Philippe Bouchet² and Benoît Fontaine³

BioScience
A Forum for integrating the Life Sciences

Where Have All the Turtles Gone, and Why Does It Matter?

JEFFREY E. LOVICH, JOSHUA R. ENNEN, MICKEY AGHA, AND J. WHITFIELD GIBBONS

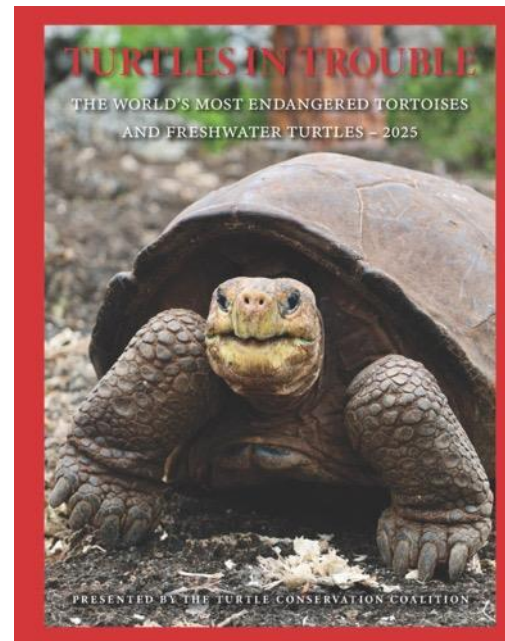
Current Biology CellPress

Review

Turtles and Tortoises Are in Trouble

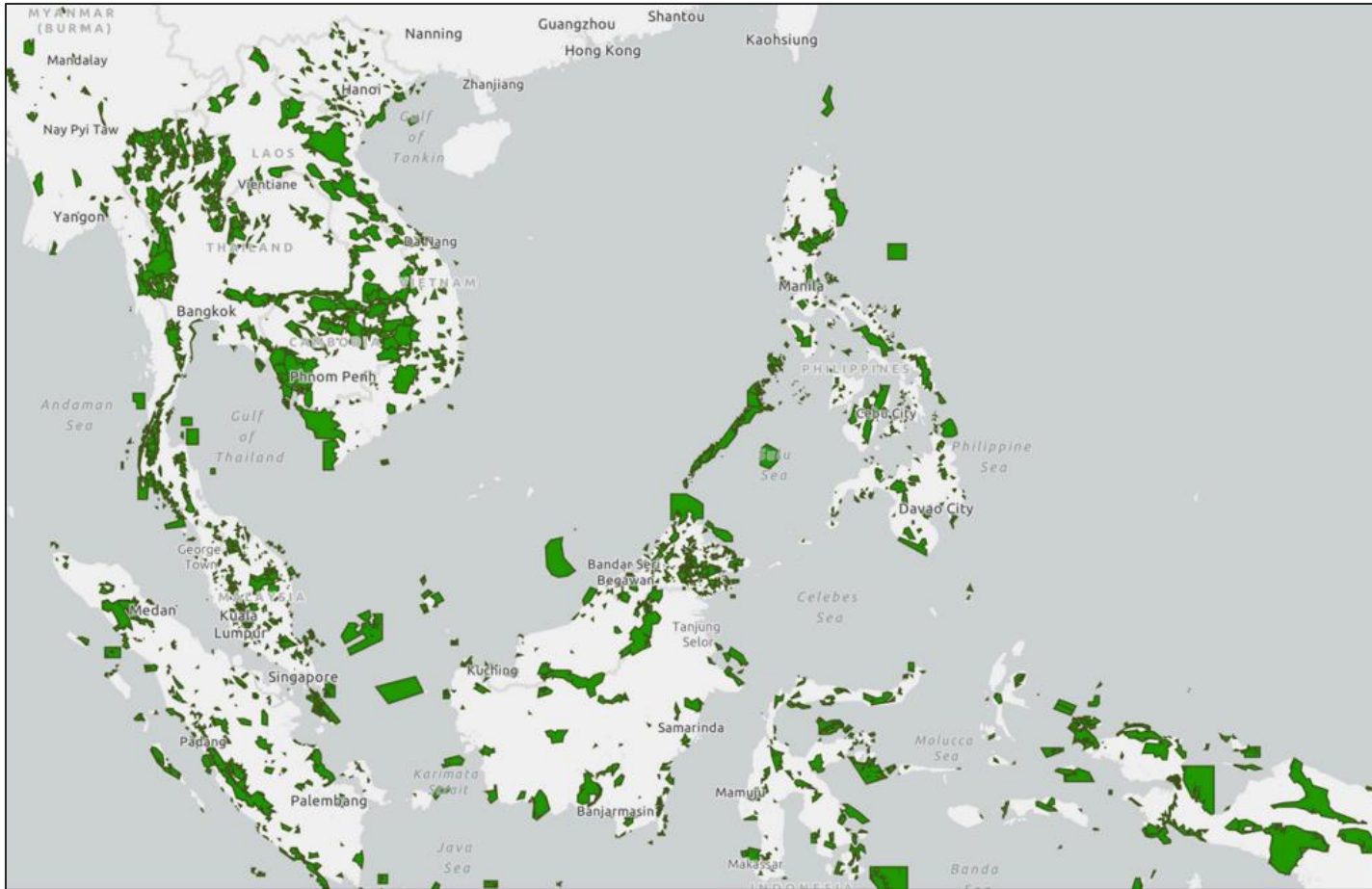
Craig B. Stanford^{1,2,47,*}, John B. Iverson³, Anders G.J. Rhodin^{4,5}, Peter Paul van Dijk^{5,6}, Russell A. Mittermeier⁶,

- Over 50% of world's ~360 turtle species threatened with extinction
- **75% of all native turtle species in Asia endangered or critically endangered**



Illustrations: Robert Hall

Modern protected areas, policies and laws against hunting and wildlife trade have not stopped regional turtle declines



Modern protected areas, policies and laws against hunting and wildlife trade have not stopped regional turtle declines

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Analysis of a decade of trade of tortoises and freshwater turtles in Bangkok, Thailand

Original Paper | Published: 30 September 2014

Volume 24, pages 309–318, (2015) [Cite this article](#)



Current Biology
Magazine

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Disappearance of endangered turtles within China's nature reserves

Shi-ping Gong¹, Hai-tao Shi^{2*},
Ai-wu Jiang³, Jonathan J. Fong⁴,
Daniel Gaillard⁵, and Ji-chao Wang²



Images: en.nordensark.se/conservation/turtles/big-headed-turtle/, cnbc.com/2018/08/10/hydropower-in-southeast-asia-dams-may-risk-economic-damage.html

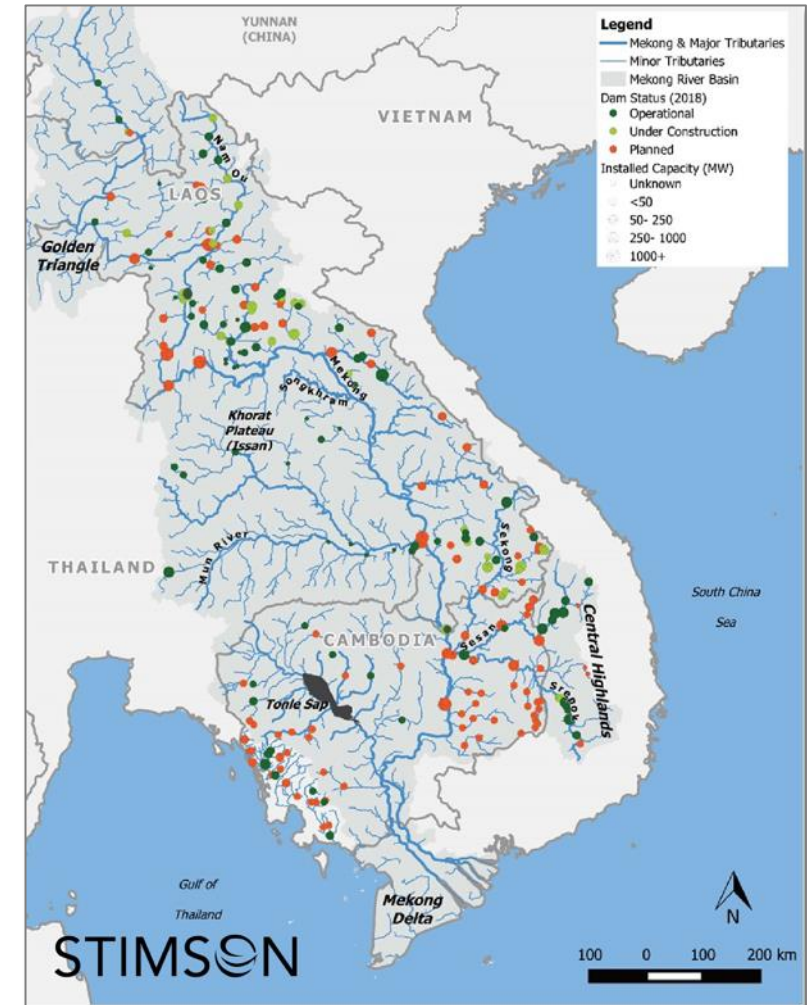
Conservation blindspot: Dams and the ever-expanding resource demands of economic growth and private capital investments

Review Article

Impacts of Dams on Freshwater Turtles: A Global Review to Identify Conservation Solutions

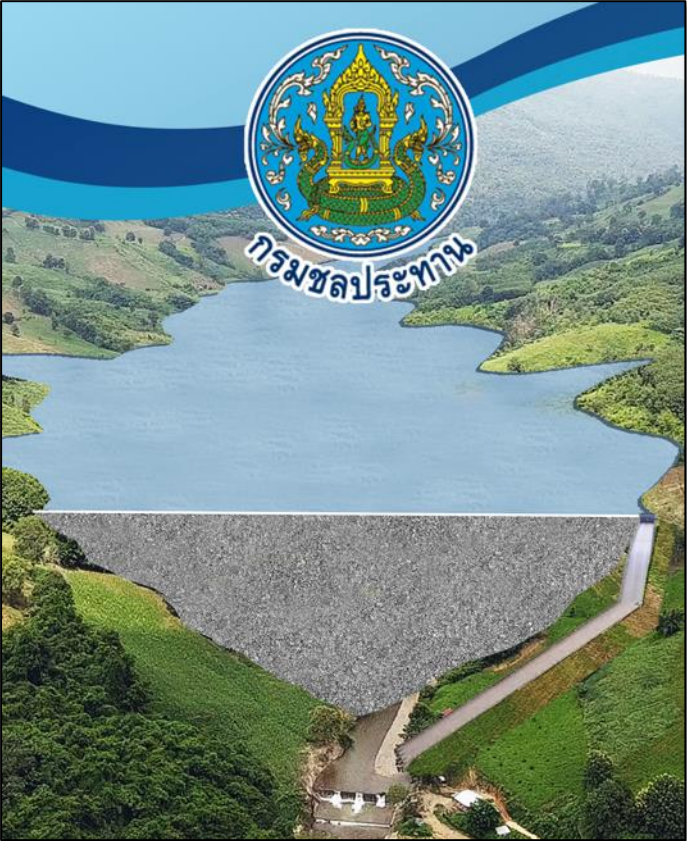
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Andrea Bárcenas-García^{a,b}, Fernanda Michalski^{a,b}, William H. Morgan^{c,d},
Rebecca K. Smith^{c,d}, William J. Sutherland^{c,d}, James P. Gibbs^e, and Darren Norris^{a,b,f}



Images: waterkeeper.org/news/southeast-asia-doomed-by-dams/, riverresourcehub.org/resources/science-takes-a-backseat-as-xayaburi-dam-continues/

“Mae Lao Subdistrict residents join forces to reject Mae Lao Reservoir” in Phayao Province, northern Thailand



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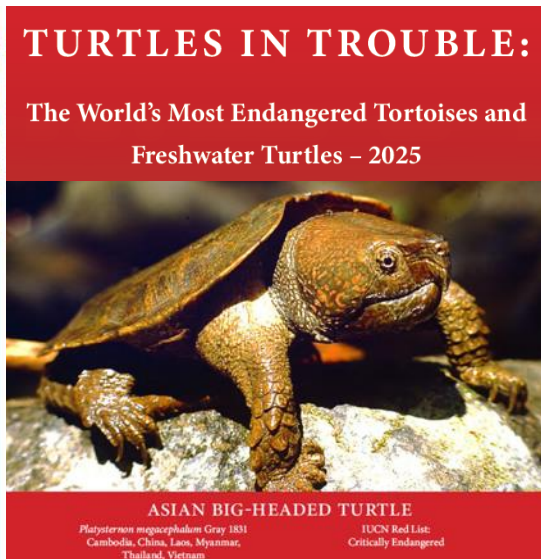
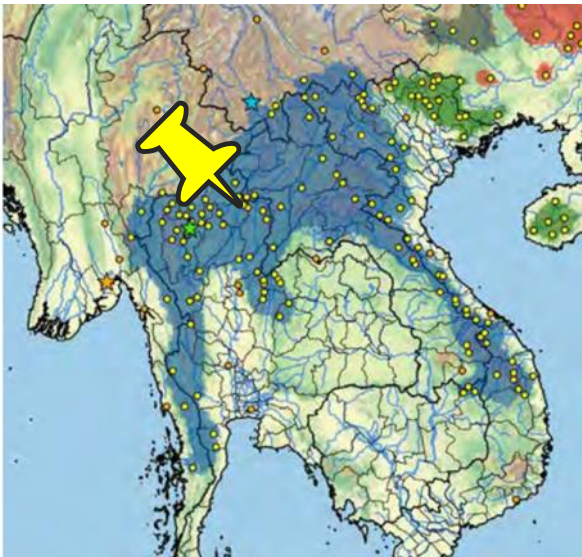


Images: bmcecolevol.biomedcentral.com/articles/10.1186/1471-2148-6-11, chiangmainews.co.th/social/1804617/

Studying habitat associations of big-headed turtles to support grassroots conservation of the upper Mae Lao River ecosystem

- How are turtles distributed in the watershed?
- How do different pool features affect species occurrence and observed body size?
- Traps at 250 pools (494 trap-nights) spanning 5+ km of river and streams

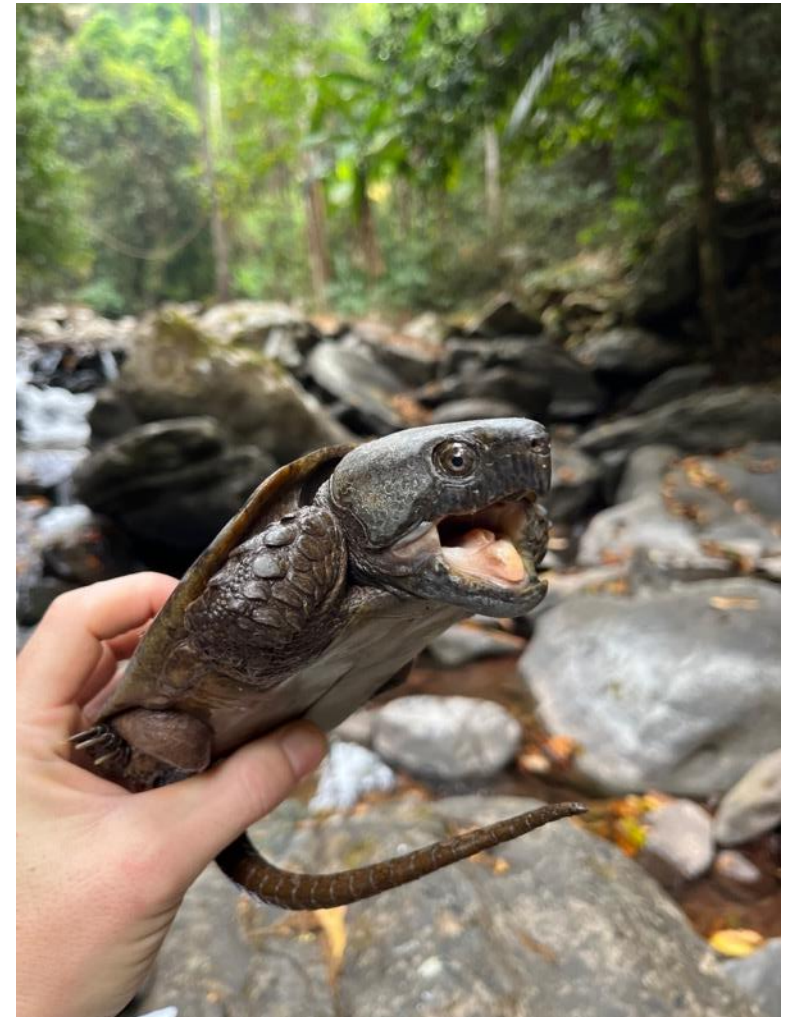
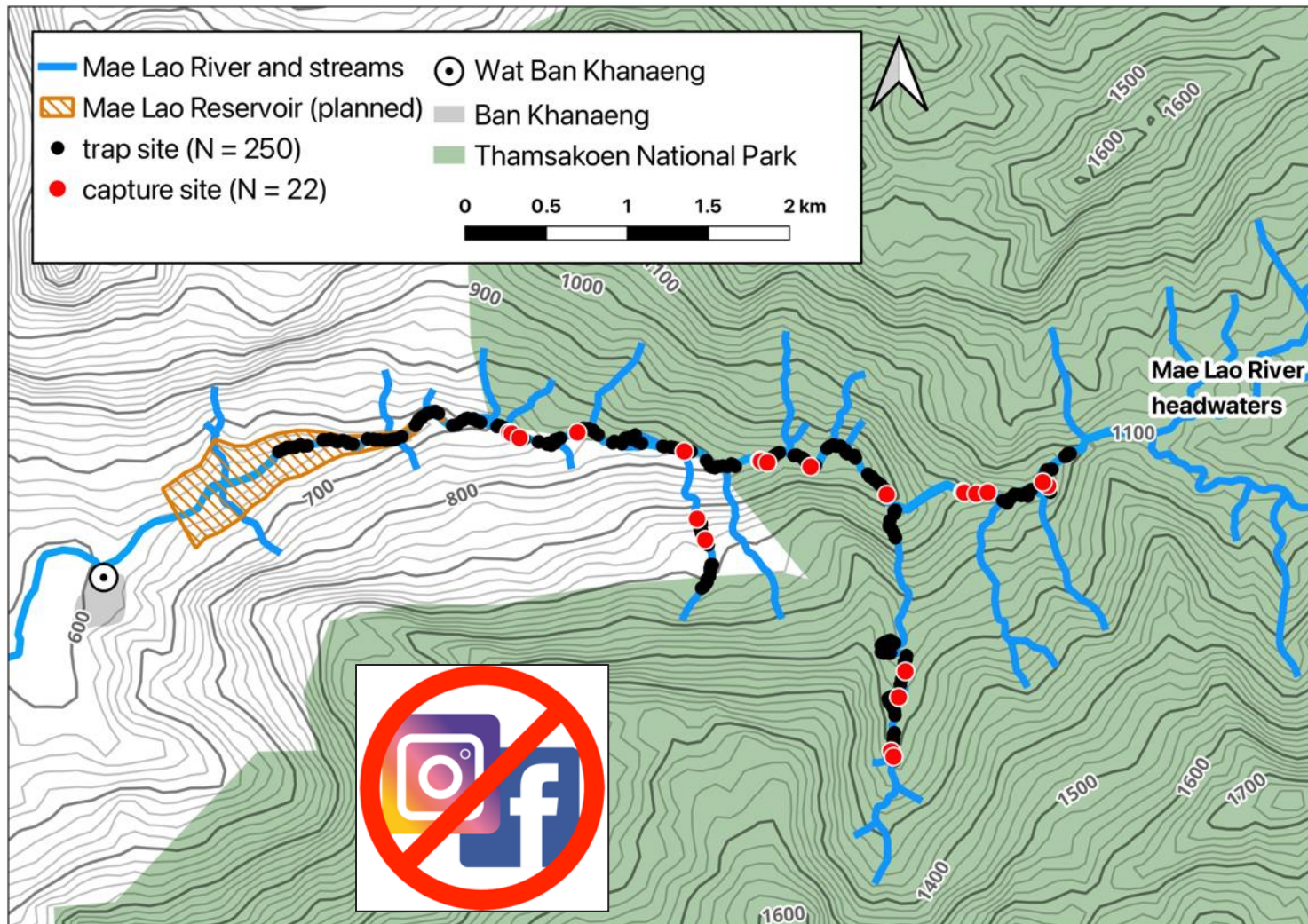
Southeast Asian big-headed turtles (*Platysternon megacephalum peguense*)



Map: iucn-tftsg.org/wp-content/uploads/crm.10.checklist.atlas_v10.2025.pdf

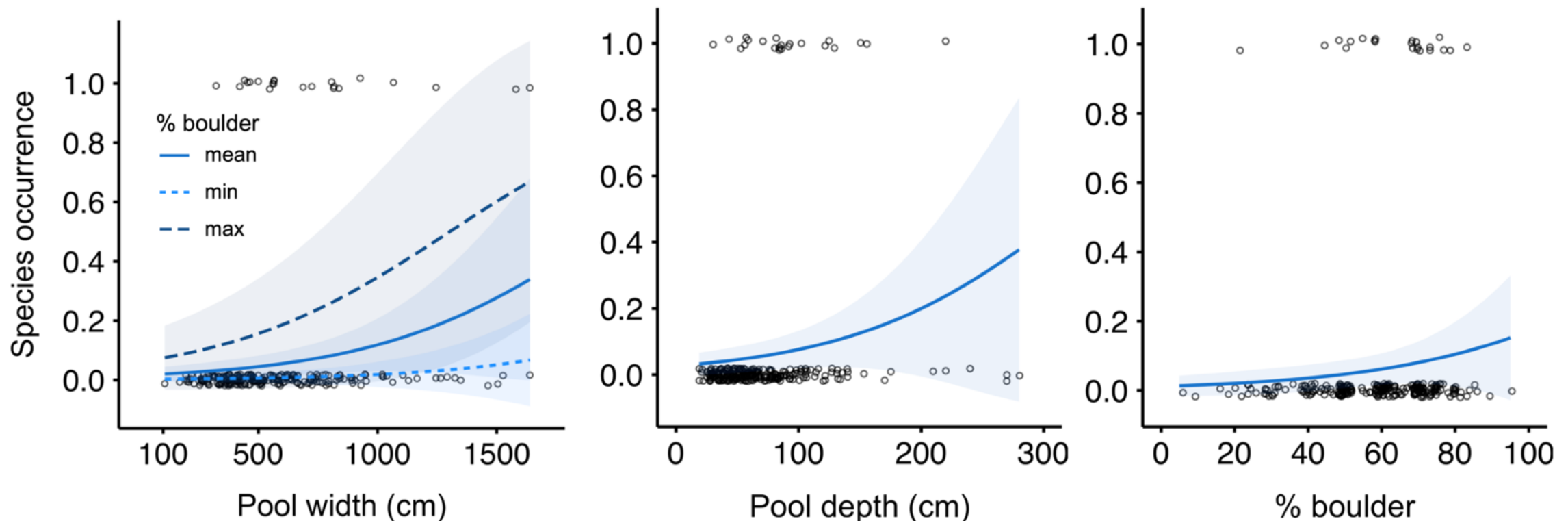
Captured 24 turtles in 22 pools, 3 within 500 meters of planned dam

- **widespread distribution** in river and both surveyed streams (16 of 26 transects)



Species occurrence increased with pool width and depth and % boulder substrate (refugia)

- Turtles prefer **large pools with many boulders**
- imperfect detection means **estimates biased low**



Presence of large adults, subadults, and juveniles indicates active breeding and little or no pressure from hunting or trade



Conservation Biology

Contributed Paper

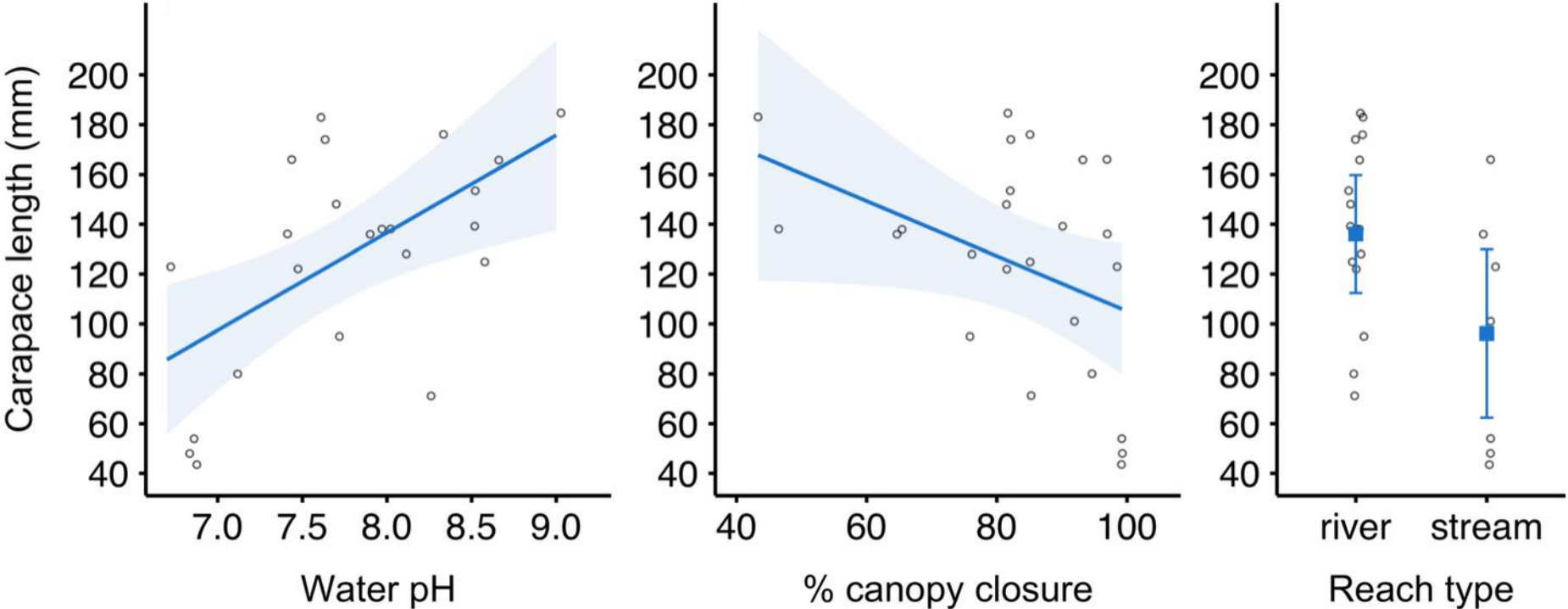
Demographic Evidence of Illegal Harvesting of an Endangered Asian Turtle

YIK-HEI SUNG, * NANCY E. KARRAKER, † AND BILLY C. H. HAU
School of Biological Sciences, The University of Hong Kong, Hong Kong SAR, China



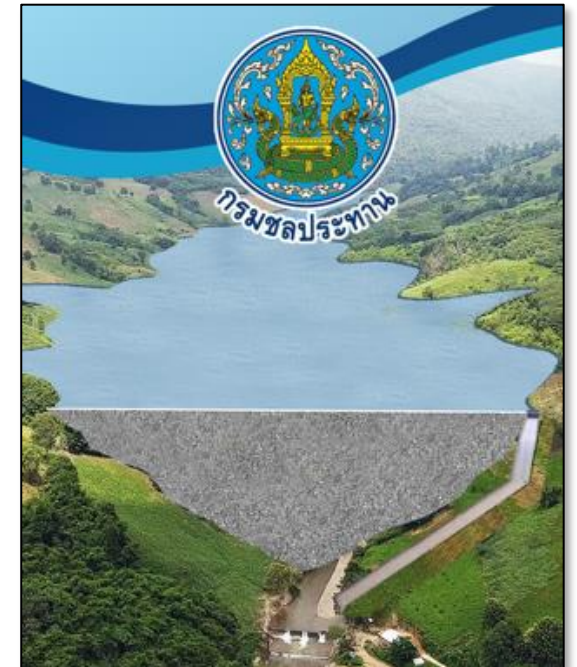
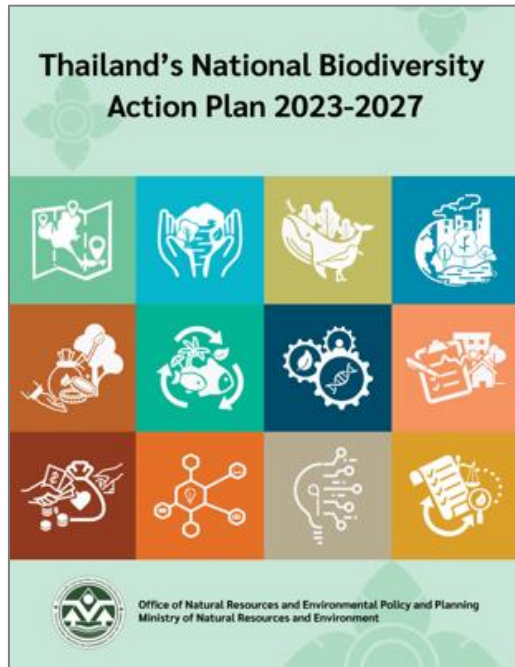
Body size decreased with water pH and forest canopy closure and was correspondingly lower in streams than in the river

- linear mixed effect models
- **streams may be favorable for nesting and/or juvenile survival**

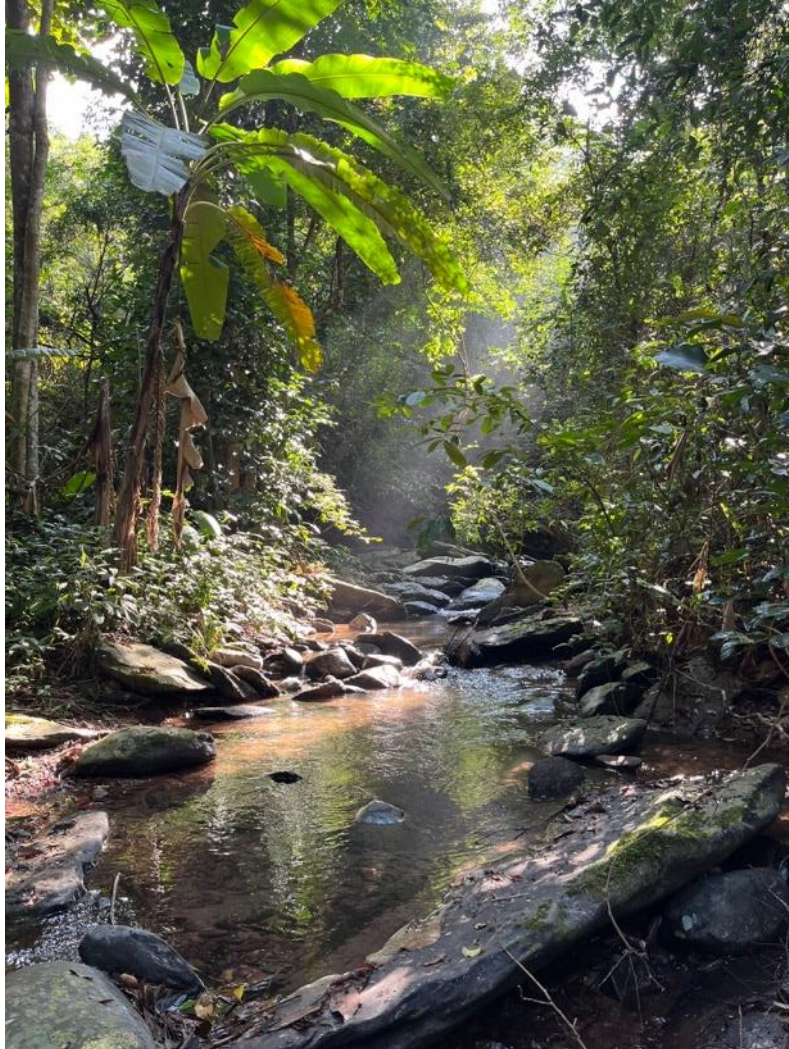


Cancelling the dam project is necessary to avoid destroying, degrading, and/or isolating key habitats of big-headed turtles

- NBAP 2023–2027 **Strategy 1**: “safeguard threatened species.”

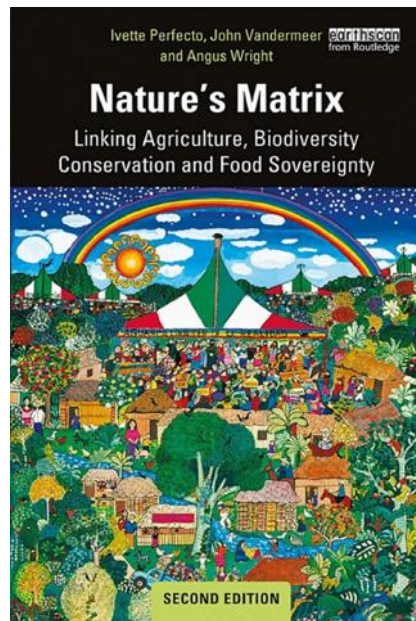
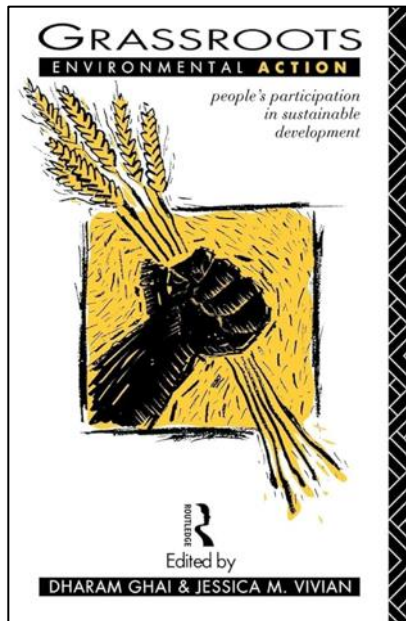


Local irrigation measures to avoid potential turtle mortalities or dry-season water depletion could further improve conservation



Grassroots conservation initiatives have important but under-recognized roles in maintaining biodiversity and ecosystems

- interface between **key habitats** and **undesirable development projects**
- limited **decision-making rights**, resources, and scientific support



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- Ban Khanaeng community
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- Kupadakvinij family

