

Impacts of Non-Harvest Anthropogenic Activities on Freshwater Turtles in the United States

Peter Paul van Dijk, Ph.D.

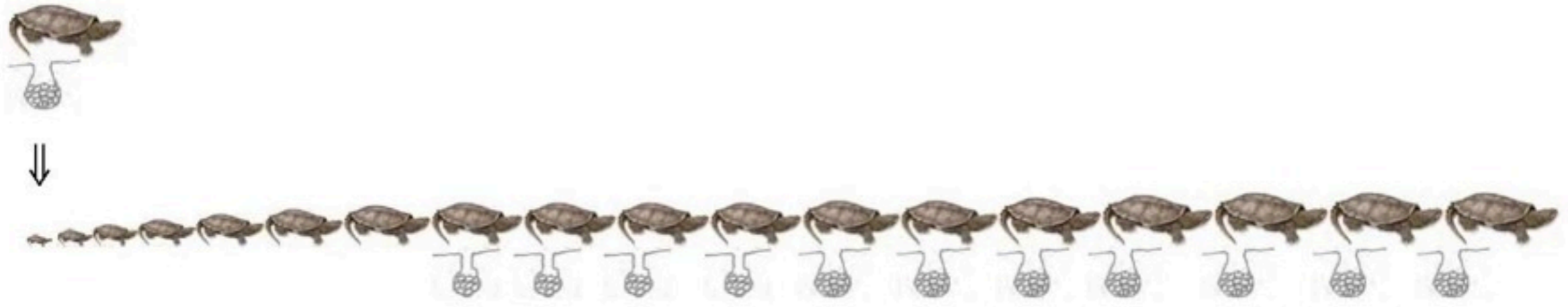
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Conservation Program at Conservation
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Freshwater Turtle Specialist Group

St. Louis, Missouri
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Schematized Turtle Life History

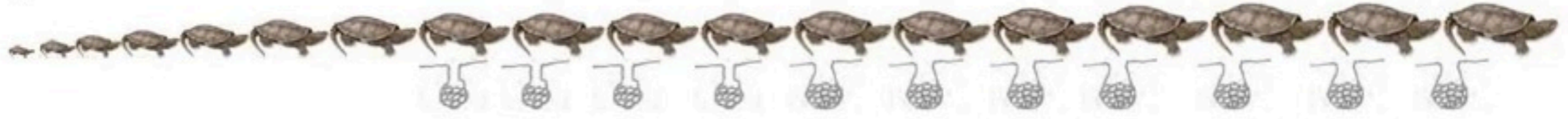


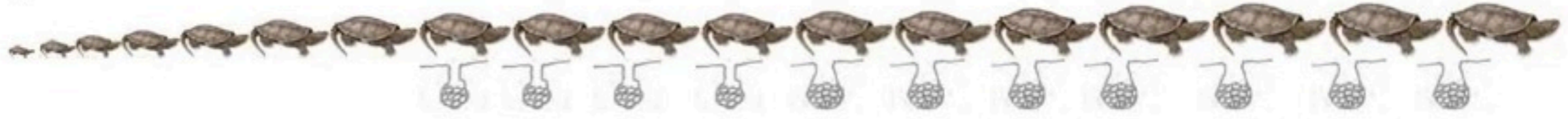
Age to Maturity / first reproduction: 4 - 20+ years

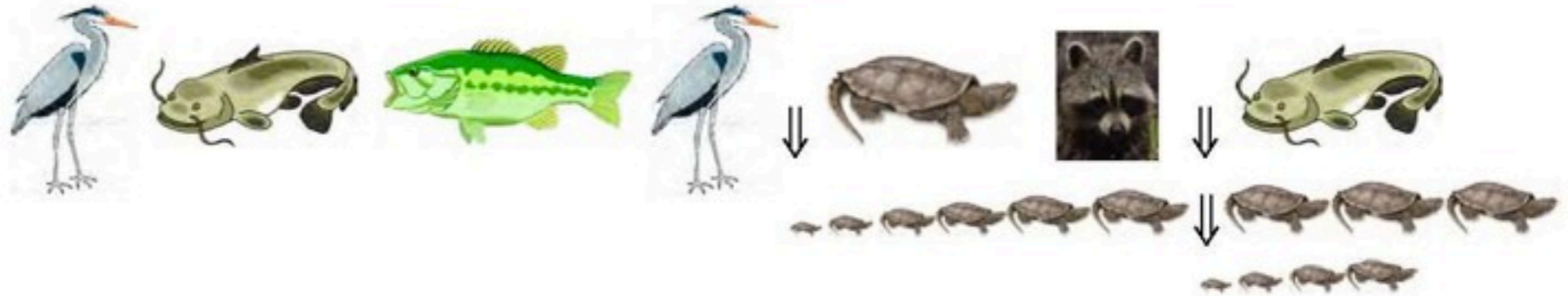
Longevity: 8 - 60 - 100+ years

Number of clutches / mature female: 1 every other year - 7+ per year
Generally more and/or larger eggs or clutches from larger females

Survival rates: eggs & hatchlings: very low
subadults & adults: high to very high







Threats to freshwater turtles:
Forest Habitat Loss and
Degradation



Threats to freshwater turtles:
Terrestrial and Wetland
Habitat Loss and Degradation



Threats to freshwater turtles: Riverine Habitat Loss and Degradation



Threats to freshwater turtles:
Habitat Pollution







Pollution

Unseasonal flooding

No habitat:

- no food
- no shelter
- no population

Threats to freshwater turtles: Direct Exploitation for subsistence consumption



Early evidence (ca. 12,000 B.P.) for feasting at a burial cave in Israel

Natalie D. Munro^{a,1} and Leore Grosman^b

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Edited by Henry T. Wright, University of Michigan, Ann Arbor, MI, and approved July 30, 2010 (received for review February 13, 2010)

Feasting is one of humanity's most universal and important behaviors. Although evidence for feasting is common in the archaeological record, the cultural association of the Neolithic evidence is

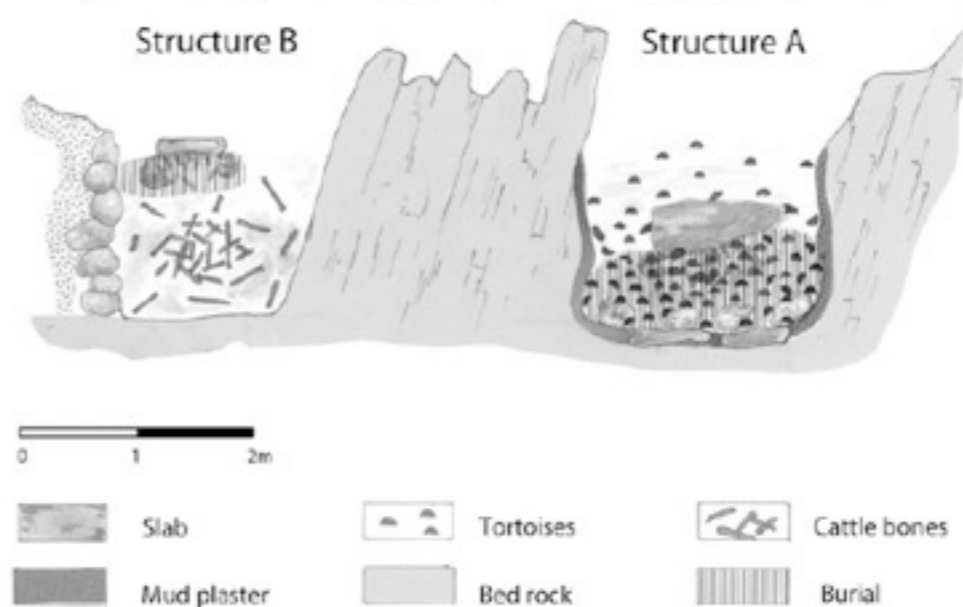


Fig. 2. Overview of structures A and B from Hilazon Tachtit cave and artist's reconstruction of their stratigraphic cross-section (to scale). Illustration by Peter Groszman.

Journal of California and Great Basin Anthropology
Vol. 11, No. 2, pp. 175-202 (1989).

The Desert Tortoise (*Xerobates agassizii*) in the Prehistory of the Southwestern Great Basin and Adjacent Areas

JOAN S. SCHNEIDER and G. DICKEN EVERSON, Dept. of Anthropology, Univ. of California, Riverside, CA 92521.

Threats to freshwater turtles: Exploitation for Mass Consumption Trade



Trade Globalization - what's that got to do with freshwater turtles?

Trade: connecting a local deficiency to a supply source elsewhere.

Demand-driven or Supply-driven

Cost of production + transport <-> acceptable price to final buyer

Southern China:

Traditional consumption of turtles and other wildlife

Turtle populations depleted over time

(collection, habitat loss, pollution)

Barter trade with other areas (Viet Nam)

Around 1989 - Renminbi became convertible

1990s onwards - buy turtles elsewhere

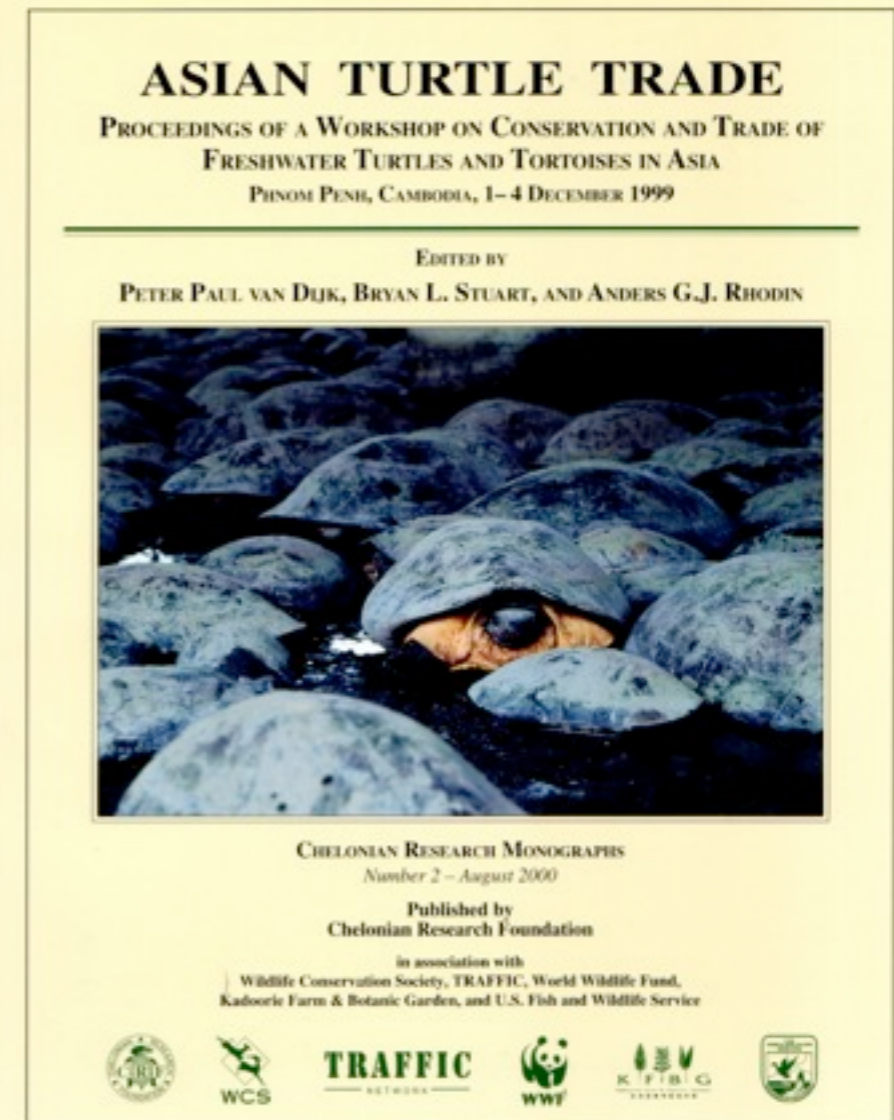




Graphic by J.F. Parham

The “Black Hole” of Asian wildlife

- Estimated 13-20+ million turtles per year
- Wide range of species over time:
 - sequential vacuuming of supply areas
 - 2-3 year boom & bust cycles per area and species



The “Black Hole” of Asian wildlife

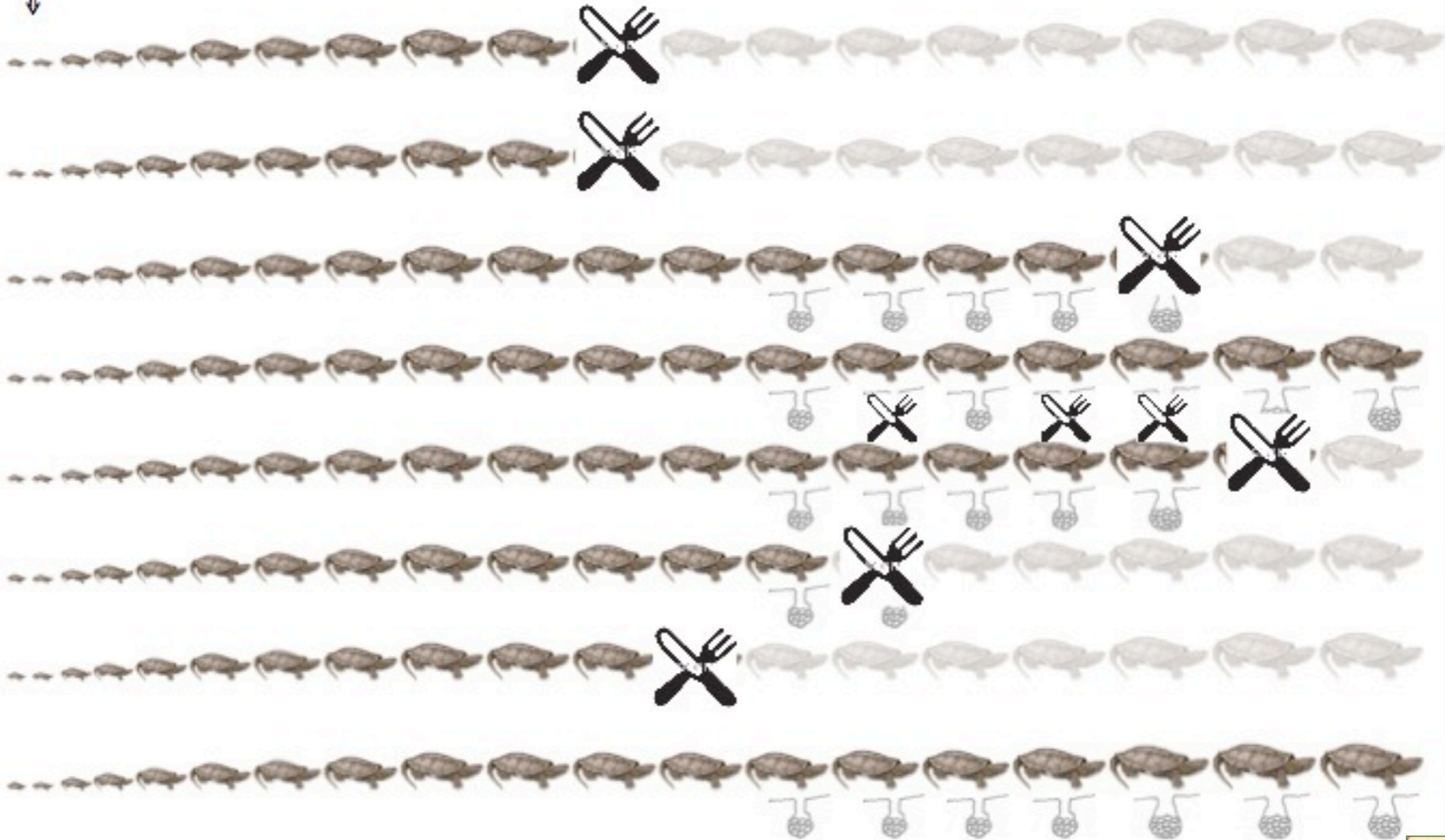
- Not just turtles



Threats to freshwater turtles: Exploitation for Mass Consumption Trade



Tortoises Sold in the Markets of Philadelphia.—The taste for “stewed terrapin” and “snapper soup” has become so general in Philadelphia, that the United States are now ransacked for the means of supplying it. Within a few years the species sold were the “terrappin,” *Malacoclemmys palustris*; the “red-belly,” *Chelopus insculptus*; the “slider,” *Chrysemys rugosa*; and the “snapper,” *Chelydra serpentina*. Now large invoices of turtles are sent from Mobile, New Orleans, and St. Louis, which include the following species: *Chrysemys bellii*, *C. elegans*, *C. concinna*, and *C. troostii*; *Malacoclemmys geographica*, and *M. leseurii*; total, exclusive of sea turtles, ten species. All are abundant in the market except the *C. bellii*.—E. D. COPE.



Florida Scientist



Biological Sciences

DISCOVERY OF A MODERN-DAY MIDDEN: CONTINUED EXPLOITATION OF THE SUWANNEE COOTER, *PSEUDEMYS CONCINNA SUWANNIENSIS*, AND IMPLICATIONS FOR CONSERVATION

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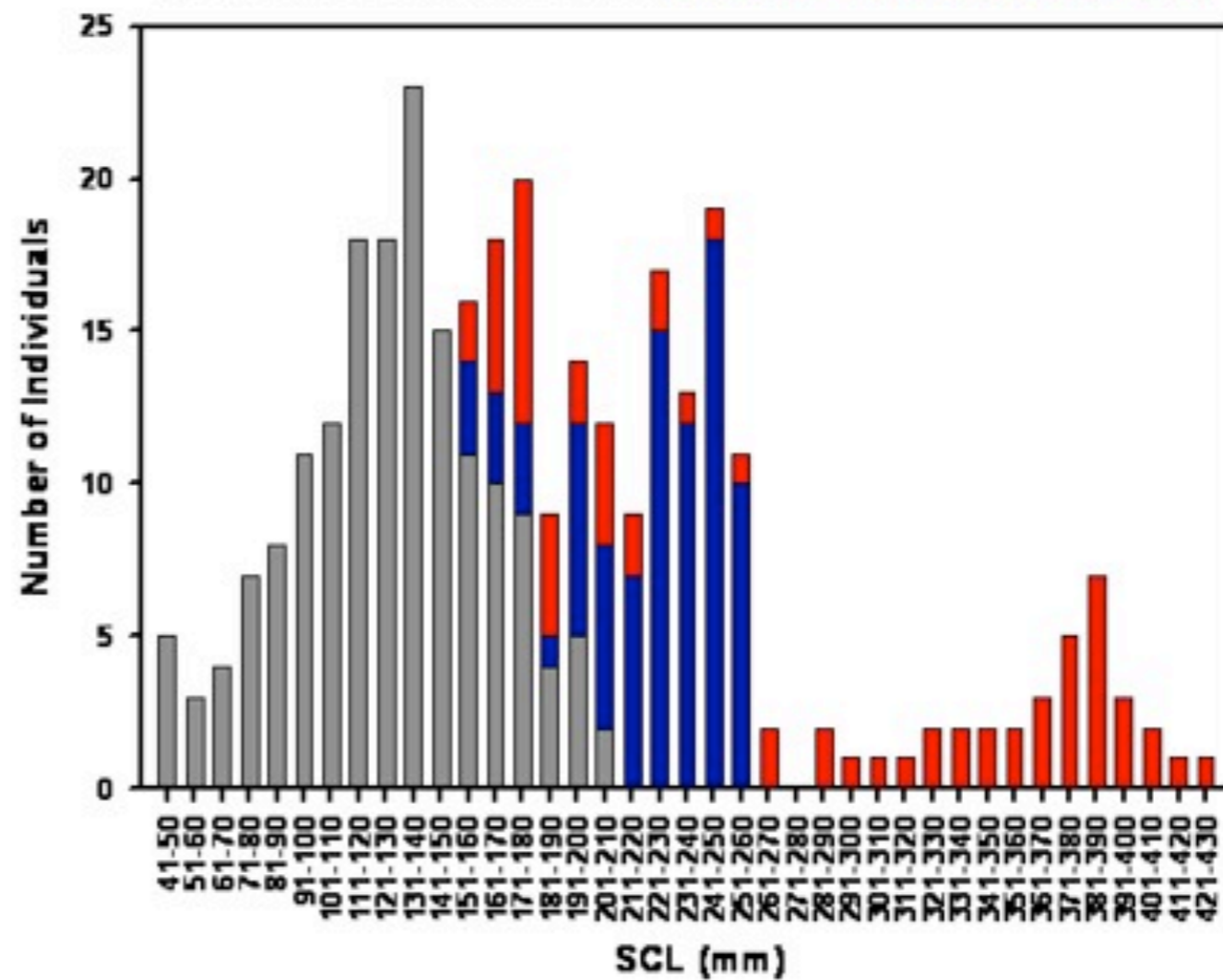
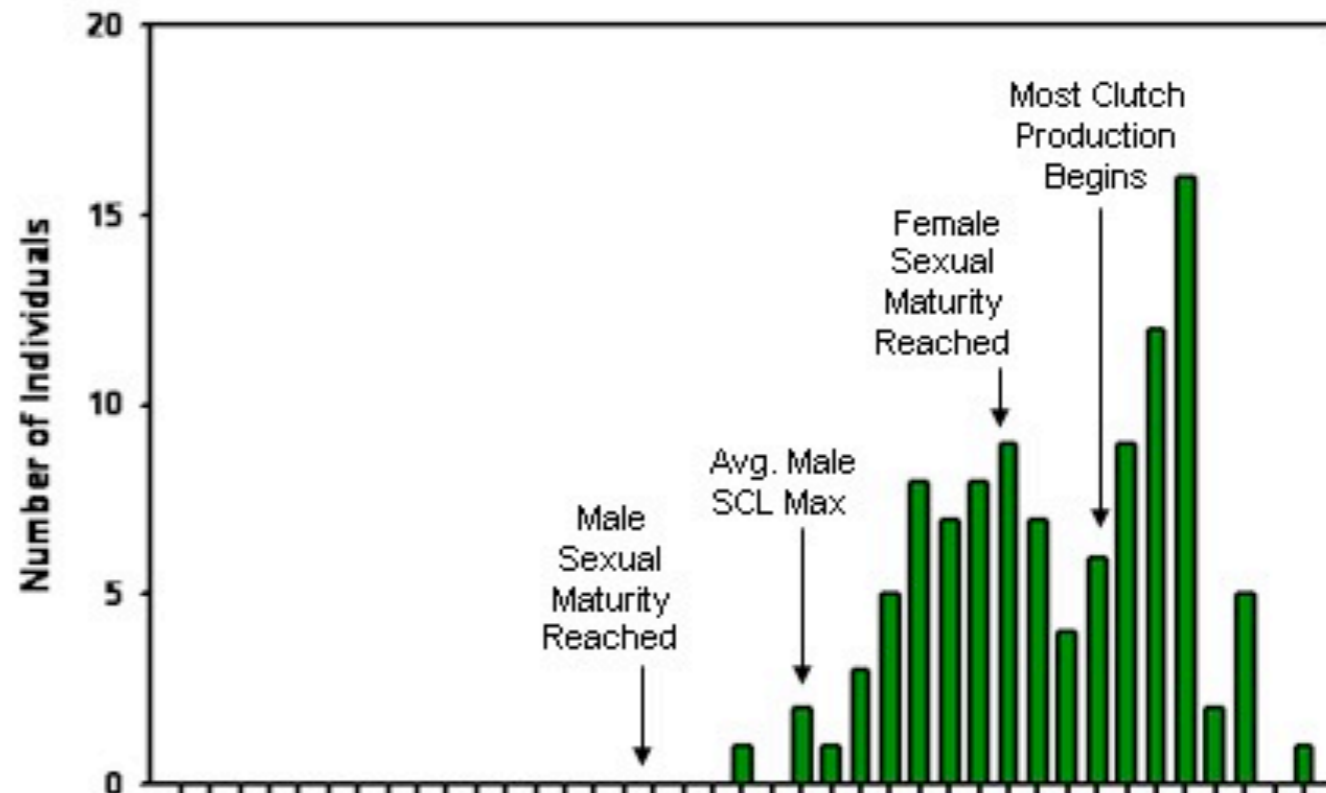
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ABSTRACT: We present evidence of continued take of the Suwannee cooter, *Pseudemys concinna suwanniensis*. Exploitation of this sexually dimorphic, state-listed species is particularly damaging to populations because it is focused on the large adult females. Our results illustrate the need for increased conservation actions for this imperiled riverine turtle. Recommendations include the development of effective education and enforcement programs.



Trachemys stejnegeri

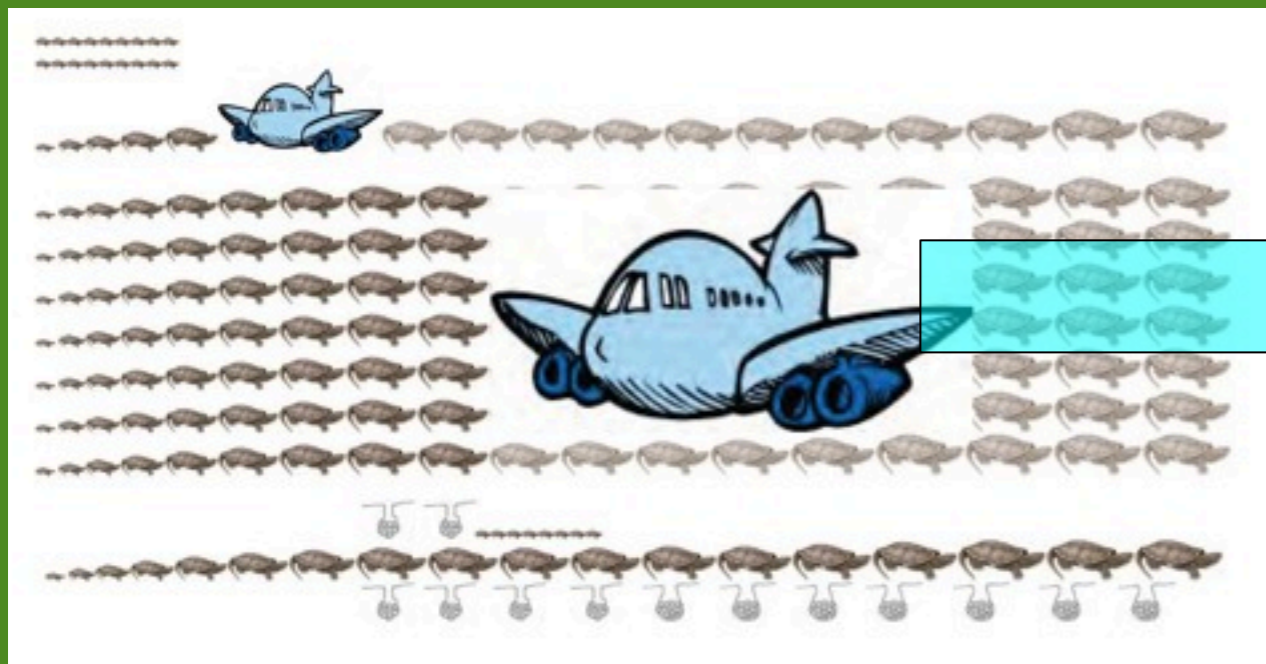
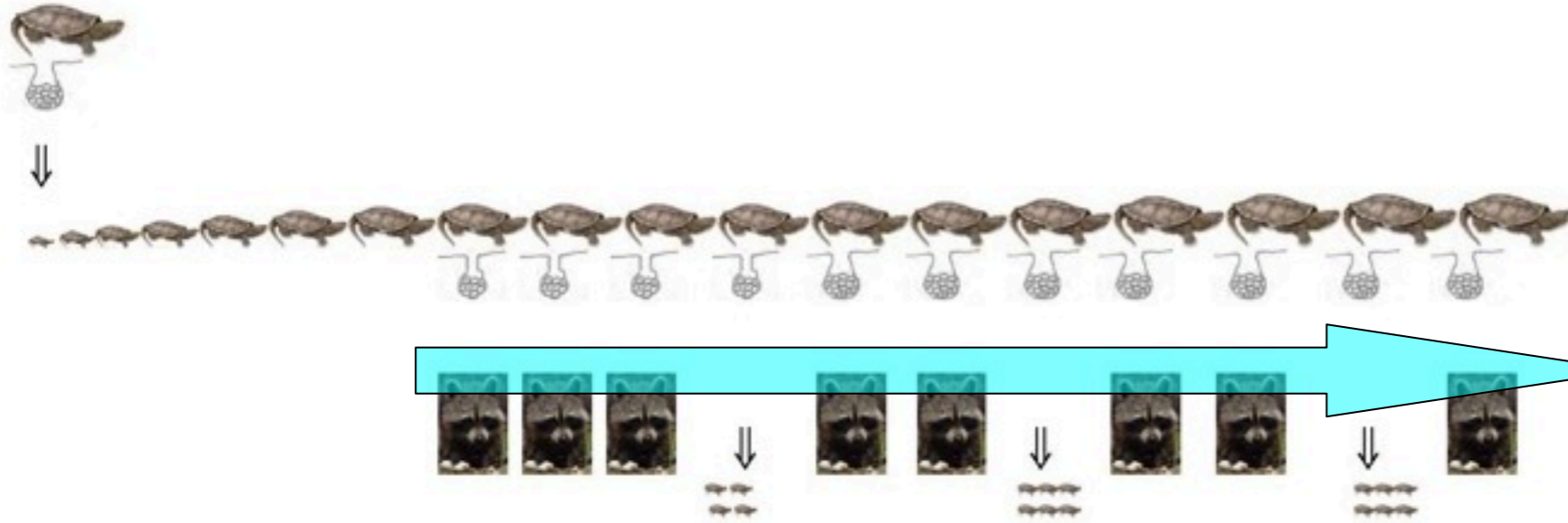


Threats to freshwater turtles: Medicinal Utilization



Threats to freshwater turtles: Exploitation for Pet Trade





LETTERS

edited by Etta Kavanagh

Scientific Description Can Imperil Species

SCIENTISTS ARE RACING TO DISCOVER AND describe new species in the face of a global biodiversity crisis. Ironically, in cases of commercially valuable taxa, publishing new species descriptions may inadvertently facilitate their extinctions. These descriptions advertise "novelties" for hobbyists and drive new markets. Most modern descriptions provide detailed information on the locality and habitat where the new species occurs, turning a scientific article into a treasure map for commercial collectors. Researchers in fields with application to bioterrorism are debating codes of conduct to ensure that their findings do not fall into the wrong hands, the so-called "dual-use dilemma" (1). Taxonomists describing new species that have the potential to become commercially valuable are also faced with a dual-use dilemma.

Three of us have published descriptions of new species of restricted-range reptiles and amphibians that tragically aided their commercial exploitation. Immediately after being described, the turtle *Chelodina mccordi* from the small Indonesian island of Roti (2) and the gecko *Goniurosaurus luii* from southeastern China (3) became recognized as rarities in the international pet trade, and prices in importing countries soared to highs of \$1500 to \$2000 each. They became so heavily hunted that today *C. mccordi* is nearly extinct in the wild (4) and *G. luii* is extirpated from its type locality (5). The salamander *Paramesotriton laozensis* from northern Laos was not known in the international pet trade prior to its recent description as a new species (6). Over the past year, Japanese (6, 7) and German collectors used the published description to find these salamanders, and they are now being sold to hobbyists in those countries



A *Goniurosaurus luii* gecko

for \$170 to \$250 each. Similar cases are known from elsewhere in the world and from other taxa.

Withholding locality information from new species descriptions (8) might hamper profiteers, but it also hampers science and conservation. However, with the aid of the Internet, scientists can now monitor commercial demand for species just as commercial collectors can monitor scientific journals. This means prior information exists on which taxa will likely become commercial commodities (we should become concerned for any newly described species of *Chelodina* and *Goniurosaurus*). In such cases, taxonomists should work closely with relevant governmental agencies to coordinate publication of the description with legislation or management plans that thwart overexploitation of the new species. Of course, this will not always be easy or successful, and may lengthen publication time, but alternative solutions that allow taxonomists to continue their work without contributing to species decline are wanting.

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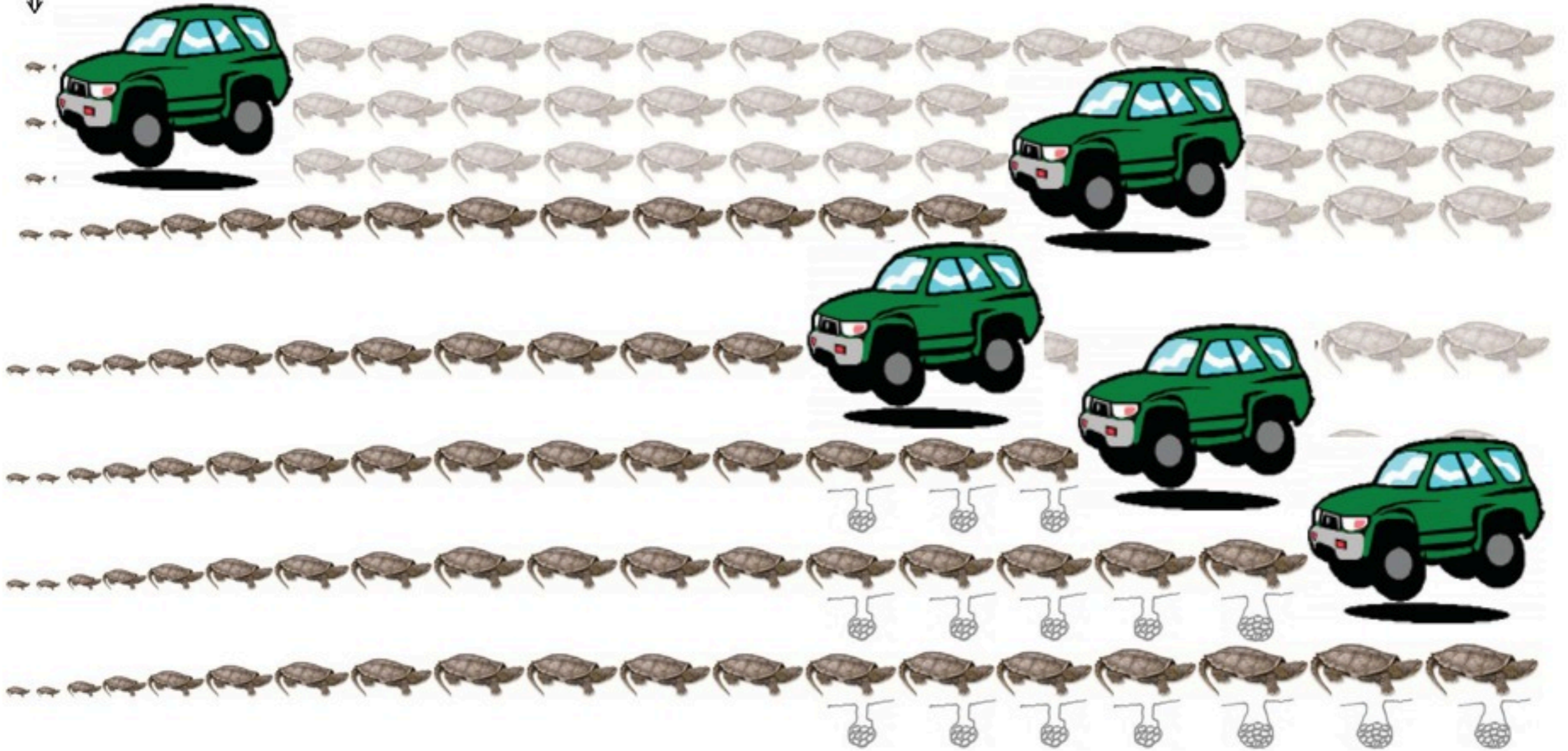
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3. L. L. Grismer, B. E. Vitt, L. J. Boyle, *J. Herpetol.* 33, 382 (1999).
4. C. R. Shepherd, B. Barrondo, "The trade of the Roti Island snake-necked turtle *Chelodina mccordi*" *ORANANG South East Asia*, Selangor, Malaysia, 2005.
5. B. L. Stuart, T. J. Papenfuss, *J. Herpetol.* 36, 145 (2002).
6. H. Masumitsu, *Daily Yomiuri*, 24 Apr. 2006, p. 3.
7. K. Chang, *N.Y. Times*, 25 Apr. 2006, p. D1.
8. For an example, see G. Nilson, C. Andrin, B. Filardi, *Amphibia-Reptilia*.



Threats to freshwater turtles: Road mortality





Threats to freshwater turtles: Subsidized and Introduced Predators



Photograph by George Grall
<http://animals.nationalgeographic.com/animals/mammals/raccoon.html>



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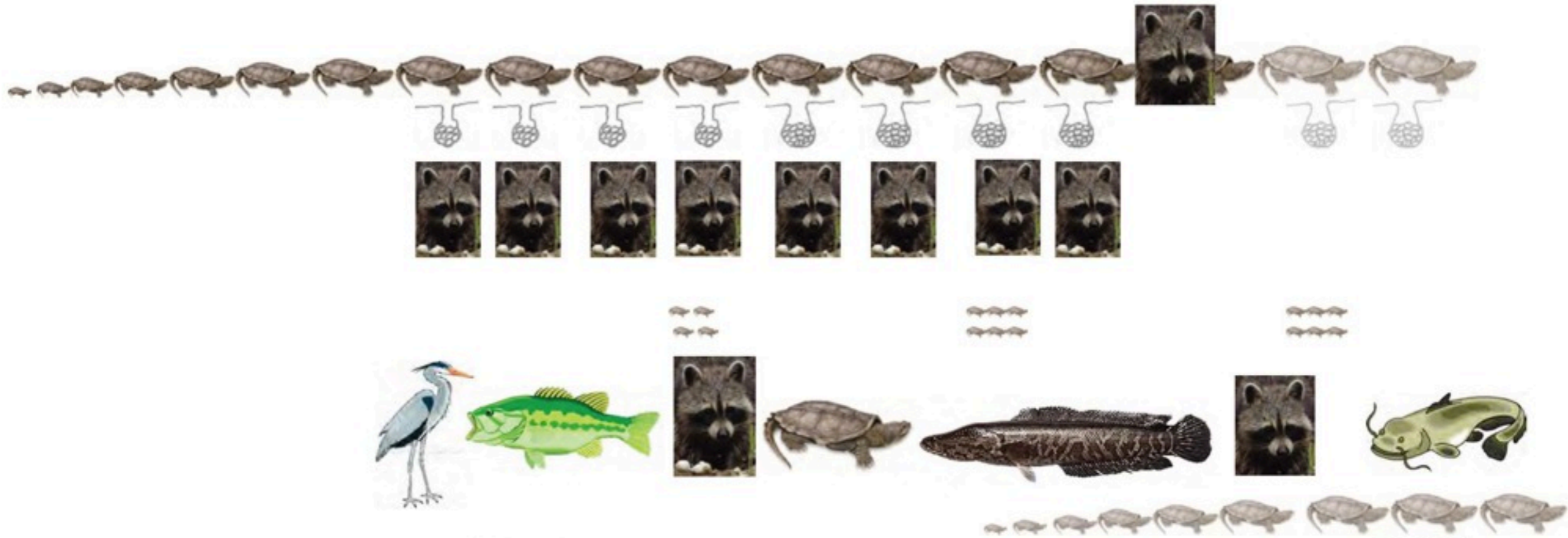
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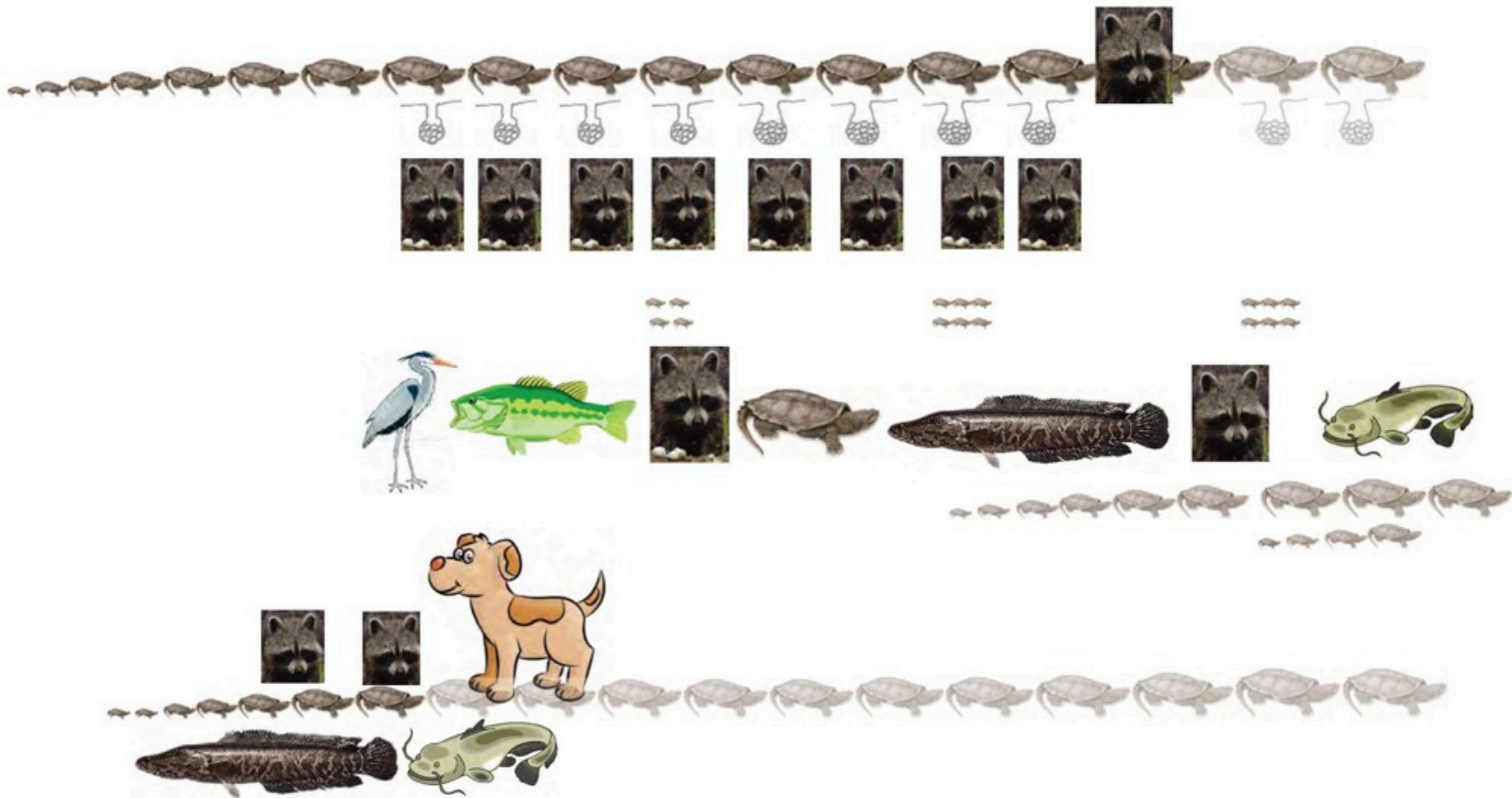
The Ecological impact of Subsidized and Introduced Predators



The Ecological impact of Subsidized and Introduced Predators



The Ecological impact of Subsidized and Introduced Predators



Threats to freshwater turtles:
Exotics / invasives / diseases / genetic pollution



Threats to freshwater turtles: Exotics / invasives / diseases

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CHINESE SOFTSHELL TURTLE (*PELODISCUS SINENSIS*) IN THE POTOMAC RIVER AND NOTES ON EASTERN SPINY SOFTSHELLS (*APALONE SPINIFERA*) IN NORTHERN VIRGINIA -- Two recent observations of softshell turtles from the Potomac and Occoquan rivers, Fairfax County, Virginia, indicate that this species of *softshell* may



Fig. 1. Chinese Softshell (*Pelodiscus sinensis*) at Dyke Marsh, Potomac River, 3 August 2006 (Photos: Ed Eder).

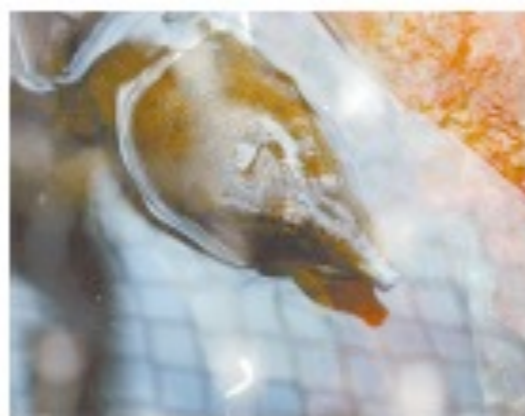
THIS IS HERTFORDSHIRE

Turtle power: pond predator

by NEETA DUTTA A ferocious snapping turtle, capable of severing a human finger, has been captured in Mill Hill pond, where he is believed to have been feeding on ducklings and small amphibians.

The foot-long creature was found in Sheepwash Pond, The Ridgeway, last week, raising the prospect that previous suspects in the ducklings' murder case - 15 terrapins deported to Tuscany in 2004 and a cat fish - were, in fact, innocent.

The baby turtle is carnivorous and, despite his tender years, his neck extends a foot away from his body as he searches for prey.



● Touch away: Snappy could be responsible for killing ducklings, a crime for which 16 innocent

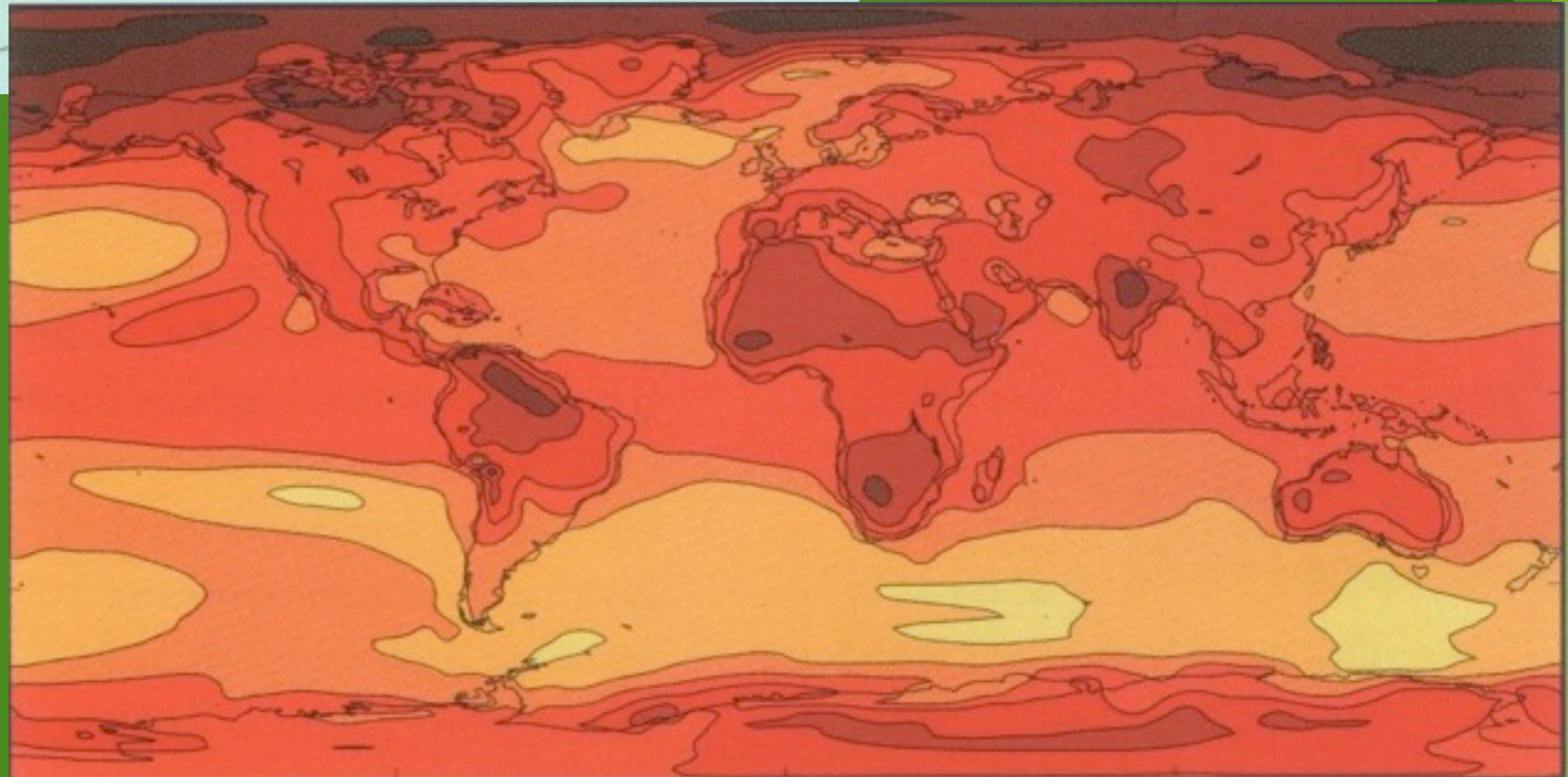
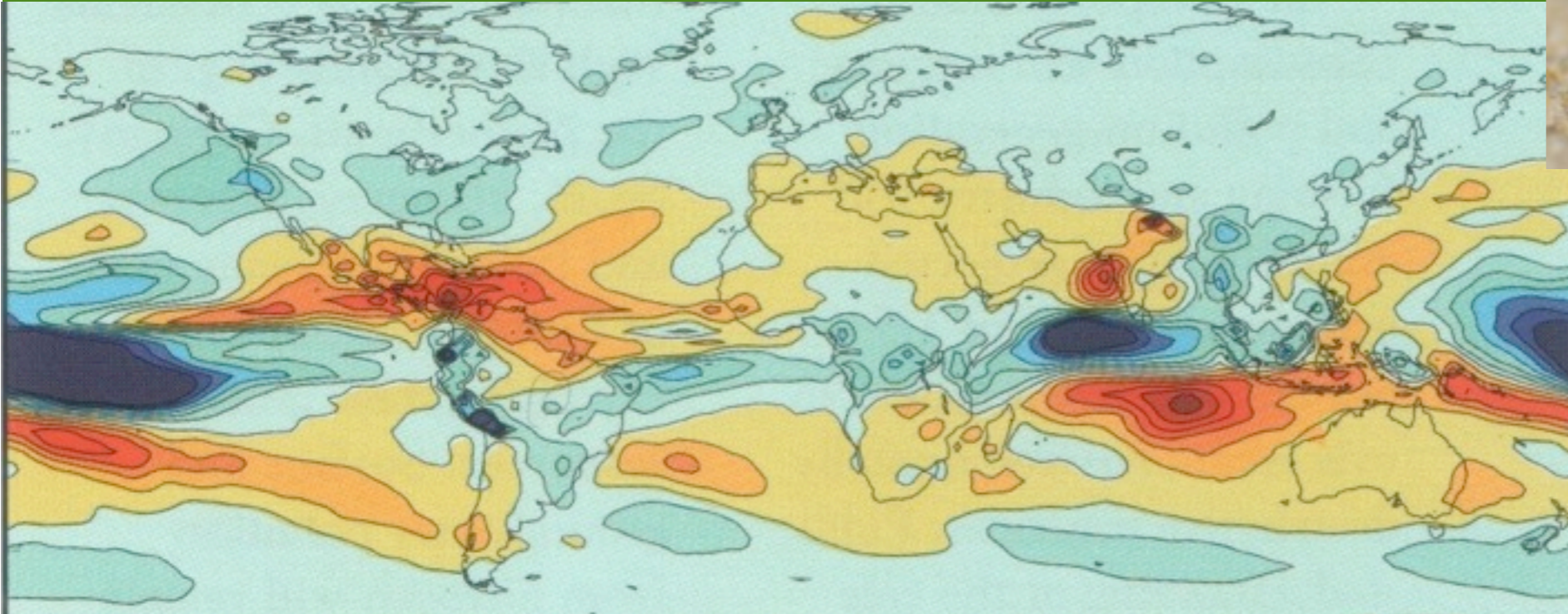
Wanted dead, not alive INVADING SPECIES

Northern Snakehead, *Channa argus*



Aliases: Unknown

Threats to freshwater turtles: Climate change



Predicted global climate change by 2080
(unmitigated CO2 emission) -

The Meteorological Office Hadley Center for
Climate Predictions & Research, 1999



Why are Threats to Turtles so severe?

- Long time to mature: about 10 (4-15+) years
- Low annual output: 1-200+ eggs / mature female / year
- Very high mortality of eggs and juveniles
- Very low mortality of adults
- Long lifespan: 10-100+ years longevity

In their evolutionary history, turtles settled on a life strategy to live long and reproduce often; chances are that at some time, some hatchlings will survive to maturity.

Human exploitation of adults breaks the strategy ==> population collapses

Add additional stressors to a collapsing population ==> ==>

Conservation Solutions

- Legislation & regulation - protection & exploitation management
- Enforcement of laws & regulations
- Protected Areas
- Headstarting & population reinforcement
- Farming (as alternative supply)
- Public awareness & changed consumer patterns
- Predator, invasive & disease management
- Ex-situ assurance colonies



Questions....



Thank you
for your attention

