Biodiversity, Health and Global Governance

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Overview cont.: global governance

- Seeking commonalities
- Vertical/horizontal adaptive frameworks
- Science-public policy interfaces
- Public opinion
- public-private integration
- Scientific advances and regulatory gaps: opportunities for groundwork
Common priorities

- Invasive alien species
- Invasive pathogens
- Illegal and legal wildlife trade
- Tourism
- Plastic pollution
- Conflict
- The climate change umbrella
Pine beetle invasion: 19 million hectares and rising
From beetle to people

- Increases carbon emissions/reduces sinks
- Increases forest fire hazards; billions in economic damages
- Chemists and atmospheric scientists at the Desert Research Institute in Colorado & Southern Illinois: infested forests release 21X more volatile organic compounds (VOCs)
- VOCs create harmful particulate matter that contribute to formation of haze or smog; cardiovascular problems
invasive species

- Major threat to biodiversity
- Human health and economic security threats: destruction of ecosystems, economic harm in the 100 billions, brutal small island state impact
- Incidental and deliberate introductions
- Solutions: IAS as food and fuel, border control
- GISP dies young; complex network through IUCN ISSG, CBD, and others
- Convention fatigue factor
West Nile Virus - North American Introduction

• 1999, New York City: unusual encephalitis cases reported

• Initially attributed to St. Louis encephalitis

• Simultaneous avian die-offs in region and at Bronx zoo, and equine infections

• Genetic lineage with Middle Eastern strain. Arrival route?
  - Infected mosquito (via ship or plane)?
  - Infected person?
  - Infected bird?

• Complex transmission cycle – biotic and abiotic factors

• Now endemic in many parts of U.S.
West Nile Virus- North American Introduction

Figure 6. Postulated transmission cycle of WN virus. Primary cycle involves enzootic and epizootic amplification by avian hosts and mosquito vectors (primarily Culex species). Human beings and other incidental hosts can become infected by bites from the amplifying vectors or other mosquito vectors with epidemic potential ("bridge" vectors). ?=postulated routes of transmission.

invasive pathogens: vector-borne disease

- Linked with land use change, climate change
- USDA: Invasive microbes are introduced microorganisms which are usually single-celled, or too small for the unaided eye to see, including bacteria, viruses, protists, and fungi
- Invasive species (mammals, fish, insects, birds) can act as vectors
- WHO and integrated vector management
Wildlife trade
(slow loris)
Amphibian chytridiomycosis ("chytrid")

- Major threat to amphibians, especially given pressures from habitat loss
- Responsible for >100 species extinctions
- Spreading globally and rapidly through wildlife trade
The (illegal) wildlife trade

- Threat to ecosystems and disease vector for zoonotic pathogens
- >13,000,000 animals extracted each year (Karesh et al. 2012)
  - Major pressure on wildlife populations
- CITES, Traffic, CBD, CMS
- Interpol: Projects Leaf, Wisdom, Predator, Scale, and Eden
- Hub control and monitoring
- Training & capacity building necessities
Marine debris
Plastic pollution

- Epiplastic organisms, including new bacteria, spreading via plastics dispersal; potential invasive species
- Woods Hole Oceanographic Institution identifies a variety of microorganisms using plastic trash as rafts: 1,000 different species of microbes attached to millimeter-sized scraps of plastic afloat in the North Atlantic.
- Global Ocean Commission Proposal 5
tourism

- Physical destruction of overwhelmed ecosystems
- Pollution: local and global
- Microbial transmissions
- World Tourism Organization guidelines
Spraying the enemy/biodiversity
Conflict

- The circle of ecocide: preparation, warfare, destruction, population displacement, preparation….
- Natural resources as plunder
- ENMOD: a zombie convention
- International criminal law: the Charles Taylor case as a prototype, BUT the International Criminal Court cannot add ecocide to its list at this time
Climate change

- An umbrella covering all other issues, often to the point of rendering them invisible
- UNFCCC, IPCC, and Paris
- WHO: renewed emphasis on climate
- Biodiversity remains as important since ecosystem resilience is key to climate change adaptation
Global Governance: the Balancing Act

- Multi-scaling: local needs and exclusions
- Legitimacy deficits: CITES examples
- State-led (vertical) & non-state (horizontal) governance: co-existence or collaboration?
- Transparency vs. effective diplomacy
Private-Public Integration

- Scaled, shared decision-making (communities, corporations, local and national governments, UN system)
- Corporate social responsibility: window or veil?
- Pharmaceutical industry and biodiversity: symbiotic or parasitic? (Nagoya & beyond)
Science/Public Policy Interfaces

- IUCN CEC; International University Network on Cultural and Biological Diversity (IUNCB)D)
- IPBES, IPCC
- Traditional knowledge databases (eg., Arctic governance issues)
- Future Earth and affiliates
Public Opinion & Awareness

Framing the issue(s):

- NATIONAL SECURITY
- BIODIVERSITY AS COMMONS
- CLIMATE CHANGE UMBRELLA
- ECONOMIC RESILIENCY
- SDGs
Scientific advances as opportunities

- Synthetic biology, nanotechnology, biofuelism, antibiotics, plastics: human health grey zones, environmental questions
- Adaptive governance networks needed to adjust and regulate
Thanks

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