Zoonosen in der Natur und beim Menschen - Wie kommen Zoonosen zu uns?

ZZF Symposium, Frankfurt, 15.10.2022

Dr. Stefan Ziegler, WWF Deutschland

60% of existing human infectious diseases are zoonotic

At least 75% of emerging infectious diseases of humans (including Ebola, HIV, and influenza) have an animal origin

Wie viele Krankheiten treten jährlich neu auf, die einen tierischen Ursprung haben?

?

3-4

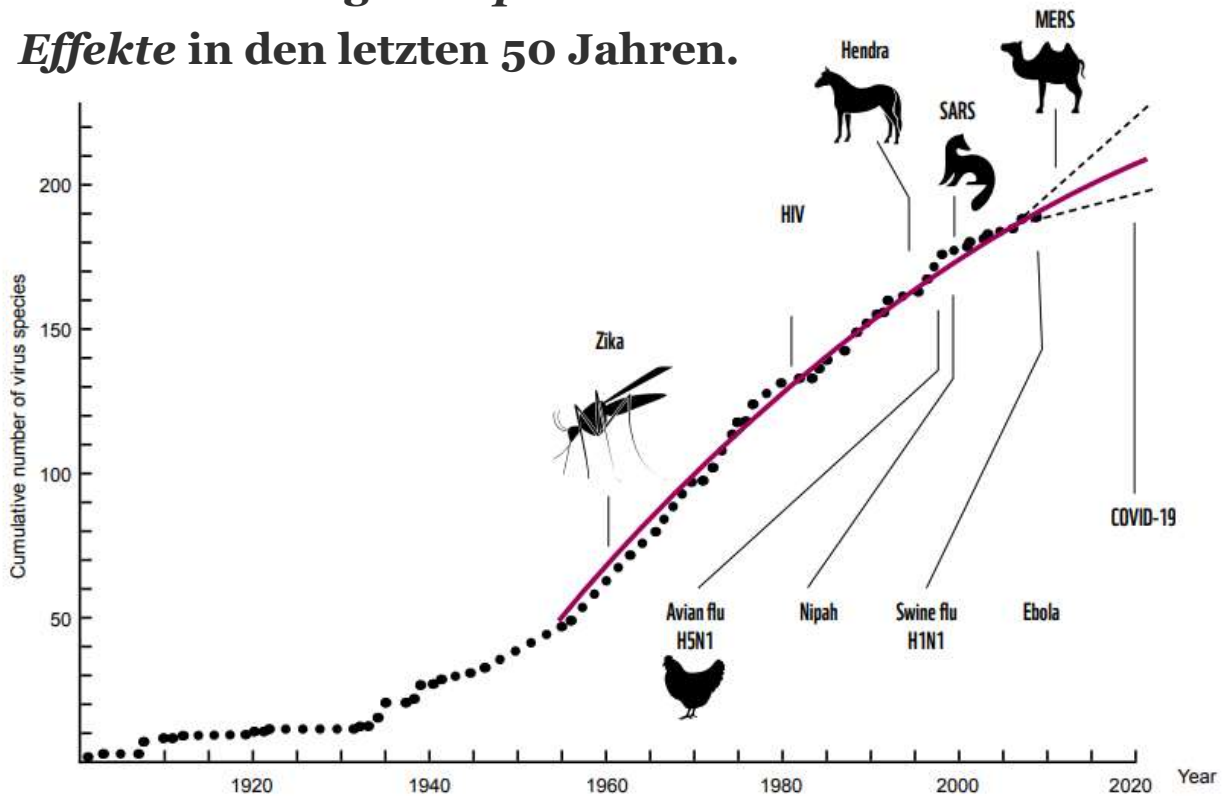
Quelle: Jones et al. 2008. Global trends in emerging infectious diseases. Nature, 451 (7181), 990-993.

Spillover Effekte können in verschiedenen Situation entstehen.

Quelle: https://preventpandemics.org

Wer hat Pandoras Büchse geöffnet?

Verdreifachung der *Spillover Effekte* in den letzten 50 Jahren.



Quelle: WWF. 2020. COVID-19: urgent call to protect people and nature. WWF International, Switzerland

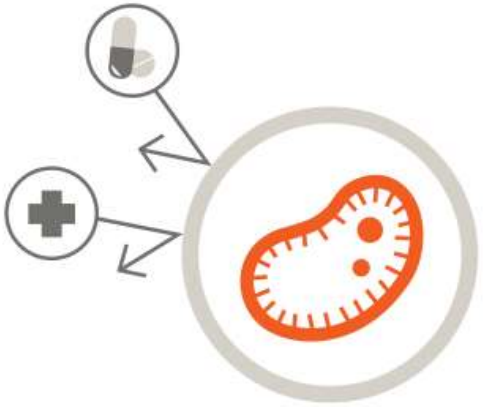
Direkte Treiber von Infektionskrankheiten

Deforestation and
other land-use changes

Illegal and poorly
regulated wildlife trade

Climate change

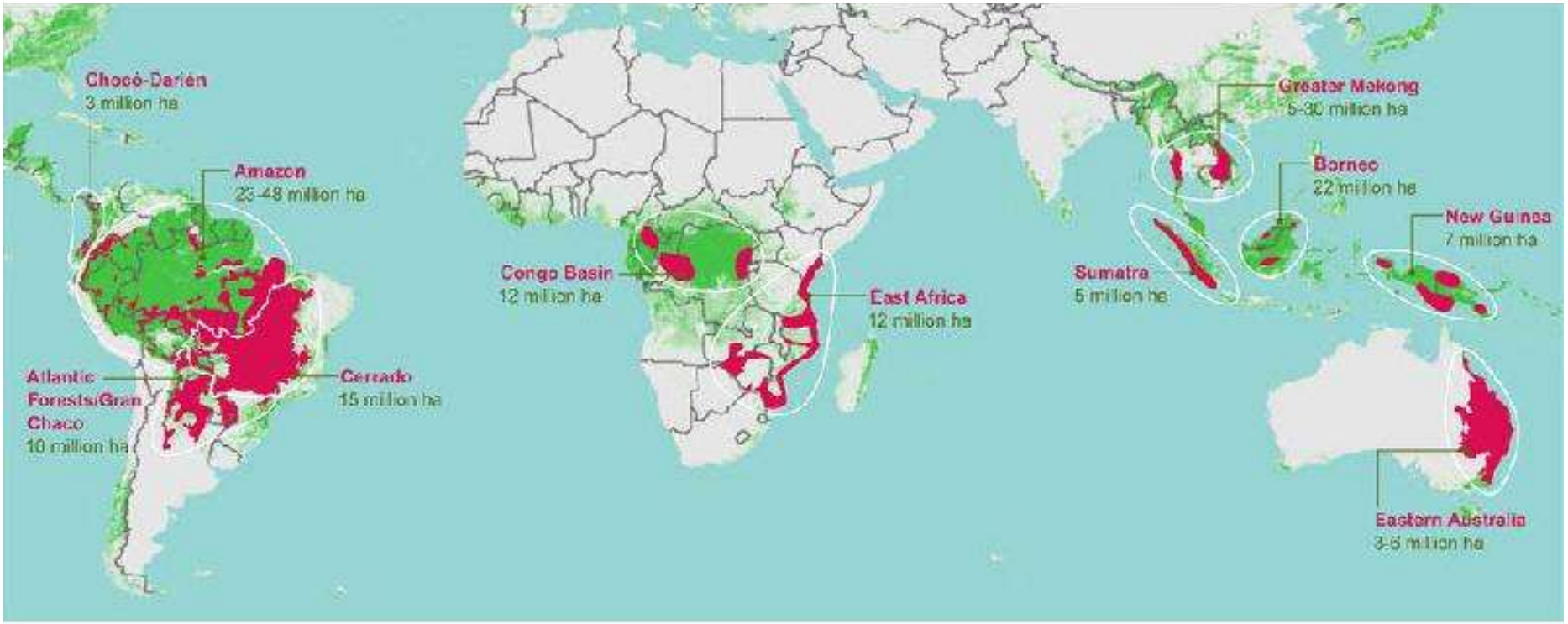
Intensified agriculture and
livestock production



Antimicrobial resistance


16 MIO.
HEKTAR WALD GEHEN
JEDES JAHR VERLOREN
® Andre Dib WWF-Brazil

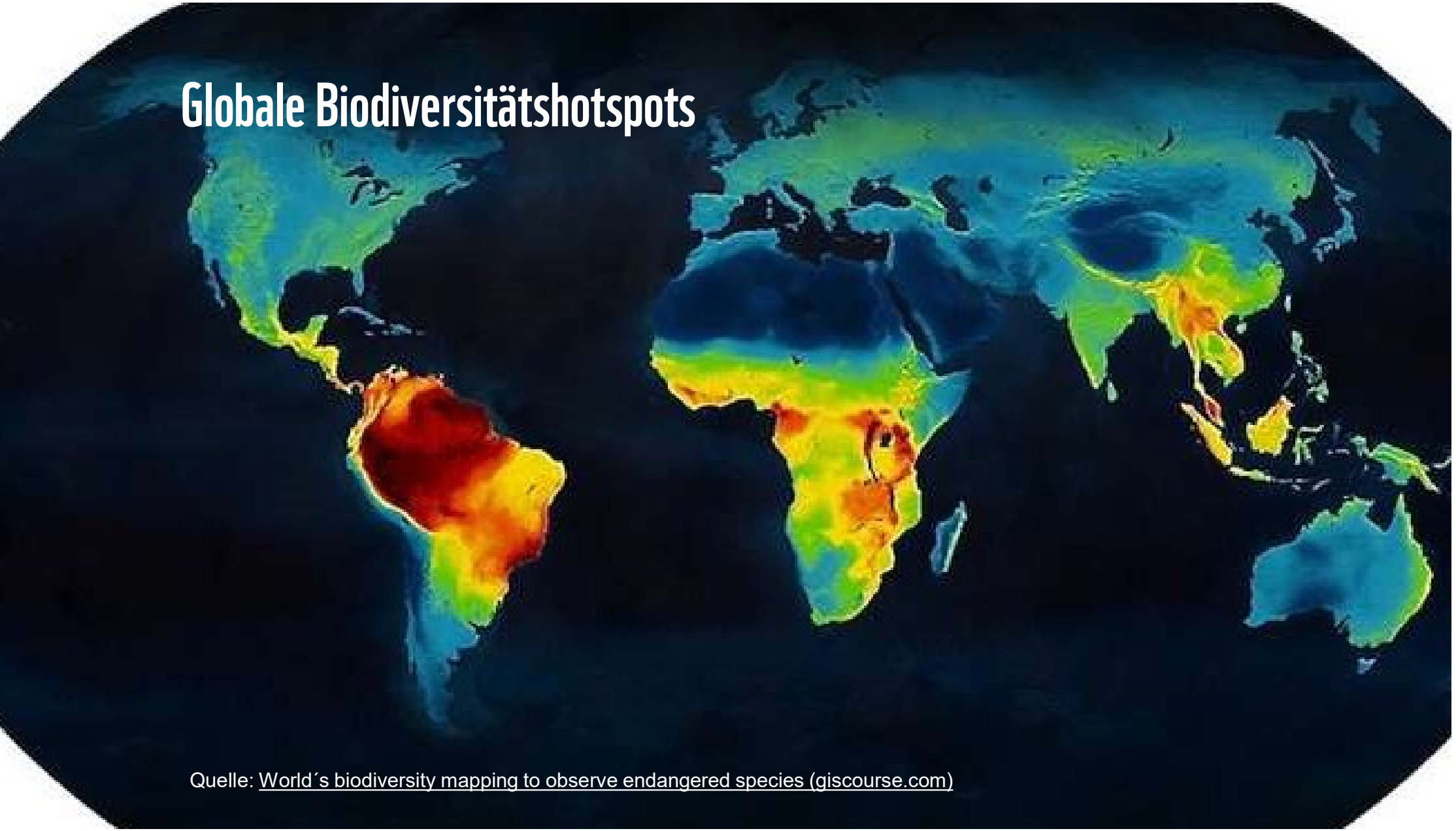
Globale Entwaldungsfronten



The 11 deforestation fronts, with projected losses, 2010-2030

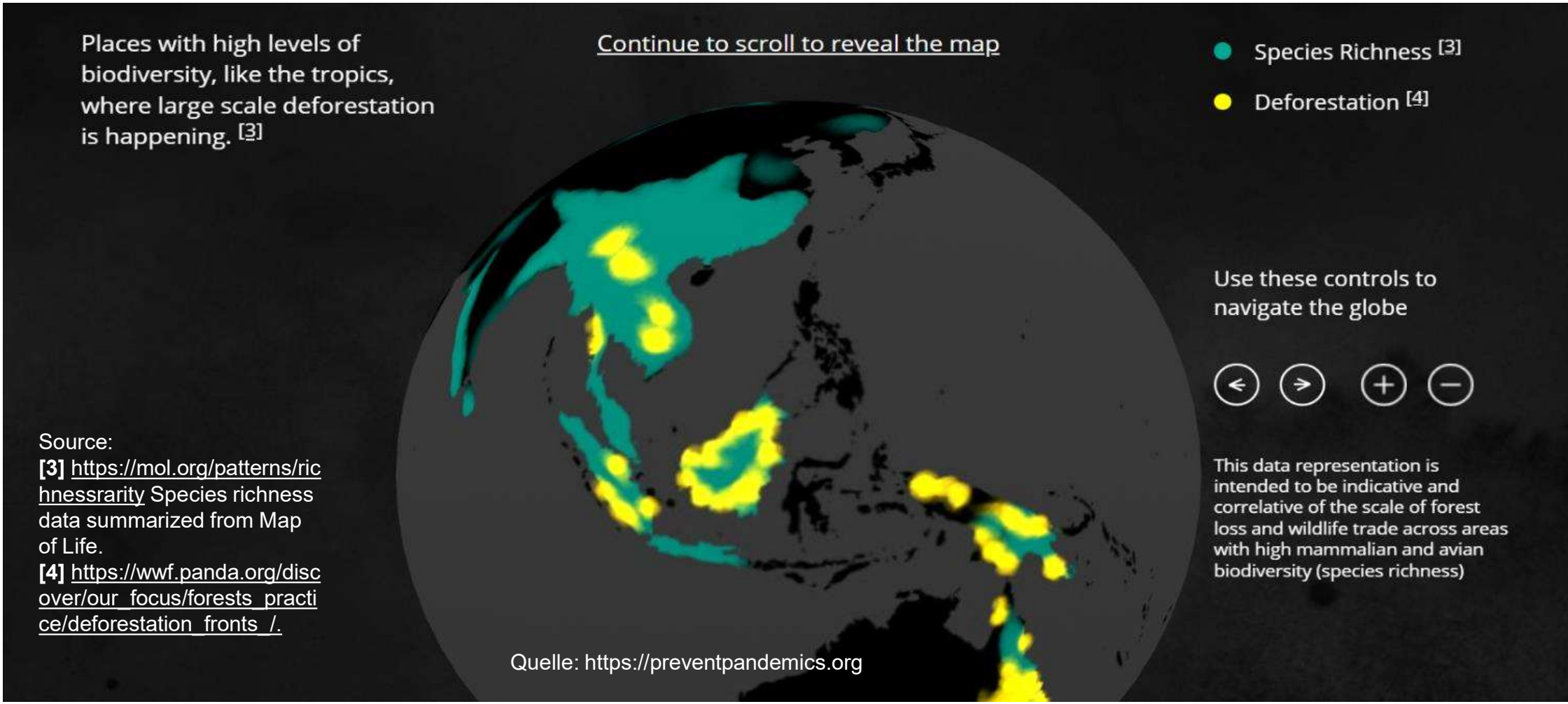
Quelle: WWF, 2015. Saving forests at risk. WWF International, Gland, Switzerland.

Globale Biodiversitätshotspots



Quelle: World´s biodiversity mapping to observe endangered species (giscourse.com)

Risikozonen für *spillovers*



Source:
[3] https://mol.org/patterns/richnessrarity Species richness data summarized from Map of Life.
[4] https://wwf.panda.org/discover/our_focus/forests_practice/deforestation_fronts_/.

Quelle: https://preventpandemics.org

Waldverlust in der Mekong Region

- 1973 – 2009:
  49.000.000 ha
- Schätzung bis 2030:
  weitere **25.000.000 ha**

Quelle: WWF, 2015. Saving forests at risk. WWF International, Gland, Switzerland.

Mekong Region ist eine biolog. Schatzkiste

Quelle: Belecky, M., Gray, T.N.E, 2020. Silence of the Snares: Southeast Asia's Snaring Crisis, WWF International

Mekong Region: Hoher Jagddruck

Site	Size (km²)[10]	Snares (total removed)	Snares removed /year average)	Data years
Srepok Wildlife Sanctuary, Cambodia[1]	3,730	12,600	1,260	2010-2019
Phnom Prich Wildlife Sanctuary, Cambodia[1]	2,700	7,219	1,444	2015-2019
Keo Seima Wildlife Sanctuary, Cambodia[3]	2,990	8,477	942	2010-2018
Kulen Promtep, Cambodia[3]	5,500	10,789	2,158	2014-2018
Southern Cardamom National Park,Cambodia[2]	5,546	195,206	19,521	2010-2019
Nam Et-Phou Loey National Protected Area, Lao PDR[6]	3,000	1,144	191	2010-2015
Nam Pouy National Protected Area, Lao PDR[1]	2,500	240	80	2016-2018
Nakai Nam Theun National Protected Area, Lao PDR[4]	3,445	3,400	850	2016-2019
Hue-Quang Nam Saola Reserves, Viet Nam[1]	320	127,857	14,206	2011-2019
Royal Belum State Park, Malaysia[1]	1,175	1,272	212	2014-2019
Kerinci Seblat National Park, Indonesia[5]	6,500	3,652	365	2005-2014

Table 1: Snare removal data from 11 sites in Southeast Asia.

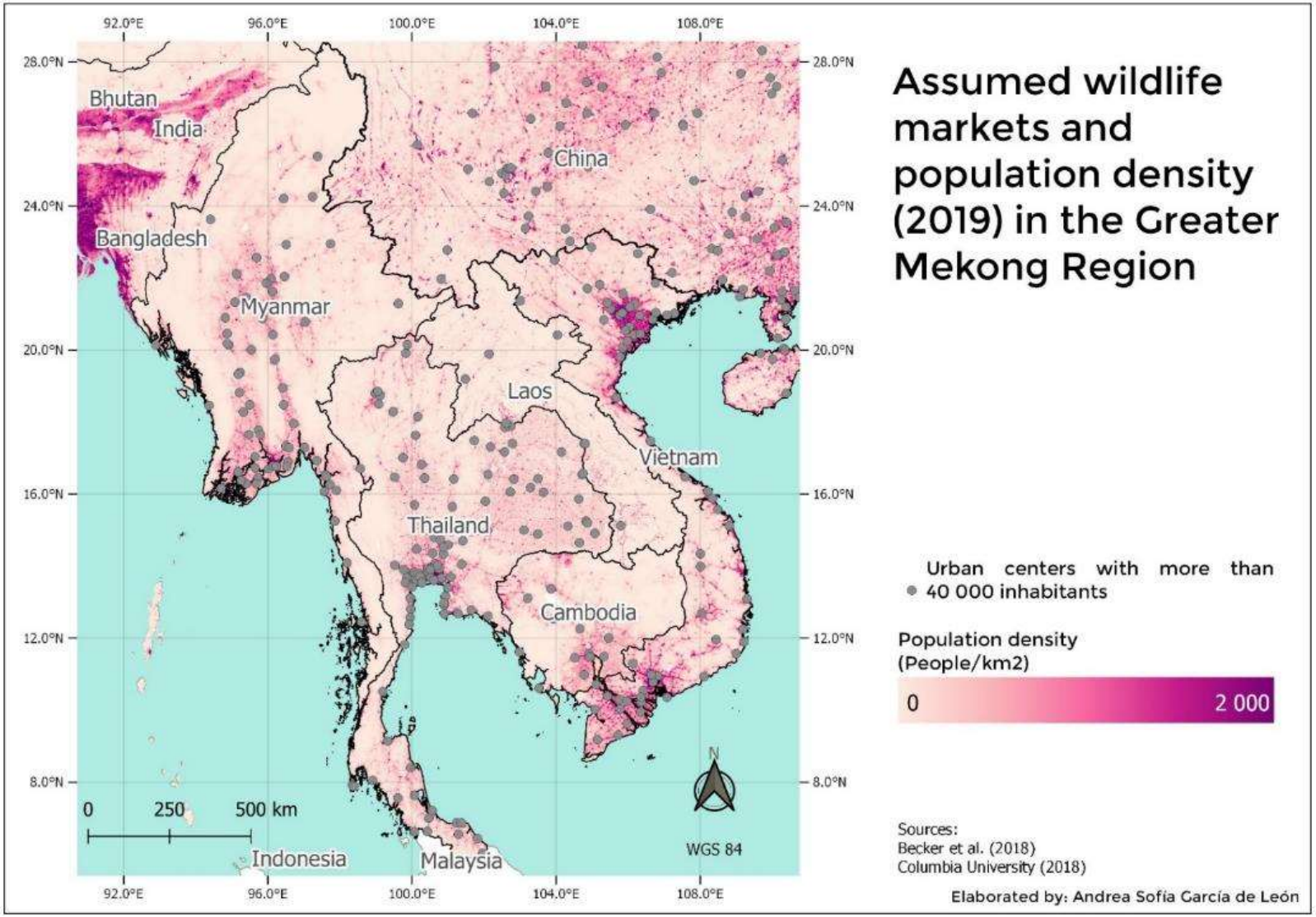
Data Sources

1 WWF / Government Partner SMART Patrol Reports
2 Gray et al., 2018 / Wildlife Alliance Annual Reports [https://www.wildlifealliance.org/financial-reports/]
3 WCS / Government Partner SMART Patrol Reports
4 Anoulak Annual Reports [https://www.conservationlaos.com/resources/our-annual-reports/]
5 Risdianto, D., Martyr, D.J., Nugraha, R.T., Harihar, A., Wibisono, H.T., Haidir, I.A., Macdonald, D.W., D'Cruze, N. and Linkie, M., 2016. Examining the shifting patterns of poaching from a long-term law enforcement intervention in Sumatra. Biological Conservation, 204, pp.306-312.
6 Gray, T.N., Hughes, A.C., Laurance, W.F., Long, B., Lynam, A.J., O'Kelly, H., Ripple, W.J., Seng, T., Scotson, L. and Wilkinson, N.M., 2018. The wildlife snaring crisis: an insidious and pervasive threat to biodiversity in Southeast Asia. Biodiversity and conservation, 27(4), pp.1031-1037.

Quelle: s. vorherige Folie

Was ist eigentlich Wildtierhandel (engl. wildlife trade)?

Wildtierhandel bezeichnet den Handel mit nicht domestizierten Tieren oder Pflanzen, die normalerweise aus ihrer natürlichen Umgebung gewonnen oder unter kontrollierten Bedingungen aufgezogen werden, entweder als lebende oder tote Tiere oder ihre Körperteile



Quelle: Engel, E., Ziegler, S., 2020. Pandora's box, WWF Germany.

Relative Zoonotic Disease Risk of Major Types of Wildlife Trade Chains & Points of Sale

	Market Type descriptor	Market Type	TR	Uncertainty	SP	Uncertainty	VLR	Uncertainty	Market Risk (TR+SP+PR)/3 <1 = Very Low Risk; 1-2 = Low Risk; 3-5 = Medium Risk; 6-8 = High Risk; 9-10 = Very High Risk	
1	Wildlife stalls in larger, permanent markets in cities (consumption, pets, parts) (locally wild caught, possibly transported over distance or international, or captive bred, alive and dead)	Larger permanent wildlife markets (citi	10	L	10	L	10	M	10.0	Very High
2	Urban (town) bushmeat markets (domestic markets, caught in region, shorter transport)	Urban (town) bushmeat markets	6	M	8	M	8	M	7.3	High Risk
3	Wildlife sales from stores or retrieved from warehouse on demand	Warehouse sales	2	M	2	M	8	M	4.0	Medium Risk
4	Wildlife sales from TCM shops & stalls (usually dead, dried, frozen)	TCM shops & stalls	1	M	2	M	1	m	1.3	Low Risk
5	Wildlife sales from online or offline ads – shipped or picked up or delivered	Online trade delivery	3	M	7	H	5	M	5.0	Medium Risk
6	Roadside sale of recently caught wildlife	Roadside stalls	3	L	8	M	0	M	3.7	Medium Risk
7	Rural & village bushmeat markets (locally-caught or transported within region – live, dead, smoked)	Rural & village bushmarkets	3	M	3	M	2	M	2.7	Low Risk
8	Wildlife sales from restaurants	Restaurant sales	6	M	8	M	9	H	7.7	High Risk
9	Research animal facilities	Research facility	4	L	4	L	8	H	5.3	Medium Risk
10	Local village sales/trade/barter & one-off sales from vehicles/boats of freshly caught wildlife	Local village sales/trade/barter	1	L	1	M	0	M	0.7	Very Low Risk

Quelle: Wikramanayake et al. A tool for rapid assessment of wildlife markets in the Asia-Pacific Region for risk of future zoonotic disease outbreaks. One Health 13 (2021) 100279.

Relative Risk of Asia-Pacific Terrestrial … **ctious**

Contact: David Olson (dolson@wwf.org.hk) or Eric Wikramanayake (ericw@wwf.org.hk)

Target zoonotic diseases - Paramyxoviridae, Beta Coronaviruses, Influenza viruses (Orthomyxoviridae) are highest priority, while Bunyaviridae, Retroviridae, Arenaviridae, Filoviruses, Poxiviridae, Rotaviridae (Rotavirus B), Hepaviridae (Hepatitis E), Reovirus, and Flaviviridae are high priority and precautionary

Note: interme… is considerable… pathogens wit… mammalian ta…

…documented outbreaks, epidemics,

	relatedness to humans	taxon known to diverse serious pathogen comm…	…breaks and	TAXONOMIC RISK FACTOR (sum of variables from	TAXONOMIC RISK CATEGORY
TAXON	*very closely related - 5; other primates & relatives - 4; mammal but not closely related - 3; non-mammal - 1*	*diverse risk pathogens well documented - 6; uncertain - 3; fe… know risk patho… 2; low risk - 1*			*VHR - very high risk; HR - high risk; MR - medium risk; LR - lower risk*
Primates (Great Apes, such as orangutan, gibbons)	5	6		25	**High Risk (HR)**
Pteropid and other Bats	3	6	…endra), …bola), …yavirales	23	**High Risk (HR)**
Sciurognathi (mice, rats, hamsters, jerboas, voles, others)	3	6	…s, …tis virus …orrhagic fever …an …ssa fever …ezuelan …azilian	23	**High Risk (HR)**

Quelle: s. vorige Folie

Enter Taxa & Numbers | Risk of W… | Risk Regi …

Table 2

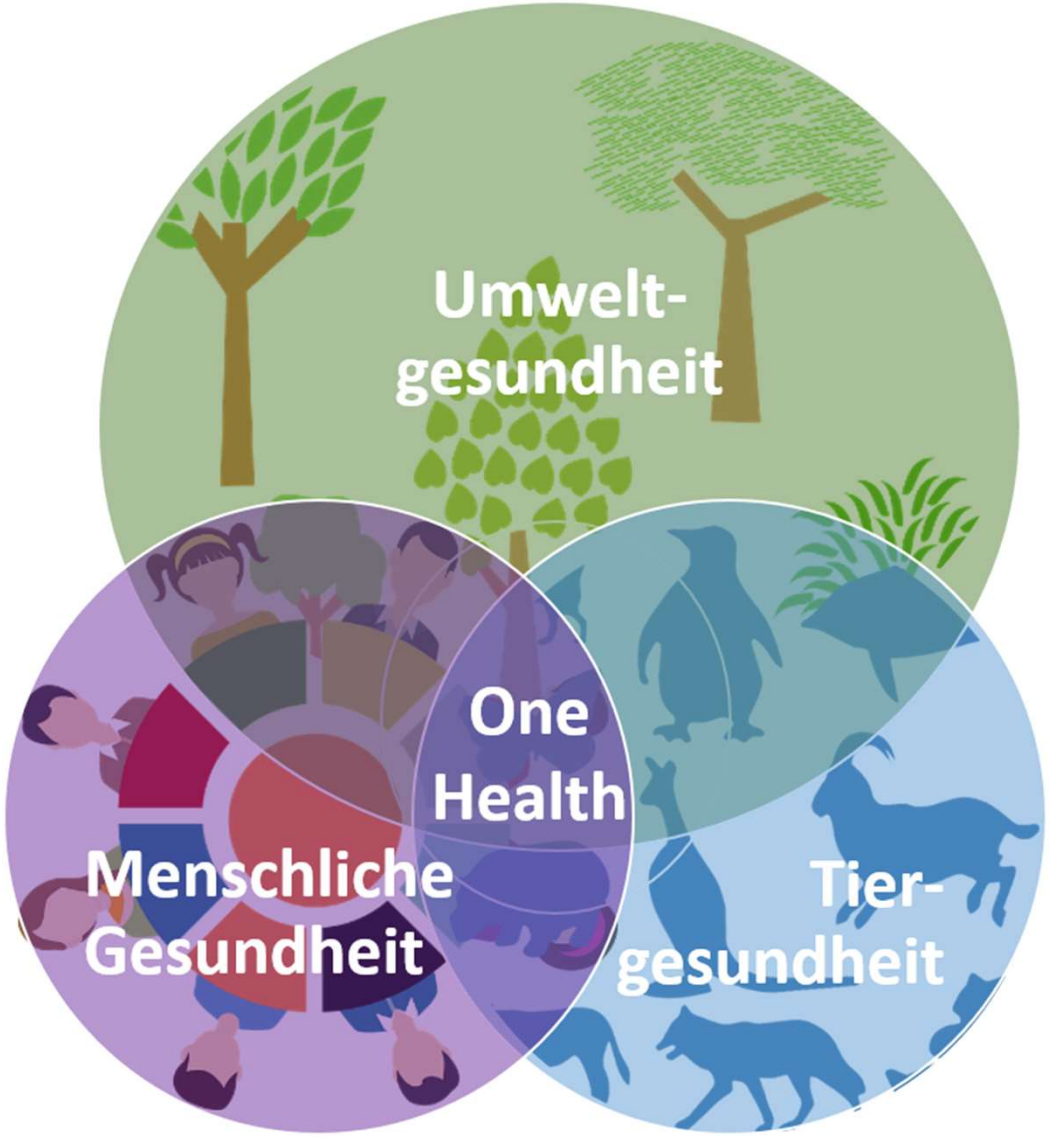
Taxonomic Risk categories of key faunal groups. Criteria for categorizations and references are provided in Supplementary Material Appendix A.

Taxonomic Group	Taxonomic Risk Category
Primates-Great Apes (Orangutan, Gibbons)	High
Pteropodidae - fruit bats/flying foxes	High
Rhinolophidae - horseshoe bats	High
Sciurognathi - mice, rats, hamsters, jerboas, voles, others	High
Manidae - pangolins	High
Viverridae - civets, mongooses	High
Primates - monkeys, macaque, loris, tarsier, other non-great ape	High
Wild birds - notably waterbirds	High
Mustelidae - weasels, otter, badgers, hog badgers, polecats, marten	High
Sciuridae - squirrels	Medium
Suidae - wild pigs, babirusa	Medium
Cervidae, Moschidae, Tragulidae other deer-like Artiodactyla	Medium
Felidae - wild cats	Medium
Canidae - wild dogs, jackals, foxes, wolves,	Medium
Perissodactyla - tapir, rhinoceros, asses, horses	Medium
Ailuridae - red panda	Medium
Ursidae - bears	Medium
Hystricidae - porcupines	Medium
Tupaidae - tree shrews	Low
Elephantidae	Low
Dermoptera - colugo	Low
Leporidae - hares	Low
Reptiles	Low
Amphibians	Low
Fishes	Low
Invertebrates	Low

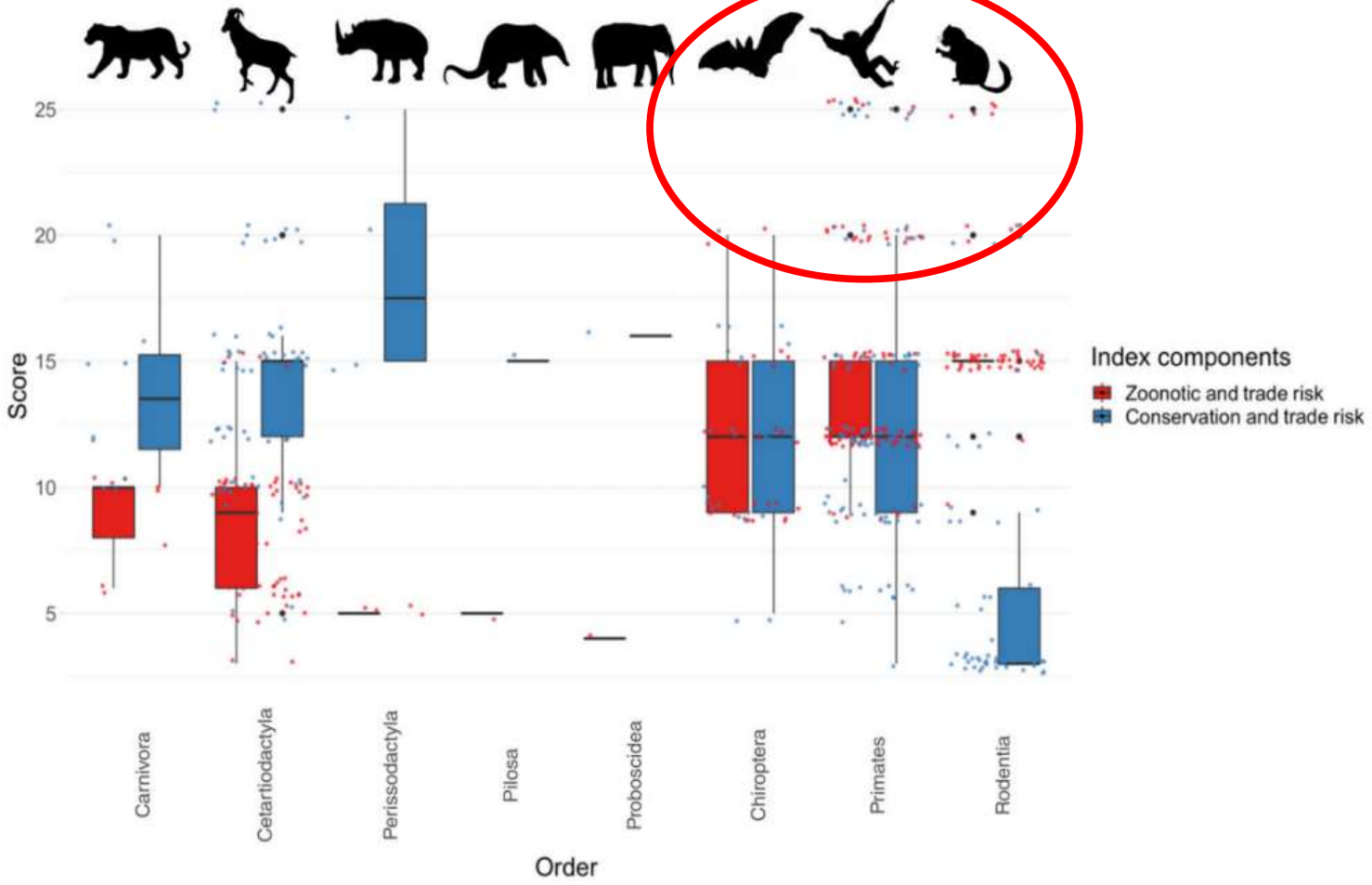
Globaler Wildtierhandel

Quelle: Cronin et al., 2022. Aligning conservation and public health goals to tackle unsustainable trade of mammals. Conservation Science and Practice. 2022;e12818


WWF
NATUR
SCHÜTZEN
HEISST
GESUNDHEIT
SCHÜTZEN
#COVID19


Umwelt-
gesundheit
One
Health
Menschliche
Gesundheit
Tier-
gesundheit

Wie erkennen wir Risiken im Wildtierhandel?



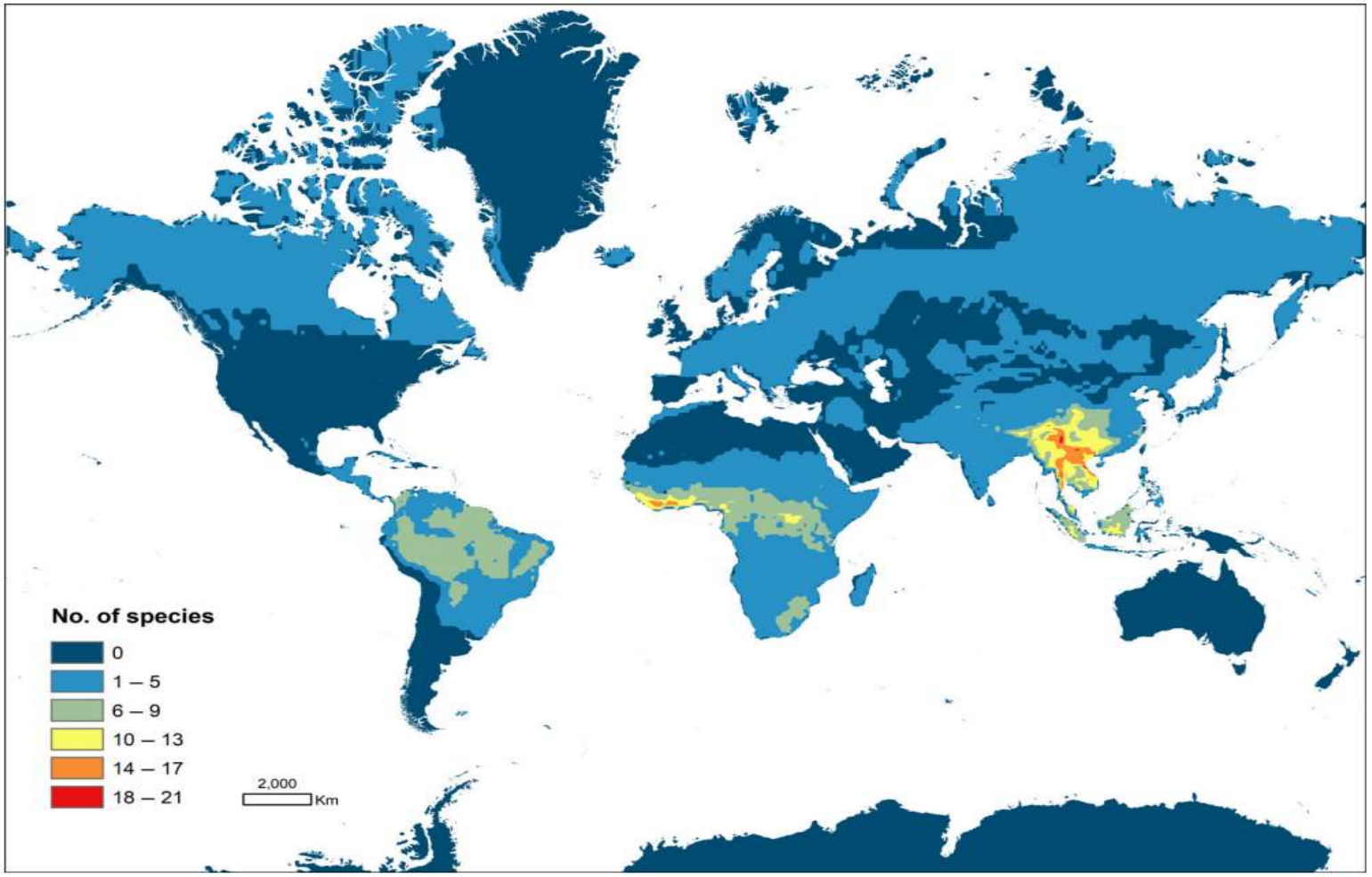
Quelle: Cronin et al., 2022. Aligning conservation and public health goals to tackle unsustainable trade of mammals. Conservation Science and Practice. 2022;e12818

Risky species

Fotos:
Engel, E., Ziegler, S., 2020.
Pandora's box, WWF Germany.

https://live.staticflickr.com/
4484/37312695031_d832750520_b.jpg

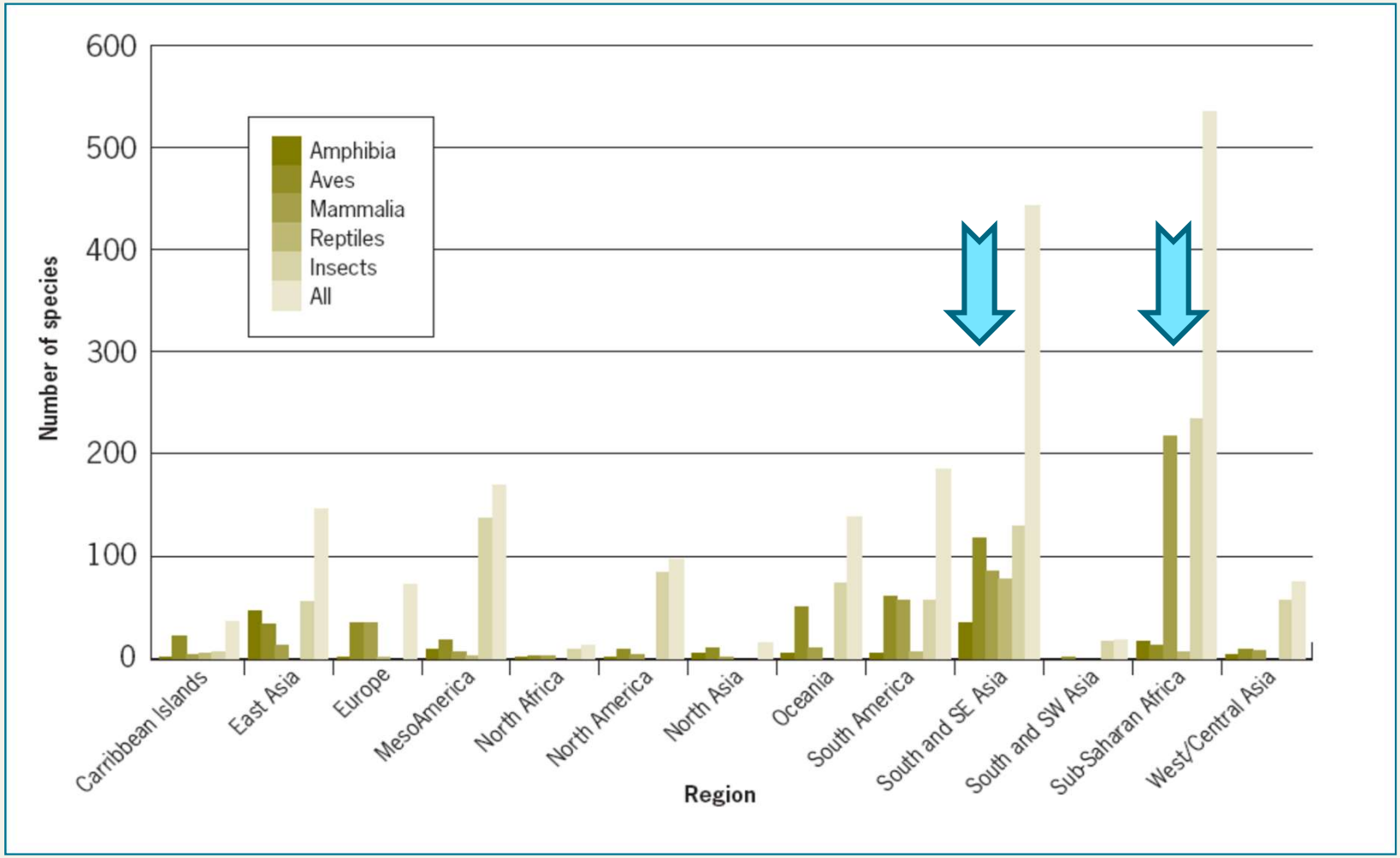
Verbreitung der 284 prioritären gehandelten Säugetierarten



Quelle: Cronin et al., 2022. Aligning conservation and public health goals to tackle unsustainable trade of mammals. Conservation Science and Practice. 2022;e12818

Quelle: https://shop.katzundgoldt.de/originale/echte-unkenrufe/

Bedeutung der Jagd

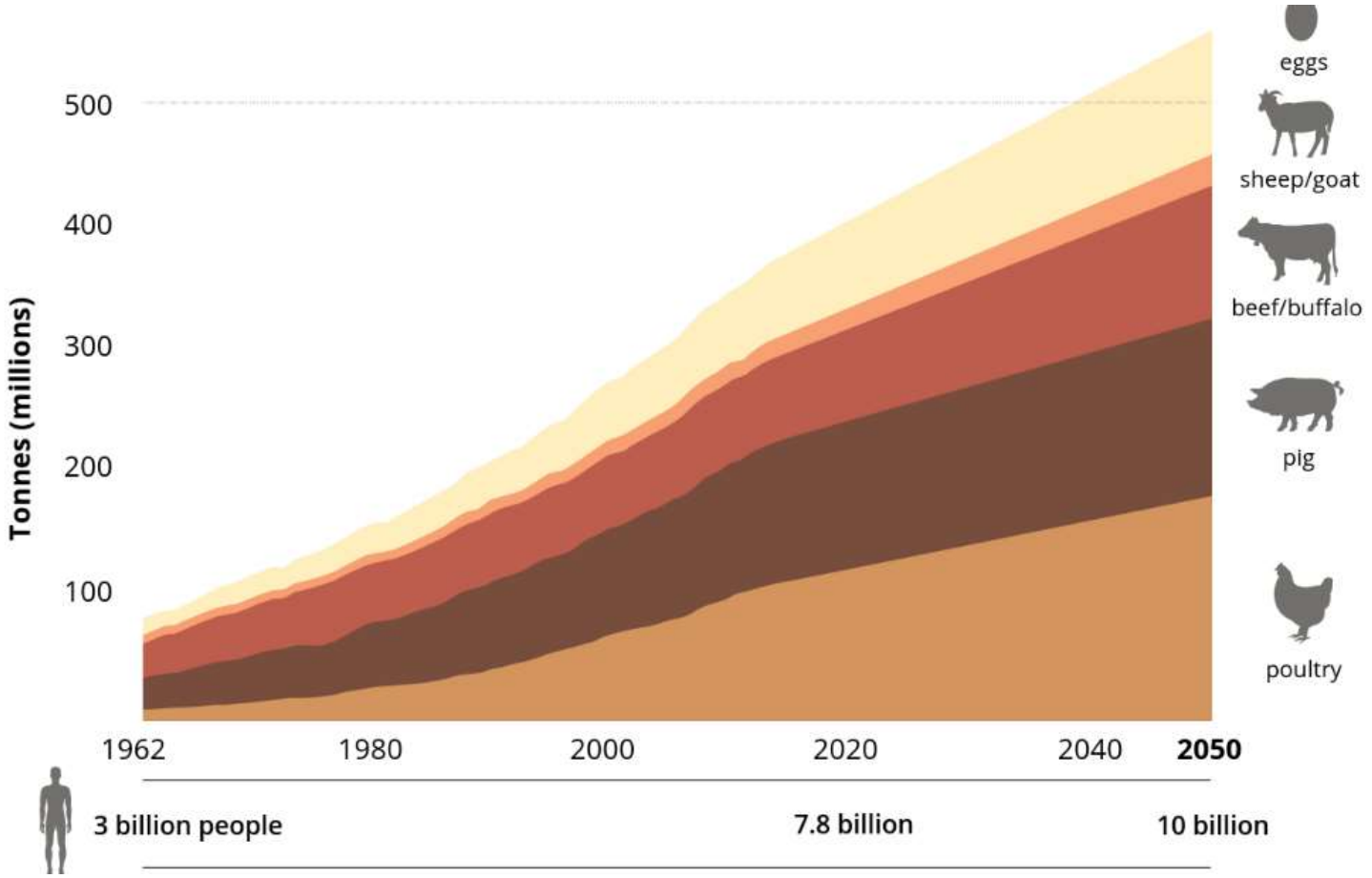


Jagd – eines der ältesten Handwerke der Menschheit

- **Früheste Jagd** auf Säugetiere vermutlich bereits vor **2 Mio. Jahren**.
- **Wildtiere** waren **Hauptlieferant** von **Proteinen**.
- **Fell** und **Knochen** wurden zu Kleidung, Werkzeugen und Schmuck verarbeitet.
- **Elefanten** und deren Vorfahren wurden schon vor 1,8 Mio. Jahren **bejagt**.

Foto: https://www.americanscientist.org/article/meat-eating-among-the-earliest-humans

Erhöhte Nachfrage nach tierischem Eiweiß: Risiko Entstehung Zoonosen



Quelle: FAO, 2012.

Wir können das Risiko künftiger Pandemien deutlich verringern

- Konsequentes Vorgehen gegen illegalen Wildtierhandel & Verminderung der Risiken durch unregulierte Wildtiermärkte

- Nachfragereduktion für hochriskante & nicht nachhaltige Wildtier-Produkte

- Stopp von Lebensraumverlust & Entwaldung
  - Entwaldungsfreie Lieferketten, Konjunkturprogramme

- Fleischkonsum verringern

- Artenschutz

Vielen Dank!

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