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Faculty of Mathematics and Natural Sciences
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INSTITUTE OF ECOLOGY AND BIOLOGICAL RESOURCES



KÖLNER ZOO

IUCN's One Plan Approach - Zoo conservation initiative for Vietnam

Prof. Dr. Thomas Ziegler

One Plan Approach to Conservation

by IUCN's CPSP



Optimal, contemporary species conservation combines:

- In situ conservation
- Ex situ conservation
- Various expertises



Vietnamese crocodile newt (*Tylototriton vietnamensis*)

Recently discovered, microendemic, threatened



Vietnamese crocodile newt

Threat analyses led to official protection



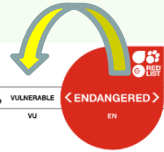
Vietnamese crocodile newt

Conservation breeding



Vietnamese crocodile newt

More than 350 bred individuals



NOT EVALUATED	DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED	EXTINCT IN THE WILD	EXTINCT
NE	DD	LC	NT	VU	EN	CR	EW	EX



Vietnamese crocodile newt

Repatriation from Cologne to Vietnam



Species discoveries

You can only protect what is known



Conservation priorities

Micro-endemism / protected area coverage



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Assessment of the threat status of the amphibians in Vietnam - Implementation of the One Plan Approach

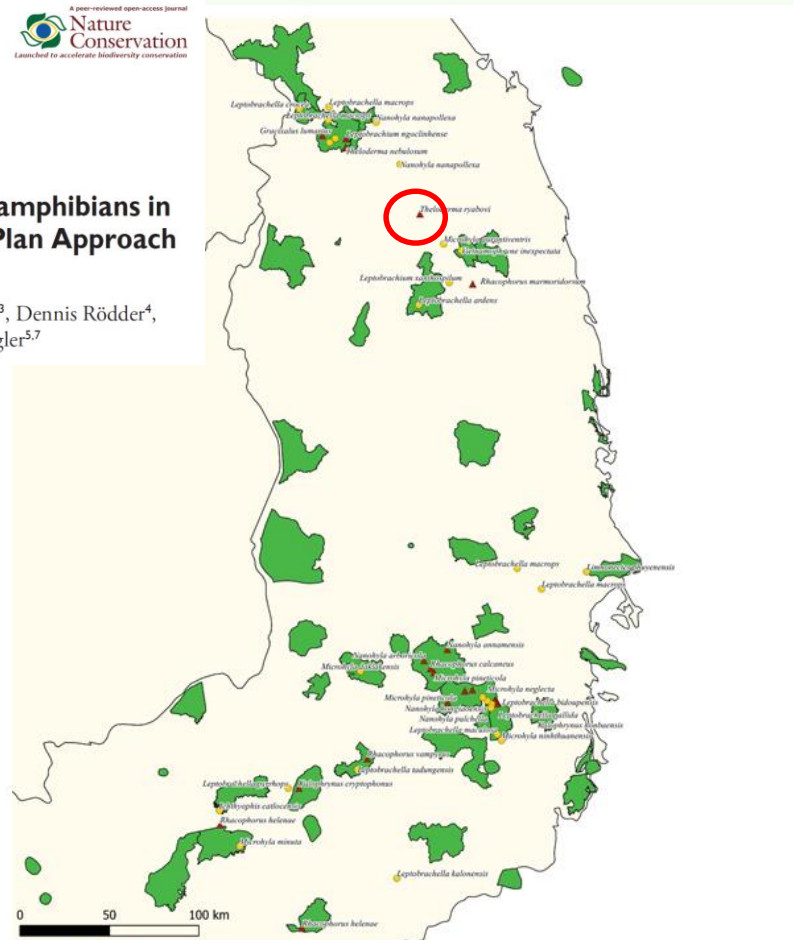
Marie Krzikowski¹, Truong Q. Nguyen², Cuong T. Pham³, Dennis Rödder⁴, Anna Rauhaus⁵, Minh D. Le⁶, Thomas Ziegler^{5,7}



Nature Conservation
Launched to accelerate biodiversity conservation

RESEARCH ARTICLE

Nature Conservation
Launched to accelerate biodiversity conservation



„The time is now!“ Filling the gaps in conservation



Scientists identify gaps in the protection of Vietnam's amphibians

A new study assessing the status of amphibians in Vietnam found a high level of species richness and local endemism.

July 5, 2022

Nature Conservation

amphibians, conservation,
endemic species, species
conservation, threatened
species



As was highlighted in the foreword to the renowned [WWF Greater Mekong Report 2021](#), written by Prof. Dr. Thomas Ziegler, Curator for Herpetology, Ichthyology, and Invertebrates, at [Cologne Zoo](#) (Köln, Germany), there is an urgent need for more studies that identify the gaps in species conservation.

In a new [scientific article](#), published in the open-access peer-reviewed journal [Nature Conservation](#), Ziegler and his team present precisely such an analysis, focusing on the world's most threatened vertebrate class: the amphibians. The share of amphibian taxa classified as threatened with extinction – 41% – is a clear indicator for the decline in global biodiversity and a warning sign for significant environmental degradation.

„The time is now!“

Demand for conservation related research



KÖLNER ZOO



FOREWORD

The Greater Mekong region is one of planet Earth's most important biodiversity hotspots, highlighted by the endless number of new species discovered there every year. The region's biodiversity richness is a result of its complex geological and climatic history, and its diverse landscapes, including extensive karstic regions. Only by using different methods, including comparing physical characteristics and performing molecular analyses, can researchers determine the true dimensions of this partly hidden biodiversity.

High species richness and ongoing discovery rates also underscore the conservation importance of the Greater Mekong region and its unique inhabitants. To record this treasure trove of biodiversity before it is completely lost, we must accelerate our work and strengthen international cooperation. Greater support is required for local and early-career scientists and conservationists to establish and expand international collaborations, because such networks help to record biodiversity more quickly.

Discovery and description of new species is only the first step. Ecological traits, distribution, and population size also urgently need to be studied to assess a species' conservation status. In particular, species that only occur in highly restricted geographic areas need our concerted support because they are highly vulnerable to direct human-caused threats and face increased extinction risks. In this respect, studying the degree of endemism and existing threats is as important as the work of discovery. Unfortunately, for many species, these data are completely unknown, and we must build the capacity of young researchers to help fill these knowledge gaps.

A better understanding of the protected area coverage of threatened species will greatly assist the conservation prioritisation of neglected wildlife. However, many species are not yet included in IUCN's Red List, and many of the current assessments are outdated. Habitat assessments ~~are insufficient~~, ~~and the time does not happen quickly enough~~. Here, the "One Plan Approach," supported by the IUCN, is very promising, since it links *in situ* and *ex situ* conservation measures and diverse expertise for the best possible protection. Species with a

limited range that are threatened by imminent extinction can be housed by local facilities or zoos, serving as modern "Noah's Arks," where conservation breeding programs and networks can be established. In parallel, nature conservation in the wild is our ultimate goal, so that this ark has some land where it can dock later.

Nature conservation has been supported by governmental and non-governmental agencies, but more support is needed. The Covid-19 crisis has made it very clear that humans cannot intervene in nature, its networks, food chains and biodiversity with impunity. In an increasingly globalised world, we have to take a step back and reconsider our behaviours. If we learn to use natural resources more carefully and sustainably, then this current crisis may help us make critical progress in conserving wildlife and wild places.

Public outreach reports like this one by WWF are thus crucial to inform people about the rich species diversity of our planet, a precious and limited gift. We must all learn to be more careful and coexist with all the other creatures on our planet, instead of just exploiting and exterminating them. This is the most important conclusion of this report, which spotlights one of the world's richest biodiversity hotspots and its desperate call for improved conservation.

Prof. Dr. Thomas Ziegler

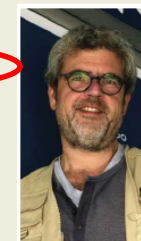


Photo by Ralf Schlosser

Curator for Herpetology, Ichthyology and Invertebrates, Zoological Garden Cologne; and Coordinator of the Zoo's biodiversity and nature conservation projects in Vietnam and Laos
Adjunct Professor, Institute of Zoology, University of Cologne

Spotted softshell turtle (*Pelodiscus variegatus*)

INTERESTING FACTS

Often mistaken as the Chinese softshell turtle.

THREATS

Competition from native species.



NORTH-CENTRAL VIET NAM
AND HAINAN ISLAND, CHINA

"Pelodiscus variegatus is a familiar, yet poorly known species."

Balázs Farkas

DISCOVERED BY

Balázs Farkas Gyűrő, Hungary (unaffiliated)

Thomas Ziegler Cologne Zoo and Cologne University, Germany

Cuong e Pham Viet Nam Academy of Science and Technology

An Vinh Ong Vinh University, Viet Nam

Uwe Fritz Museum of Zoology, Dresden, Germany

PELODISCUSVARIEGATUS

Discovery method: Species revision

Common name: Spotted softshell turtle

Name basis: Variegatus derived from Latin for "spotted"

CITATIONS - SEE INDEX



KEY FEATURES

- Large dark spots on underbelly shell

Spotted softshell turtle

Rediscovery, habitat protection, restocking



KÖLNER ZOO

In search of the Spotted Softshell Turtle in Vietnam:

An implementation of the One Plan Approach

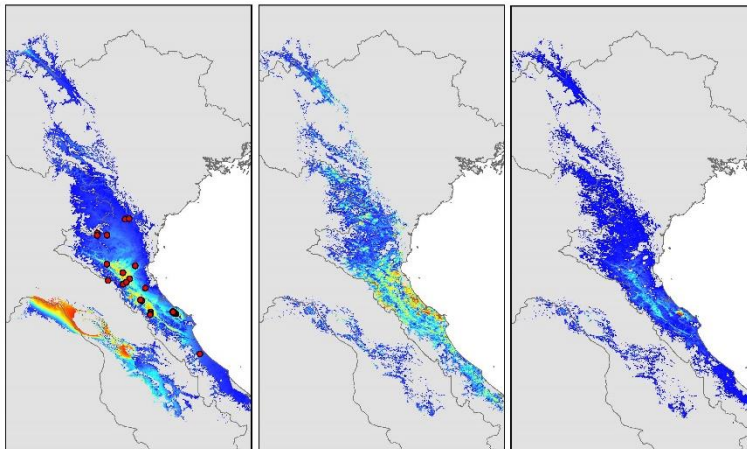
Thomas Ziegler¹, Tao Thien Nguyen², An Vinh Ong³, Cuong The Pham⁴, Truong Quang Nguyen⁴

¹ Cologne Zoo, 173 Riehler Str., 50735 Cologne, Germany. E-mail: ziegler@koelnerzoo.de

² Vietnam National Museum of Nature, Vietnam Academy of Science and Technology, 18 Hoang Quoc Viet Road, Hanoi, Vietnam.

³ Vinh University, Department of Zoology, 182 Le Duan St., Vinh City, Nghe An Province, Vietnam.

⁴ Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology, 18 Hoang Quoc Viet St., Cau Giay, Hanoi, Vietnam.



Climate

Vegetation

Climate * Vegetation



Vietnamese pond turtle (*Mauremys annamensis*)



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Bắc Từ Liêm, Hà Nội
7/1/2022



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NOT EVALUATED	DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED	VULNERABLE	ENDANGERED	< CRITICALLY ENDANGERED >	EXTINCT IN THE WILD	EXTINCT
NE	DD	LC	NT	VU	EN	CR	EW	EX

- Together with ATP, Prof. Dr. Minh Le
- Genetic screening of confiscations
- Habitat suitability
- Protected area creation
- Restocking

Four-eyed turtle (*Sacalia quadriocellata*)



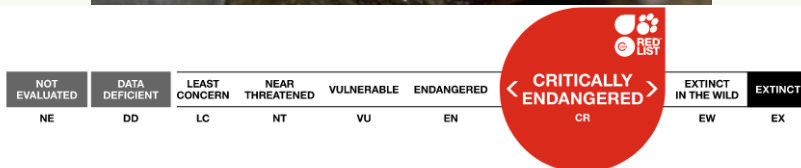
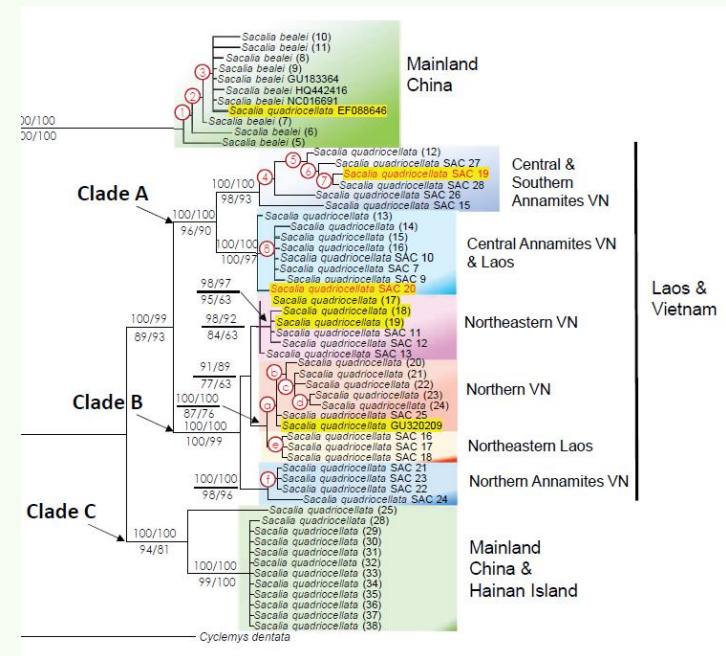
Nature Conservation 41: 91–111 (2020)
doi: 10.3897/natureconservation.41.54661
http://natureconservation.pensoft.net

RESEARCH ARTICLE



Threats from wildlife trade: The importance of genetic data in safeguarding the endangered Four-eyed Turtle (*Sacalia quadriocellata*)

Minh Duc Le^{1,2,3*}, Timothy E.M. McCormack⁴, Ha Van Hoang⁴,
Ha Thuy Duong⁵, Truong Quang Nguyen^{6,7}, Thomas Ziegler^{8,9},
Hanh Duc Nguyen¹⁰, Hanh Thi Ngo^{2,5*}



Four-eyed turtle (*Sacalia quadriocellata*)



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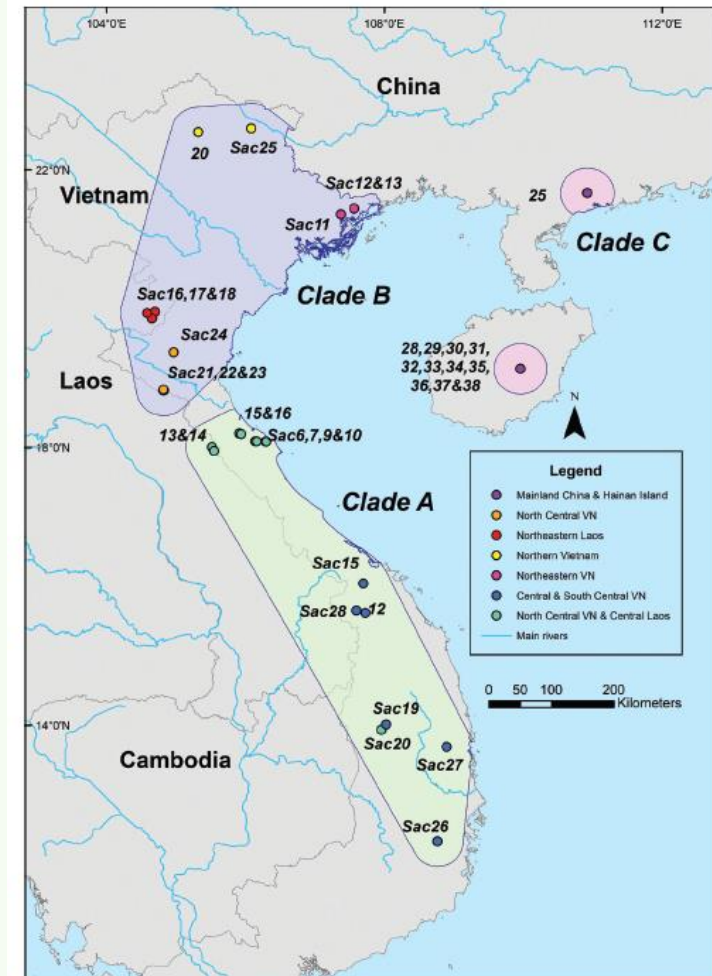
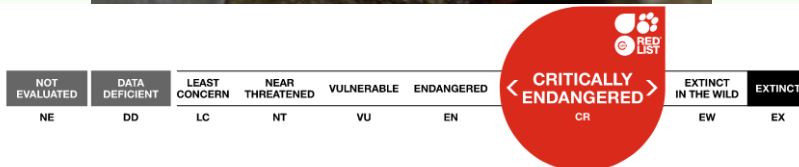
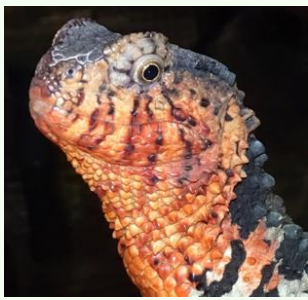


Figure 2. Samples of *Sacalia quadriocellata* collected from the field and local trade. Three delineated areas, A, B and C, represent distributions of three phylogeographic clades shown in Figs 3, 4. See Table 1 for more information of the samples.





Vietnamese crocodile lizard (*Shinisaurus crocodilurus vietnamensis*)



Conservation based research

Received: 20 October 2017 | Revised: 26 August 2018 | Accepted: 27 November 2018
DOI: 10.1002/aqc.3038

RESEARCH ARTICLE

WILEY

Monitoring a loss: Detection of the semi-aquatic crocodile lizard (*Shinisaurus crocodilurus*) in inaccessible habitats via environmental DNA

Timm Reinhardt^{1,2} | Mona van Schingen^{1,2} | Heidrun Sigrid Windisch² |
Truong Quang Nguyen⁴ | Thomas Ziegler^{3,5} | Patrick Fink^{2,5,6}



BRILL

Amphibia-Reptilia (2022) DOI:10.1163/15685381-bja10089



brill.com/amre

Will climatic changes affect the Vietnamese crocodile lizard? Seasonal variation in microclimate and activity pattern of *Shinisaurus crocodilurus vietnamensis*

Mona van Schingen-Khan^{1,2,5,*,**}, Leon Marian Fynn Barthel^{1,2,**}, Dung Thi Kim Pham³,
Cuong The Pham^{3,4}, Truong Quang Nguyen^{3,4}, Thomas Ziegler^{1,2}, Michael Bonkowski¹

Frontiers of Biogeography 2022, 14.1, e54779



RESEARCH ARTICLE

Frontiers of Biogeography
the scientific journal of
the International Biogeography Society

Molecular phylogenetic analyses and ecological niche modeling provide new insights into threats to the endangered Crocodile Lizard (*Shinisaurus crocodilurus*)

Tham Thi Nguyen^{1,2} | Hanh Thi Ngo² | Quynh Quy Ha³,
Truong Quang Nguyen^{3,4} | Tuan Quang Le^{3,5,6},
Son Hoang Nguyen^{7,8}, Cuong The Pham^{3,4} | Thomas Ziegler^{9,10} |
Mona van Schingen-Khan¹¹ and Minh Duc Le^{1,2,12,*}

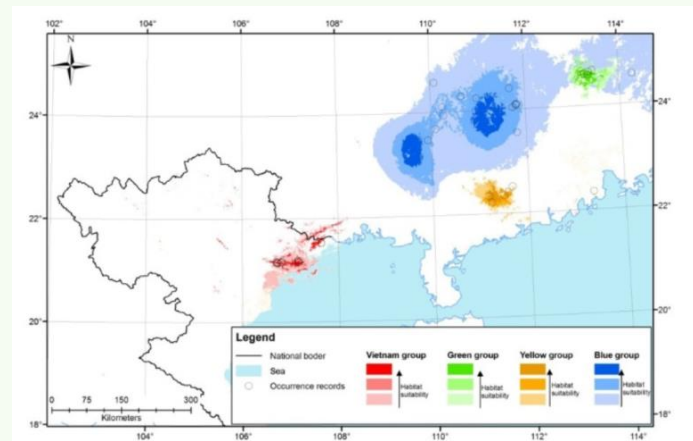


Figure 3. Predicted suitable habitat in 2020 for four populations of *Shinisaurus crocodilurus* based on the GCM ensemble model under SSP 245. For each population, the pale color indicates low habitat suitability and dark color indicates high habitat suitability.



Vietnamese crocodile lizard

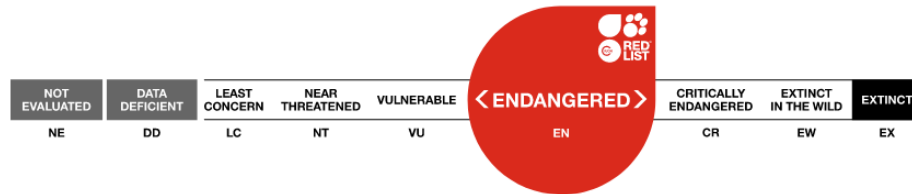
Conservation breeding / release



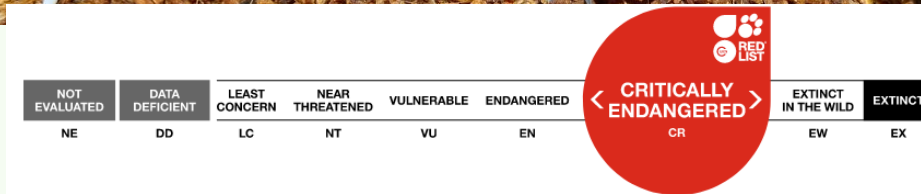
Tiger geckos (*Goniurosaurus* sp.)



Goniurosaurus catbaensis



G. huiliensis



- Discovery
- Threat analysis
- Official status
- Conservation breeding
- International cooperation / network
- Reserve creation



La Sierra University, Germany zoo partner in first U.S. tiger gecko 'ark' program





Media response

One Plan Approach / The conservation zoo



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Nature Conservation
Launched to accelerate biodiversity conservation

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Thomas Ziegler selected for The Blooloop 50 Zoo & Aquarium Influencer List 2022

01 November 2022

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Thomas Ziegler


Aquarium Curator and Coordinator, Biodiversity and Nature Conservation Projects, Vietnam and Laos
Cologne Zoological Garden






Thomas Ziegler, aquarium curator and coordinator of biodiversity and nature conservation projects for Vietnam and Laos at the **Cologne Zoological Garden**, has been campaigning for a new understanding of zoos for many years. In particular, he believes that the **species conservation zoo** is a facility that serves as a modern ark where threatened species are given space and keeper expertise.

Ziegler has been involved in the discovery of more than 100 vertebrate species and in nature reserve extensions and creations. He discusses the IUCN's One Plan approach to **species conservation** in TV, radio and newspaper interviews. Alongside his students and cooperation partners, he performs population and threat analyses. These have resulted in a number of species making the IUCN's Red List.

Additionally, he is developing a growing international conservation network. On his ResearchGate project **The Conservation Zoo**, he uploads scientific zoo biology and conservation papers. He has published more than 500 papers and books, mainly dealing with diversity research and conservation. Recently he has been invited by the World Wildlife Fund (WWF) to write a foreword for the WWF Greater Mekong report. He discussed the One Plan approach and highlighted the importance of investing in young people to create future conservation leaders.

Alongside his team, Ziegler keeps more than 100 threatened species in the Cologne Zoological Garden's aquarium house. Some of these **threatened species** have been repatriated to support diminishing natural populations, including the critically endangered Philippine crocodile. The conservation and repatriation programme has been praised by Reverse the Red, a global movement that promotes cooperation and action to ensure the survival of wild species and ecosystems.



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Vietnamazing

