

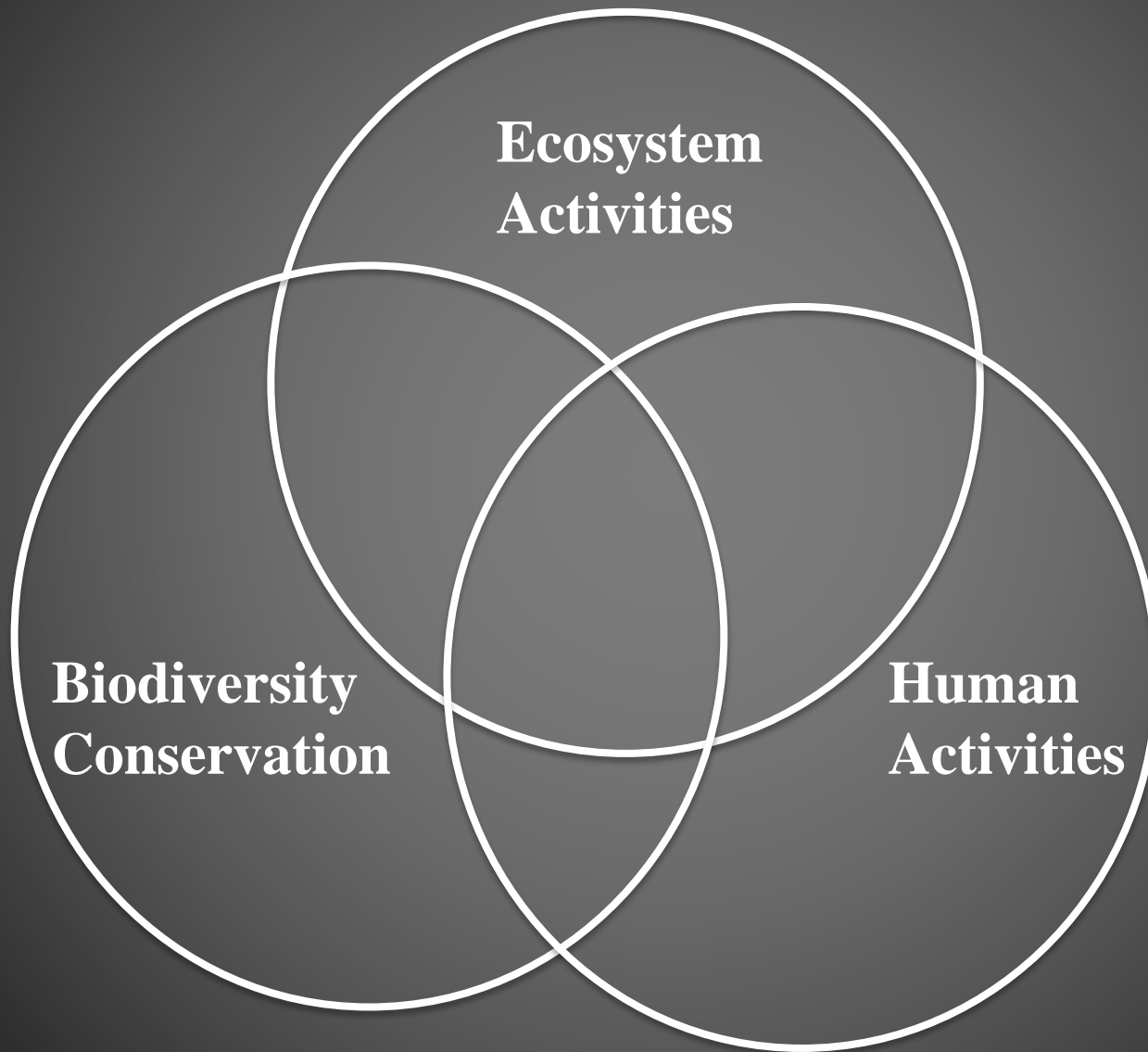
OLD WORLD VULTURES AND CARCASS POISONING: AN ECOSYSTEM SERVICE UNRAVELED



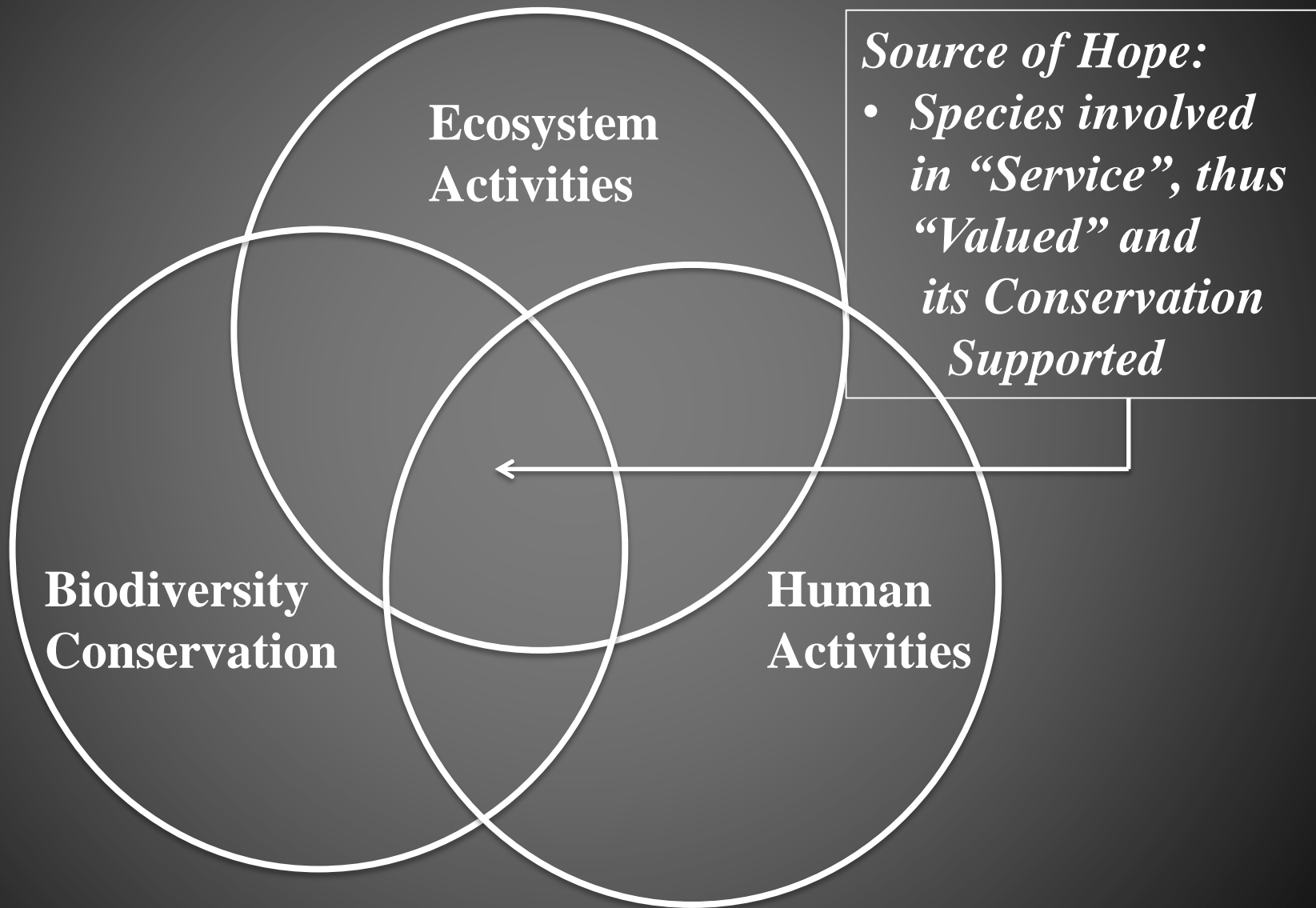
Steve Zack
Jane Carter Ingram



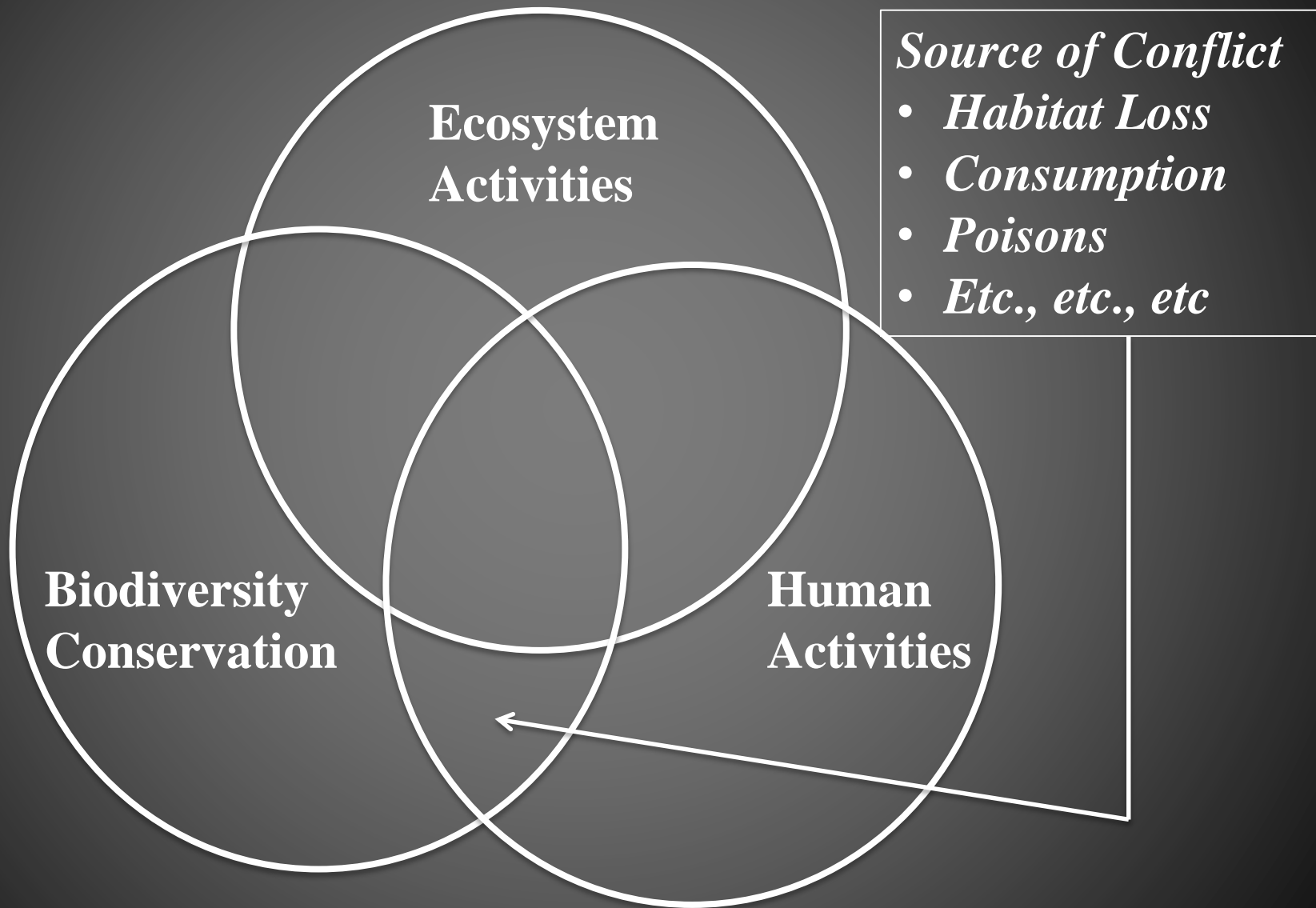
Biodiversity and Ecosystem Services



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Ecosystem Services:
Anthropogenic Concept of
Determining What Nature Products Serve Us;
and how to give them Valuation





Beaver Ecosystem Service:

Water retention on landscape

Recharge Water Table

Create Habitat, Cover, in Wetlands

Beavers as Ecosystem Engineer

Beaver Ecosystem “Disservice”:

Disrupt water management systems

Damage to human structures in floodplains

Beavers as Pest

Intersection of Biodiversity Conservation and Ecosystem Services:

- Potential Conflict in Valuation of Species and their Varied and Associated “Services” by Different Stakeholders



Vultures' Ecosystem Service: Obligate scavengers of large carcasses



All vultures have low pH
(highly acidic) stomachs:

- kills most pathogens



... many individuals of several species respond quickly to new carcasses . . .



... Vultures fly from often great distances in response to carcass ...



(These two traits = vulnerability to carcass poisoning)

Use of Veterinary Diclofenac in the Indian Subcontinent: Catastrophic Collapse of Vultures (>95% of populations)



**White-rumped
Vulture**

Loss of Ecosystem Service: Carcass Consumption in India

Counting the cost of vulture decline—An appraisal of the human health and other benefits of vultures in India

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Ecological Economics 2008



Estimated Costs 1993-2006
\$34 Billion

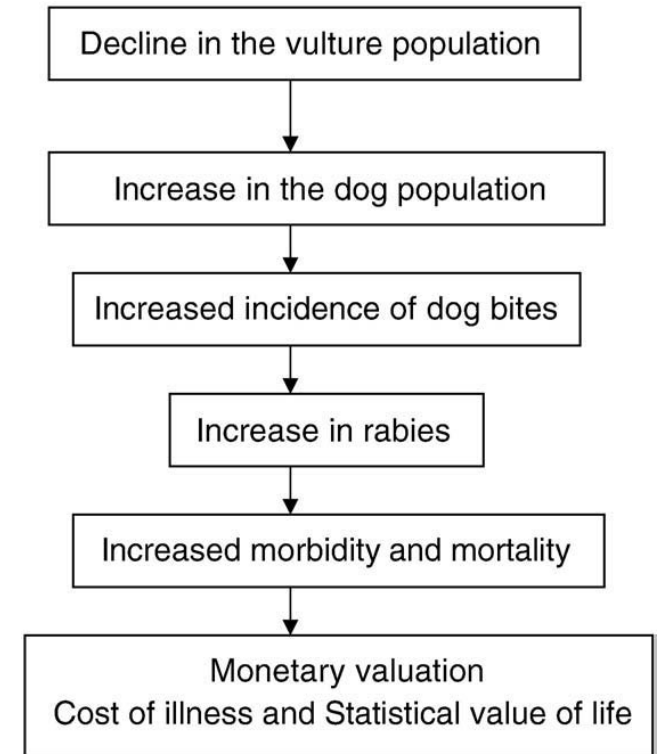


Fig. 1 – Valuing health damages from reduced vulture populations in India.

Poisoning and African Vultures: Many contexts . . .



Ecosystem Service Context:

- *Service endangered*
- *Different Stakeholder Activities/Valuation*
- *Conservation Valuation*

Hooded Vulture

Carbofuran (insecticide) and related poisons



Ecosystem Service Context:

- *Misuse of Agricultural Product*

Photos by Edward Okot Omoya and Andrew Plumptre, WCS

Poisoning in Africa, Version I:
Lion-livestock conflict;
Carcass poisoned,
Vultures in harm's way

Ecosystem Service Context:

- *Pastoralist Stakeholders
and Protection of Livestock*



Poisoning in Africa, Version II: Elephant poaching for ivory



Ecosystem Service Context:

- *Slaughtered elephants laced with poison, so that vultures don't signal site of kill*

Ecosystem Service:

- *Elephant Slaughter for Tusks*
- *Carved Items of High Value*
- *Worldwide Demand, especially Asia now*



A photograph of a savanna landscape. In the foreground, a giraffe is bent over, drinking from a small pool of water. Its long neck is extended down to the water's surface. The giraffe has a brown and white patterned coat. In the background, there are green bushes and trees. Another giraffe is visible in the distance, partially obscured by the foliage. The sky is not visible.

Poisoning in Africa, Version III: Subsistence “hunting” in dry season water sources

Ecosystem Service Context:

- *Wildlife poisoned for consumption*
- *Human community at risk of consuming poisons*

Poisoning in Africa, Version IV: Witchcraft trade for vulture brains

A photograph of two vultures standing on dry, grassy ground. Both birds have dark brown feathers and white underparts. Their heads are a striking, bloody red color, indicating they have been poisoned. They are facing each other with their beaks slightly open.

Ecosystem Service Context:

- *High Valuation for gaining clairvoyance (finding food, winning lottery numbers)*

Growing Conservation Crisis in Africa: Poisonous Collapse of Vultures, Loss of Ecosystem Service

- 
- Ecosystem Service Context:
Different Stakeholders/
Different Valuation*
- *Agricultural Poisons*
 - *Livestock/Carnivore Conflict*
 - *Elephant Poaching*
 - *Traditional Witchcraft*
 - *Subsistence “Hunting”*
 - *Ecotourism*