

**Some new species are found, but they are endangered too:
A selective *'show and tell'* of Amphibians and Reptiles of the World**



Falk Huettmann



E W H A L E

LABORATORY FOR
**Ecological
Wildlife
Habitat
Data
Analysis
for the
Land- and Seascape**

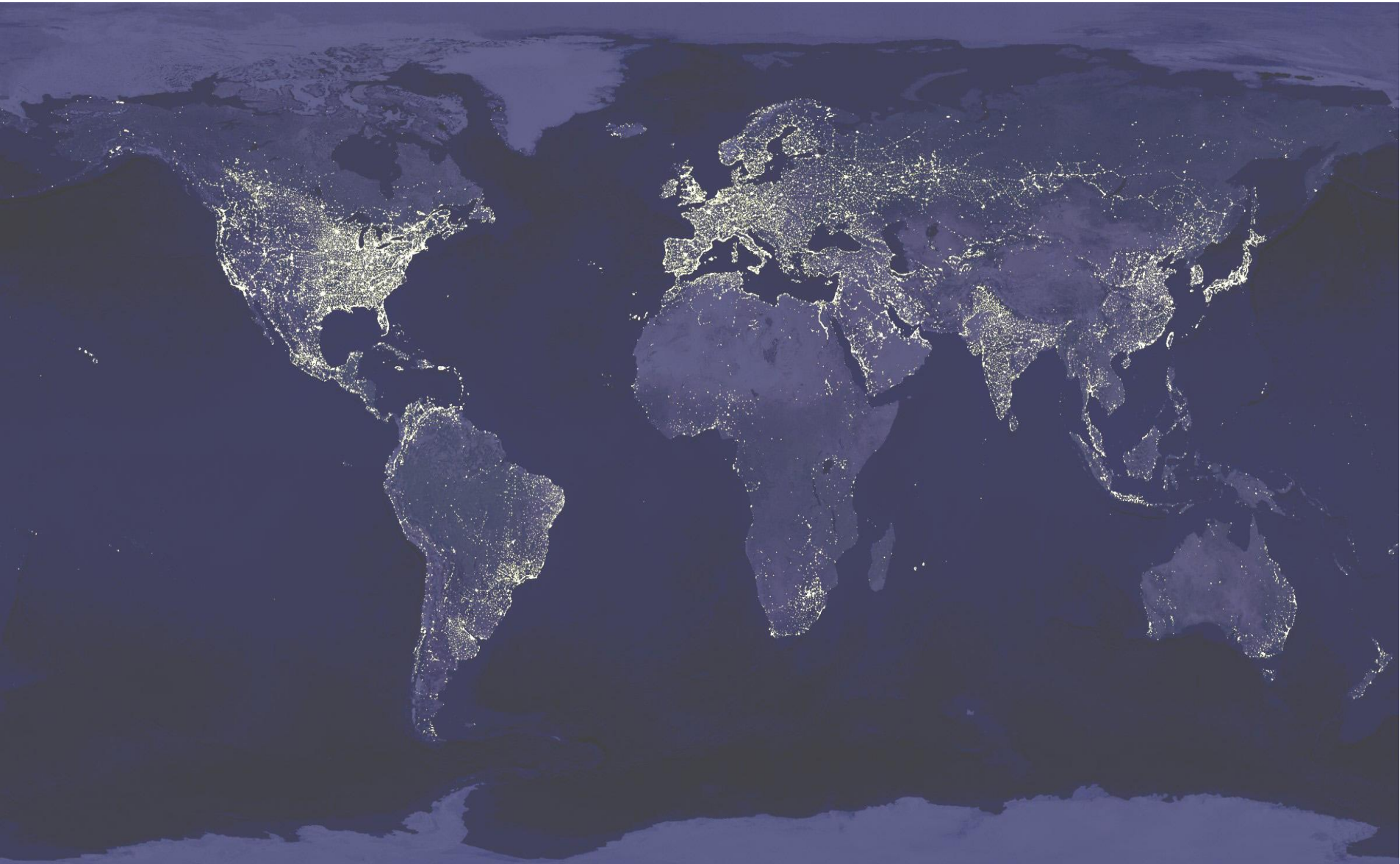


**UNIVERSITY OF
ALASKA
FAIRBANKS**

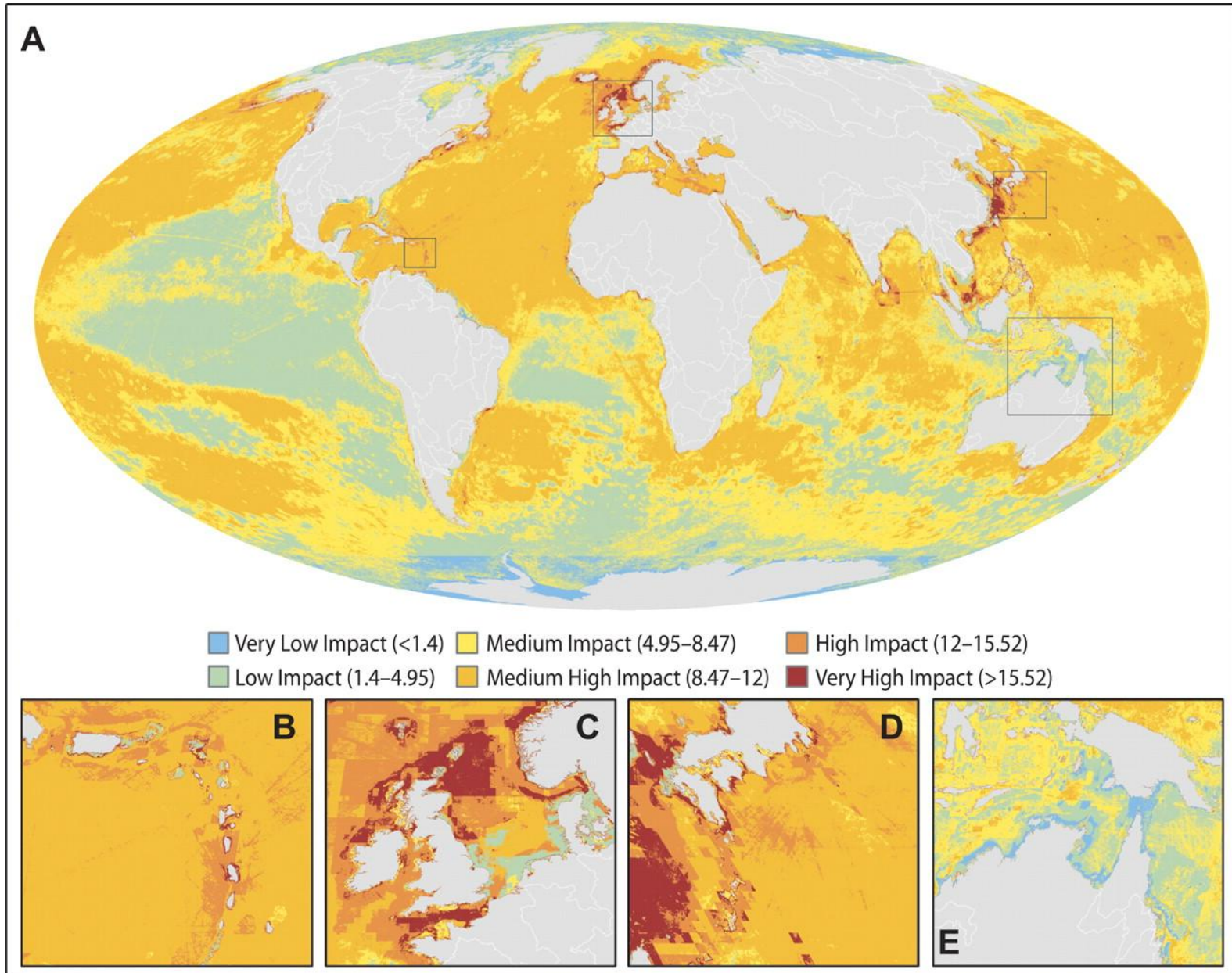
What's the world like, and from a frog-eye perspective ?



The Human Footprint on land



The Human Footprint at sea





Human Footprint in the Atmosphere



Carbon cycle

Nitrogen cycle

Phosphate cycle

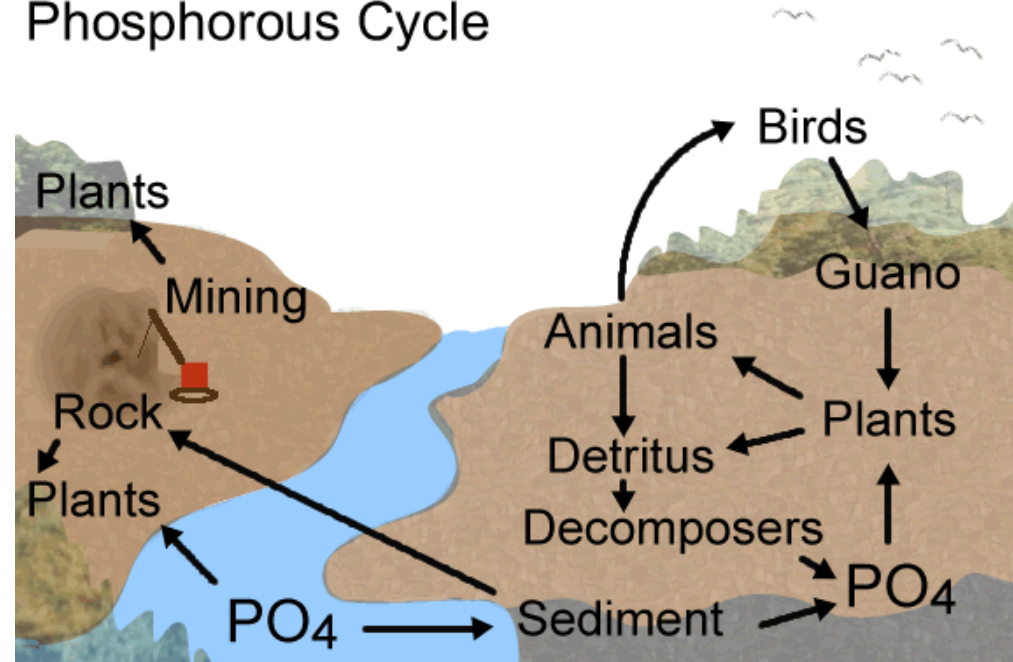
Sulphur cycle

Ozon cycle

Methan cycle

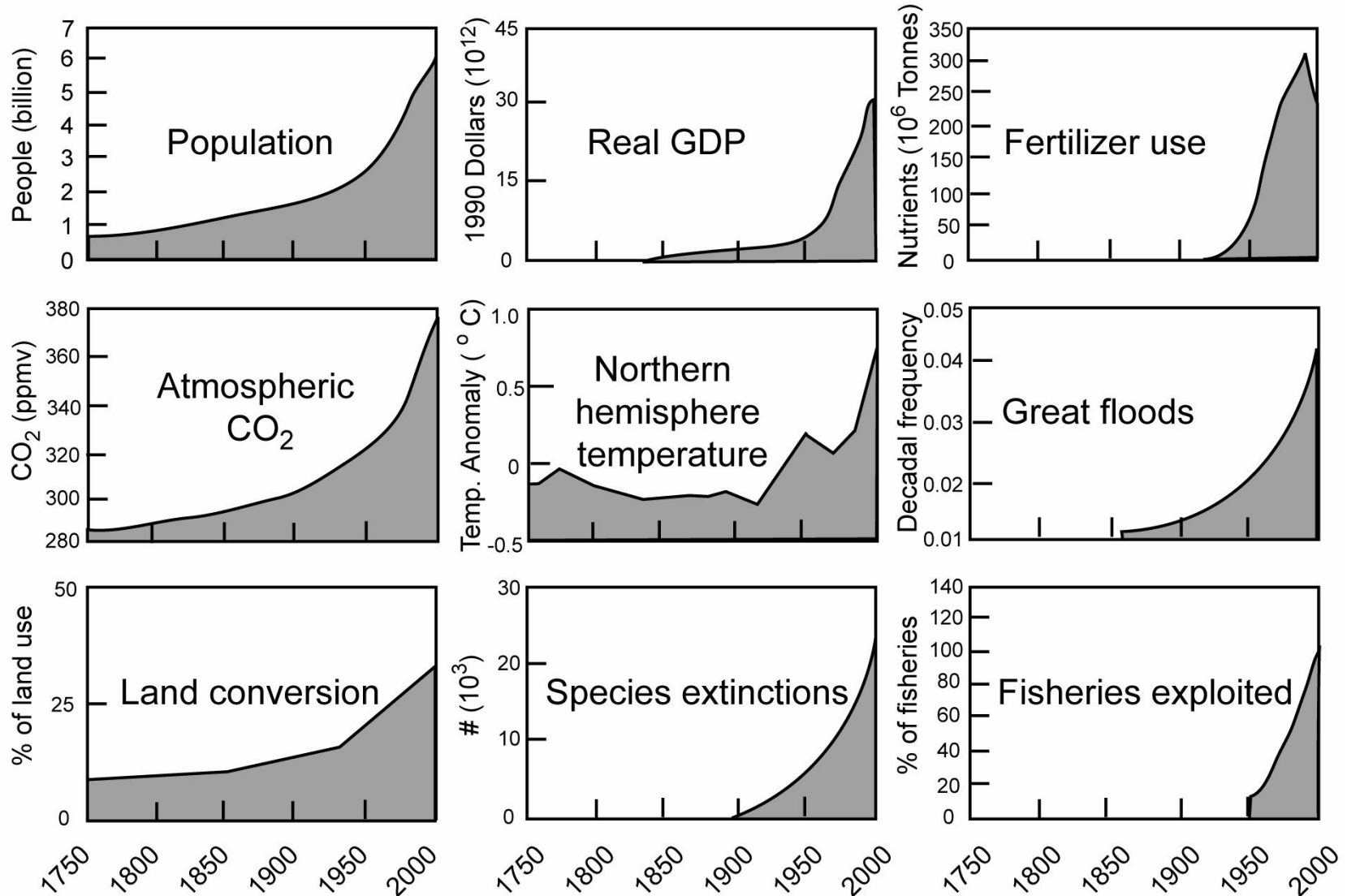
...

e.g.
Phosphorous Cycle



=> A 'Toxic Tort' ... ?!

Earth is experiencing directional changes in many drivers of social-ecological processes (...out of bounds...)



Year

Steffen et al. 2004

What do the world experts and the literature say about frogs ?

App. 1/3 of all reptiles and amphibians in the world are threatened, or worse

Firefox | 10 Studies That Revealed the Great Gl... | Are we in the midst of the sixth mass ... | +

www.pnas.org/content/early/2008/08/08/0801921105.full.pdf+html

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PNAS

1 / 8 | 133% | Find | Proceedings of the National Academy of Sciences

Are we in the midst of the sixth mass extinction? A view from the world of amphibians

David B. Wake^{*†} and Vance T. Vredenburg^{**}

^{*}Museum of Vertebrate Zoology and Department of Integrative Biology, University of California, Berkeley, CA 94720-3160; and [†]Department of Biology, San Francisco State University, San Francisco, CA 94132-1722

Many scientists argue that we are either entering or in the midst of the sixth great mass extinction. Intense human pressure, both direct and indirect, is having profound effects on natural environments. The amphibians—frogs, salamanders, and caecilians—may be the only major group currently at risk globally. A detailed worldwide assessment and subsequent updates show that one-third or more of the 6,300 species are threatened with extinction.

families and nearly 60% of the genera of marine organisms were lost (1, 2). Contributing factors were great fluctuations in sea level, which resulted from extensive glaciations, followed by a period of great global warming. Terrestrial vertebrates had not yet evolved.

The next great extinction was in the Late Devonian (≈364 Mya), when 22% of marine families and 57% of marine genera.

FrogTalkFH1.ppbx - ... | Endangered Frogs o... | Are we in the midst ...

Firefox | 2004-Hero-and-Morrison.pdf (applicatio... | +

www.griffith.edu.au/_data/assets/pdf_file/0020/170084/2004-Hero-and-Morrison.pdf

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HERPETOLOGICAL JOURNAL, Vol. 14, pp. 175-186 (2004)

FROG DECLINES IN AUSTRALIA: GLOBAL IMPLICATIONS

JEAN-MARC HERO¹ AND CLARE MORRISON^{1,2}

¹School of Environmental & Applied Sciences, Griffith University - Gold Coast campus, Australia

²Current Address: Institute of Applied Sciences, University of the South Pacific, Suva, Fiji

Amphibian declines have been reported from around the world. Here we examine life history and distributional characteristics of Australian frogs listed as threatened under the IUCN Global Amphibian Assessment guidelines, and compare these results to available information on threatened amphibians around the world. Forty of 213 Australian frog species (18.8%) are currently recognised as threatened. While eight species are listed as Vulnerable due to small or restricted populations alone (VU D2), the remaining 32 species are associated with population declines. Threatened species are concentrated in upland areas (41% of all upland species are threatened, while only 8% of lowland species are threatened). Twenty-eight of the 40 threatened species (70%) primarily occur in upland areas while only 42 of the 173 non-threatened species (24.3%) occur in upland areas. Restricted geographic range is characteristic of 31 of 40 threatened/declining species (77.5%). However, 41 non-threatened species (23.7%) also have restricted geographic range. Terrestrial amphibian species are not strongly associated with the loss of

FrogTalkFH1.ppbx - ... | Endangered Frogs o... | 2004-Hero-and-Mor...

Some extinct and endangered Reptile and Amphibian examples

Dinosuchus (largest crocodile, c. 15m long)



Koolasuchus (large amphibian, c. 5m long)

Big Land tortoises/turtles (Mauritius, Galapagos, Seychelles...)

Big Marine turtles (Caribbean, SE Pacific, Africa...)

Yunnan Box turtle



Vegas Leopard frog (mind the genetics)



Golden toad



Gastric brooding frog



Chamaleons (trade to U.S. and EU from Africa and Madagascar)

en.wikipedia.org/wiki/Category:Extinct_reptiles



=> isolated(island) species and populations are in trouble, extinction by body size, exposure and human pressures



Bradypodion thamnobates

What about other species than frogs ?

Decline of ecological services in general

Decline of many bees (pollinators)

Decline of most very large (and slow) mammals

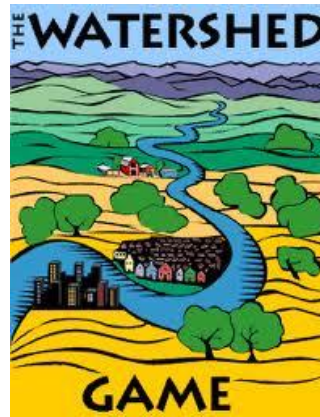
Decline of many songbirds

Decline of most (arctic) shorebirds and many waterbirds

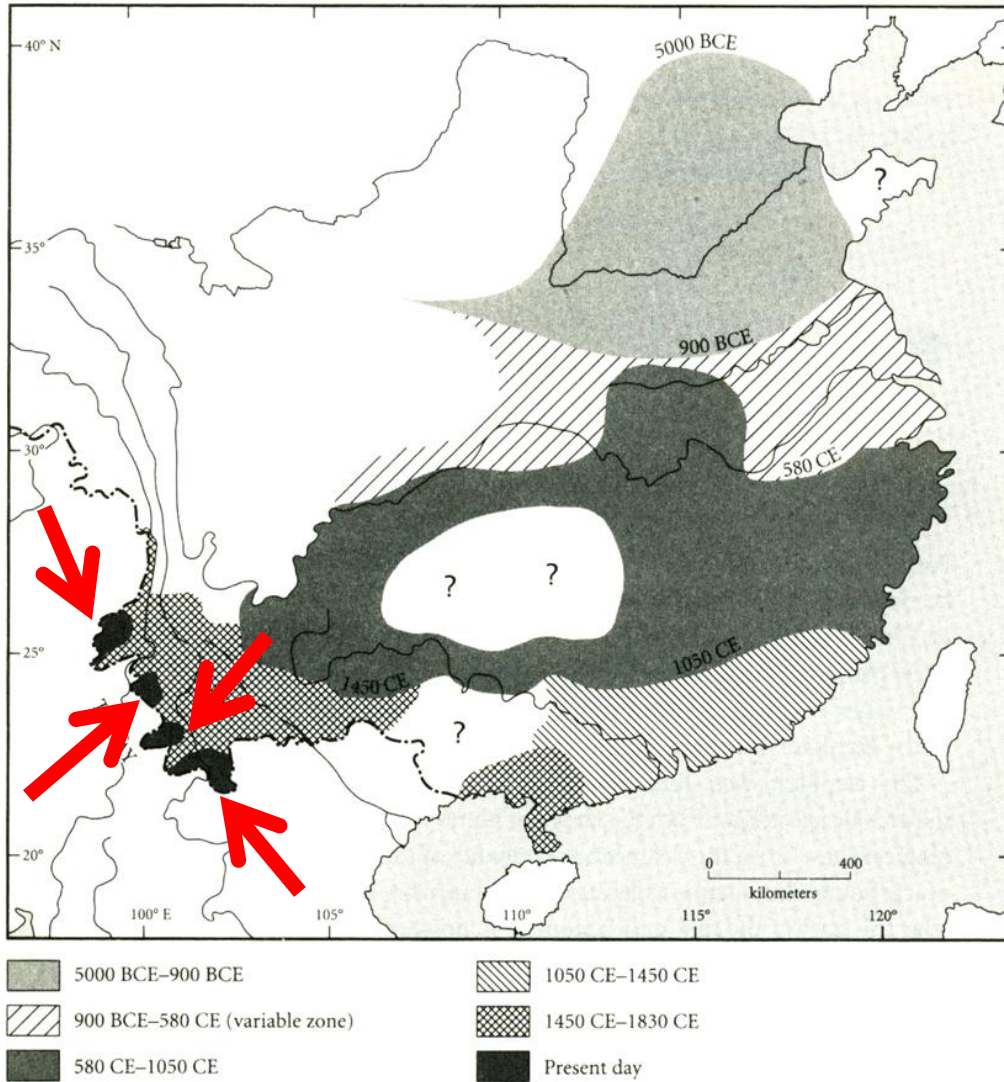
Also...

Decline of wilderness areas

Decline of wetlands and watershed integrity



Example for a declining big mammal (Elephant in China)



Note: Apart from the variable zone, earlier dates include later dates. Modern coastlines.



Elvin M. (2006). The Retreat of an Elephant.

A record size Cat Fish in (Thailand)...

(=>generally, more 'big' animals/individuals existed in earlier times)



Tortuguero (Costa Rica)



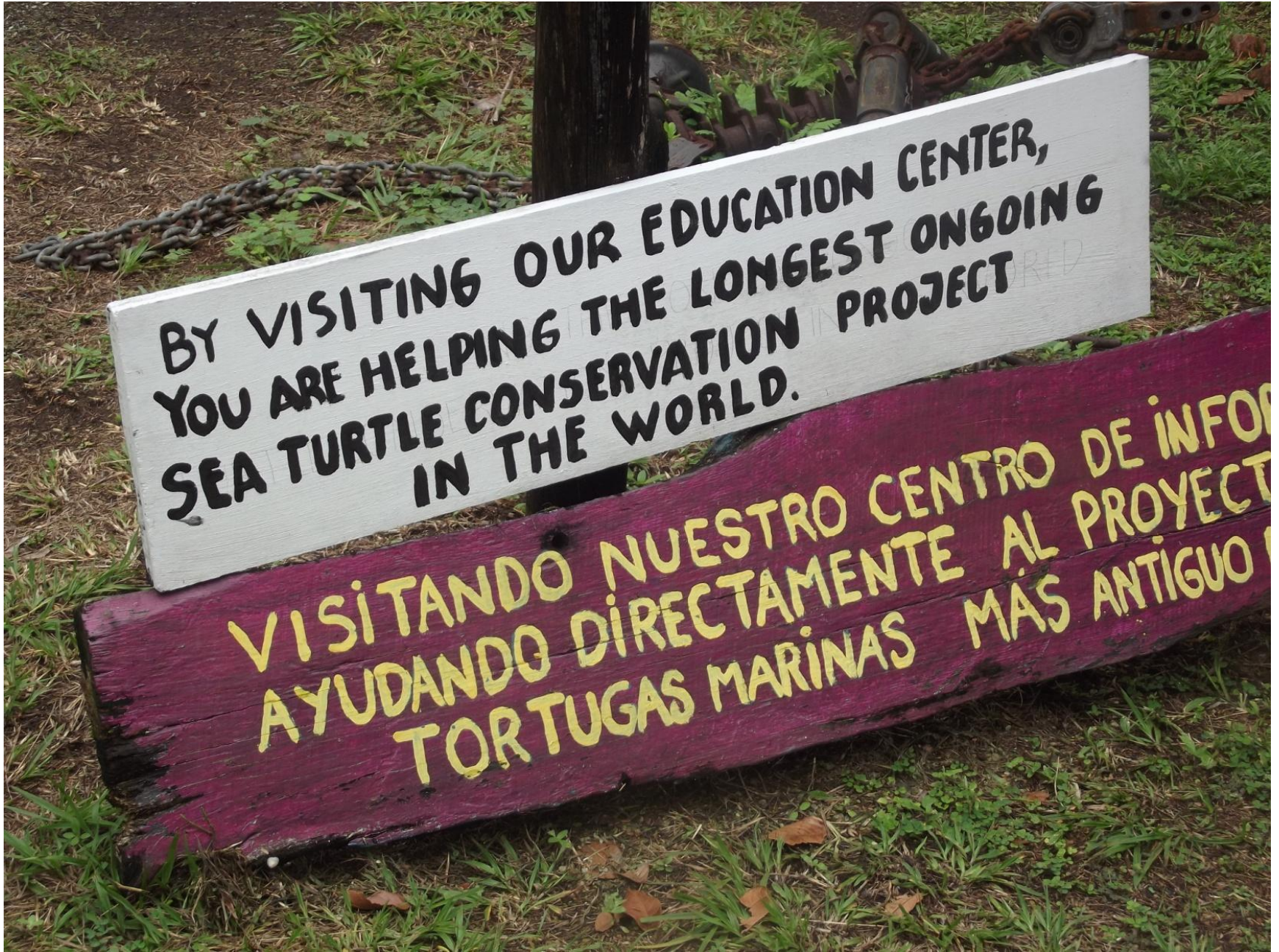
Tortuguero (Costa Rica)



Tortuguero (Costa Rica)



Tortuguero (Costa Rica)



Central America: Costa Rica & Nicaragua



(Monteverde Cloud Forest)



Central America: Costa Rica & Nicaragua



Central America: Costa Rica & Nicaragua



Central America: Costa Rica & Nicaragua



Central America: Costa Rica & Nicaragua



Central America: Costa Rica & Nicaragua



Central America: Costa Rica & Nicaragua



Central America: Costa Rica & Nicaragua



Central America: Costa Rica & Nicaragua



Australia

AUSTRALIAN DRAINAGE DIVISIONS AND RIVER BASINS

VIII TIMOR SEA DIVISION

- | | |
|----------------------|--------------------------------|
| 1 Cape Leveque Coast | 14 Daly River |
| 2 Fitzroy River | 15 Finnis River |
| 3 Lennard River | 16 Bathurst & Melville Islands |
| 4 Jodrell River | 17 Adelaide River |
| 5 Ponca Ragart River | 18 Mary River |
| 6 King Edward River | 19 Wildman River |
| 7 Drysdale River | 20 South Alligator River |
| 8 Penfolds River | 21 East Alligator River |
| 9 Oro River | 22 Goodee River |
| 10 Keep River | 23 Liverpool River |
| 11 Victoria River | 24 Bight River |
| 12 Zhouzouise River | 25 Oyler River |
| 13 Moyle River | 26 Buckingham River |

VII INDIAN OCEAN DIVISION

- Greenough River
- Murchison River
- Woolamal River
- Goswami River
- Lyndee-Mintye rivers
- Ashton River
- Onslow Coast
- Fortescue River
- Port Hedland Coast
- De Grey River

VI SOUTHWEST COAST DIVISION

- | | |
|------------------------|----------------------|
| 1 Esperance Coast | 11 Preston River |
| 2 Albany Coast | 12 Cullie River |
| 3 Denmark Coast | 13 Harvey River |
| 4 Kent River | 14 Murray River |
| 5 Franklin River | 15 Avon River |
| 6 Shannon River | 16 Swan Coast |
| 7 Warren River | 17 Moore-Hill rivers |
| 8 Donnelly River Lakes | 18 Yarra Yarra Lakes |
| 9 Bedwood River | 19 Ninghan |
| 10 Busselton Coast | |

XII WESTERN PLATEAU DIVISION

- | | |
|----------------|-----------|
| 1 Gardner | 6 Mookley |
| 2 Mullerbar | 7 Burt |
| 3 Warburton | 8 Wiso |
| 4 Salt Lake | 9 Barkly |
| 5 Sandy Desert | |

XI BULLOO-BANCANNIA DIVISION

- Sulpho River
- Lower Banninia

V SOUTH AUSTRALIAN GULF DIVISION

- | | |
|---------------------|--------------------|
| 1 Rensieu Peninsula | 8 Mandary Coast |
| 2 Myponga River | 9 Willochra Creek |
| 3 Onkaparinga River | 10 Lake Torrens |
| 4 Torrens River | 11 Spencer Gulf |
| 5 Gawler River | 12 Eyre Peninsula |
| 6 Wakefield River | 13 Kangaroo Island |
| 7 Broughton River | |

IV MURRAY-DARLING DIVISION

- | | |
|-----------------------|----------------------------|
| 1 Upper Murray River | 14 Mallee |
| 2 Kiewa River | 15 Wimmera-Avon rivers |
| 3 Ovens River | 16 Border Rivers |
| 4 Broken River | 17 Moore River |
| 5 Oodjini River | 18 Gwydie River |
| 6 Campaspe River | 19 Namoi River |
| 7 Loddon River | 20 Castlereagh River |
| 8 Avoca River | 21 Macquarie-Bogan rivers |
| 9 Murray Rensieu | 22 Condamine-Cudgee rivers |
| 10 Murrumbidgee River | 23 Vallego River |
| 11 Lake George | 24 Paroo River |
| 12 Lachlan River | 25 Darling River |
| 13 Bermane | 26 Lower Murray River |

X LAKE EYRE DIVISION

- Georgina River
- Diamantina River
- Cooper Creek
- Lake Frome
- Finkle River
- Toad River
- Hay River

IX GULF OF CARPENTARIA DIVISION

- | | |
|----------------------|--------------------------|
| 1 Kadalang River | 16 Norman River |
| 2 Walker River | 17 Gilbert River |
| 3 Ripper River | 18 Gossler River |
| 4 Towns River | 19 Mitchell River |
| 5 Linmen Bight River | 20 Coleman River |
| 6 Rose River | 21 Holroyd River |
| 7 McArthur River | 22 Archer River |
| 8 Robinson River | 23 Jardine River |
| 9 Gilbert River | 24 Embley River |
| 10 Settlement Creek | 25 Westlock River |
| 11 Mornington Island | 26 Dooie River |
| 12 Nicholson Island | 27 Janine River |
| 13 Leichardt River | 28 Torres Strait Islands |
| 14 Morning Inlet | 29 Crooke Eylandt |
| 15 Flinders River | |

I NORTHEAST COAST DIVISION

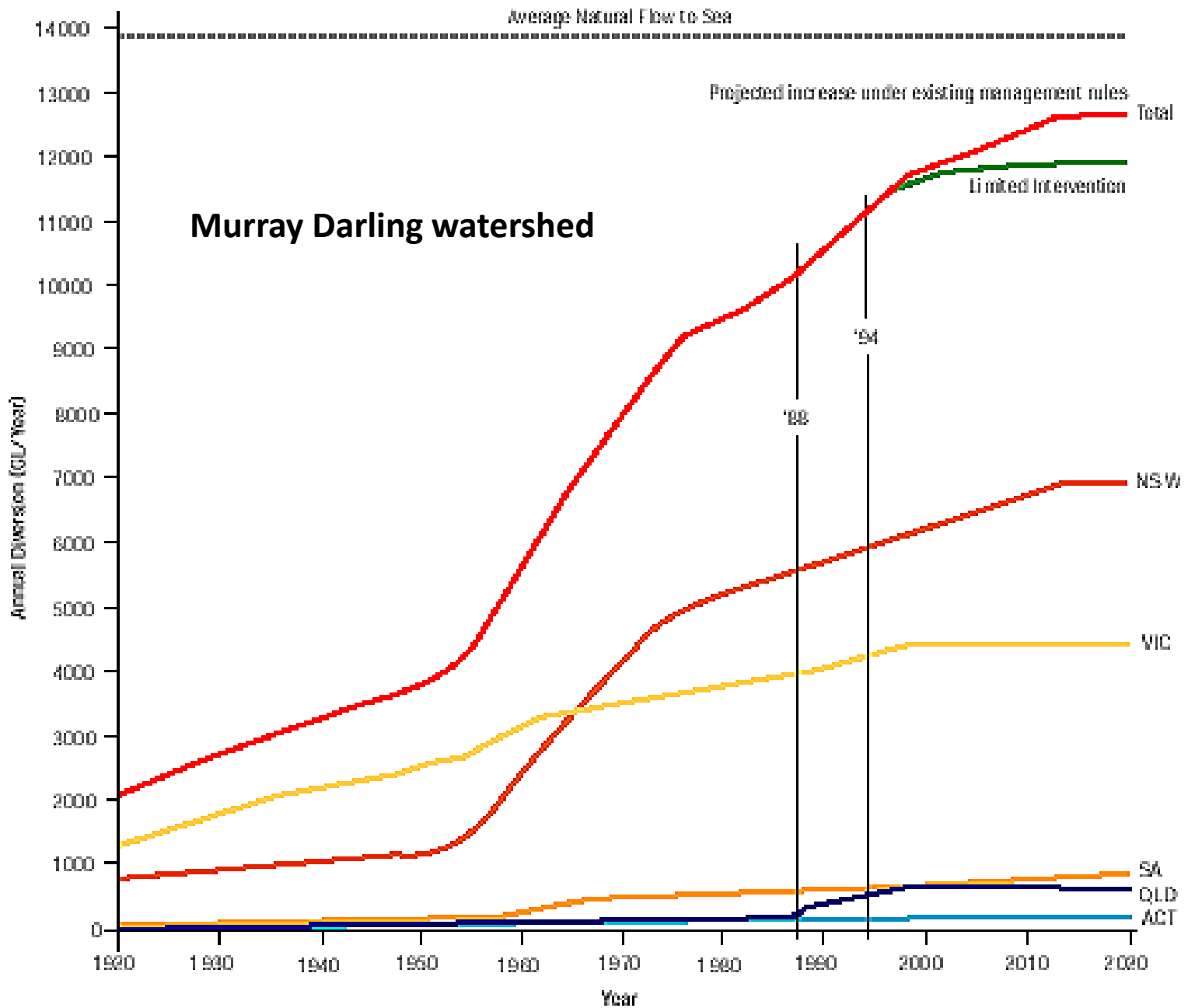
- | | |
|----------------------------|------------------------|
| 1 Jocky Jocky Creek | 24 O'Connell River |
| 2 Olive-Poore rivers | 25 Plover River |
| 3 Lockhart River | 26 Flax Creek |
| 4 Stewart River | 27 Gys River |
| 5 Northway River | 28 Shoalwater Creek |
| 6 Jennings River | 29 Water Park Creek |
| 7 Endeavour River | 30 Fitzroy River |
| 8 Daintree River | 31 Curtis Island |
| 9 Mossman River | 32 Calligo River |
| 10 Barron River | 33 Boyne River |
| 11 Mulgrave-Russell Rivers | 34 North Creek |
| 12 Johnstone River | 35 Kolan River |
| 13 Tully River | 36 Burnett River |
| 14 Murray River | 37 Barum River |
| 15 Hinchbrook Island | 38 Fraser Island |
| 16 Herbert River | 40 Noosa River |
| 17 Black River | 41 Maroochy River |
| 18 Ross River | 42 Pine River |
| 19 Houghton River | 43 Brisbane River |
| 20 Burdekin River | 44 Stradbroke Island |
| 21 Don River | 45 Logan-Albert rivers |
| 22 Proserpine River | 46 South Coast |
| 23 Winesundey Island | |

II SOUTHEAST COAST DIVISION

- | | |
|-------------------------------|-------------------------|
| 1 Tweed River | 20 Tawamba River |
| 2 Brunswick River | 21 East Goppland |
| 3 Richmond River | 22 Snowy River |
| 4 Clarence River | 23 Tambo River |
| 5 Bellinger River | 24 Mitchell River (Vic) |
| 6 Madroay River | 25 Thompson River |
| 7 Hastings River | 26 Laffroie River |
| 8 Manning River | 27 South Goppland |
| 9 Kahush River | 28 Burryj River |
| 10 Hunter River | 29 Varro River |
| 11 Macquarie-Tuggerah Lakes | 30 Martymong River |
| 12 Macintyre River | 31 Wambree River |
| 13 Sydney Coast-Georges River | 32 Mooroodoo River |
| 14 Wollangong Coast | 33 Barron River |
| 15 Shoalhaven River | 34 Lake Comangetia |
| 16 Clyde River-Jarvis Bay | 35 Chivy Coast |
| 17 Murrumbidgee River | 36 Hopkins River |
| 18 Lrossa River | 37 Portland Coast |
| 19 Bega River | 38 Clonbeg River |
| | 39 Millicent River |

III TASMANIAN DIVISION

- Sandy Cape Batten Islands
- King Island
- Southwest Coast
- King-Henty Rivers
- Sandy Cape Coast
- Arthar River
- King Island
- Smithton-Barnie Coast
- Kingston Coast
- Huan River
- South-West Coast
- Costello River
- King-Henty Rivers
- Piper-Baginacra Rivers
- Sandy Cape Coast
- Arthar River
- King Island
- Smithton-Barnie Coast
- Kingston Coast
- Huan River
- South-West Coast
- Costello River
- Piper-Baginacra Rivers



Australia



Invasives like Cane Toad, Bull frog etc etc



A rediscovery:
Yellow-spotted Bell Frog
(c. 100 individuals)



Papua New Guinea

Crocodile farming and hunting



Heimkehr von der Krokodiljagd.

Papua New Guinea



Papua New Guinea

Crocodile farming and hunting, e.g. Sepik River



Papua New Guinea (Sepik River)



Papua New Guinea



A few new species found...



Papua New Guinea



Nepal and the wider Hindu Kush Himalaya region



Gharial

threatened by hydro dams ... (~WWF statement)

...use of hydro power is suggested (~WWF statement)

New species found: Does it matter ?



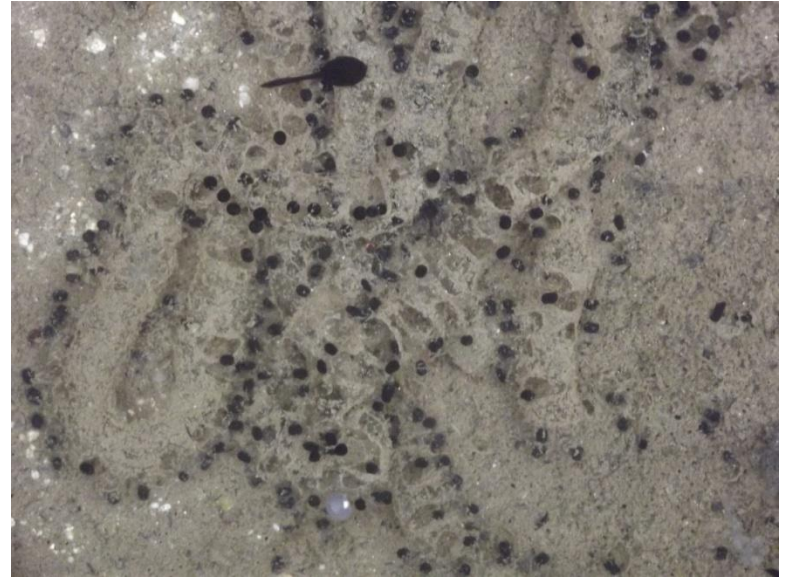
Flying Tree Frog



Gecko

Ilam (Darjeeling)







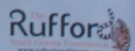


DISTANCE SAMPLING Workshop

25 August, 2012

Organized by

Partners



Maipokhari Ramsar Site Ilam

(Wetland of International Significant)



-  Entry Point
-  Information Centre
-  Hepetofauna Centre
-  Demonstration Plot
-  Germplasm Centre
-  Pond View Site
-  Pond
-  Temple
-  Monastery (Gomba)
-  Bedashrum Settlement
-  Main Road
-  Drain

LunaArt ILAM-2
9847062515





The Andes region

Almost extinct

*New found
Harlequin species*



Firefox | Catenazzi Lehr Rodriguez Vredenburg 20...

userwww.sfsu.edu/vancev/Vredenburg_Lab/Publications_files/Catenazzi Lehr Rodriguez Vredenburg 2010.pdf

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Conservation Biology

Contributed Paper

***Batrachochytrium dendrobatidis* and the Collapse of Anuran Species Richness and Abundance in the Upper Manu National Park, Southeastern Peru**

ALESSANDRO CATENAZZI,* EDGAR LEHR,† LILY O. RODRIGUEZ,‡
AND VANCE T. VREDENBURG§

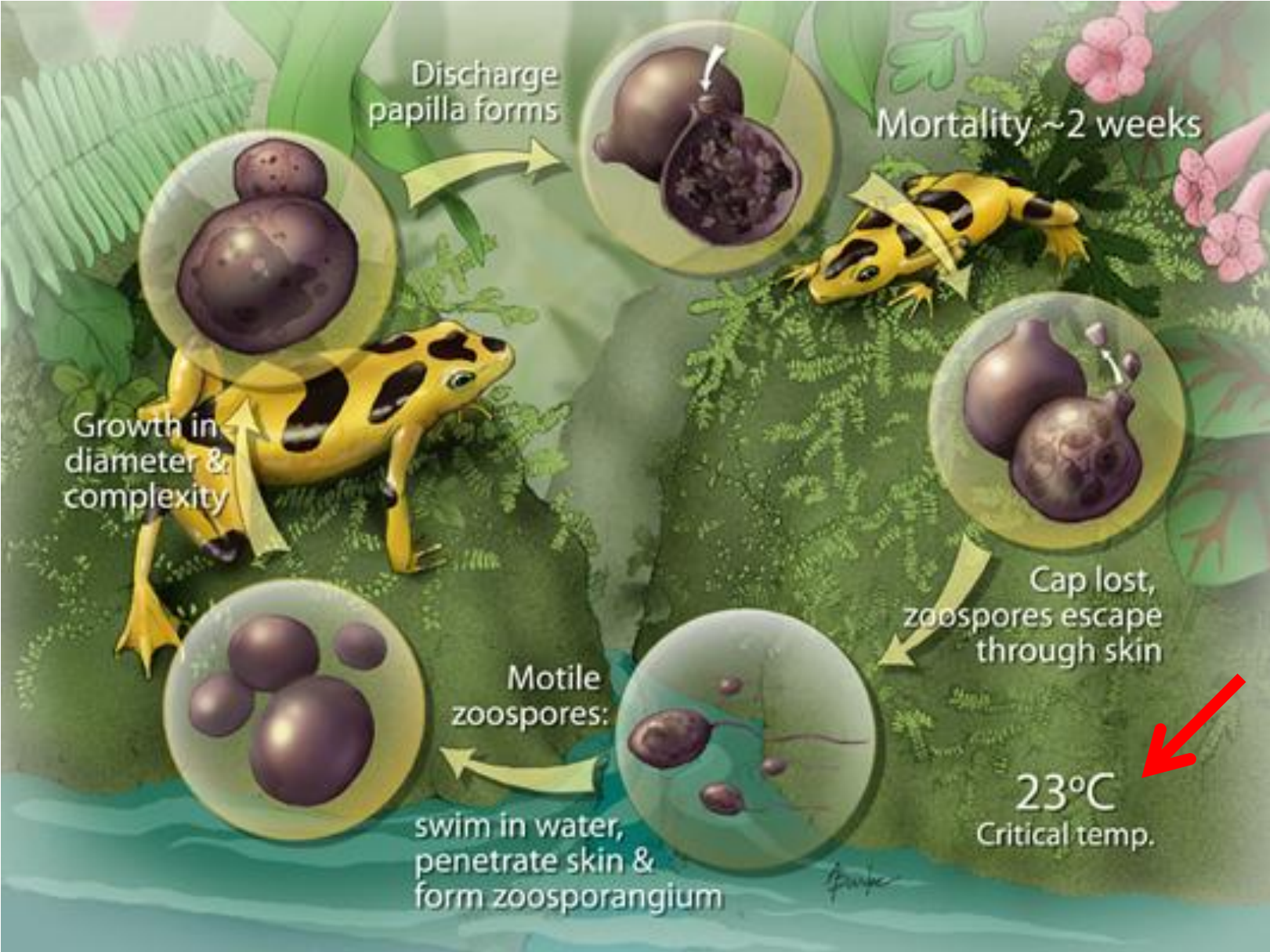
*Department of Integrative Biology, University of California at Berkeley, 3060 Valley Life Sciences Building, Berkeley, CA 94720, U.S.A, email acatenazzi@gmail.com
†Department of Biology, Illinois Wesleyan University, 303 East Emerson, Bloomington, IL 61701, U.S.A.
‡GTZ-Perú, Los Incas 172, San Isidro, Lima 34, Peru
§Department of Biology, San Francisco State University, San Francisco, CA 94132, U.S.A.

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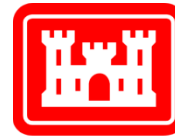
vs. *ex situ* breeding programs...



The Chytrid fungus...



North America...



**US Army Corps
of Engineers®**

Watershed Decay

Fish stocking of lakes, e.g. in National Parks

Bullfrog vs California Red-legged Frog

Cane Toad

Cuban treefrog => Power outages



Filing of a [mega-petition](#) requesting Endangered Species Action protection for 53 amphibians and reptiles in 45 states. The petition, filed with E.O. Wilson, Thomas Lovejoy and others, asks the U.S. Fish and Wildlife Service to protect six turtles, seven snakes, two toads, four frogs, 10 lizards and 24 salamanders under the Act.

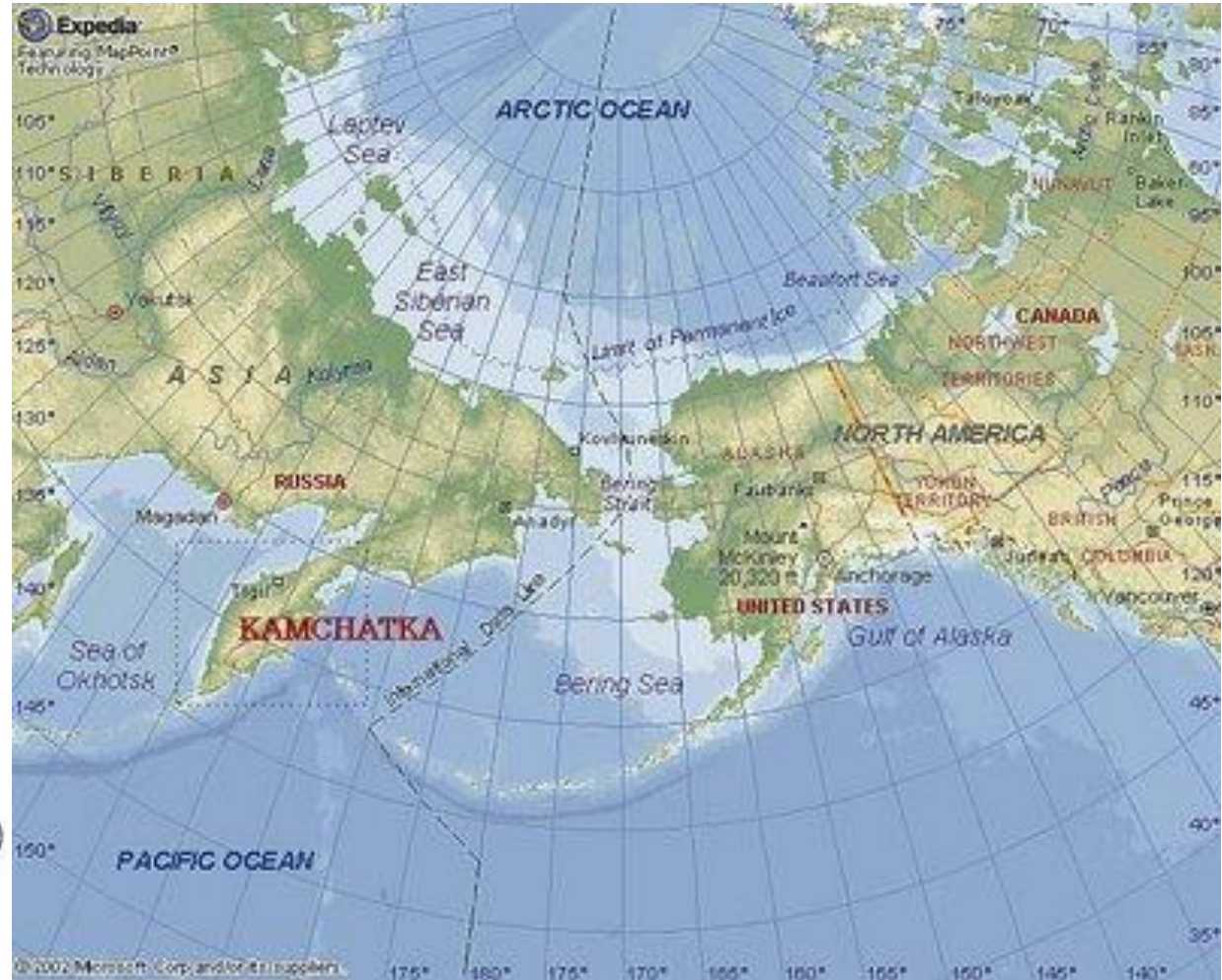
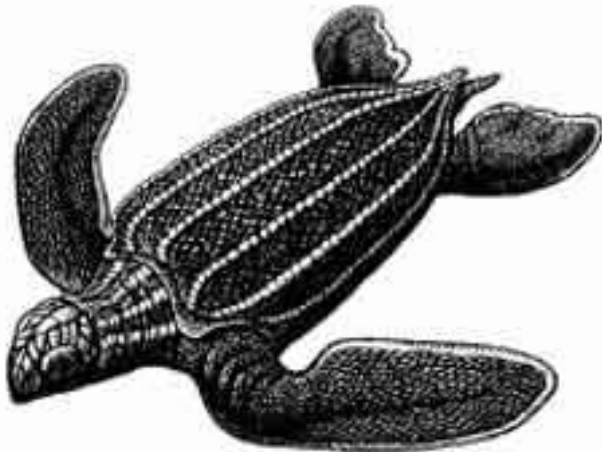


Canada has a weaker Species Act (SARA) than ESA

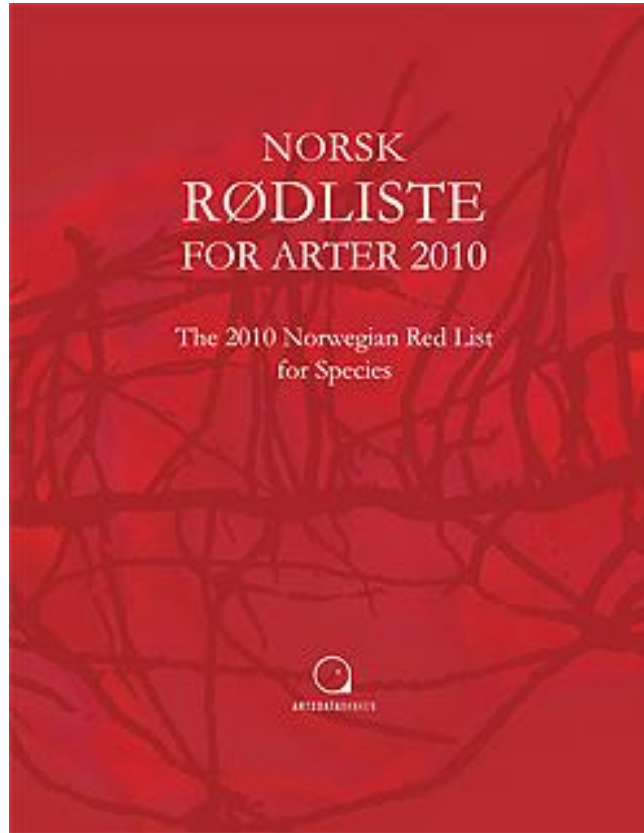
Kamchatka



Rana ridibunda
(*Pelophylax ridibundus*)
(IUCN Red List)
e.g. at hotsprings with
roads...



A view from Norway



www.artsdatabanken.no

Eleven species occur

One expert for reptiles and amphibians

"...Most herptiles are still declining..."

Acid rain and pollution is a problem

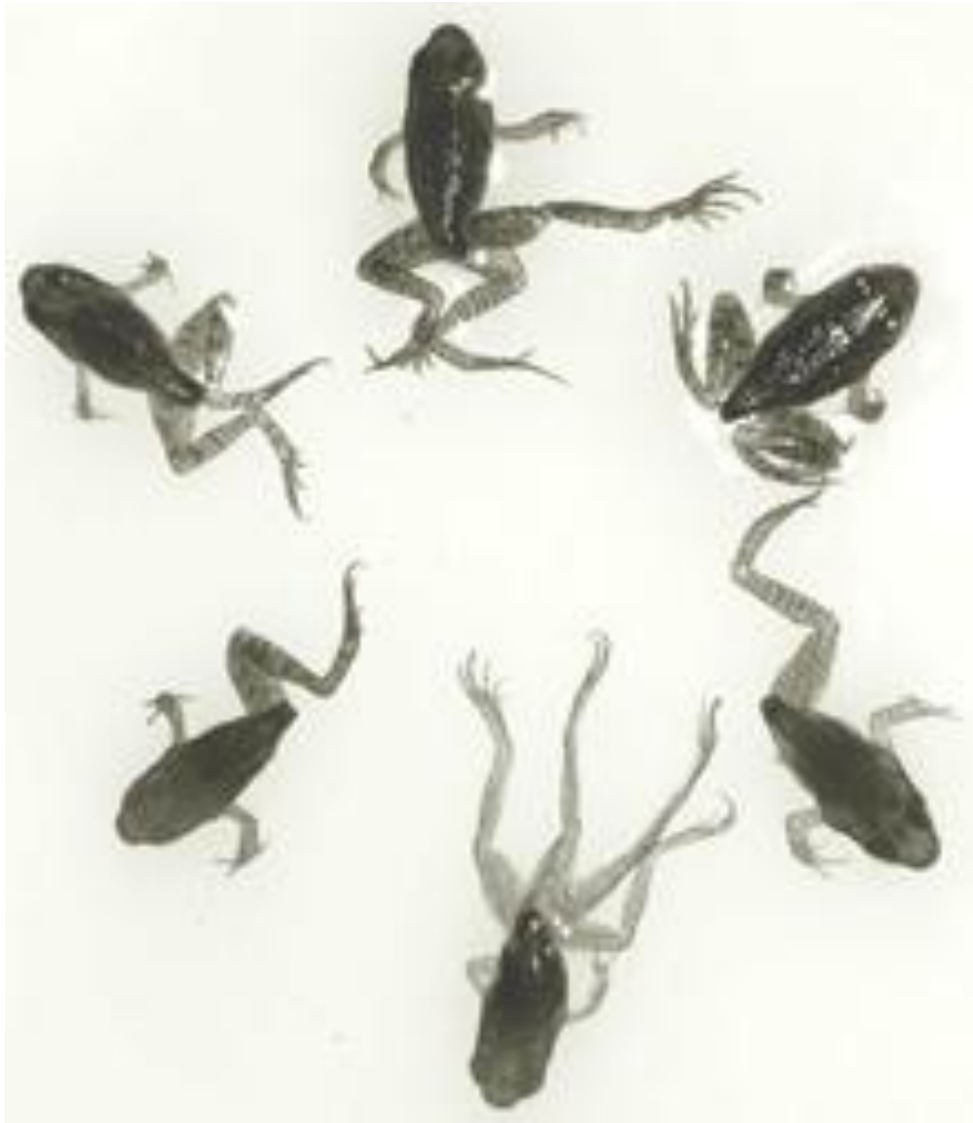
c. 30% ponds lost last 50 years

Climate Change not well addressed



Rana lessonae (c. 50 individuals left)

The 'toxic tort' for amphibians and reptiles...it's for real ?!



Is it the environment...
or dragonflies biting off the limbs...
or other reasons ?!

**And, can our industry and agriculture produce without polluting,
'spraying', modifying the environment etc. ?**

The 'toxic tort' for amphibians and reptiles...it's for real ?!



http://en.wikipedia.org/wiki/Tyrone_Hayes

- Class Action law suit re. Atrazine by Syngenta as well as EPA standards
- demasculinized frogs, cancer in other species , human impacts etc.

What has 100% not worked for maintaining amphibian and reptile populations, so far ?



- 'business as usual'
- holding on to more economic growth
- relying on institutions like IUCN, UNEP, FAO, USFWS, USGS, USNPS, WWF etc.
- treaties like CITES and TRAFFIC
- identify a narrow and single direct human threat, and outlaw it (e.g. collection)
- sustainable development (current concept)
- classic model of science, including more genetic studies
- non-game species management (e.g. Ducks Unlimited)





Where do we re. amphibians and reptiles ?



- Climate Change will not get better next decades
- Human Population will increase from 7 billion to 9 billion people
- Consumption of good and resources will increase
- Wetland quality will not improve ('peak water')
- Invasive species and diseases will increase
- No effort is known, studied or underway to manage amphibians and reptiles of this world efficiently



=> more declines are to be expected

...so what... ?!





Spaceship Earth

...where nobody has gone before...



Thanks to the conference organizers !!

(Photos by www, author and L.Strecker)