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POSTER ABSTRACTS
(in alphabetical order by presenter's last name)

BOTTOM-UP INFLUENCES ON VERNAL POOLS AND ANURAN DEVELOPMENT

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Conservation problem or question: Vernal pools provide critical habitat for amphibians, yet protection of these ecosystems is weak and many pools have been destroyed. The success of restoring vernal pools and amphibian habitat rests on understanding what makes a vernal pool functional and successful. I aim to address this question by assessing how bottom-up processes drive vernal pool food webs.

Research methods: Most vernal pool productivity comes from terrestrial plant litter, which provides nutrients and microbial colonization that supports the food web. My study assesses the nutritional quality of different litter types. I use in-pond enclosures to measure microbial growth and larval anuran growth and development in different litter treatments. I also assess these processes in reference pools differing in litter type.

Relevance to conservation: Wetland restoration efforts are growing; however, much remains unknown regarding constructing pools to foster amphibian habitat. Additionally, amphibian declines have prompted calls to study amphibian natural history and trophic interactions. My work contributes to both of these conservation efforts by providing insight into what terrestrial litter best supports microbes and amphibians, while also improving the understanding of amphibian nutritional requirements.

INDUSTRIAL DEVELOPMENT AND WILDLIFE CONSERVATION

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Conservation problem or question: Studies quantifying the responses of wildlife behaviour to industrial disturbances have shown that the construction of facilities, such as roads, trails, buildings and increased presence of human activities beyond certain threshold will result in both direct loss of wildlife habitat and indirectly through avoidance behaviour of affected wildlife species.

Research methods: Wildlife location data are collected along transects that are placed at right angles to access roads and oil drilling areas. Remote sensing imagery will be used for habitat characterisation.

Relevance to conservation: Recent discoveries of oil and natural gas deposits in the Albertine rift, Uganda have raised concerns about the impacts of industrial activities and the associated land-cover change on wildlife. This study will be useful in guiding and evaluating drilling operations through the use of Geographic Information System modelling to enable maintenance of movement of corridors for wildlife in the region.

LAND USE AND LIZARD DENSITY: ACCESS TO PERCHES VS. PREY

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Conservation problem or question: Reptiles occur in developed habitats, yet impacts of development on lizards remain understudied. Land "improvement" generally removes vegetation, reducing availability of natural lizard perches. Conversely, human activity increases garbage, water, and habitat edges, increasing insect (lizard prey) abundance. I examine whether perch availability or insect abundance has a greater impact on the density and body condition of green anole lizards.

Research methods: In summer 2010, I will study anoles in 1000m2 plots (including campsites, trails, roads, and undisturbed areas) in Palmetto State Park (Texas). In each plot, I will quantify perches along transects and insect abundance via transect counts and insect traps. I will determine lizard abundance using mark-recapture methods, and body condition using lizard mass:length ratios and fat pad mass.

Relevance to conservation: This project examines the impacts of human habitat modification on a natural population of vertebrates. Greater abundances of native species is the goal of most conservation efforts, but human development may indirectly increase the abundance of a species in some cases. Using green anoles, I address potential roles of development on insectivorous lizards, 46 species of which occur in Texas.

THE DYNAMICS OF ANIMAL MIGRATIONS CAPTURED BY SATELLITES

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Conservation problem or question: The advent of Global Positioning System (GPS) technology has transformed the way animal migrations can be monitored. However, understanding the drivers of migrations and their sensitivity to environmental change is challenging, as it requires in-depth study of animals' movement strategy as well as the dynamics of their environment.

Research methods: We used timeseries of satellite data to quantify spatiotemporal changes related to climate and resources in a variety of seasonal ecosystems that host animal migrations and combined these data with animal locations acquired through GPS to identify and visualize patterns and drivers in migratory behavior. Case studies include Giant Panda, Goose, Elephant and Zebra migrations.

Relevance to conservation: The insights our case studies have generated into migratory behavior have provided concrete recommendations for the animals and ecosystems they studied. Since our methods use publically available satellite data and open-source software to process it, they can be directly applied to aid the conservation of other seasonal ecosystems and the migratory animals they host.

STAKEHOLDERS AND ENDANGERED KILLER WHALES: A CASE STUDY

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Conservation problem or question: Recovery of endangered species in heavily used coastal areas is enhanced by strategic stakeholder involvement. How has stakeholder engagement factored into recovery planning for the endangered southern resident killer whale? This case study on the opportunities and challenges integral to stakeholder engagement is based on Federal policy planning regarding endangered killer whales in U.S. waters of the Salish Sea.

Research methods: This is a case study relying upon Federal documents and public comments on record, literature review, personal observations and interviews with key informants and coding and analysis of over 2000 written comments submitted in response to the Advanced Notice of Proposed Rulemaking, 2007, and Proposed Regulation, 2009, in policy planning for recovery of the endangered Southern Resident Killer Whale.

Relevance to conservation: As human populations are increasingly concentrated in coastal areas around the world, the resulting pressures on marine systems often place entire ecosystems and many individual species at risk. Policy decisions must successfully address commitments to human well being and environmental conservation. Stakeholder engagement offers a valuable tool to reconcile these competing priorities.

ECOLOGICAL NICHE MODELING OF GREY-SHANKED DOUCS IN VIETNAM

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Conservation problem or question: I will address the current status of the Grey-shanked douc, a critically endangered primate, in central Vietnam. The species was only identified in 1997, and very little is currently known about them in the wild. Estimates place their global population at under 1000 individuals. This study will be one of the first to map their distribution in detail.

Research methods: The first part of the research are transect surveys, to be undertaken this June in Vietnam as a joint effort between AMNH, WWF, and the Quang Nam Forest Protection Department. I will use the collected data to create ecological niche models that predict suitable habitat for the doucs, as well as to create a map of threats.

Relevance to conservation: My results will help identify priority regions for the conservation of Grey-shanked doucs. They will guide future survey work, and identify regions of greatest importance to douc conservation, as well as regions that pose the greatest threats to wild populations. The maps will also provide support for the proposed Western Que Son Species and Habitat Conservation Area.

CARBON-USE EFFICIENCY AND THE FATE OF THE ARCTIC TUNDRA

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Conservation problem or question: As temperatures have increased in the Alaskan arctic tundra, shrublands have been encroaching on the tundra tussock ecosystem. I hope to understand whether these plants acclimate their respiration and photosynthetic rates differently in response to temperature across the growing season. This differential carbon-use efficiency may help predict the fate of this critical ecosystem as climate change continues.

Research methods: I will travel to Toolik Lake, Alaska from June 3rd-July 9th to study how the respiration rate and the photosynthetic temperature optimum of a common tussock

species, Eriophorum vaginatum, and a common shrub species, Betula nana, change throughout the growing season. An infrared gas analyzer will be used to measure respiration, and a fluorometer to measure the photosynthetic temperature optimum.

Relevance to conservation: The arctic tundra is crucial to conserve because its permafrost stores 12% of the earth's carbon. The rates at which carbon cycles through tundra may change with the ecosystem, potentially releasing carbon dioxide. Also, as the tundra is warming faster than the rest of the globe, understanding how plants respond there may help understand and conserve more slowly warming ecosystems.

RED WOLF-COYOTE HYBRIDIZATION IN EASTERN NORTH CAROLINA

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Conservation problem or question: Our research will examine patterns of hybridization between the critically endangered red wolf and invasive coyotes in eastern North Carolina. Hybridization with coyotes poses the greatest threat to red wolf recovery yet interactions between these species are poorly understood. Here we examined patterns of hybridization between these two species along a potential hybrid zone where both species come in contact.

Research methods: We used non-invasive genetic sampling of fecal material to identify individual canids along this contact zone. Five hundred fecal samples were collected in the winter of 2010 across a 2,500 square km region. Individual canids will be identified from scats using microsatellite nDNA markers and ancestry for each individual will be evaluated using Bayesian clustering methods.

Relevance to conservation: This study will provide insight into the patterns of hybridization and genetic introgression that occur when two species with expanding ranges come into contact. Also, our results will examine the potential for an endangered species to remain reproductively isolated in an area dominated by a species it can potentially hybridize with.

HABITAT USE AND ECOSYSTEM SERVICES OF BATS IN PECAN ORCHARDS

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Conservation problem or question: I documented habitat use by insectivorous bats within a pecan agroecosystem to evaluate: 1) the role of pecan orchards as a source of riparian woodland habitat for bats in a semi-arid landscape, 2) the influence of management intensity on bat activity and diversity and 3) the role of bats in suppressing the pecan nut casebearer moth (PNC), a devastating pest of pecans.

Research methods: From 2008-2010, I conducted fieldwork in San Saba, Texas, a county dominated by pecan cultivation. I documented bat diversity, activity and roosting behavior in: 1) organic native pecan orchards, 2) conventional orchards, and 3) unmanaged mesquite/juniper woodlands using mistnets, AnabatII ultrasonic-detectors, radiotelemetry and thermal-imaging cameras. Pest patterns were monitored with pheromone traps. Consumption of PNC was documented in guano using molecular markers.

Relevance to conservation: Encouraging landowners to consider the benefits of maintaining habitat for species capable of providing ecosystem services is a creative way to work with a sector of the society that is typically resistant to conservation efforts. Factors influencing

habitat selection by bats and the evaluation of pecan pest consumption are key components to a comprehensive conservation plan in the pecan agroecosystem.

HABITAT SUITABILITY MODELING FOR THE SHOREBIRDS OF NEW YORK

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Conservation problem or question: Will it be possible for the NYSDEC to develop an analysis tool for eco-system based management of the near shore environment with our current level of available natural history data and GIS technology?

Research methods: I am currently conducting a literature review of existing GIS modeling techniques and natural history data for 68 species of birds. This data is to be weighted and incorporated into conceptual models built by the project manager, Jason Smith, and myself. The conceptual models will be added as layers on ARCGIS which includes existing hazards and developments.

Relevance to conservation: The conservation focus maps (CFMs) we are trying to create will primarily be used by the state to make regulatory decisions based on which coastal areas have the most biodiversity or sensitivity. By highlighting these areas, the NYSDEC can make better informed decisions regarding the cumulative impacts of development on our natural resources.

EFFECTS OF CLIMATE CHANGE ON AMERICAN REDSTART SURVIVAL

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Conservation problem or question: Survival of wintering populations of the American redstart in Jamaica is correlated with precipitation. Multiple models of climate predict extensive precipitation declines in the Caribbean over the next 50-100 years. I explore the relationship between precipitation and American redstart survival over multiple years in different habitat types to predict the effects of future precipitation declines on these populations.

Research methods: I am using a Bayesian modeling approach to estimate probability distributions of survival parameters and future precipitation scenarios. I incorporate known uncertainty in projected climate scenarios, and estimate future survival based on a current long-term dataset. I use hierarchical models to incorporate different survival and capture probabilities across sexes and habitat types.

Relevance to conservation: Understanding the potential fate of populations in response to future climate change is an integral part of making appropriate management decisions today. Modeling populations using a Bayesian approach allows estimation of probability distributions for population parameters rather than single values, which may yield a more realistic view of potential population responses and how they may vary under different scenarios.

ABYSSAL BENTHIC DIVERSITY PATTERNS IN THE GULF OF MEXICO

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Conservation problem or question: The Sigsbee Abyssal Plain (SAP) in the Gulf of Mexico shows the presence of 6 large submarine canyons and several smaller ones. These slopes serve as a source of nutrients for deep benthic macrofauna. Here we examine how infaunal benthic populations of polychaetes emerged in this geological setting and possible mechanisms that have lead to their isolation and speciation.

Research methods: Deep-sea sediment samples were obtained during 3 cruises from 9 stations along a transect with a multicorer on board the R/V Justo Sierra. Samples were sorted with 300-500µm sieves. Morphological identifications were carried out using specialized taxonomic keys. Additionally, mitochondrial markers cytochrome C oxidase subunit I (COI) and 16S ribosomal RNA were used for species identification.

Relevance to conservation: The SAP being a region of commercial interest, generating pre-disturbance biodiversity data will help in the accurate evaluation of human impact on benthic communities. Additionally, using morphological identifications and molecular data will reveal known species existing at these depths as well as those that are new to science. Macrofaunal diversity and population connectivity are being currently evaluated using molecular data.

BIRDS AND REDUCED-IMPACT LOGGING IN ACRE, BRAZILIAN AMAZON

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Conservation problem or question: Reduced-impact logging (RIL) is a type of forest management that aims to minimize changes to forest structure. Understanding how species respond to RIL is important for assessing its effectiveness and improving its implementation. Our goal was to assess the effects of RIL on indicator bird species in Acre state, southwestern Brazilian Amazon.

Research methods: We selected bird species expected to be sensitive to changes in forest structure and likely to respond to logging if forest changes were biologically significant. We performed 426 point-counts in logged and unlogged areas in two sites in Acre state, Brazil. We used occupancy modeling to adjust for differences in probability of detection and assess species responses to logging.

Relevance to conservation: We detected effects of reduced-impact logging on our indicator species, which will be important to improve forest management in Acre state, Brazilian Amazon. Our results showed that interaction between logging and presence of bamboo can play an important role in the avian responses to RIL. Future studies should consider the importance of bamboo when evaluating logging effects on wildlife.

CLIMATE AND COMPETITION INFLUENCE COEXISTENCE

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Conservation problem or question: Identifying suitable habitat for at-risk species is critical, especially in light of shifting climate regimes. Yet, disentangling how biotic and abiotic variables influence habitat suitability remains challenging. Here, I use two species of toad to evaluate how both climate and competition contribute to species distributions, and how the distributions of these species may be affected by global climate change.

Research methods: I use ecological niche modeling to identify habitats where species are predicted to occur both singly and where they coexist, and I use traditional statistical models to compare these environments. Finally, I make use of reconstructed past, and predicted future, climate scenarios to model how climate has previously affected species interactions and how climate may influence interactions in the future.

Relevance to conservation: As global climate change leads to shifting ranges, predicting how species will respond to novel climates becomes essential. As interacting species may differentially respond to climate change, considering how interactions affect range limits is critical. My work provides strategies for incorporating species interactions in predicting future ranges, which will improve conservation efforts aimed at mitigating the effects of climate change.

HABITAT SELECTION OF THE ENDANGERED HAWAIIAN GOOSE

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Conservation problem or question: The habitat of the endemic, highly endangered Hawaiian Goose has yet to be fully characterized and they remain vulnerable to introduced predators. My research identifies previously unknown roost sites and intra-island migration movements of Hawaiian geese on Hawaii Island. This new information will be used to fully characterize habitat use, and findings will guide predator management and habitat restoration plans.

Research methods: I employ noninvasive satellite transmitters with GPS capacity to track geese to previously unknown roost and summer locations (n=12). I use satellite imagery to create coarse-scale habitat selection models using GPS locations from satellite transmitters. I characterize vegetation at random and known GPS locations to determine fine-scale habitat selection. High-resolution habitat selection analysis is conducted using foraging and behavioral observations.

Relevance to conservation: Satellite transmitters are not currently used for microhabitat studies and my research is demonstrating the ability to use such information to understand fine-scale habitat selection. Identifying previously unknown roost locations will inform predator-control efforts. Capturing seasonal habitat preferences will delineate the realized from theoretical niche of the Hawaiian Goose. Results will guide restoration planning and management of an endangered species.

AN ORCHID HOST: HOME IS WHERE THE HEART OF THE PROBLEM IS

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Conservation problem or question: *Lepanthes caritensis* is an endemic orchid from Carite, PR whose populations are declining. This rare epiphyte only grows on large individuals (>20 cm dbh) of a single tree species, *Micropholis guyanensis*. We aim to determine if potential host trees will grow fast enough to become suitable recruitment sites for the establishment of new Lepanthes populations before extant populations go extinct.

Research methods: We are analyzing the population dynamics of *Lepanthes caritensis* and *Micropholis guyanensis*. We utilize stage based matrix models to project the future sizes of

known orchid populations. We measure growth rates of potential host trees to project the number of suitable recruitment sites over time. We will compare the results of these models to determine the most appropriate conservation strategies.

Relevance to conservation: Our results will demonstrate how monitoring the ecological interactions of endangered orchids can help identify various drivers of rarity. They will also elucidate how projection models can be used to increase the efficiency of endangered species management efforts. Finally, our results will provide an example of how to determine the applicability and effectiveness of reservation or restoration strategies for conservation.

BUSHMEAT HUNTING ON BIOKO ISLAND, EQUATORIAL GUINEA

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Conservation problem or question: Anthropogenic pressures, such as hunting, influence the community structure of and temperate and tropical forests throughout the world. I will address my ongoing research into the extent to which illegal, commercialized hunting influences the relative abundance, richness, and composition of large mammal species on Bioko Island, Equatorial Guinea.

Research methods: Line-transect surveys are used to collect data on large mammal populations. Signs of hunting are enumerated along these transects as well. Data from surveys is collected using a Trimble Nomad PDA equipped with Cybertracker software. Encounter rates are calculated to assess spatial and temporal changes. Future efforts include hunter follows and interviews to better quantify hunting levels.

Relevance to conservation: A recent ban, prohibiting the hunting of primates, has done little to stem the growth of the bushmeat market on Bioko. Data on the magnitude of this hunting pressure, and its influence on Bioko's fauna, are essential to shed light on the situation. These data will be integral in informing necessary conservation actions.

CULTURAL ECOLOGY OF OYSTER CONSERVATION AND RESTORATION

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Conservation problem or question: The interconnectedness and context-dependency of ecosystem-based approaches to coastal and estuarine conservation, restoration, and management encompass not only geographical, ecological, and physical factors and contexts, but cultural and social ones as well. What can cultural and social considerations contribute to our understanding of these systems and efforts to conserve, restore, and manage them?

Research methods: Using a cultural model approach to understand the social context of conservation and restoration is useful because it illustrates unarticulated reasoning that connects positions of opposing groups. Stakeholder groups utilize cultural models to give meaning to oysters and evolving conservation and restoration efforts. To elucidate the models, I conducted qualitative analysis of semi-structured interviews and utilized participatory mapping methodology.

Relevance to conservation: There are overlaps and conflicts in how groups conceptualize oyster conservation and restoration. Differences in underlying worldviews among groups

result in different actions toward nature and goals for conservation. The evolution of collaborative research and conservation across fishermen, scientists, and conservation practitioners is critical for oysters, other estuarine resources, and those who depend on the goods and services they provide.

CONSERVATION STATUS OF RARE PRIMATES OF THE PERUVIAN ANDES

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Conservation problem or question: Little is known concerning the conservation status and specific threats facing two geographically rare and endemic primate species of the Peruvian Andes (*Oreonax flavicauda* and *Callicebus oenanthe*). Both species are highly endangered and persist in increasingly isolated, threatened cloud forests and premontane forests in scattered areas of the Departments of San Martín and Amazonas, in northern Peru.

Research methods: Data were collected on the range use and group size of yellow-tailed woolly monkey (*O. flavicauda*) in the Bosque de Protección de Alto Mayo, and its conservation threats were assessed. Behavioral and ecological data were collected on Andean titi monkey (*C. oenanthe*) using instantaneous focal animal sampling, and data were gathered on its conservation threats and general distribution.

Relevance to conservation: In this research I document the conservation status of the yellow-tailed woolly monkey, which had not been studied in 20 years; and I present results of the first long-term study on the socio-ecology and conservation of the Andean titi monkey. Due to intense, rapid fragmentation and scarcity of potential habitat, I suggest specific, targeted management is needed.

CHANGES IN BIRD ARRIVALS AND COHORT SIZES IN MASSACHUSETTS

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Conservation problem or question: Animals are responding to an altered climate and conditions that are often less favorable than they once were. The degree to which species are capable of adjusting their phenologies is highly variable. Here we consider how birds with different population sizes have adjusted the timing of arrival to breeding grounds, and whether these patterns can be explained by evolutionary relatedness.

Research methods: Bird banding data from the Manomet Center for Conservation Sciences in Manomet, Massachusetts, for the years 1970-2008 were analyzed to examine how arrival dates have changed over time and relative to temperature and how these variables relate to a changing population cohort size. This was expanded with a phylogenetic analysis to test if evolutionary relatedness helps to further explain variation.

Relevance to conservation: The population size of most of the studied species has significantly declined. They show varying degrees of change in arrival date and temperature response, with only limited evidence for the phylogenetic conservatism of these traits. By understanding such changes we can begin to investigate their causes, decipher where along the birds' migratory routes they are occurring, and inform conservation practices.

EVALUATING GOVERNMENT-DRIVEN CONSERVATION PLANNING

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Conservation problem or question: California's Natural Community Conservation Planning Act attempts to balance conservation and economic growth on a regional level. These plans have had variable success in implementation. Our research evaluates the barriers to plan completion, so that this important program might be used as a guide for land use planning for the rest of the country.

Research methods: We have collected data from publicly available plan records, as well as from interviews with planning and government officials. We have also conducted a survey of elected local officials statewide.

Relevance to conservation: The best hope for effective conservation in the United States is to provide planning mechanisms that set aside land for conservation while allowing for economic development. Our research provides important insights into how the planning process for one such mechanism, NCCPs, can be completed more efficiently. These insights can likely be applied to a wide range of cooperative planning situations.

HABITAT FRAGMENTATION AND ANGOLAN BLACK AND WHITE COLOBUS

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Conservation problem or question: I will address the impact of habitat fragmentation to the social behavior of the Angolan Black and White Colobus monkeys (*Colobus angolensis rwenzorii*), in the Gisakura fragment of the Nyungwe Forest National Park, Rwanda.

Research methods: Data on specific behavioral variables will be collected mainly using the instantaneous scan sampling method (White & Edwards, 2000). This method consists of a rapid scan of a whole group of animals at regular intervals, and the behavior of each individual at that instant recorded. (Martin, P. & Bateson, p. (1986), Setchell, M. J. & Curtis, J. D. (2003).

Relevance to conservation: Results will enable to find out if there are some behavioural abnormalities caused by the stress due to the habitat size. This will allow better design of conservation approaches for both the colobus monkeys living in the large forest and in fragment or other primates living in a small area in general.

LANDSCAPE CONFIGURATION AND TREE PLANTATION HABITAT QUALITY

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Conservation problem or question: Tropical reforestation has the potential to provide substantial wildlife habitat in degraded agricultural landscapes. In northern Costa Rica, tree plantations are subsidized to improve habitat connectivity. However, isolation and edge effects in tree plantation patches may lower their habitat quality. This study tests how forest fragmentation influences habitat usage by forest-dwelling birds of tree plantations relative to wooded pasture.

Research methods: To quantify forest fragmentation, I created a land cover map for the region using recent Landsat imagery and GPS data. I selected twenty tree plantations and

wooded pastures located across a range of forest isolation and fragmentation. At each site, I measured forest structure and evaluated forest bird communities through point counts and recorded bird songs over eight days.

Relevance to conservation: In tropical agricultural landscapes, tree plantations are a productive land use that can potentially increase habitat connectivity. Although forest-dependent birds utilize them as habitat across a wide range of landscape fragmentation, increasing fragmentation around tree plantations selectively impoverishes forest-dependent bird communities. Tree plantations provide better habitat than wooded pastures, but incentives are necessary to cluster tree plantations near natural forests.

EFFECTS OF ALTERED NITROGEN CYCLES ON TEMPERATE FOREST TREES

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Conservation problem or question: I am studying the response of several species of native northeastern temperate forest saplings to oak-girdling (mimicking pathogen-induced mortality) and urbanization, two types of large-scale disturbance with similar effects on soil nitrogen dynamics and nitrogen availability in forest ecosystems. Physiological changes resulting from these disturbances have the potential to impact forest carbon storage, water quality, and species composition.

Research methods: Using an in vivo assay I will measure nitrate reductase activity in the collected leaf material and xylem sap. I will also dry some of the harvested leaf material for δ15N analysis and CHN analysis to determine the %N and the source of the nitrogen used by the trees. I will use an analysis of variance to analyze the data.

Relevance to conservation: A greater understanding of tree physiology and nutrient cycling following natural and anthropogenic forest disturbances will help future conservation and restoration efforts ensure the integrity of ecological processes and the creation of suitable habitat for biodiversity. The increasing threats of introduced pathogens and urbanization in northeastern forests make it essential to study physiological changes in important native tree species.

METHODS FOR RESERVE SELECTION: THE CASE OF MALAGASY LEMURS

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Conservation problem or question: In 2003, the government of Madagascar, a global biodiversity hotspot, committed to tripling the size of its protected area network to protect 10% of the country's total land area. Although data quality and weighting decisions impact the outputs of reserve selection algorithms, these factors have not been closely studied. We address this deficiency with a case study of Madagascar.

Research methods: We examine methodological issues in reserve selection algorithms by comparing: (1) quality of input data and (2) weighting methods for prioritizing species. We apply the Zonation reserve selection algorithm to distribution data for 52 lemur species to identify priority areas for the expansion of Madagascar's reserve network and compare areas selected by different data types and different species weights.

Relevance to conservation: Reserve areas selected for protection based on two data types and three different species weighting schemes, resulting in marked variation in species

representation for IUCN Red List of Threatened Species extinction risk categories. This demonstrates that both input data and species weights influence if reserve networks prioritize maximizing overall species protection or maximizing protection of the most threatened species.

CYTB SEQUENCES IDENTIFY SEAHORSES FOR SALE IN NYC CHINATOWN

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Conservation problem or question: Our poster will address issues involved in the sale of seahorses (genus Hippocampus) in New York City's Chinatown, and their usage. It will also address what it means for Hippocampus species to be protected by the Convention on International Trade of Endangered Species (CITES) and what should be done to protect these species to avoid further endangerment of seahorses.

Research methods: We extracted DNA from dried seahorses purchased in NYC's Chinatown. Then we amplified the cytochrome b gene (cytb) via PCR and sent purified PCR products to Macrogen to be sequenced. We edited the resulting sequences and BLAST searched them in GenBank. The species of each seahorse sample was identified via 99-100% match to sequences in the GenBank database.

Relevance to conservation: Our research uses a novel tool to identify commercially available protected species using seahorses as a test case. It raises points about why endangered species are being sold and raises awareness for the conservation of Hippocampus species. Our results will potentially elevate the conservation status of *Hippocampus algiricus* on the International Union for Conservation of Nature's Red List.

MAHOGANY POPULATION DYNAMICS-IMPORTANCE OF SPATIAL PROCESSES

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Conservation problem or question: The listing of mahogany on CITES Appendix II requires producing countries to demonstrate the harvest of exported volumes of mahogany in a manner deemed non-detrimental to its role in the ecosystem; however, there has been little empirical basis for evaluating the sustainability of proposed regulations. The present study provides a novel tool for evaluating the sustainability of proposed harvest regulations.

Research methods: A spatially explicit population growth model, parameterized according to the Grogan and Landis (in prep) procedure, was developed using NetLogo software in order to assess the differences in the population growth trajectories predicted by a spatially explicit and implicit modeling approach. A field-based initial population was simulated in order to determine the mechanistic and predictive differences between these modeling approaches.

Relevance to conservation: The population growth model developed by Grogan and Landis (in prep) provides an empirical basis for evaluating the sustainability of harvest regulations but is limited by its non-spatial approach. This model, as an artifact of its non-spatial approach, predicts gradual population decline, whereas the new spatial model predicts gradual population growth. This has important implications for developing sustainable harvesting regulations.

MATRIX & EDGE EFFECT ON PHENOLOGY OF MOUNTAIN TREE SPECIES

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The landscape surrounding a forest (=the matrix type) can strongly influence ecological processes within the forest, and can mediate edge effects (the penetration of abiotic and biotic factors from outside forest into the forest). Edge effects (increased temperatures, moisture, wind, etc) can penetrate up to 5km inside forest and affect processes such as regeneration, decomposition, and nutrient cycling.

Transects and Plots methods for data collection have been used. Sampling phenology patterns at three distances (50m,100m and 500m)from the border of the forest.10 Individuals of each specie at each distance were chosen and immature Fruits and Mature fruits phenophases were collected.(Kaplin & Moernond, 2000; White Edwards 2001 and Chapman et al 2002).Data were analysed with microsoft Excel pivo table.

Matrix and Edge effect are more remarkable to the site with small size of surrounding plantation than to the site with big size of plantation. The site with small size of surround plantation, matrix and edge effect are observed at 50m, 100m and 500m. The sites with big size of surrounding plantation, the same effects are observed especially within 50m.

HEALTH OUTCOMES OF NATURAL RESOURCE ACCESS AND UTILIZATION

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Conservation problem or question: My presentation will quantitatively address the interface of biodiversity conservation and human health outcomes in rural Madagascar. Specifically, I will demonstrate the importance of bushmeat (any wildlife harvested for food) in preventing the incidence of anemia. Through modeling and simulation, I will demonstrate the risks of removing bushmeat from local people's diets through either conservation or self-depletion.

Research methods: I am using an interdisciplinary mixed methods approach. I am drawing from sociological field methods to conduct semi-structured interviews and participant observation. I am using public health field methods in a prospective cochort study, including clinical hemoglobin sampling, anthropometry, and illness recalls. Finally, I am employing multi-level mixed models as a statistical approach to longitudinal data analysis.

Relevance to conservation: This will be the first study to quantitatively connect clinical nutritional health outcomes to wildlife resource use. Although connections between biodiversity and health are increasingly common, they are often anecdotally referenced and not quantitatively studied. This research will provide empirical evidence of the nutritional value of biodiversity and the possible risks of either conservation or self-depletion.

FOOD AND FEEDING ECOLOGY OF *RHINOCEROS UNICORNIS* LINN.

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Conservation problem or question: Habitat degradation, anthropogenic pressure and weed invasion in grasslands are major problems for conservation of *Rhinoceros unicornis*. Meagre data on food plants, food preference and seasonal variation of food selection, dietary spectrum, crop raiding and soil licking behaviour are available. Knowledge of food and feeding habit of the species is essential to adopt better management and conservation strategy.

Research methods: Two methods were adopted: a) Vegetation sampling Quadrat method: For grassland (1 x 1 m), scrubland (5 x 5m) and woodland (10 x 10 m).
b) Food and feeding behaviour sampling. Scan animal sampling and Ad libitum sampling (Altman, 1974). Seasonal variation of time spent in feeding and food preference- selectivity, staple food and dietary spectrum of Indian rhino.

Relevance to conservation: Present study quantifies the food plant preference, seasonal variation and habitat selectivity of *Rhinoceros unicornis*. Since the species is concentrated in limited protected areas, there is an urgent need for habitat management and translocation. Knowledge of food plant, food selectivity and habitat will help conservationists to facilitate in habitat management practice for present population and translocated rhinos.

ON THE BACKS OF TURTLES: NEGOTIATING POLICY IN GALAPAGOS

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Conservation problem or question: As new participatory conservation policies are debated and applied in the Galapagos Islands, I use the islands' most iconic species—the giant tortoise—as a lens through which to examine how and to what effect these policies are reshaping relations among science, conservation, and development. This trans-disciplinary approach addresses the complex entanglements of multiple processes involved in sustainable environmental management.

Research methods: I use ethnographic and archival methods, including historical policy analysis, participant observation at tortoise breeding and tourism sites, and in-depth interviews across stakeholder groups. Foregrounding the tortoise analytically, I map the intersections of historical and contemporary processes in which tortoises are studied, commodified, exploited, and cared for to evaluate changing relations among science, conservation programs, and development practices.

Relevance to conservation: First, by mapping the socio-cultural landscape in which new conservation policies are debated and applied, this work will help inform locally relevant management policies. Second, by focusing on a key species, this research provides an innovative and broadly applicable framework for exploring how the diverse views, values, and practices of multiple stakeholders and processes come together to shape conservation outcomes.

ASSESSING AQUATIC INSECT DIVERSITY IN QUEENSLAND, AUSTRALIA

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Conservation problem or question: The diversity and abundance of aquatic insect families in an area depends on certain habitat characteristics. Many species of aquatic insects serve as regulators for monitoring the health of aquatic environments. This research project searches for overall diversity of aquatic insects in Northern Queensland, Australia as well as questions what environmental factors will affect aquatic insect diversity.

Research methods: An aquatic insect diversity survey was conducted at three fresh water sites in Northern Queensland, Australia. A dip and kick net were used to collect insects when sampling in stream pools and riffles. Specimens were preserved and later identified to family level. Statistical analyses were conducted to test species evenness between sites, pools and riffles, and insect community diversity.

Relevance to conservation: Freshwater macroinvertebrates are a diverse group of organisms, ranging from sponges and jellyfish to mussels and insects. Aquatic insects serve important roles in keeping and monitoring freshwater ecosystems health. This project assesses and compares the diversity of several aquatic sites and tests what variables affect the absence or abundance of aquatic insects.

LEMUR POPULATION SIZE IN FOREST EDGES AND INTERIOR

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Conservation problem or question: In Madagascar, a biodiversity hotspot, endemic flora and fauna lose habitat every day. Forest fragmentation increases the proportion of edges, or area exposed to surrounding nonforest. The edge habitat is affected by higher temperature, wind, and exploitation by people. We sought to test the effects of forest edges on lemur population size in the southeastern rainforest of Madagascar.

Research methods: Between June - August, 2008, we measured lemur population density in forest edge (within 500m of clear-cut area) and interior (6km from forest edge) habitats at Ranomafana National Park (RNP). We calculated densities for three species, *Eulemur rufus*, *E. rubriventer*, and *Avahi laniger*. We then used GIS operations to measure the area of forest edges from satellite images.

Relevance to conservation: We found that all three species had lower densities in the edge habitats, which is approximately 40% of the forest in RNP. Based on these estimates, we extrapolate the lemur population size in the park. The results suggest that as forests contract and the proportion of edge habitat increases, lemurs are forced to survive in suboptimal habitats.

ECOLOGICAL IMPACT OF AGRICULTURAL ABANDONMENT IN MEXICO

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Conservation problem or question: This project examines the links between the patterns of biodiversity within abandoned coffee fields and emigration, in a context of community

conserved areas, as expressions of the interaction of coupled human and natural systems. The primary objective is to address how the household decision to emigrate has impacted biodiversity of abandoned coffee plantations at various stages of succession.

Research methods: Vegetation measurements were taken in each abandoned coffee field utilizing a variation of the Gentry transect method. Each plot was examined with three 2x25m transects per elevation zone, in which all woody species (>2.5cm DBH) were documented. Social research consisted of structured and semi-structured interviews with community members, focused on factors that influenced the decision to abandon coffee fields.

Relevance to conservation: Oaxaca's Sierra Norte region has become known for its Indigenous Community Conserved Areas, but their direct impact on conservation is not well documented. Community decisions to conserve cloud forests are being augmented by household decisions to emigrate, expanding the effective areas of conservation. Research explores an emerging culture of community conservation as a response to and a result of emigration.

INSIGHT FROM LANDSCAPE ECOLOGY AID MARINE RESERVE ASSESSMENT

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Conservation problem or question: Distinguishing management effects from natural, spatial variability is a key consideration in assessing reserve efficacy. Here, we demonstrate how seascape heterogeneity, defined as the spatial configuration and composition of coral reef habitats, can mask our ability to detect reserve effects using existing assessment methods.

Research methods: We test the application of a landscape approach, utilizing advances in benthic habitat mapping and GIS techniques, to quantify this heterogeneity and improve existing reserve assessment methods. Landscape metrics were measured at over 80 patch reef sites in Glover's Reef Lagoon, Belize, within and outside the boundaries of a no-take marine reserve.

Relevance to conservation: By relating features of reef habitat heterogeneity to fish and coral communities, we demonstrate the application of a landscape framework to: (1) improve our ability to distinguish marine reserve effects from natural variability across the seascape; (2) guide future reserve placement; and (3) further our understanding of the influences of landscape structure on the coral community.

CARBON ISOTOPE EVIDENCE OF METHANE RECYCLING IN A COOL TEMPERATE BOG

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Conservation problem or question: My poster will describe my thesis research, reconstructing changes in water table depth and methane recycling in northern bogs after the last glacial maxima.

Research methods: I am using stable isotope proxies derived from sphagnum and vascular plant biomarkers. The different rooting depths and carbon sources leave different isotope signatures in characteristic leaf waxes from the different plants. These can be used to infer

changes in the water table and the amount of methane that is recycled under different precipitation regimes.

Relevance to conservation: This project has implications for predicting future emissions of methane from northern peatlands, and for predicting the composition of future bog plant communities in the face of climate change.

GREAT APE CONSERVATION, WAR & ENVIRONMENTAL PEACEMAKING

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Conservation problem or question: Today, violent armed conflicts are occurring in areas that are home to the greatest density of biodiversity throughout our globe. The effects of war are not only detrimental to local human communities but also to the surrounding environments, ecosystems, numerous species that live within these areas, and the conservation efforts aimed to protect the viability of the biodiversity.

Research methods: Research methods will include conducting content analysis of action plans, policies, reports, press releases and lectures given by top great ape conservation organizations, conducting interviews with staff members of conservation field work sites, conducting interviews with community members living around the Bwindi Impenetrable National Park, executing and designing impact assessments and conducting conservation policy analysis.

Relevance to conservation: The results of this study will hopefully be used by conservation practitioners and organizations as a signifier of the impact, positive, negative or neutral, of conservation efforts in areas of conflict. Additionally, this research may offer a new insight into the ability of conservationists to conduct more effective work by encouraging cooperation through environmental peacemaking.

CONSERVATION GENETICS OF L. POLYPHEMUS IN LONG ISLAND SOUND

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Conservation problem or question: The specific problem we addressed was to determine if the no-harvest zones, established by the CT-DEP, are located in areas that will conserve the genetic diversity of the Long Island Sound (LIS) horseshoe crab (*Limulus polyphemus*) population. We also performed a fine scale genetic analysis of the LIS horseshoe crab population to determine overall genetic health and population structure.

Research methods: DNA was isolated from 40 individuals collected at four geographically distinct locations within LIS (n=160). Each individual was analyzed to determine microsatellite genotype at 14 unlinked loci. The genotypes for the crabs were compared, and multiple statistical analyses were run to determine if there was subpopulation structure and assess the overall genetic health of the LIS population.

Relevance to conservation: Our results that indicate the LIS horseshoe crab population is genetically homogenous and substantially similar to other Mid-Atlantic and Southern New England populations, and is in stable genetic health. Therefore, the location of the established no-harvest zones is appropriate to conserve genetic diversity. We determined that a multi-state management strategy is needed to conserve the population in LIS.

CLIMATE AFFECTS THE DEMOGRAPHY OF A SUBALPINE POPULATION

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Conservation problem or question: Due to global climate change, the impact of climatic factors is intensifying on the population dynamics of most species. Organisms that occupy montane ecosystems are particularly vulnerable. To help protect vertebrate populations inhabiting increasingly variable environments, we investigate the role of environmental stochasticity and climate in driving the population dynamics and probability of extinction of a subalpine ground squirrel
population.

Research methods: Utilizing 19 years of demographic data, we employed multi-state CMR models implemented in Program MARK using RMark interface for estimating survival. Logistic and zero-truncated Poisson regression models were used for breeding probability and litter size analysis, respectively. Population dynamics and persistence were investigated with simulation-based age-structured matrix models, assuming a uniform independent and identically distributed environment and incorporating density-dependence.

Relevance to conservation: To mitigate the potential ecological consequences of climate change, it is critical to understand how the fluctuating environmental factors influence the demographic parameters, dynamics, and persistence of populations. Our results show strong evidence for the effect of climatic variables on demography. The simulations highlight the squirrel population's vulnerability to environmental perturbations and have conservation relevance to other montane species.

SPECIES INTERACTIONS DISRUPTED BY HABITAT DEGRADATION IN THE TUMBESIAN REGION, ECUADOR

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Conservation problem or question: Extensive areas of the tropics are undergoing small-scale livestock grazing and tree clearing. I will address the impact of these activities on the persistence and behavior of mixed species flocks, which are interspecific interactions important to the conservation of many tropical birds. I conducted this research in the Tumbesian region, one of the most threatened bioregions in the world.

Research methods: I compared the species composition, number of individuals, and behaviors of mixed species flocks of birds in arid scrub and tropical dry forest vegetation under two disturbance levels each in Machalilla National Park, Ecuador. I also compared flocking propensities, feeding rates and nesting success of many species across vegetation types and disturbance levels.

Relevance to conservation: I found that the structure and behavior of mixed species flocks is disrupted by small-scale livestock grazing and tree clearing by rural communities, especially in tropical dry forest vegetation. Since mixed species flocking plays an important role in the ecology of the majority of species in the region, maintaining these unique associations is of the utmost importance to their conservation.

TRIBAL RIGHTS AND TIGER CONSERVATION IN SOUTH INDIA

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Conservation problem or question: As concerns over the alarming disappearance of tigers mounts in India, measures are being taken to increase protection; simultaneously the government has heightened efforts to safeguard rights to land and livelihoods of historically marginalized tribal communities, including those who live in and around tiger habitats. This case study looks at the intersection of these conflicting concerns at Mudumalai, South India.

Research methods: This study involves semi-structured interviews, participant observation, and document analysis. Interviews and participant observation were primarily with tribal and non-tribal members of the local community, conservationists, tribal rights activists, and Forest Department employees.

Relevance to conservation: Successful conservation requires a synthesis of ecological knowledge, and a thorough understanding of social and cultural values that shape the future trajectory of current conservation efforts. This case study documents the conflicts, obstacles and potential solutions that present themselves in implementing successful conservation in places where the interests of diverse and large human populations are also at play.

ANTHROPOGENIC DISTURBANCE INCREASES THE PREVALENCE OF PATHOGENIC PROTOZOA IN WILD RODENT RESERVOIRS IN UGANDA

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Conservation problem or question: Our research shows that prevalence of pathogenic protozoa *Giardia sp*. and *Cryptosporidium sp.* increases along a gradient of anthropogenic habitat disturbance in Western Uganda. These pathogens have not only been classified as zoonotic, but also as neglected tropical pathogens. The increasing prevalence of these pathogens in densely populated regions is a consequence of habitat and biodiversity loss.

Research methods: Rodent fecal samples were screened using immunoflourescent antibody testing (IFA). Pathogen prevalence was quantified as the number of individuals expressing positive results (via 400X microscopic magnification detection) divided by the number of individuals sampled. *Giardia sp.* cysts and *Cryptosporidium sp.* oocysts were calculated by analyzing 10 microliters of 10 milliliter solution of 0.1 grams of feces from each sample.

Relevance to conservation: Our research examines the environmental consequences that arise from increasing anthropogenic habitat disturbance and addresses the potentially adverse health effects on the people living in these regions. Our results demonstrate the interplay between biodiversity loss and the increase in emerging zoonotic diseases. Addressing these public health concerns enables scientists to educate the world on the importance of conservation efforts.

ANTHROPOGENIC ENCROACHMENT OF TROPICAL RESERVES

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Conservation problem or question: Tropical protected areas represent the cornerstone of biodiversity conservation and ecosystem maintenance, yet forest loss has been recorded in and adjacent to them. Drivers of forest loss include national governance, population expansion, and road density. However, drivers may be disparate and idiosyncratic within and among countries. Here, we examine the relative effects of encroachment drivers in and around tropical reserves.

Research methods: Using several independently derived high-resolution remotely sensed land-cover data, we quantify forest encroachment in and 50km buffer distance, as well as their hypothesized drivers across at least 50 countries and among four regions. By building multi-level, multi-regional and multi-predictor path models, the extent of anthropogenic activities at two distinct administrative levels (reserve and nation) of forest encroachment are elucidated.

Relevance to conservation: Our findings will advance our understanding of the local, regional and global human encroachment pressures on tropical forest at protected areas across the tropics with the goal of developing more viable tropical forest policies.

BASELINES AND TEA LANDSCAPES IN THE NILGIRIS HILLS, INDIA

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Conservation problem or question: My research will help detail the trajectory of landscape changes and agriculture intensification in the Nilgiris Hills, as well as biodiversity transformations since the introduction of tea as a cash crop in the 19th Century. Establishing biodiversity baselines of an agriculture landscape is a novel approach to investigating how tea production has impacted local and regional landscapes and ecosystems.
Research methods: I am utilizing a combination of historical records (found both in Oxford as well as local Indian institutions) and stakeholder interviews to establish biodiversity and agricultural baselines for the tea plantation landscapes of the Nilgiris Hills, India. My aim is to integrate long-term accounts and information with modern data, making use of knowledge accumulated about these landscapes through time.

Relevance to conservation: The Nilgiris Hills are an important biodiversity landscape, especially for several endangered mammal species, yet much of the landscape has been altered by agriculture. Tea is an important crop to the South Indian economy, and so I hope my research will help inform the transition towards more wildlife and environmentally friendly tea production that concurrently secures local livelihoods.

HABITAT CHOICE BY BIRDS IN COFFEE AGROFORESTRY LANDSCAPES

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Conservation problem or question: Most of the evidence for shade coffee as an alternative habitat for birds comes from surveys alone. Information on habitat choice, reproduction, and survival in modified landscapes is necessary to determine if sustainable populations can be maintained in agrofroestry landscapes. Human modifications to tropical forests can result in ecological traps or population sinks.

Research methods: The methods used are behavioral observation, nest monitoring, mark-recapture, and landscape analysis using GIS software.

Relevance to conservation: My work shows that resident species found in shade coffee can suffer from population declines not evident from survey information. The conservation of common species in agricultural landscapes can be aided by further study of habitat choice and landscape patterns

WHAT TYPE OF CORRIDOR IS SUITABLE FOR ECOLOGICAL NETWORK?

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Conservation problem or question: I will present about the ecological network of habitats in urban areas. Urbanization causes the destruction and fragmentation of habitats, leading the loss of biodiversity. Ecological network is considered to be an important tool for conservation of biodiversity. In this study, I examined whether the condition of corridors which connect isolated habitats affects the effects of habitat connectivity.

Research methods: There are mainly two parts as a method in my study. The first one is a field-observation method. In this study, I researched birds' distribution and structure of vegetation in the habitats. The second one is to analyze the satellite images with a geographic information system (GIS) to reveal the vegetation cover of the whole study area.

Relevance to conservation: The condition of corridors affected the distribution of birds in the surrounded habitats of each corridor. The corridor consisted of a tree layer with understory vegetation led more bird species observed in the surrounded habitats than that of only a tree layer. This result contributes to more effective planning for conservation of habitats in urban areas.

SUSTAINABILITY OF WILDLIFE IN LOGGING CONCESSIONS

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Conservation problem or question: The purpose of this study is to reduce threats to wildlife and encourage sustainable management practices in the Nouabale Ndoki National Park buffer zone with the involvement of local people.

Research methods: Data have been collected in two villages located in two logging concessions adjacent to national parks. Methods, including semi-structured in-depth interviews, direct observation, written documents, focus groups and key informants to collect data about traditional institutions, formal institutions, and evolution of property rights, access to forest resources, infrastructure, social structures and regulations.

Relevance to conservation: This study will improve understanding of relationships between institutional design, livelihoods, destructive activities, and bushmeat sustainability. It will analyze causes of poor participation of local communities in collaborative wildlife management and/or collective actions. It will also improve communication between communities, conservation NGOs, private companies and Government.

CULTURAL SEASCAPES AND MARINE PROTECTION PLANNING IN NEWFOUNDLAND

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Conservation problem or question: It addresses the problem of marine protected area planning and asks what role cultural significance may play. The idea of a cultural landscape is applied to the marine realm by defining a cultural seascape. It asks what marine sites hold cultural significance, is their protection valued, can it benefit biodiversity, and if it can help with community engagement.

Research methods: Methods involve key informant interviews and community focus groups. Key informant interviews are done with two government agencies, four active NGOs, the local university, and managers at each community site. The sites consist of the two established MPA locations and two locations that have focused on cultural heritage development.

Relevance to conservation: My results provide a new tool for defining marine space and engaging with local communities. Bringing together local fishers knowledge and planning policies under the common aim of safeguarding historic fishing sites. Marine conservation is often challenged by the 'out of sight, out of mind' attitude; by defining and acknowledging human history and culture the marine environment becomes more visible.

PRIORITIZING ISLANDS GLOBALLY FOR INVASIVE MAMMAL REMOVAL

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Conservation problem or question: Islands contain significant avian biodiversity, endemism, and threat, making them high priorities for conservation. Invasive animals are a leading threat to island birds, and eradication is a powerful conservation tool. However, the conservation benefits and economic costs of eradications vary widely across islands. I present a strategy for prioritizing islands to maximize bird conservation and the cost-effectiveness of eradication projects.

Research methods: I used BirdLife International's database to identify insular bird species facing threats from invasive animals, and determined each species' threat status, population size, and impact from invasives. I estimated eradication costs using data on island physiography, human population, and invader type, and used mathematical optimization techniques to select priority islands for eradications based on a variety of conservation goals.

Relevance to conservation: Invasive species are a leading threat to island biodiversity, yet my project is the first to assess the global scope and distribution of this threat. Funds for eradications, like all conservation funds, are limited, so thoughtful planning is needed to identify top priorities. I demonstrate how quantifying both benefits and costs can aid decision-making and increase cost-effectiveness of conservation actions.

LIFE ON THE EDGE: PROPITHECUS COQUERELI IN NW MADAGASCAR

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Conservation problem or question: We examined how edge effects impacted *Propithecus coquereli*, an endangered lemur species, in Madagascar. Edge effects are the interactions of non-living and/or living conditions between two adjacent habitats separated by an abrupt boundary. This research is important for lemurs in Madagascar where 90% of the forest has been lost since the arrival of humans on the island.

Research methods: We compared range size, activity, and feeding ecology in groups of *Propithecus coquereli* living near a forest edge versus a forest interior over 14-months in Ankarafantsika National Park, NW Madagascar. We examined the depth of edge influence and edge magnitude of abiotic and biotic variables in relation to the distribution of groups in this area.

Relevance to conservation: Only a few studies have examined the impact of edges on primates. This study will highlight how habitat loss and edge effects can impact lemur behaviour. If lemur behavioural ecology is influenced by the forest edge, then the amount of edge that exists in a protected area must be taken into account when assessing park management and conservation strategies.

DISCOVERING NEW YORK'S FORGOTTEN APPLE POLLINATORS

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Conservation problem or question: Future pollinator shortages are projected if global demand for pollination continues to increase while pollinator health and abundance continue to decline. Conserving sustainable pollination services requires agro-ecosystems be managed to protect wild pollinators. Too little is known about these "forgotten" pollinators, even for crops entirely dependent on insect pollination, like apple, to develop management schemes that would protect their services.

Research methods: In 2009 and 2010, New York apple orchards were net surveyed for bee diversity and abundance. Effects of orchard size, honey bee rentals, spray regime and floral resources on bee diversity and abundance were tested. In 2010, per-visit effectiveness of honey bees and native Andrena were compared by recording number of pollen grains deposited each visit to a virgin flower.

Relevance to conservation: Wild bees were abundant and diverse. Relative to honey bees, Andrena was an effective apple pollinator. A marginally significant size effect on wild bee abundance likely reflected the importance of natural habitat to sustain wild pollination services. This study supports the importance of wild bees in apple pollination and protection of natural edge habitat for conserving wild pollination services.

DISTRIBUTION AND PRIORITY AREAS FOR COLOMBIAN SPIDER MONKEYS

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Conservation problem or question: Colombia harbours three species of spider monkeys. Extreme habitat loss and hunting pressure have resulted in IUCN classifications of Endangered and Critically Endangered for these species. Knowledge of their distribution is critical in order to establish conservation strategies and to prioritise further research. I modelled the distribution of all three species to propose areas where conservation efforts should be focused.

Research methods: I modelled the distribution of the genus Ateles in Colombia using Genetic Algorithms for Rule set Prediction (GARP) incorporated into a Geographic Information System (GIS) to perform Gap analysis. The combination of GIS and GARP analysis is useful as it enables the connection of distributional information to land use and protection to identify gaps and priorities for conservation action.

Relevance to conservation: In this research I found that only 18.8% of the distribution area of *Ateles hybridus* is remains and less than 0.7% of this area is being protected by the Protected Areas System in Colombia. I also identified priority conservation areas for Colombian spider monkeys. These areas are characterised by their (relatively) large size, degree of connectivity and "low" human-related pressures.

ANALYSIS OF ATTITUDES TOWARD EURASIAN LYNX IN SLOVENIA

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Conservation problem or question: For successful conservation of large carnivores a support of public and key interest groups is required. Large carnivores management is often more socio-political in nature than biological, as they are controversial species that awake many opposing feelings. The presentation is about factors that influence public and hunters' attitudes towards Eurasian lynx in Slovenia.

Research methods: A survey research was conducted in 2007-2008 in a core lynx habitat area in Slovenia on public attitudes and on hunters. A sample of total 705 questionnaires was analyzed using multivariate statistic methods (primary component analysis, multiple regression method and analysis of indexes of fear, knowledge and attitudes). I am currently writing a thesis upon the results.

Relevance to conservation: Eurasian lynx was exterminated in Slovenia in early 20th century and was reintroduced in 1973 to Dinaric mountains. The reintroduced population managed to grow, but today numbers are again decreasing. Possible reasons are genetic, poaching and habitat fragmentation. For successful future management of the species, the aspect of human dimensions is necessary to include.

CLOSING THE GAP: PREDICTING AND PREVENTING SPECIES DECLINES

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Conservation problem or question: This study addresses the problem of amphibian declines. I use an emerging machine-learning framework (Random Forests) to integrate intrinsic (host life-history and ecological traits) and extrinsic threats (invasive species, disease, habitat destruction) in order predict declining species and, more importantly, identify the factors that endanger some species but not others. This illuminates paths for conservation action at the species level.

Research methods: In this study, I integrated information from a range of data domains. Underlying data were compiled into a database, species distribution modelling methods were implemented on these and similar data to provide spatially explicit measures of threats, macro-analysis techniques were used to compile information on species traits and ecology and machine-learning classifiers were used to generate final results.

Relevance to conservation: In extinction risk studies, it is insufficient to conclude that species with narrow ranges or small clutch sizes require prioritized protection. To improve

conservation outcomes, we also need to know which threats interact with these traits to endanger some species but not others. I illuminate methods to achieve this goal, closing the gap between prediction and prevention of species declines.

CONSERVATION OF A SOUTH AFRICAN SAGE USING BIOTECHNOLOGY

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Conservation problem or question: *Salvia stenophylla* (a South African Sage) is increasingly being used for formulation of pharmaceutical and cosmeceutical products because of its essential oils. These industries largely depend on the natural populations for raw materials. The plant is thus threatened with over-harvesting as a consequent of over-commercialization. This study seeks to reduce wild-harvesting and improve essential oil quality from *S. stenophylla*.

Research methods: The study employs tissue culture techniques to formulate efficient propagation for medicinal plant. This was followed by heterologous gene expression to alter the yield and quality of the active compounds produced by the plant. Transformation was done using *Agrobacterium tumafaciens*. GCMS techniques were used to assess the in compound profile and quantity.
Relevance to conservation: The study showed that tissue culture can provide a more efficient alternative source of essential oils with potential for industrial manipulation and thus reduce pressure on natural stands which tend to grow slowly. Genetic manipulation resulted plants with increase α-bisabolol production giving transformed plants superior processing value and reducing the amount of plant material needed per unit product.

CONSERVATION LAND-USE PLANNING IN THE DEM. REP. CONGO (DRC)

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Conservation problem or question: The goal of my research is to understand how patterns of land-use change are contributing to increased vulnerability of less-disturbed forest blocks and connectivity areas in the Maringa-Lopori-Wamba (MLW) Landscape in the Democratic Republic of the Congo (DRC), and to evaluate how land-use plans might be developed to balance the competing needs of conservation and local livelihood strategies.

Research methods: 1) Analyze patterns of agricultural expansion in the landscape over the past 15-20 years through analysis of satellite imagery; 2) Employ threat-based multi-criteria GIS modeling and wildlife corridor modeling to identify locations of conservation priority in the landscape; 3) Engage in participatory mapping with local communities to define village agricultural limits for future land-use planning and management.

Relevance to conservation: The MLW Landscape was identified in 2002 by the Congo Basin Forest Partnership as an area of high conservation priority, especially because it contains the endangered bonobo ape. The DRC government has recently acknowledged the need for a land-use planning strategy and has recognized this work as a pilot model for future planning for the conservation of DRC's forests.

STATUS, DISTRIBUTION & CONSERVATION OF HISPID HARE,NE-INDIA

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Conservation problem or question: I will present about status, distribution and conservation of Hispid hare (*Caprolagus hispidus*) in North Bank Landscape, NE-India. Hispid hare is highly endangered Lagomorph, inhabits the tall grasslands and occurs only in a few protected areas in India and Napal. The species is elusive, poorly known, facing high risk of extinction and seeking urgent conservation action for its future survival.

Research methods: Transect and interview survey was followed. 50X2m belt transects were laid randomly in grasslands within study sites soon after early burning in search of both direct and indirect (pellet) evidence. Interview survey was carried out with ground level forest staff and fringe villagers following a standard datasheet. Questionnaires were designed to be highly visual with photographs and pellet sample.

Relevance to conservation: Hispid hare is critically endangered, elusive and data deficient. Findings of this study will help to broaden understanding about this poorly known species and its distribution. Information on threat factors identified during this study will help park authorities to strengthen and improve their protection mechanism and rectify the existing habitat management practices which are biased towards large and charismatic species.

GENETIC DIVERSITY OF RHIZOBIA NODULATING *ACACIA PYCNATHA*

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Conservation problem or question: The aim was to determine if rhizobial symbionts of invasive *A. pycnantha* in South Africa follow the co-introduction or host jumping hypothesis. We also determine whether *A. pycnantha*-rhizobial association is specific or general and how that pertains to native geographic source of invasive populations. We also determine if lateral gene tranfer occurs between the native rhizobia and South African rhizobia.

Research methods: Two nuclear genes (16S rRNa and the 16S-23S rDNA) regions of rhizobia isolated from *Acacia pycnantha* nodules collected from Australia (native provenance) and South Africa (invaded region) will be sequenced to bacteria nodulating this species. Two nodulation genes will also be sequenced and phylogenetic trees constructed in order to infer lateral gene transfer.

Relevance to conservation: The study will gives insights into what nodulates invasive Acacia pycnantha in South Africa. Lateral gene transfer indicates the presence of Australian rhizobia in South Africa thus highlights the ecological risk of introducing exotic mutualists in reafforestation projects i.e exotic mutualists support the growth of introduced or invasive species at the expense of local flora thus promoting plant invasions.

EXTRACTIVISM AS A LIVELIHOOD OPTION IN MULTIPLE-USE RESERVES

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Conservation problem or question: Multiple-use reserves are central to the conservation of tropical forests but it is unclear to what extent non-timber plant products contribute to the subsistence and cash economies of reserve residents. This study examines the diversity of livelihood options adopted by residents of two contiguous Amazonian multiple-use forest reserves, and seeks to explain those choices within their biological and economic contexts.

Research methods: Trained reserve residents in 26 communities each conducted weekly surveys in 10 households for up to three years. They recorded spatial, temporal, volumetric and economic details of all fishing, extractivist and agricultural activities. These surveys were complemented by one-off interviews detailing the demographics, material development and accessibility of resources and markets of each household and community.

Relevance to conservation: Understanding spatial and temporal patterns of resource use within reserves is critical in helping managers to develop extractive activities within dynamic demographic and economic scenarios. If significant community-level heterogeneity exists in engagement in extractivism, it implies a degree of context-dependency for the implementation of payments for ecosystem services and other development programs within multiple-use protected areas.

GEOREFERENCING MARINE SPECIMENS FROM NATURAL HISTORY MUSEUMS

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Conservation problem or question: Specimens in natural history museums play a key role in our understanding of biodiversity and how to preserve it, and the value of those records increases when they are georeferenced. We will address the issue of uncertainty and type localities when georeferencing marine specimens from natural history museums, following the standard protocols that are currently available.

Research methods: A comparison of the levels of uncertainty and niche-based distribution model outputs that result from georeferencing marine specimens using the standard published protocols, and an approach that considers marine-specific environmental layers in the georeferencing process.

Relevance to conservation: Considering that information on the geographic distribution of species and the variables that determine those patterns is one of the fundamental tools in conservation biology, our results could provide the knowledge necessary to potentially decrease the uncertainty of the data that would be used as an input to create niche distribution models and future conservation planning.

DO TROPHY HUNTERS VALUE RARITY?

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Conservation problem or question: Humans value rarity, and this may drive further exploitation of threatened species. This phenomenon, termed the anthropogenic Allee effect, has been described in a number of human activities. I investigated this in the context of the trophy hunting industry in Africa, specifically looking at whether changes in threat level were associated with changes in trophy price.

Research methods: I updated a large database of prices for trophy hunted species in several African countries (mainly by searching hunting operators' websites). I analysed the database to investigate the factors, including rarity (as measured by IUCN status), that might have influenced changes in price between 2004 and 2010.

Relevance to conservation: The results suggest that (for bovids at least), change in IUCN status was significantly associated with change in price. Taxa that became more threatened had larger increases in price than those that did not. If badly managed this could lead to

over-exploitation of threatened species; if well managed it could help raise money for their conservation.

BIOMASS CERTIFICATION AND LANDSCAPE RESTORATION IN NAMIBIA

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Conservation problem or question: Bush encroachment, the increase in density of woody plants, is a major environmental challenge in Namibia, affecting 14% of the country's land mass and causing N$700 million in annual losses to the economy. Habitat restoration is not cost-effective without adding value to the removed biomass. This poster addresses the potential for certification to create economic incentives to initiate landscape restoration.

Research methods: My research focuses on the effectiveness of certification schemes at encouraging sustainable management practices, fostering access to markets, and attracting participation from stakeholders. Comparative analysis of several schemes was the primary basis of the paper. This was based on extensive literature review, analysis of data available through certification bodies, and interviews with certification experts, industry representatives and landowners.

Relevance to conservation: Market-based incentives have become increasingly prevalent in conservation. The development of a biomass industry using woody plants is an opportunity to drive restoration at the landscape level, improving conditions for biodiversity and promoting a renewable energy source. This is especially relevant to Namibia, but also applicable to other regions where invasive species removal and management is being considered.

FLOW AND MACROINVERTEBRATE COMUNITIES AT HIGH-ANDEAN STREAMS

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Conservation problem or question: High-altitude Andean aquatic ecosystems are one of the less studied ecosystems of the world. These ecosystems provide water for all the major cities located at the Andean Ranges and are highly threatened. With this study we want to know how hydrology structures aquatic macroinvertebrate communities and the effects of water diversion on stream biota, at a high altitude Andean stream.

Research methods: We studied a stream in two seasons (dry and wet, two months at each season). We chose two reaches, one pristine and one with water diversion for trout culture. Stream flow was followed every 10 minutes using loggers. We quantitatively sampled the benthic (at high and low flow microhabitats separately) and drifting macroinvertebrates every 5 days at each season.

Relevance to conservation: Knowing the structure and the role of the natural instability of flow structuring aquatic communities at Andean streams is of primary importance because human pressures are increasing at these ecosystems (water supply), producing biodiversity loss. Also, the effects of climate change on Andean Ranges, will affect these ecosystems (glacier reductions will also alter hydrology) and the biodiversity they shelter.

SOCIAL CONSEQUENCES OF HABITAT FRAGMENTATION IN BLUE MONKEYS

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Conservation problem or question: We report ways in which habitat fragmentation has influenced social organization in forest living monkeys. Fragmentation decreased the home range size of one group, which soon fissioned into three daughter groups. These fissions separated frequent social partners and affected rates of affiliative grooming behavior, suggesting that a shift to fragmented habitat may be associated with unexpected changes in social behavior.

Research methods: This study draws on 30 years of research on a population of wild blue monkeys in the Kakamega Forest, Kenya. We have group composition records for six fissions that have occurred in our study population, including two immediately following habitat fragmentation. Focal animal data allows a comparison of grooming partners and frequencies before and after the two fission events.

Relevance to conservation: Many animal species are facing high rates anthropogenic habitat loss and fragmentation, however, little research has been done to quantify the short-term effects of these processes on behavior and social structure. Research on species who have undergone habitat fragmentation can be used to develop and evaluate conservation strategies for other species facing similar threats.

PHYLOGEOGRAPHY OF BROWN SPIDER MONKEYS

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Conservation problem or question: This project evaluates the influence of the Magdalena River as a barrier to gene flow between populations on different riversides (distinct pelage coloration) of brown spider monkeys in Colombia, one of the 25 most critically endangered primates. Additionally it evaluates the phylogenetic relationships and the degree of genetic differentiation of its geographically isolated populations.

Research methods: I examined mitochondrial Dloop and COII sequence variation from different populations on different banks of the Magdalena River to evaluate their phylogenetic relationships. I determined if closely related haplotypes could be explained by gene flow or incomplete lineage sorting and if patterns of genetic differentiation could be explained by IBD. I also conducted an AMOVA and assessed past demographic changes.

Relevance to conservation: This project will provide valuable information for the conservation of the genetic diversity of this threatened species and for designing and implementing a successful large scale conservation action plan towards the protection of its remaining populations. It will also give evidence for the role of rivers as evolutionary and biogeographical processes that maintain species diversity and shape genetic diversity.

EXAMINING FOREST PARCELIZATION PATTERNS IN EASTERN NEW YORK

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Conservation problem or question: In the last thirty years the number of private forest owners in the US has increased significantly, while the total amount of forestland has increased only slightly. This process of parcelization creates a conservation challenge through physical and ownership fragmentation of forestland, which significantly impedes the sustainability and function of forested landscapes and can lead to increasing loss of forestland.

Research methods: This project addresses the problem of identifying the extent and patterns of forest parcelization in a priority conservation landscape of eastern New York. Using a GIS analysis of social and landcover data I will identify the changes in property sizes and distribution, property classification and development, and spatial distribution of forested properties in a three county area.

Relevance to conservation: More owners controlling increasingly smaller parcels results in increased forest fragmentation, restricted management options for landowners, reduced ecosystem services for society, and changes in habitat conservation values. The success of conservation efforts depends on understanding the extent and causes of this change while developing alternative strategies for preservation and supporting sustainable management activities on smaller parcels.

CROSS-SHELF CONNECTIVITY IN BELIZE

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Conservation problem or question: The project addresses the importance of the different habitats used by commercially important fish species during their different life stage, specifically from juvenile to adulthood. The main focus is to show that these target species depend on certain habitats before making it to the reefs as adults, mainly mangroves, sea grass beds and shallow reefs.

Research methods: The methods used were visual surveys and collection of samples for stable isotopes and laser ablation of otoliths. The visual surveys were 30x2 belt transects at four different habitats, coastal, lagoonal reefs, barrier reef and oceanic atoll. Samples were collected using a variety of methods, line fishing, traps and nets, at all locations.

Relevance to conservation: Belize's fisheries industry is quite small and little importance is given to the habitats commercially important fish species use during early life stages. This study not only show abundance of these species at the different location, but also their sizes. It further strengthens our results with the δC and δN signatures from the stable isotope ratio.

HABITAT UTILIZATION PATTERN OF ASIAN ELEPHANT IN MNP, INDIA

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Conservation problem or question: Shrinkage of Grassland in Manas National Park (MNP) threatened Asian elephant as it depends on Grassland, woodland, riparian forest as habitat due to invasion of the woodland into grasslands. Hence present study was done on habitat utilisation pattern of Asian elephant on wet grassland, tall grassland, semi evergreen forest, riparian forest, mixed deciduous forest, evergreen forest and short grassland.

Research methods: Data on direct sighting of Asian elephant with number in different habitats, GPS reading of sighting location, time were collected for enumerating habitat utilisation pattern. Dawn to dusk sampling of Asian elephant using scan animal and Ad. Libitum sampling (Altman, 1974) along with seasonal variation of utilising different habitats were done to record habitat utilisation and selectivity.

Relevance to conservation: The present study reveals that Asian elephant utilised wet grassland highest followed by tall grassland, semi evergreen forest, riparian forest, mixed deciduous forest, evergreen forest and short grassland; broadly uses grassland more than woodland. Hence management of grassland should be topmost management priority for Asian elephant Survival in Manas National Park reducing human elephant conflict.

METAPOPULATION CAPACITY WITH SELF-COLONIZATION AT BIG SCALES

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Conservation problem or question: Habitat fragmentation is a leading threat for our global future. Methods to quantify fragmentation would be especially useful in conservation planning. Using the principles of metapopulation theory, we updated and devised two methods: modified metapopulation capacity and area abandonment rate. Our version of metapopulation capacity includes a self-colonization component that counteracts the issue metapopulation theory experiences with single large patches.

Research methods: We use a large dataset on bird species' ranges and landscape characteristics for four tropical forest locations. Integrating area and connectivity to make estimates about fragmented landscapes, Hanski and Ovaskainen (2000) introduced the concept of metapopulation capacity as a way of assessing the ability of a spatially-explicit landscape to support a species. We modify this for large scale application.

Relevance to conservation: Modified metapopulation capacity highlights which patches best allow for species persistence, based on size and connectivity to surrounding patches. Area abandonment rate method measures individual patch's support to the remaining landscape, for ranking according to contribution. Using satellite maps of now deforested habitat, we generated optimal restoration sequences by ranking each historically forested land's potential contribution.

CONSERVATION OF AUTOCHTHONOUS NOBLE CRAYFISH POPULATIONS

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Conservation problem or question: The noble crayfish is a highly threatened European species. Besides of habitat deterioration, alien crayfish and crayfish plague are the major threats. We want to identify autochthonous and genetically diverse populations to serve as donor populations for a restocking program. The integration of a genetic assessment within a regional conservation initiative serves as a model and demonstration project.

Research methods: To reconstruct the phylogeographical pattern and to identify autochthonous noble crayfish populations, we analyzed partial sequences of two mitochondrial genes (16s rRNA, COI) from specimens of the main European river basins. A microsatellite analysis was carried out to study the diversity within and between populations.

Relevance to conservation: Restocking measurements form an essential part in many species conservation programs. However, restocking measurements are often conducted without taking into account genetic differences between populations. As an example for best practice we want to: 1.identify autochthonous crayfish stocks, because they are locally adapted and represent the diversity between populations. 2.identify most diverse populations to support adaptability and long-term survival.

ADVANCES IN PVA MODELING USING CAPTURE RECAPTURE DATA

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Conservation problem or question: Population viability analysis (PVA) has been a centerpiece of conservation biology since the field was in its infancy. However, PVA analysis has been criticized for its lack of rigor, potential to mislead policymakers, and difficulty in treating uncertainty. I use a case study to illustrate the benefits of Bayesian PVA models for incorporating parameter uncertainty and enhancing scientific rigor.

Research methods: I used a 10-year capture history dataset to evaluate the posterior probability distribution of several key demographic parameters for a rare turtle (the bog turtle, *Glyptemys muhlenbergii*). I then performed a simple Population viability analysis by repeatedly sampling from these posterior distributions. Bayesian analysis was performed using the BUGS (Bayesian inference Using Gibbs Sampling) programming language.

Relevance to conservation: Capture recapture methods are commonly used by conservation scientists to estimate demographic parameters for threatened species. However, long term capture history datasets can be difficult to analyze, and statistical methods that can more fully exploit these powerful datasets have only recently become available. My study illustrates how Bayesian analysis can be used to achieve rigorous estimates of demographic rates.

IMPACT OF HABITAT FRAGMENTATION ON LEMURS IN NW MADAGASCAR

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Conservation problem or question: I will address the issue of landscape level habitat fragmentation and its impact on primate conservation. My specific focus is on how habitat fragmentation impacts the abundance and richness of lemur species within a landscape. This topic is central to primate conservation because primate habitat is becoming increasingly fragmented, especially in Madagascar.

Research methods: I will survey a 1000ha landscape containing 10 fragments of deciduous dry forest ranging from 1-100ha in NW Madagascar. I will determine lemur species richness and abundance using line transects surveys. I will use GIS to determine the level of habitat fragmentation, habitat loss, and the composition and configuration of the fragments within the landscape.

Relevance to conservation: Habitat fragmentation is a major issue impacting most primate species. Madagascar is losing forest at a dramatic rate resulting in lemur species habitat fragmentation and loss. Many lemur species are red listed due to loss of habitat. No studies on lemurs have focussed on how habitat fragmentation and habitat loss has impacted primate species at the landscape level.

SOIL & WATER CONSERVATION PROJECTS IN THE WESTERN SAHEL

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Conservation problem or question: I investigate the relationship between the presence of local soil and water conservation projects and areas where vegetation has increased beyond what can be explained by an increase in rainfall.

Research methods: Utilizing climate data such as rainfall from precipitation stations and Normalized Difference Vegetation Index, we created maps of the prevalence and interaction of vegetation and rainfall in the Western Sahel. Data on local soil and water conservation projects is overlaid on these maps to conduct spatial and statistical analyses of the association between rain, vegetation, and soil & water conservation.

Relevance to conservation: The Sahel, my regional focus, is the site of natural disasters that have been debated for decades. My results could contribute to the research that investigates the positive impacts of anthropogenic activity on the Sahelian environment. These findings add to the research linking the local use of traditional agricultural practices and conservation in mitigating larger-scale environmental degradation of the Sahel.

A PUBLIC HEALTH APPROACH TO PRIMATE CONSERVATION

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Conservation problem or question: My research focuses on awareness of the public health risks associated with the bushmeat trade in Sierra Leone. Handling bushmeat, particularly ape meat, facilitates zoonosis. This project aims to introduce a conservation education program that instructs rural communities in Central Sierra Leone about the health risks of bushmeat in an effort to promote conservation and prevent emergence of infectious diseases.

Research methods: I am partnering with the Tacugama Chimpanzee Sanctuary in Freetown, Sierra Leone. My methods involve surveying 2-3 selected communities on their level of engagement in bushmeat hunting and awareness of disease transmission risk. We will use the information accordingly to determine an effective conservation education strategy. This project will take place between May-July 2010.

Relevance to conservation: The results from my project will offer a new interdisciplinary approach to community conservation that may address two issues: the bushmeat industry and emerging infectious disease. By assessing communities' awareness and perceptions of zoonotic risk associated with bushmeat, public health experts can devise strategies to alter behaviors and minimize transmission events that could, as a result, yield improved conservation outcomes.

A SEMIPARAMETRIC METHOD FOR ALLEE EFFECT THRESHOLD DETECTION

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Conservation problem or question: Determining the presence of Allee effect thresholds (quasi-extinction population size) among harvested species is an important current research topic. These thresholds play a considerable role in conservation science, because their presence affect how we identify extinction probabilities, estimate risk of invasion by introduced species, determine optimum harvesting rates and robust restoration programs for overexploited species.

Research methods: Allee effect thresholds assessed with parametric models may fail when several, statistically-indistinguishable parametric models, produce contradicting results. In light of this, we developed a semiparametric Bayesian method to test for the presence of thresholds in stock-recruitment data. We validate this method using simulated data, and apply it to several empirical datasets.

Relevance to conservation: We only found few cases (e.g.,Herrings) in which Allee effect thresholds were detected. These results suggest that Allee effects are not reasonable explanations for the collapse of fisheries and their rebuilding failure. Alternative explanations for failures to rebuild following a collapse are therefore more likely, such as replacement by competitors, ecological regime shifts, or evolution in over-exploited populations.

SPERM METABOLISM IN THE TERATOSPERMIC CAT AND CHEETAH

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Conservation problem or question: My research focuses on understanding the physiological basis of teratospermia (ejaculation of >60% structurally-abnormal spermatozoa). This condition is linked to reduced genetic diversity and occurs in certain domestic cats and many endangered felids, including the cheetah. Even apparently normal spermatozoa from teratospermic ejaculates have reduced fertilizing ability, but nothing is known about the metabolic function of these cells.

Research methods: My research compares sperm metabolic function in ejaculates from the teratospermic domestic cat and cheetah to normospermic domestic cat counterparts. Specifically, I am using enzyme-linked fluorescence assays to evaluate rates of substrate utilization and metabolic inhibitors to identify pathways of sperm energy production. This comparative approach allows me to distinguish species differences from those associated with the teratospermic phenotype.

Relevance to conservation: These findings will help increase the success of reproductive technologies that are critical to improving reproduction and preserving genetic diversity in small populations of endangered species. Understanding sperm energy production is important for optimizing medium composition for artificial insemination, in vitro fertilization and cryopreservation. These results also provide the first objective, field-friendly indicator of gamete function in felids.

FOAL SURVIVAL IN GREVY'S ZEBRA (*EQUUS GREVYI*)

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Conservation problem or question: Grevy's zebra is an endangered species that has experienced drastic population declines in the past few decades. Foal mortality in this species is believed to be high, and focusing efforts on the foal life stage is an important

conservation strategy. The current project aims to determine rates of foal survival and investigates causes of foal mortality in Grevy's zebra.

Research methods: Mark-resight data collected between 2003 and 2010 will be used with MARK software to determine rates of foal survival. Other factors such as rainfall, habitat type, grass nutrient content, and predator occurrence will be incorporated into this analysis in order to determine important causes of mortality.

Relevance to conservation: The information from this study can be used to develop conservation strategies that will enhance population recruitment and ultimately facilitate growth of Grevy's zebra populations. In addition, the study site is an important stronghold for the species, providing a critical breeding and birthing area. Focusing on this population will be important for the long-term survival of the species.

LANDSCAPE SCALE PATTERNS OF BIODIVERSITY IN BANGLADESH

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Conservation problem or question: The biodiversity in tropics is mainly threatened by land use changes. The biodiversity conservation in tropical forest ecosystems of Bangladesh faces significant pressures of land use changes from the fast increasing human population. I test the hypothesis that species distribution and richness patterns of plant species (alpha-diversity) as well as biological heterogeneity (beta-diversity) vary with respect to land use changes.

Research methods: I apply representative, rapid, unbiased and systematic sampling procedure on plant species diversity combined with information on land uses. I use GIS technologies to locate the sampling plots throughout the study area based on different land uses and land cover classes. I will use multivariate statistics and geostatistics to the gathered bioinformation to identify the major drivers of biodiversity loss.

Relevance to conservation: The outcomes of my study will set a baseline information relating to biodiversity conservation and land use changes which will improve the implementation effectiveness of conservation efforts. The study will find out approaches for future comparisons and identifying major drivers for biodiversity within specific landscapes. It may make a fruitful plan which will ensure the sustainable use of forest biodiversity.

CONSERVATION OF SOME COSTA RICAN MEDICINAL PLANTS

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Conservation problem or question: I will be addressing the biological and cultural aspects of conserving endangered or locally threatened medicinal plant species in Latin America. I will be conducting my research, which has both biological and social/institutional components, at Semillas Sagradas, a conservation-based medicinal garden in north central Costa Rica, that was begun by Dr. Michael Balick at the New York Botanical Garden.

Research methods: I will be simulating leaf harvests on the commonly used woody shrub, *Hamelia patens* (Rubiaceae) to determine sustainable harvest limits. I will also be assessing the role of certain types of organizations, such as botanical gardens, in the conservation of ethnobotanical knowledge and of endangered medicinal plant species.

Relevance to conservation: My results will be relevant to the field of conservation by illuminating some of the biological aspects of wild medicinal plant collection as well as the role of institutions in this type and other types of conservation processes for biocultural diversity.

FUTURE DISTRIBUTION MODELS FOR ANDEAN SPECIES IN COLOMBIA

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Conservation problem or question: Climate change will have strong impacts on species distributions of many taxa in the world. Our aim was to identify whether is possible predict patterns in contraction/expansion of geographic ranges in Andean species in several climate change scenarios or in other terms why some species are more threatened by climate change effects than others in the Andean region

Research methods: We compiled occurrence data from several sources including recent fieldwork in some areas. We used environmental niche models approaches to predict changes in distribution of eight Andean species in Colombia with several climatic future scenarios. We predicted the future potential distribution using three climatic scenarios models in three different times

Relevance to conservation: Our results shown that species with narrow distributions in the Andean region probably will suffer more impacts by climate change than species with distributions in lowlands or inter-valley Andean. However, some species with distributions in lowlands or inter-valley Andean exhibit a disperal limitation to occupy these new areas and probably go to extinction in the future.

MEASURING MATRIX CONDUCTANCE FOR FRUIT FEEDING NYMPHALIDS

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Conservation problem or question: Matrix conductance characterizes the ability of organisms to move through non habitat vegetation. The conductance of different types of matrix vegetation, and the relative abundance and location of matrix types and habitat, determines the functional connectivity of landscapes. This study quantified conductance in a variety of vegetation types, information that is crucial for understanding how organisms move through fragmented landscapes.

Research methods: This study evaluated the potential of static trap arrays to measure matrix conductance for a guild of fruit feeding nymphalid butterflies in a post agricultural landscape. Matrix conductance was determined using a mark release recapture method. The study used experimental trap arrays of Van Someren-Rydon traps centered on vegetation borders. Both initial captures and recaptures provided information about matrix conductance.

Relevance to conservation: We can predict that species will move through matrix vegetation types that are structurally similar to habitat vegetation. However, we do not know a priori which structural discontinuities in vegetation represent substantial barriers to organisms. This study evaluated an organismal based definition of matrix conductance and explored new tools for measuring matrix conductance.

POPULATION GENETICS OF THE GIANT ARAPAIMA IN GUYANA

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Conservation problem or question: Arapaima, a CITES Appendix II species, is one of the most important freshwater food fish in Guyana and intense unmanaged harvesting over the last 30 years has reduced the population to less than 3000 individuals. My study evaluated the population genetic structure of Arapaima which is critical for effective management and consequently the long-term survival of Arapaima.

Research methods: I captured live Arapaima from using a 50 m seine and remove a 2x2 cm fin clipping. I then extracted DNA from the fin clippings and PCR-amplified 11 microsatellite loci. I measured with-in population genetic diversity (allelic richness, heterozygosity) and among-population differentiation (FST) using the software Genepop.

Relevance to conservation: The Arapaima population in Guyana has never been studied and is therefore difficult to effectively manage without relevant scientific data. My results will be used to help determine appropriate stocks and rates for harvesting thereby reducing the risk for depletion of genetic variation and consequently decrease the chances of extinction.

ALTERED GENE FLOW FOLLOWING ADAPTATION TO CLIMATE CHANGE

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Conservation problem or question: Gene flow can serve to hinder local adaptation or promote increased adaptive fitness through the spread of alleles between populations. This research predicts an increase in gene flow of adaptive alleles in *Brassica rapa* following rapid evolution in response to climate change.

Research methods: This research will utilize variations in neutral genetic markers, microsatellites, to determine the degree to which gene flow has been altered in two populations of *Brassica rapa* in California following a shift in flowering time in response to climate change.

Relevance to conservation: The results should provide evidence of climate change altering the level of gene flow between two populations. Climate change has already been shown to significantly effect natural populations in distribution and other traits, therefore, an understanding of the effects that climate change can have on the evolutionary processes of populations are important in aiding in the conservation of species.

BULKHEADING AND TERRAPIN NESTING ECOLOGY IN BARNEGAT BAY

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Conservation problem or question: In the past thirty years, the rate of coastal development within Barnegat Bay has been greater than any other mid-Atlantic estuary. Resultant bulkheading limits diamondback terrapin nesting beach access, thus reducing reproductive output. The impacts to terrapin nest beach fidelity, inter-nesting movements, and hatching

success must be quantified to determine the effects of development upon the species within this estuary.

Research methods: Two beaches of high terrapin nesting frequency will contain both an experimentally blocked and reference site. Radio and sonic telemetry will be implemented to measure inter-nesting female spatial habitat use. Sites of oviposition will be recorded to determine fidelity. Hatching success will be recorded. All variables will be associated between 'bulkheaded' and open beach sites through paired comparison analyses.

Relevance to conservation: Studies show that increased turtle nesting habitat availability reduces individual female travel distance and mortality overall. Our previous landscape genetic studies demonstrate nesting beaches of natal fidelity for terrapins within Barnegat. As this is also the area preferred by humans for housing, the impacts of fragmentation by bulkheading must be quantified to best conserve the habitat requirements this species.

AGRICULTURAL IMPACT ON SEX RATIOS OF GROUNDNESTING SONGBIRDS

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Conservation problem or question: My research examines the effects of agricultural management on evolutionary and population processes of ground nesting songbirds, the Savannah Sparrow and the Bobolink, breeding in Vermont. I am exploring how anthropogenic events (hayfield management) affects population sex ratios by performing molecular sex identification of nestlings. Both of these species are declining throughout their range, largely due to agricultural processes.

Research methods: Extraction of avian DNA through blood samples. The extracted DNA is then amplified in a polymerase chain reaction with primers for avian sex determining chromosomes Z and W. The amplified product is processed through gel electrophoresis to generate images that are determinant of sex. The results will then be used to generate a ratio of gender occurrence amongst sample populations.

Relevance to conservation: Population dynamics are integral factors when considering the overall health of a species and its related ecosystem/habitat. The sex ratio is a critical factor influencing population dynamics. If the sex ratios of these species are significantly altered by agricultural activity then conservation action must be taken through adaptive management and policy.

PILGRIM'S PROGRESS: CONSERVATION OF SACRED MOUNTAINS IN ASIA

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Conservation problem or question: I will discuss the changing relationship between pilgrims and sacred mountains, how mountain environments are affected by human traffic, and what methods are being used to conserve ecosystems, religious beliefs, and cultural practices. Determining the connections that link devotion, pilgrimage, sacred mountains, and conservation policy will help establish steps that should be taken to conserve these natural and spiritual monuments.

Research methods: I explored these topics via two case studies: Sagarmatha/Everest in Nepal/China (Tibet) and Mount Kailash in China (Tibet). Through library research and interviews with mountaineers, monks, and conservationists, I assessed the conservation

practices currently employed in the Sagarmatha and Mount Kailash regions, focusing on the role of religious belief in said practices.

Relevance to conservation: The Mount Kailash and Sagarmatha studies have illustrated the effect of mountains upon human spirituality as well as the consequences of human devotion within the natural world. Local communities and religious beliefs must be considered within environmental efforts and policymaking. Conservationists must work carefully to stabilize ecosystems and extant anthropogenic developments without compromising natural or spiritual aspects of the mountains.

A GIS BASED PEST MANAGEMENT IN BLUEBERRY PRODUCTION IN USA

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Conservation problem or question: Blueberries are grown in ecologically sensitive areas in pinelands region of New Jersey. Because of the complex of native and exotic insect species attacks blueberries, growers require pesticide applications to protect crop damage. We propose a Geographic Information System based protocol to reduce pesticide use in farms to protect environment at the same time growing safe fruits without compromising quality.

Research methods: A spatially-based whole farm Integrated crop management program was established in blueberry farms covering 1500 acres of fields. Farms were selected based on three geo-spatial and landscape categories: farms surrounded by forest, open fields or other crops, and other blueberry farms. Insect monitoring device and GIS technologies were used to identify pest's movement in fields to make management decisions.

Relevance to conservation: We observed different pest movement in fields with variable landscape. We found a reduction in the number of insecticide applications in the ICM farms. Reduction in insecticide use increases the abundance of beneficial insects and keeps the environment free from pesticide residue. The results reduced the risk of insect contaminated fruit export from infested region to a non-infested region.